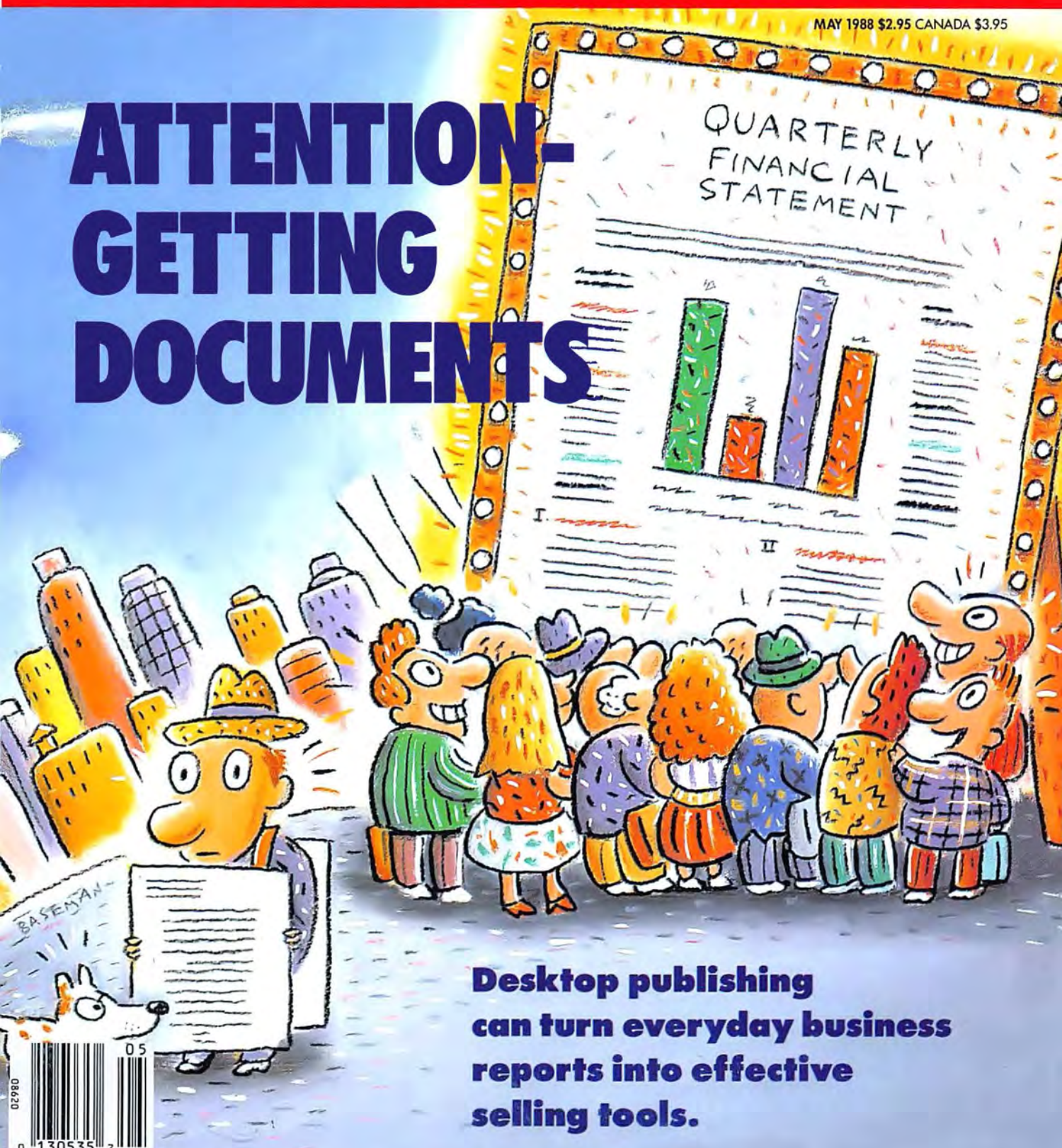
BUYERS' GUIDE: DESKTOP PUBLISHING TOOLS • POSTSCRIPT PRINTERS

PC WORLD

THE BUSINESS MAGAZINE OF PC PRODUCTS AND SOLUTIONS

MAY 1988 $2.95 CANADA $3.95

ATTENTION-GETTING DOCUMENTS



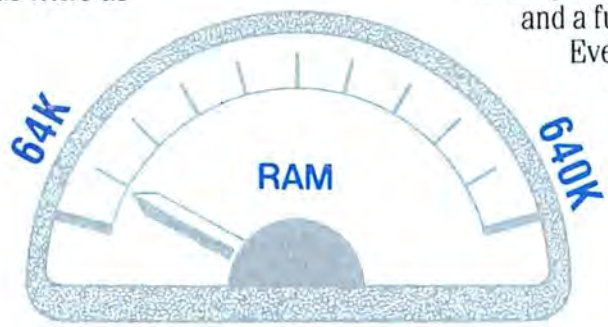
Desktop publishing can turn everyday business reports into effective selling tools.

05
08620
0 130535 7

Lots of software packages help you work,

Moving ahead takes more than hard work, it takes smart work. There are stacks of productivity software you can buy for your PC. But to work smart, you only need one: SideKick® Plus. It's the newest member of Borland's professional series, from the same people who brought you the original SideKick: the program that introduced more than a million PC users to the convenience of using their computer as an organizing tool.

To buy productivity applications like those in SideKick Plus *separately*, you'd spend almost a thousand dollars and drain your computer's memory dry. SideKick Plus takes as little as



SideKick Plus puts you in control . . . for as little as 64K!

64K of your computer's RAM; you decide exactly how much.

You can select just the productivity applications you need. Like a sophisticated telecommunications package, a powerful DOS manager, nine notepads, a versatile outliner, four different calculators, support for both EMS and extended memory. And lots more.

You decide how to use SideKick Plus, too. Put your applications on your hard disk to call up when you need them, or leave them in RAM for instant availability. Either way, they're always at your fingertips. Accessible over any *other* application you're working in. Amazingly affordable. And very, very smart.

Here's What You Get!

- **The PhoneBook:** complete data and voice communications that you can set to take place in the background, with autodialing, an encrypted glossary, and a full Script language. Even if you don't have a modem, it keeps your names, addresses, and phone numbers at your fingertips
- **Outlook: The Outline Processor:** nine Outliners with automatic numbering, tree charts, and table of contents
- **The File Manager:** extended DOS file and directory management
- **The Calculator:** four types: business, scientific, programmer and formula
- **The Clipboard:** for copy-and-paste integration between files and with other applications
- **The Time Planner:** includes a Calendar, Appointment Book, and Schedule window, plus alarms, repeating appointments, and attached agenda. Supports networks via a common calendar
- **The Notepad:** nine file-editor Notepads, up to 11,000 words each
- **The ASCII Table:** to find and paste characters quickly and easily
- **Supports both EMS and extended memory:** if you have expanded memory or the Intel Above™Board, you can load the SideKick Plus desk accessories into expanded memory and leave even more of your conventional memory for your other applications.

Only $199.95
(not copy protected)

60-day money-back guarantee*

For a brochure, the dealer nearest you, or to order
Call (800) 543-7543

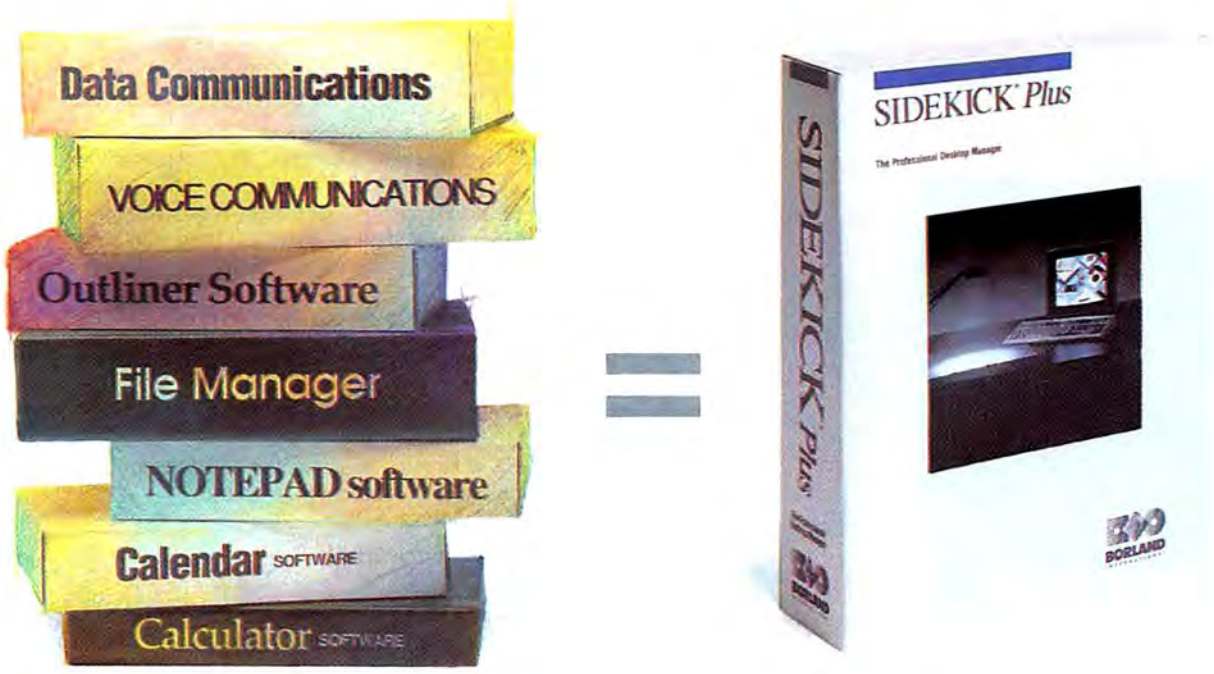
Minimum System Requirements: For IBM PS/2, IBM family of personal computers, and all 100% compatibles. Operating system: PC-DOS (MS-DOS) 2.0 or later. Minimum system memory: 384K bytes. Minimum resident memory size: 64K. Hard disk required.

*Customer satisfaction is our main concern. If within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department and we will arrange a refund.

All Borland products are trademarks or registered trademarks of Borland International, Inc. Other brand and product names are trademarks of their respective holders. Copyright ©1988 Borland International, Inc.

BI 1176

Only one helps you work smarter...



NEW! Announcing SideKick Plus!

$25 Rebate

SideKick Owners: Get a great deal from your dealer and a $25 Rebate from Borland!

$25 Rebate

Go to your favorite retailer for a great deal on new SideKick Plus. And, because you're a SideKick owner, we'll make it an even better deal—with a $25 rebate from Borland! To receive your rebate, you must return your completed SideKick Plus registration form from your manual, a copy of your dated SideKick Plus sales receipt, and this completed coupon to:
Borland International, Dept. PSPR, 4585 Scotts Valley Drive, P.O. Box 660001, Scotts Valley, CA 95066

Name _____

Street _____

City _____ State _____ Zip _____

Phone _____

SideKick Serial No. (*must be included to process rebate*)* _____

PCW/588

Available at your dealer after March 20, 1988.

BORLAND INTERNATIONAL

*If your copy of SideKick does not have a serial number, remove and return the front cover of your SideKick manual.

To take advantage of this rebate you must purchase SideKick Plus by May 31, 1988 and return the rebate request to Borland by July 31, 1988. This offer is good for one rebate per registered copy of SideKick. Not good with any other offer from Borland. Please allow 6 to 8 weeks for delivery of rebate. Offer good in the U.S., and Canada only.

Circle 87 on reader service card

CONTENTS

REVIEW

142 **PostScript Printers' Progress** *Daniel Miles Kehoe*
Until recently, desktop publishers were forced to rely on Apple's LaserWriter family for PostScript laser output. No more—printers from AST, IBM, NEC, QMS, and Qume all generate PostScript output, and most can emulate the HP LaserJet too.

152 **Imaging Becomes Electric** *Richard Jantz*
The hang-up in any desktop publishing scheme occurs when hard copy images can't be easily reproduced with PC software. That's where scanners come in. We evaluate five low-cost devices that turn hard copy into image files readable by programs such as *PageMaker, Ventura Publisher,* and *PC Paintbrush.*

162 **Byline—For Better Business Documents**
Lan Barnes
Everyone agrees that polished business reports command more attention, but who has the time to learn a complicated desktop publishing program? *Byline* makes short work of most documents, and its hooks into *dBASE* make it especially useful for form letters and invoices.

170 **The Hardware Shelf**
Edited by Michael Goodwin and Wes Nihei
Hewlett-Packard turns out a 12-MHz AT clone for power users with expensive tastes; AST's 286 turbo board features hot performance but tough installation and a steep price; NEC improves the MultiSync; plus a high-res monitor with limited support, and a speedy 24-pin printer.

194 **The Software Shelf**
Edited by William Rodarmor and Scott Spanbauer
A powerful desktop publishing package that sets new users adrift; a *1-2-3* clone that slices data in five—count 'em—dimensions; a shareware communications package that rivals commercial brands; plus the *HyperCard* of PC data bases and a better hard disk manager.

OS/2 untamed, page 230

DEPARTMENTS

6 **In This Issue**
PC World introduces its new *Preview* department and explains what it *isn't.*

13 **Top of the News**
Mike Hogan
Tandy lines up software developers behind *Professional DeskMate* and hints at a PS/2 clone; *SideKick* owners get rebates on *SideKick Plus;* Lotus readies a new work-group application; Mac developer Cricket to release new *Windows* software.

21 **David Bunnell**
Reader input is the driving force behind the changes in the new *PC World.*

59 **Letters**
Who were those important people on the cover?

75 **Richard Landry**
Spreadsheet users rejoice—you're looking at the interface of the future.

80 **Next in PC World**

85 **Stewart Alsop**
Who says you can't teach old dogs new tricks?

97 **On IBM**
William F. Zachmann
The truth behind the "early" shipment of OS/2.

105 **Industry Outlook**
Edited by Eric Bender
Ventura stays ahead with help from Big Brother; the scanner market booms; Lotus prepares for the biggest upgrade of all time.

113 **Two-Fisted Management**
Mark Marek
Pendly learns the meaning of "team effort."

118 **Product Outlook**
Mike Hogan
Three new laptops from Zenith, a full-page display from NEC, and two new entries in the VGA game.

May 1988

Volume 6, Number 5

FEATURE

218 **Is Desktop Publishing Worth the Effort?**
Marina Hirsch
Users say yes—desktop publishing provides a competitive edge by slicing production costs, shortening lead times, and improving document quality. But be prepared to hit a few snags.

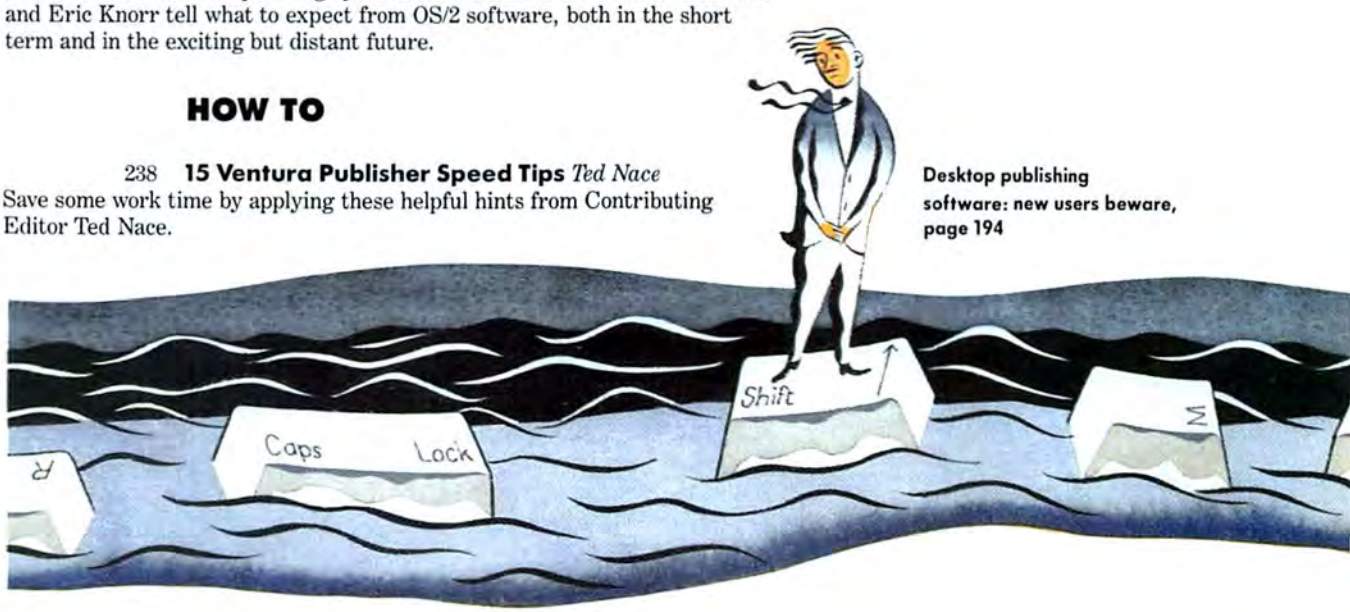
222 **Buyers' Guide: Ventura Publisher and PageMaker Tools** *Scott Spanbauer*
Here's a compendium of templates, style sheets, clip art, graphics tools, fonts, and utilities for the two most popular PC desktop publishing packages.

230 **OS/2 in Transition** *Michael Goodwin and Eric Knorr*
The first OS/2 applications to arrive on the scene are simple look-alikes of their DOS cousins. But these first steps don't even hint at what's in store for this controversial new operating system. *PC World* editors Michael Goodwin and Eric Knorr tell what to expect from OS/2 software, both in the short term and in the exciting but distant future.

PostScript printers built for the PC, page 142

HOW TO

238 **15 Ventura Publisher Speed Tips** *Ted Nace*
Save some work time by applying these helpful hints from Contributing Editor Ted Nace.



Desktop publishing software: new users beware, page 194

124 **Briefly Noted**

128 **Update**
More power, LAN support, and improved speed grace *Q&A 3.0*.

134 **Preview**
PC World's newest department offers first glimpses of *1-2-3* release 3 and *WordPerfect 5.0*.

247 **Consumer Watch**
Anita Amirrezvani
Tips on securing your PC investment.

255 **The Upgrade Path**
Edited by Robert Luhn
Get the lead out of the PS/2 Model 50.

263 **The Help Screen**
Karl Koessel
How to decipher PC sales talk.

271 **Star-Dot-Star**
Edited by Tom Swan
Batch files for each day of the week and data entry screens for *WordStar*.

277 **PC World Catalog**
A convenient buying guide to PC products and services.

294 **Products Featured in This Issue**
More information for *PC World* readers.

295 **Advertiser Index**

310 **Another Angle**
Steve Bass
IBM beware: Sometimes enlightenment is a two-by-four between the eyes.

Cover illustration by Gary Baseman

PC WORLD

David Bunnell
Editor-in-Chief

Jacqueline Poitier
Director/Art & Design

Richard Landry
Editor

Skip Johnston
Art Director

Editorial
Managing Editor: Ed Bott
Senior Editors: Eric Knorr, Robert Luhn
News Editor: Mike Hogan (213/312-8041)
East Coast Editor: Eric Bender (617/574-9321)
Technical Editor: Karl Koessel
Associate Editors: Anita Amirrezvani, Michael Goodwin
Production Editor: Cynthia Brown
Senior Copy Editor: Tema Goodwin
Editorial Mgr.: Gina Vanlue
Assistant Editors: Rex Farrance (New Products), Marlene Nesary, Wesley Nihei, William Rodarmor, Scott Spanbauer
Copy Editors: Barbara Lewis, Peggy Nauts, Dan Tynan, Sally Zahner
Editorial Assistant: Otto Waldorf
Administrative Assistant: Nancy Endy
Contributing Editors: Stewart Alsop, Stephen A. Blumenthal, Eric Brown, Robert M. Carr, Steven Cook, Dennis Dykstra, Judy Getts, Ken Greenberg, Richard Jantz, Ted Nace, Charles Rundgren, Art Wilcox, William F. Zachmann
National Software Testing Laboratories (NSTL): Michael D. Stern (President), Lawrence D. Goldstein (Director of Operations), Jim Hurd (Technical Director), Charles Vogt (Technical Engineer), Mindy Klein (Communications Mgr.), Vicki Weiss (Director of Marketing)

Harry Miller
Corporate Editor

Karen Wickre
Editorial Administrator

Art and Design
Acting Associate Art Director: Dennis McLeod
Assistant Art Director: Donna Sharee
Senior Design Associates: Rick Binger, Liz Miranda
Design Associate: Barbara Adamson
Assistant to the Director: Jon Christianson

Production
Director: Herbert Linden
Senior Production Mgr.: Linda Manes
Editorial Production Mgr.: Ellyn L. Hament
Production Editor: Susan M. Ford
Lead Typesetter: Mark L. Duran
Typesetters: Barbara Tannenbaum, Virginia Weir
Assistant Production Mgr.: MaryAnn DePietro
Advertising Booking Coordinator: Rosanne Reynoso
Advertising Billing Coordinator: Kevin Greene
Production Assistant: Katie Scott

John Griffin
Publication Director

Margaret O'Reilly
Publisher

Advertising Sales & Marketing
Northwest: Sharon Van Leuven (Western Advertising Mgr.) (415/243-0500)
Northern California (San Francisco): Natalie Wood (415/243-0500)
Northern California (San Jose): (415/243-0500)
Southern California (Los Angeles): Vivian Ritondale (Southwest Advertising Mgr.) (213/312-8008)
Southern California (Orange County): Lilly McFadden (213/312-8008)
Southern California (San Diego/Southwest): Christine Kopec
Texas: Jennifer Walker (214/233-3492)
New England (Boston): Bob Ostrow (617/879-0700)
Midwest (N. Chicago): Robert Diftler (312/827-4477)
Eastern Midwest (S. Chicago): Jill Burrow (312/826-4477)
Manhattan: Jeff Edman (Eastern Advertising Mgr.) (201/967-1350)
Mid-Atlantic: Steve Lincoln (201/967-1350)
Southeast (Atlanta): Judy Sutter (404/394-0758)
PC World Catalog: Eric Cressy, Deborah Tarantino, Carol Watson

Circulation
Circulation Mgr.: Jeff Ente
Circulation Business Mgr.: Gail Egbert
Single Copy Sales Mgr.: George Clark
Single Copy Sales Rep.: Martin Garchar
Promotion Coordinator: Billie Brownell
Fulfillment Mgr.: Debbie Winders
Fulfillment Coordinator: Doug Norde

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

Corporate Development
Publicist: Shirley Gines
Special Projects: Jeffrey S. Glines
Administrative Assistants: Emily Bower, Cathleen Brennan

Administration
Chief Administrative Officer: Herbert Linden
Director of Human Resources: Janet D. McGinnis
Accounting Mgr.: Pat Murphy
Admin. Services Mgr.: Joseph Wollenweber
Employee Relations Mgr.: Shelly Ginenthal
Technical Mgr.: Nancy Canning
Training Mgr.: John Knight
Assistant to the President: Christina W. Spence

Corporate
PCW Communications, Inc.

David Bunnell
Chairman

Bartlett R. Rhoades
President & CEO

John Griffin
Vice President

Herbert Linden
Vice President

James E. Martin
Vice President

Jacqueline Poitier
Vice President

Cheryl Woodard
Vice President

Andrew Fluegelman
1943-1985
Founding Editor

PC World™ (ISSN 0737-8939) is published monthly at $29.90 for one year (12 issues), $59.80 for two years (24 issues), $89.70 for three years (36 issues) by PCW Communications, Inc., 501 Second St., San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add $18 per year for Canada and Mexico; add $25 per year for surface mail or $110 per year for airmail for all other countries. **Subscriber service questions call toll-free 800/525-0643 (in Colorado 303/447-9330) or write: Subscriber Services, P.O. Box 55029, Boulder, CO 80322-5029. To place new orders call 800/642-9606.** Second-class postage paid at San Francisco and additional mailing offices. POSTMASTER: Send address changes to *PC World*, Subscription Dept., P.O. Box 55029, Boulder, CO 80323-5029. Editorial and business offices: 501 Second St., San Francisco, CA 94107. 415/243-0500; CompuServe 74055,412; The Source STE908; MCI Mail PCWORLD/179-3813. *PC World*™ is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp.

Copyright © 1988, PCW Communications, Inc. All rights reserved. The following are trademarks of PCW Communications, Inc.: PC World View, *.*, PC World.

PC World is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the *IDG News Service* offering the latest on domestic and international computer news.

Introducing Paradox 386. Optimized for 386 environments and up to 5 times faster than Paradox 2.0

Designed exclusively for 80386-based systems, Paradox® 386 runs up to 5 times faster than Paradox 2.0. It's that much faster because it accesses your full linear address space, which in English means it uses all the memory you or your company paid for when you put together your 386 systems.

With Paradox 386, the old 640K limits are a thing of the past.

It runs in the DOS environment and is a modern must for power users confronted with very large tables (tens of thousands of records or more) and/or large applications. Paradox 386 makes more ambitious mainframe-type applications feasible on the PC because it addresses up to 16 megabytes of memory.

But back to speed. Paradox processes data 32 bits at a time instead of just 16 bits at a time, so you race rather than run.

Paradox 2.0 and 386. The same but different

Paradox 386 gives you all the functionality, power, and flexibility that earned Paradox the Software Digest top-rating for PC relational databases.* Like Paradox 2.0, the all-new Paradox 386 gives you the speed and power to:

- Query multiple tables simultaneously
- Use an unlimited number of selection criteria
- Do pattern matches and relational operations on tables with up to 2 billion records

And Paradox 386 makes fast work of big operations like:

- Retrieving data with large single or multi-table queries
- Paging through screens of information as you view large tables
- Sorting tables with several thousand records
- Developing applications with the Paradox Personal Programmer 386
- Running large memory-intensive applications

Paradox 386 also lets you share data on local area networks with workstations running different network versions of Paradox.

Make the most of your fast new 386 hardware with our fast new 386 software

Get up to speed with Paradox 386. Your 386-based system has the racing engine, Paradox 386 is the racing fuel.

For information on upgrading from Paradox 2.0 to 386, call (800) 543-7543.

Works with the Intel® Inboard™

*60-Day Money-back Guarantee***

For the dealer nearest you or a brochure, call (800) 543-7543

BORLAND INTERNATIONAL

Circle 88 on reader service card

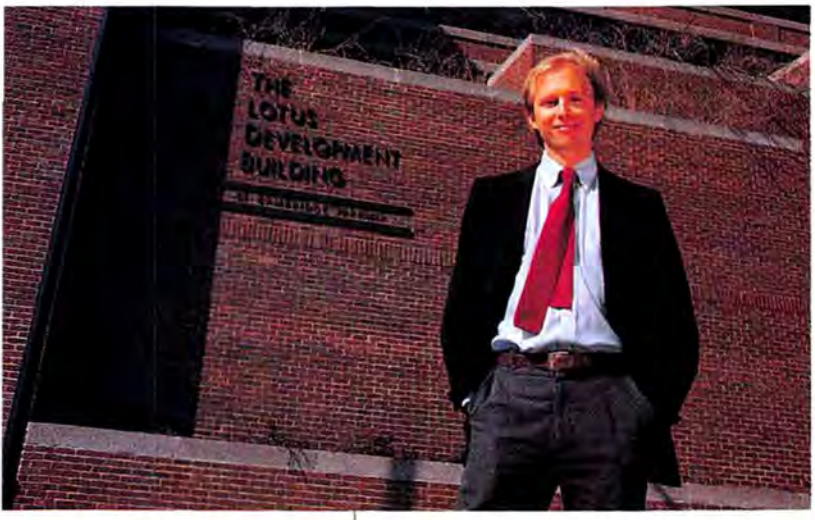
*Software Digest Ratings Report, March 1986, July 1987.

**Customer satisfaction is our main concern. If within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department, and we will arrange a refund.

Paradox is a registered trademark of Ansa Software. Ansa is a Borland International company. Other brand and product names are trademarks of their respective holders.
Copyright ©1988 Borland International, Inc.

BI 1203A

Coming Attractions



MALCOLM HARVEY

Eric Bender, East Coast editor

There's a new section in *PC World*, and you'll find it right between *Product Outlook* and the beginning of our full-scale reviews. That placement is no accident. Our two-page *Previews* are intended to give you essential information about important new products as soon as they're released—and before our formal review is completed. Each *Preview* will give you a hands-on description, with the spotlight on features. Evaluations? Performance tests? You'll still find those only where they belong, in our full-fledged reviews.

Our first *Preview*, "1-2-3 Enters the Third Dimension," was written by Eric Bender, whose responsibilities also include editing *Industry Outlook*. It wasn't hard to get a photo of Bender in front of Lotus Development Corporation's headquarters in Cambridge, Massachusetts. In good weather he just walks over from his office. The Boston-based editor has covered the Lotus beat since *1-2-3* release 1 debuted five years ago—for the past two years as East Coast editor of *PC World*. We asked Bender to tell us what to expect in a *Preview*.

"A *Preview*," he explains, "is a short look at an upcoming product of unusual interest. It is *not* a review. We'll examine prerelease and beta versions, bugs and all, which are usually a little different from what you'll be able to buy. We can touch it, poke it, and try it out—and when we're done, tell you how it looks and feels."

1-2-3 release 3 promises to be the largest single upgrade in PC history. According to Bender, Lotus has beefed up the graphics, data base, and worksheet consolidation features of *1-2-3* and made the program easier to use. Should the 3½ million registered users of *1-2-3* take the upgrade path? We'll give you all the answers you need—*after* we've given release 3 an exhaustive evaluation.

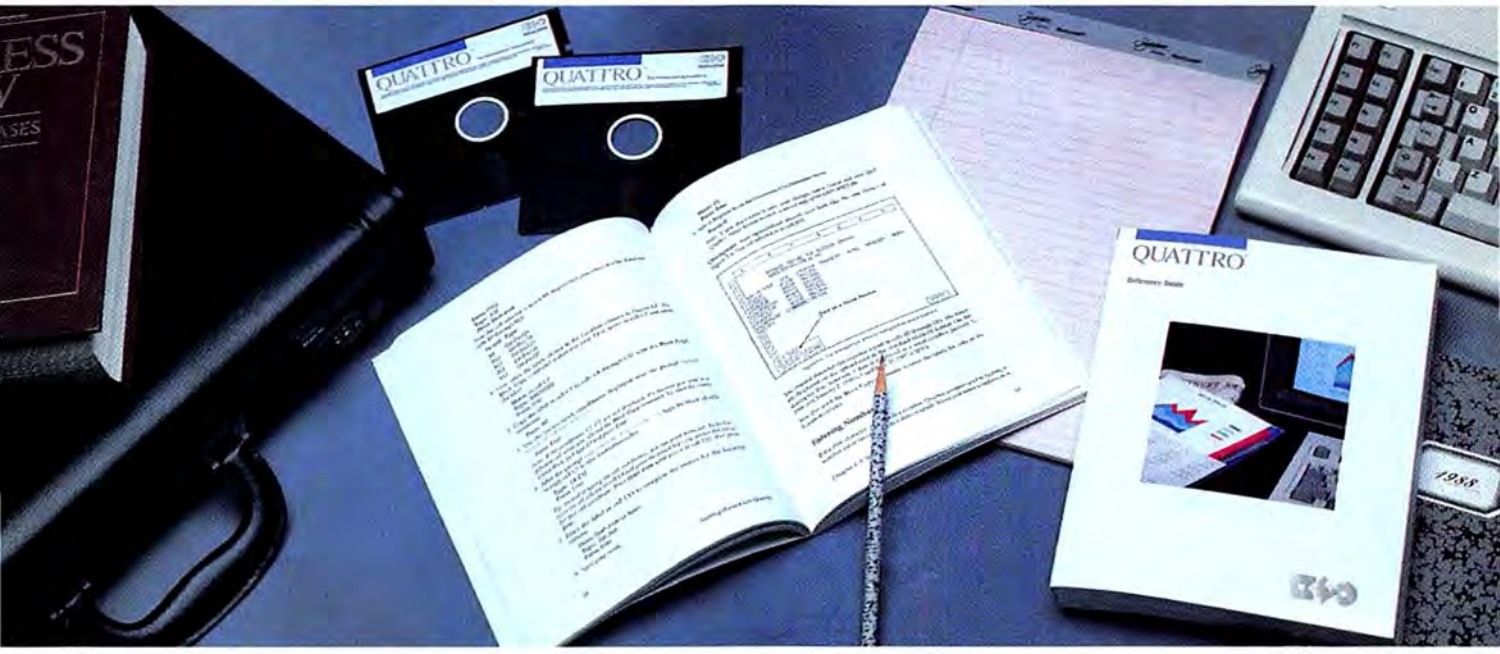
Also in this issue, we tell you what you can *really* expect from OS/2. Ralph Blodgett ("WordPerfect Desktop Publisher") previews version 5.0 of the world's most popular word processing program. Daniel Miles Kehoe ("PostScript Printers' Progress") evaluates five printers designed to bring the benefits of Adobe's page-description language to the MS-DOS world. Need to bring graphics images into your documents? Richard Jantz ("Imaging Becomes Electric") explores five desktop scanners that make it possible. Marina Hirsch ("Is Desktop Publishing Worth the Effort?") went looking for DTP success stories—and came back with some notable ones. We've got 15 tips for supercharging your *Ventura Publisher* sessions, and we've rounded up more than 50 tools to help you make better-looking pages. And of course, you'll find more exclusive test reports from National Software Testing Laboratories. ●

Ed Bott

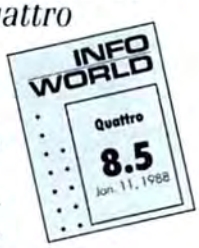
Ed Bott
Managing Editor

"Those who are considering purchasing 1-2-3 will be better off with Quattro"

—John Walkenbach, InfoWorld



Here's what InfoWorld had to say about Quattro



"There are some clear advantages in choosing Quattro over the 1-2-3 of today: easier installation, no copy protection, improved speed, much better macros, excellent graphics, a customizable command interface, and direct compatibility with industry standard file formats. If cost is a factor, you can get five copies of Quattro for the same money that would buy two 1-2-3 packages."

Quattro includes SQZ!™ Plus data compression

A special implementation of SQZ! Plus, the spreadsheet file compression utility, is built into Quattro and comes to you absolutely free. SQZ! Plus for Quattro automatically compacts and expands Quattro spreadsheets by up to 95% during file saving and retrieving.

Reprinted with permission from InfoWorld.
*Customer satisfaction is our main concern. If within 60 days of purchase this product does not perform in accordance with our claims, call our customer service department, and we will arrange a refund.
All Borland products are trademarks or registered trademarks of Borland International, Inc. SQZ! is a registered trademark of Symantec Corp./Turner Hall Publishing division. Other brand and product names are trademarks of their respective holders. Copyright ©1988 Borland International, Inc. B-12/2A

Features: Improving the industry standard

"Quattro takes the industry standard and improves upon it in the areas that count most. It addresses many of the weaknesses of 1-2-3 and adds quite a few of its own unique touches."

"Perhaps Quattro's main advantage over most other spreadsheets is its minimal recalculation capability. When you make a change in your spreadsheet, only affected cells are recalculated, greatly speeding things up in most cases."

"Other Quattro features that improve upon the 1-2-3 standard include auto-record macros, vastly superior graphics, and easy installation."

Performance: Markedly superior to 1-2-3

"Our benchmark tests show Quattro markedly superior to 1-2-3 in file saves and retrieves."

"Quattro's graphics are a sight to behold."

"Quattro makes working with macros practically painless. If you're into complex 1-2-3 macros, the debugging feature alone is good reason to make the switch to Quattro."

"No one can argue that Quattro is anything less than an excellent spreadsheet value."

Excerpts from John Walkenbach's review of Quattro™ in InfoWorld, January 11, 1988.

60-Day Money-back Guarantee*
Includes 3½" and 5¼" disks.

For the dealer nearest you or a brochure call (800) 543-7543

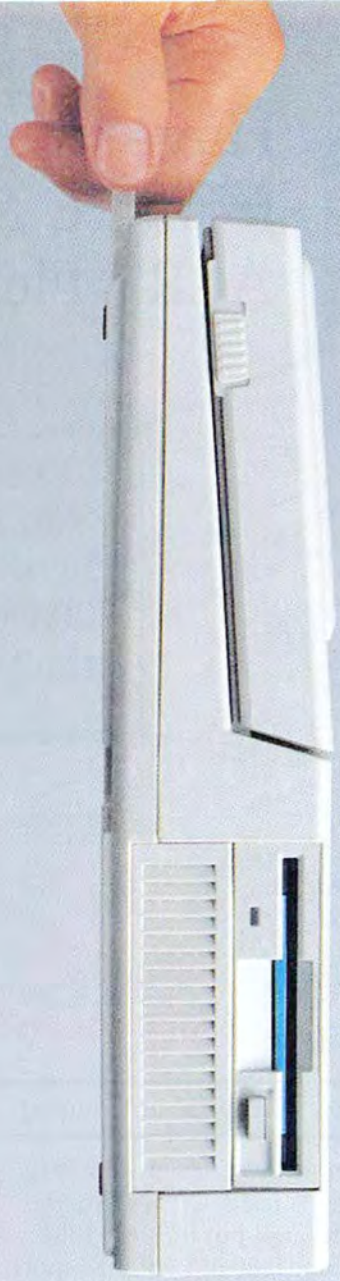
BORLAND INTERNATIONAL

Circle 21 on reader service card

Maxell Corporation of America, 22-08 Route 208, Fair Lawn, NJ 074

Never before has this level of Reliability
and Durability been available in floppy disks.
Introducing the new RD Series from Maxell.
Twice the durability of the disks you're now using.
Twice the resistance to dust and dirt.
And the RD Series is ten times more reliable
than conventional floppy disks.
The Gold Standard has always meant maximum
safety for your data. Now it means even more.

maxell®
THE GOLD STANDARD



We're Making A Small Case For The Hard Disk.

The industry said it couldn't be done. You can't put a hard disk in a portable PC, make it powerful, and keep it under 11 lbs.

Well, with that challenge in mind, we immediately went to work to prove them wrong. Presenting the results. The new T1200.

With a footprint of only one square foot, it comes with a 20MB hard disk, one 720KB 3½″ diskette drive, 1MB of RAM, MS-DOS® 3.2, and Borland Sidekick™ software. So you get desktop PC features, with the performance of a powerful PC-compatible 80C86 processor, running at 9.54 MHz.

But that's not all. Take a look around back. There you'll find more ports than the California coastline. One for everything including parallel, serial, RGB and monochrome monitors, 5¼″ floppy disk drive and numeric keypad.

The T1200 is easy to face, too. With its new supertwist LCD screen and a full-size keyboard. But better still, thanks to its removable, rechargeable battery, you can keep computing wherever you go.

Just call 1-800-457-7777 for your nearest Toshiba dealer and ask him to show you the new T1200.

Before they all get carried away.

In Touch with Tomorrow

TOSHIBA

Toshiba America, Inc., Information Systems Division

The T1200 is backed by the Exceptional Care program. One time enrollment required. See your dealer for details. MS-DOS is a registered trademark of Microsoft Corporation. Sidekick is a trademark of Borland International, Inc.

Have you read the latest from PC Magazine about ALR's FlexCache 386?

PC MAGAZINE FACT FILE

ALR FlexCache 20386
Advanced Logic Research Inc.
10 Chrysler
Irvine, CA 92718
(714) 581-6770
List Price: $7,495
In Short: Even Compaq's Deskpro 386/20 eats the dust made by the ALR FlexCache 20386 as it screams down the DOS highway at 20 MHz embedded in a 32K static-RAM cache, 2MB of zero-wait-state memory, and a 150MB ESDI-controlled high-performance disk.

CIRCLE 449 ON READER SERVICE CARD

"Even Compaq's DeskPro 386/20 eats the dust made by the ALR FlexCache 20386 as it screams down the DOS highway..."
PC Magazine, March 15, 1988

Compatible
Novell, DOS 3.X,
SCO Xenix 386, OS/2
Software

A Philosopy of Value

At Advanced Logic Research (ALR) the philosophy of getting more for your money has become a tradition. A tradition recognized by a long line of excellent reviews from all the major trade journals. FlexCache 386 Series is based on the ALR 386/220, PC Magazine's choice as "The Best of 1987". Now the fastest PCs available, the FlexCache Series approach mini-computer performance and offer you the most for your money.

FlexCache dual bus architecture separates the standard 8MHz peripheral bus from the high-speed memory bus. This permits access at the 16MHz or 20MHz CPU clock rate. By keeping frequently used data close at hand, the cache memory controller eliminates wait states 95% of the time. Since 90% of all data transfers relate to the data bus, long delays in computations disappear.

Faster Than IBM or Compaq

This innovative design allows for up to 60% faster CPU/memory data through-put than the IBM PS/2 model 80-071 with the much touted microchannel. And the FlexCache 20MHz CPU "...consistently lays down a coating of dust on Compaq's IBM-basher."
-Compaq DeskPro 386/20.

Balanced System/ Fast Disk

Full track data transferring (1:1 interleave) plus ESDI look-ahead buffering, allow FlexCache 386 systems to turn what used to be a data bottleneck into a super high-speed corridor. Compaq wants you to pay $7490 for their DeskPro 386/20 model 60 with a 60MB hard disk. But for the same price you can get ALR's FlexCache 20386 model 150 with a 150MB hard disk and 200% faster transfer rate.

Room to Grow

The minicomputer-style chassis of the FlexCache 20386 offers space for five internal devices, allowing more data storage than any other PC available.

For the name of the ALR dealer nearest you call:

1-800-366-2574

Advanced Logic Research, Inc.
10 Chrysler, Irvine, CA 92718
Phone: 714-581-6770 FAX: 714-581-9240
Telex: 510-601-4525
Answer back Advanced Logic

FlexCache 16386 and FlexCache 20386 are trademarks of Advanced Logic Research, Inc. Compaq DeskPro 386 & 386/20 are trademarks of Compaq Computer Corp. IBM PS/2 is a trademark of International Business Machines, Inc. Prices and configurations are subject to change without notice.

End users: Circle 128 on reader service card **Dealers: Circle 129 on reader service card**

Compatible with Windows 386 and OS/2

Where two worlds become one

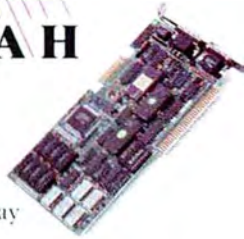
You have the best of both worlds with SigmaVGA/H. One display adapter that gives your PC/XT/AT the power to display any standard software written for the IBM PC or the PS/2.

From the PC World–Everything the Best EGA Board Offers, And More
Start with 100% hardware compatible EGA, CGA, MDA, and Hercules. SigmaVGA/H supports all the standards including digital monitors and 132-column text mode. So you can run all the PC software you own, *including Windows 386.*

From the PS/2 World–Everything That IBM's VGA Offers, And More
Continue with 100% hardware compatibility for VGA. Better yet, run VGA, EGA, CGA, MDA, and Hercules all on the new analog monitor. SigmaVGA/H gives you the power to run all the new PS/2 software, *including OS/2.*

For Your World–One Graphics Board Built on the Experience of 400,000
Sigma Designs introduced the first VGA board, and has sold over 400,000 VGA and EGA adapters to date. We know that informed customers will make the right decision. So get the facts straight from the people who wrote the book, "VGA Issues and Answers." To get your free copy or to find out more about SigmaVGA/H, call us at (415) 770-0100.

SIGMA VGA H



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

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

Trademarks: SigmaVGA/H is a trademark of Sigma Designs, Inc.; VGA, EGA, CGA, MDA: International Business Machines Corporation; Hercules: Hercules Computer Technology; Windows 386: Microsoft Corporation.

Circle 97 on reader service card

New! From America's #1 Financial Adviser

Sylvia Porter's Your Personal Investment Manager.™ Designed for Everyone.

Smart enough for experienced investors and computer users, yet easy enough for beginners.

Includes free customer technical support.

Designed by Sylvia Porter and the Editors of *Sylvia Porter's Personal Finance Magazine,* this program combines portfolio management with powerful graphics, communications, and analysis capabilities, enabling you to completely manage your investments—*at a price you can afford.*

Advanced window capability allows you to view information on any transaction—as the need occurs—without leaving the section you're working in. And, with our new Quick-Start Mini-Manual, you'll be up and running in less than one hour—*at any level.*

And, because you can transfer data directly from LOTUS or ASCII files, you need to enter your data only once.

Look at these features:

- **Manage Your Investment Transactions.** Organizes, classifies, and maintains all the important data on your investment transactions—stocks, bonds, mutual funds, options, indexes, commodities, money market accounts, and much more.
- **Tracks and Automatically Updates Your Investments From Multiple Portfolios.** And, maintains full financial profiles on individual companies.
- **Alerts You to Investment Deadline Dates.**
- **Monitors Your Taxes.** And, generates year-end interest and dividend, gain and loss reports.
- **Telecommunications Access to On-line Database Services:**** Automatically updates your investments using Dow Jones, CompuServe, and Warners.*
- **Unique Graphic & Charting Capabilities.** Create bar, pie, high/low/close price, volume, relative strength, comparison charts, & more—up to 520 periods.

This program also includes:

- **Separate manuals for *basic* and *advanced* investors.**
- **Investment Strategies**
- **Fundamental and Technical Analyzers**
- **SwiftKeys.™** Press a key & get a summary of your current holdings, or your own "hot list" of securities.

> "...More geared than other investment packages to analyzing as well as tracking investments."
>
> **Newsday**

> "...Excels in its number of preformatted reports. The manual is informative and complete."
>
> **PC Magazine**
>
> "Excellent reporting."
>
> **Computer Executive Weekly**

- **The Sideways Option.** Prints all your reports sideways.
- **Your Customized Report Writer.** *You* specify and print any report you want—tailored to fit your needs.

Each Program Includes
Free from Dow Jones
1 Hour of Prime Time
(Value Over $120)

For IBM PC, Tandy,* and compatible 512K computers. Suggested Retail Price **$149.95**

Get the complete Sylvia Porter Personal Finance Series:

- YOUR PERSONAL FINANCIAL PLANNER™—All the tools you'll need to completely manage & plan your finances. ($99.95).

At your favorite dealer today! Or call Timeworks direct at **312/948-9202**

TIMEWORKS PLATINUM SERIES™

Timeworks, Inc., 444 Lake Cook Road
Deerfield, Illinois 60015
312/948-9200

**Phone Modem Required *Reg. Trademarks of their respective companies

©1987 Sylvia Porter's Personal Finance Magazine Co. & Timeworks, Inc.

Circle 151 on reader service card

Tandy Turns DeskMate Into Operating Environment

Opens Up Graphic User Interface to Developers

Tandy Corporation has announced that it will open up the interface of its *DeskMate* desktop all-in-one utility package to other software publishers for use as a low-end operating environment. The product, which has been shipping since 1984 and has an installed base of more than 1 million, was converted to offer a graphic user interface last summer when a network version was introduced. Software publishers who opt for the pulldown menus and pop-up dialog boxes of the new *DeskMate*'s graphic user interface are virtually guaranteed a target market of approximately 500,000 PC users. That's how many copies of *Personal DeskMate 2* and the network-oriented *Professional DeskMate* Tandy plans to ship free with various computer models in 1988. Tandy will also sell both versions through its 7000 Radio Shack stores and franchised dealers. Ed Juge, Tandy's director of market planning, speculates that as many as 1 million copies could ship next year. While *DeskMate* does not support multitasking, it is possible to transfer data from one application to another using its clipboard. Unlike *Microsoft Windows* and other more ambitious environments, *DeskMate* can run comfortably on floppy-based 8088 or 8086 computers with only a 100K overhead, Tandy says. Among early backers is Symantec, which will redesign its *Q&A* file manager for this environment.

Tandy Ponders a PS/2 Clone

Could Be the First Micro Channel Compatible

Tandy Corporation will be the first to ship a computer compatible with IBM's Micro Channel–equipped PS/2s, according to press reports. Expected to ship this summer, the product may provide the first test of IBM's willingness to let another vendor duplicate the functionality of its patented Micro Channel Architecture. A key issue is whether Tandy's cross-licensing agreements with IBM will protect a functionally equivalent but independently developed PS/2 design. Tandy's Juge won't reveal the specifics of those agreements but says that "the legal issue is a nonissue for us." He admits that his company is "looking at" MCA designs and will release one "when and if our customer base demands it." An IBM spokesperson, who points out that as much as 80 percent of PS/2 technology is proprietary, would not comment on the cross-licenses with Tandy. He added that IBM has "cross-licenses with many companies in the industry," which means that Tandy may not be the only company with this opportunity.

SideKick Plus Debuts With Promotions

Current Customers Will Get Cash Rebates

Borland International has announced several promotions to get its new expanded-memory version of *SideKick* off to a fast start. Current registered users of the landmark desktop accessory package who purchase the $199.95 *SideKick Plus* before May 31 will receive a $35 rebate if they send proof of purchase and the package coupon to Borland by July 31. Nonregistered users who can prove by the serial number or other means that they own a copy of *SideKick* can get a rebate of $25. In addition, Intel Personal Computer Enhancement Operation will send a free copy of *SideKick Plus* to buyers of its AboveBoard expanded memory board through August 31. *SideKick Plus* is designed to keep its much-enhanced set of desktop utilities in expanded memory (or extended memory on a 386 system), with only its 70K program kernel in conventional memory. Those who lack such memory or want to run *SideKick Plus* on a laptop can configure "satisfactory" versions of the program to run in as little as 128K, maintains Borland president Philippe Kahn. But the full complement of *SideKick* utilities requires 384K of memory (see "Borland Ships SideKick Plus," *Top of the News, PCW,* February 1988). Borland anticipates that up to 100,000 of the current 1 million or so *SideKick* users will take advantage of its *SideKick Plus* rebate promotion. Borland will continue to market the original *SideKick* at $84.95.

CD ROM Industry Develops Slowly

Plenty of Hardware Still Waiting for Software

As the infant CD ROM industry tries to ignite smoldering sales, vendors are firming up design standards and unveiling plenty of hardware, but only a smattering of nonspecialized software is emerging. The two most significant horizontal software packages announced at Microsoft's annual CD ROM conference in March came from the sponsor itself—a $149 *Small Business Consultant* data base of government publications on how to start and run a small business, and a $125 *Stat Pack* compilation of official U.S. government facts and figures on business-related topics. Software developers were encouraged by the entry of Apple Computer's long-awaited CD ROM platform, although its $1200 price tag was disappointing. Also, CD ROM text and graphics file format standards are all but settled, and General Electric has improved its Digital Video Interactive (DVI) system, which adds 72 minutes of video and sound to the standard CD ROM's text and graphics. GE is delivering prototype application development systems for DVI, which was endorsed by Lotus, Intel, and Microsoft. On the distribution front, Egghead Software and Tandy Corporation announced plans to sell CD ROM players and software. Tandy won't stock CD ROM hardware but will offer a $995 Hitachi drive through its Express Order system. Analysts anticipate a slow year for CD ROM sales, with an explosion next year on the way to a $2.25 billion industry by 1991.

Lotus Writing Notes for Itself

Software Designed to Enhance Work-Group Productivity

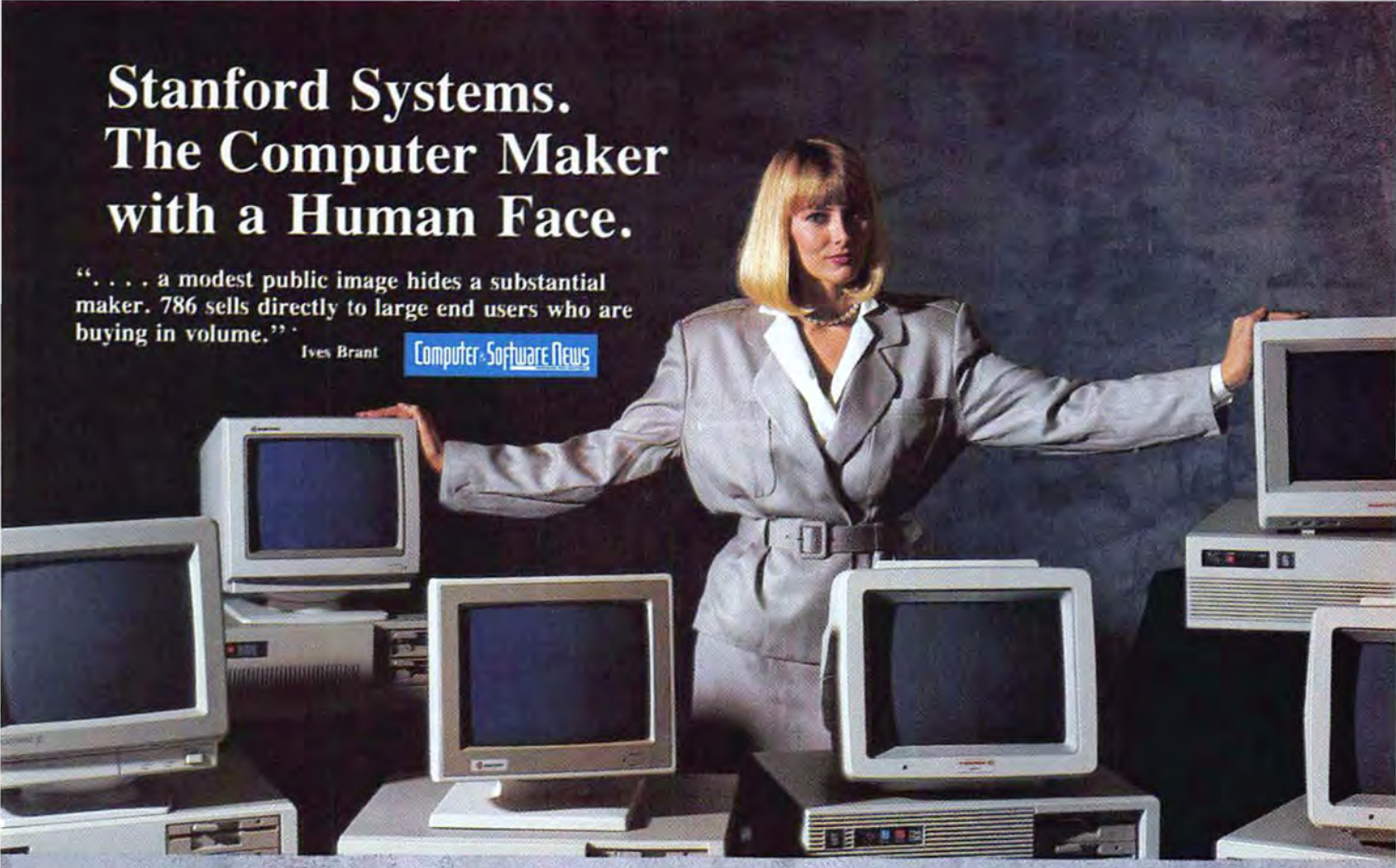
Lotus is preparing a group productivity tool code-named *Notes* that lets co-workers share documents and graphics across local area and wide area networks. *Notes* is intended as a vehicle to enable a wide range of knowledge workers to share their ideas and comments on projects. The package acts as a cooperative document-editing tool that records all input. Several large companies and about 200 Lotus employees have put *Notes* to a variety of uses, including tracking the product's own development. The software gathers and archives input from multiple departments, pulling together material for large-scale brainstorming. Action items are suggested and then tested against the reactions of corporate reviewers. Project members don't have to meet as often when they can interact this way, Lotus says. Other beta uses include the maintenance of many different market research reports in a single data base and the tracking of hundreds of Lotus business opportunities. In this last job, "a whole layer of intermediaries, information filterers, and routers disappears from the process, and the decision makers are connected more directly and actively to key pieces of information," claims Lotus chairman Jim Manzi. Requiring OS/2's Presentation Manager, *Notes* won't ship this year.

Xerox and Cricket Launch Graphics Products

Bringing Mac Market Leaders to PCs

Xerox Corporation, which has prospered in the desktop publishing market with exclusive marketing rights to *Ventura Publisher*, has inked a similar deal for the DOS and OS/2 versions of best-selling graphics packages from Macintosh developer Cricket Software. Xerox releases of *Presents*, *Draw*, and *Graph*, due before midyear, will be counterparts to Cricket's Macintosh programs of the same names and run under the OS/2 Presentation Manager or under *Microsoft Windows* in DOS-based systems. *Presents* can create, manage, and manipulate computer-generated desktop presentations for output to screen, 35mm slides, or overhead transparencies. It includes a text generator for word slides and accepts graph files from *1-2-3*. *Draw* and *Graph*, which have been Mac market best-sellers for more than a year, can work with *Presents* or as stand-alone products, and can enhance documents created with *Ventura Publisher*. The new Xerox versions are among a number of applications that support compatible files across the DOS, OS/2, and Macintosh environments. Even though the Xerox products run under *Windows*, they also can exchange files with the *GEM*-based *Ventura Publisher*. Pricing and delivery have not been announced. Market researcher Desktop Presentations predicts that sales of presentation graphics products will grow 24 percent a year.

Stanford Systems. The Computer Maker with a Human Face.



"....a modest public image hides a substantial maker. 786 sells directly to large end users who are buying in volume."
Ives Brant — Computer+Software News

SYSTEMS

Basic System Features

HD/FD Controller • 1.2 MB floppy drive • Serial port (Com 1) and parallel port • Optional 2nd serial port (Com 2) & optional game port • 200 Watt P/S • High quality metal case • Hardware reset switch and turbo L.E.D. • Optional digital L.E.D. • Clock/calendar w/ battery back-up • Complete documentation • Enhanced keyboard (101 keys) • Heavy duty packaging.

Stanford 386–20

9/20 MHz 23 MHz Throughput

Intel true 32 Bit 80386-20 CPU (20 MHz) 9/20 MHz software (keyboard) switchable clock • CMOS memory, 16 channel Interrupt, 7 DMA channels • RAM can be expanded to 16.5 MB of 32 bit high speed interleaved memory • 2–32 bit, 4–16 bit and 2–8 bit expansion slots • Supports 80387-20 and/or 80387-16 Math co-processors • Award BIOS Ver. 3.03, all set up utilities are programmed in ROM • (Phoenix BIOS optional) • Plus basic system features.

$2299*

Stanford 386–18

9/18 MHz 21 MHz Throughput

Same configuration as in system 386–20 except: intel true 32 bit 80386-16 CPU • Plus basic system features.

$2049*

Stanford 286–16

8/12 MHz 16 MHz Throughput

Intel 80286–12 cpu, 8/12 MHz software (keyboard) switchable clock • Award BIOS, Norton SI (Ver 3.0): 15.8 • DRAM can be expanded to 1 MB on M/B • Selectable between 0 wait state or one wait state • 8 expansion slots (5–16 bits, 3–8 bits) • Socket for 80287 math co-processor • Plus basic system features.

$1119*

Stanford 286–12

6/8/10/12 MHz 1 Wait State

Same configuration as in 286/16 except: Intel 80286–10 CPU, 6/8/10/12 MHz software (keyboard) Switchable clock • Plus basic system features.

$989*

*System price does not include memory (DRAMS).

*Reprinted by permission from Computer & Software News Feb. 22, 1988 Copyright–Lebhar-Friedman, Inc., 425 Park Ave., NY, NY 10022

NETWORKING

Stanford Intelligent Net-II Card

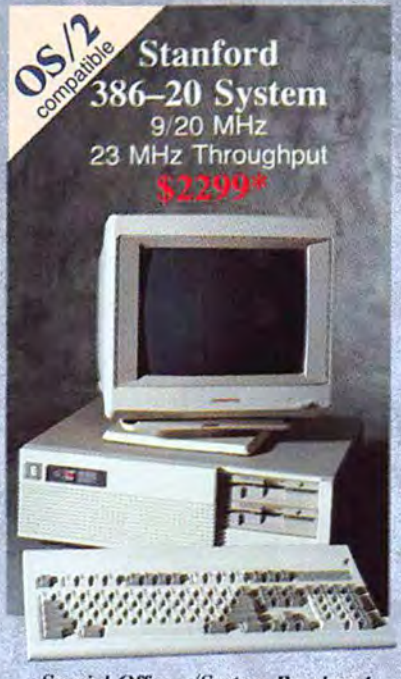
Ether Net/Cheaper Net specification • 80186 processor & 82586 LAN co-processor • Data transfer rate: 10 MB/S. Network software compatibility: PC-NET, MS-NET, Novell.

$499

Xenix Multi-Terminal Card

Microprocessor-based intelligent terminal controller. Z-80B CPU • 16 KB dual port RAM, 8 KB local RAM • 6 asynch. serial channels.

$599



Special Offer w/System Purchase!
Dr. Halo III . . . $49.99 (retail value $139.95)
or Desktop Publishers' Graphics . . . $59.99 (retail value $195.00)

SYSTEM OPTIONS

- Seagate/Miniscribe/Micropolis HD Drives
- Thomson/Samsung Monitors
- EGA/VGA/CGA Video Graphic Cards
- EEMS Memory Expansion Cards
- 300/1200/2400 Baud Modems
- Optical Mouse/No Slot Clock
- Panasonic Printers
- Panasonic Facsimile Cards

Call us for volume dealer/ reseller/discounts.

Ask us for our Optional On-Site Service

FREE Shipping and credit card usage

TO ORDER CALL:

1-(800) 248-4786

IN CALIFORNIA: (408) 435-1515
Tech Support: (408) 435-2626
FAX (International Sales): (408) 435-8424
TELEX (International Sales): 4943373 WASAE
Hours: Mon–Fri 8:00 am – 5:30 pm P.S.T.

STANFORD SYSTEMS

786 COMPUTER COMPANY

174 Component Drive, San Jose, CA 95131

Stanford Systems will run OS-2, MS DOS, Xenix, Unix, MicroSoft Excel, AutoCad Ver. 9.0, Lotus and D-Base III . . . or your money back. If Stanford Systems prove incompatible, return the system with original published version of the software mentioned within 30 days of invoice date. We will replace with a compatible system, or at our option, refund purchase price. Prices, terms of sale, and specifications are subject to change without notice. We reserve the right to substitute equivalent or better products. Errors and omissions are excepted. All trademarks are copyrighted by their respective owners.

Circle 64 on reader service card

Windows-Based Personal Information Manager Debuts

Polaris Takes On Heavy Hitters

The personal information manager market, which didn't exist before the COMDEX/Fall announcement of Lotus's *Agenda*, is about to get yet another player. Polaris Software, a small company based in Escondido, California, will challenge *Agenda*, Symantec's *Grandview*, and a growing list of other packages with *PackRat*, a *Windows*-based application designed to exchange data with Microsoft's *Excel*. Whereas *Agenda* employs free-form categories and *Grandview* is built around an outliner, *PackRat* uses a list-making metaphor. The package features a host of facilities that make extensive use of the mouse for data linking, searching, and expansion to higher levels of detail. These include a phone book with an auto-dialer, a log of phone calls, an expense log, an appointment calendar or agenda, a to-do list, index cards for notes or graphics, a facility with which to assign keywords to files, and a global list facility that aids searches across the other facilities and the creation of non-relational links between list items. *PackRat*, which will ship with a run-time version of *Windows 2.0* in May for under $400, runs with a 70K memory kernel and another 100K resident on disk. Started as an information management company in 1985, Polaris has achieved most of its success in the quiet but lucrative business of creating print drivers, downloadable fonts, and various utilities for Hewlett-Packard's popular LaserJet family.

PictureWare Ships PS/2 Image Data Base

PS/2s Reduce User Costs

IBM's PS/2 has reduced the hardware requirements for creating and using picture data bases, broadening the market potential for that product category, claims the publisher of one such program. In May, Philadelphia-based PictureWare will release a new version of *PicturePower* that leverages the PS/2's analog monitor and the greater color capabilities of the VGA graphics standard for more lifelike images. *PicturePower 1.7* supports 256 colors at 320 by 200 resolution—color being more important than high resolution in the representation of photographic images. Formerly, producing such images required a $1300 to $2000 image capture/display board and analog monitor, in addition to a video camera; now, PS/2-equipped users need this full configuration only when actually capturing images. Most picture data base users with PS/2s can rely on the system's analog monitor and get by with a less expensive display board, reducing overall hardware costs. Additionally, PictureWare will bundle in a $750 PS/2-compatible image display board free with its $945 software through July. *PicturePower* accepts *dBASE III Plus* files.

Corvus Turns Around

Pioneer Rebounds With Products and Profits

Micro industry pioneer Corvus Systems, having traveled a rocky road in the past few years, is back on track, claims new president Lew Lipton. He offers as evidence two consecutive profitable quarters and some innovative but inexpensive network products. During the six months ended November 30, Corvus logged a profit of 11 cents a share on revenues of $15.8 million, compared to a 17 cent loss per share on $22.4 million during the same period a year before. Lipton came to Corvus last June and immediately downsized both the company and its product line. He laid off almost 50 of the company's 200 employees and cut its business to network sales only. Corvus, tightly focused once more on LAN business, recently began shipping a new version of its PC Network Operating System (PC/NOS), a DOS LAN with no file server requirement—any user on the system can access the files and peripherals of any other node. First introduced in March 1987, PC/NOS now supports LIM 4.0 expanded memory and at $695, is licensed for 64 nodes. Corvus, boasting 350,000 installed nodes, also renamed its original 1-Mbps twisted pair network as Omninet/1, slashed the adapter's price to $149, and introduced a 4-Mbps version, Omninet/4, with $349 adapters. Both version work under PC/NOS or Novell's *Netware*. Complete 4-node kits are available. Lipton predicts a profitable year with sales of about $30 million.

NOW OVER 43% OFF!

Add PC World To Your Management Reading List

ACT NOW! Take advantage of these Special Savings and we'll BILL YOU LATER!

PLUS, when you order Now, you'll get a FREE miniature C WORLD computer clock!

☑ YES! Bill Me Later

Rush me one year (12 monthly issues) of PC World for only $19.97. That's over 43% off the annual cover price of $35.40 and over 33% off the regular subscription rate of $29.90. PLUS, I'll get a FREE miniature computer clock!

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

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

PC WORLD

4CBB4

☑ YES! Bill Me Later

Rush me one year (12 monthly issues) of PC World for only $19.97. That's over 43% off the annual cover price of $35.40 and over 33% off the regular subscription rate of $29.90. PLUS, I'll get a FREE miniature computer clock!

NAME _____

COMPANY _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

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

PC WORLD

4CBB4

Give Now—We'll Bill You Later

A one year subscription (12 monthly issues for just $19.97) will be sent to the person listed below. That's over 43% off the annual cover price of $35.40 and over 33% off the regular subscription rate of $29.90. PLUS, you'll get a FREE miniature computer clock!

Send Gift from:	Send Gift to:
NAME	NAME
COMPANY	COMPANY
TITLE	TITLE
ADDRESS	ADDRESS
CITY STATE ZIP	CITY STATE ZIP

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

PC WORLD

2AME1

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

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

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

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

NO POSTAGE
NECESSARY
IF MAILED IN
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 1262 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

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

ORACLE® turns Lotus 1-2-3 into a full function database.

ORACLE, the world's most powerful relational database, now works from inside your Lotus 1-2-3 spreadsheet program. Familiar 1-2-3 menus guide you through creating, modifying and retrieving data in your database. You can even perform ORACLE database functions automatically using standard Lotus macros and formulas. The point is...

Store unlimited amounts of data in your ORACLE database.

> *"What a boon to the power spreadsheet user... most wish that [Lotus 1-2-3] could do more, store more, be updated more easily... with ORACLE running behind it, it can do all this and more."*
>
> Andrew M. Seybold, Publisher, *Outlook on Professional Computing*

Use all the features of Lotus 1-2-3 to analyze, report, and graph data in your ORACLE database.

...If you already know how to use Lotus 1-2-3, then you already know how to use ORACLE.

By putting data into a database, Lotus 1-2-3 spreadsheet's performance is improved, long re-calcs are eliminated and your worksheets are smaller and more manageable.

- Have ORACLE for 1-2-3 build the query automatically for you and retrieve just the data you need.
- A single command automatically creates new database tables from data in any existing worksheet.
- In update mode, changes in your worksheet become changes in your database. And if you make a mistake, you can...
- Undo changes. Or save your changes permanently in your database and worksheet.
- Share the same data in multiple worksheets, or even across a network of different computers with many users.

ORACLE®
COMPATIBILITY · PORTABILITY · CONNECTABILITY

Call 1-800-ORACLE1, ext. 146 today.
For international pricing call (415) 598-8290

Act now, and we'll pay sales tax and shipping. So fill out and mail the attached coupon, or call today. You can also purchase ORACLE for 1-2-3 at your favorite computer store. **$199.***

Dear Oracle,

ORACLE for 1-2-3 • Oracle Corporation
20 Davis Drive • Belmont, CA 94002

Yes, I have an ☑ 80286/80386 PC running ☑ DOS 3.0+ and ☑ Lotus release 2.01. I also have ☑ 640KB of RAM, plus either ☑ 1MB of extended memory or I will reassign 1MB of my expanded (above-board) memory as extended memory. Please send me the database I already know how to use — the ORACLE database add-in for Lotus 1-2-3, on ☐ 5¼" or ☐ 3½" disks. Enclosed is my: ☐ check, or ☐ VISA ☐ MC ☐ AMEX credit card authorization for $199.*

PRINT NAME _____ DATE _____

COMPANY _____ TITLE _____

STREET *(No P.O. boxes, please)* _____

CITY _____ STATE and ZIP _____

PHONE _____

CREDIT CARD NUMBER _____

CARD EXPIRATION DATE _____

SIGNATURE _____ PCWORLD

*Prices valid in U.S. only. © 1988. ORACLE is a registered trademark of Oracle Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. TRBA

Here's a radical idea: give people who work together the means to easily share information among PCs—but don't force them to become computer experts to do it.

Here's another one. Make this network so simple to install that you can set up the whole thing in oh, say, a half hour or so.

Presenting TOPS.®

MORE NETWORK. LESS NET WORK.

With the TOPS Network, you and your co-workers can access files from each other's computers exactly as if they were sitting on your own PC or hard disk. And even print out those files (with our TOPS NetPrint™ software) directly to any PostScript® printer, such as Apple's LaserWriter.™ All through easy-to-use menu commands.

The result is the very comforting—and productive—feeling of being able to concentrate on the work at hand, instead of on having to learn the network

On a TOPS Network, every computer can share files directly with any other, thereby sharing the load of the entire network. The result is that you don't have to purchase an expensive central file server. Or shut down the network when you want to add a new computer. Or hire an extra person to manage the whole affair.

And setting up TOPS is just as straightforward. You can install the necessary network card—such as our TOPS FlashCard™—in no more than twenty minutes. Loading the TOPS software? We've unofficially clocked it under five minutes.

As if all that weren't enough, TOPS runs over common twisted-pair cabling, such as regular phone wire. And at only $189 for the software, and $239 for each TOPS FlashCard, TOPS is the least expensive way to get your workgroup working together.

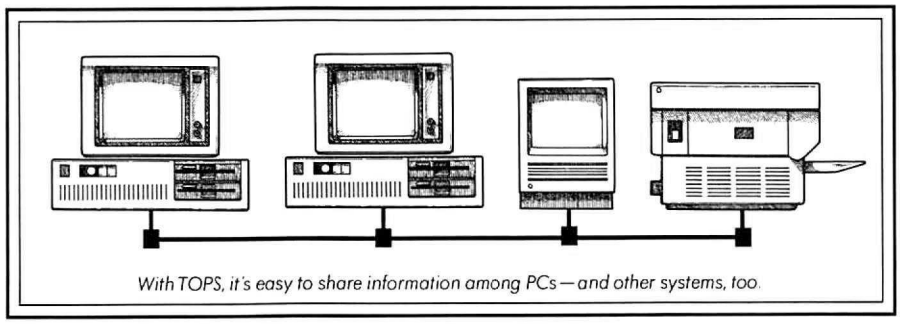
Of course with TOPS, PC-to-PC communication is just the beginning. Because without sacrificing simplicity, we also offer products that let you share information just as easily with other networks and systems, including Macintoshes™ and Sun® workstations.

Want more information? Give us a call at 800-445-TOPS (from outside the U.S. and Canada, call 415-769-8700). Or write to us at TOPS, 950 Marina Village Parkway, Alameda, California 94501.

After that, it gets easier.

TOPS®
A Sun Microsystems Company

TOPS, Sun, and the Sun logo are registered trademarks of Sun Microsystems, Inc. TOPS FlashCard and TOPS NetPrint are trademarks of Sun Microsystems, Inc. Post Script is a registered trademark of Adobe Systems Incorporated. Macintosh and LaserWriter are trademarks of Apple Computer, Inc.
Prices shown are suggested retail prices and are subject to change without notice.



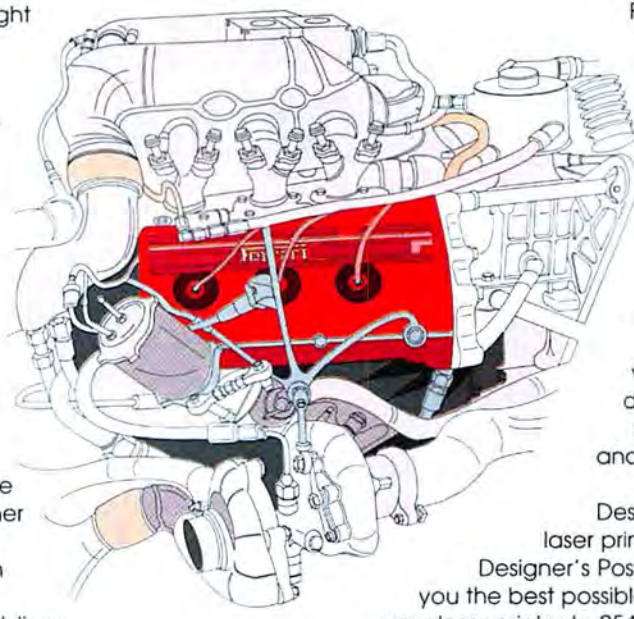
With TOPS, it's easy to share information among PCs—and other systems, too.

Circle 32 on reader service card

Advancing the State of Art

Introducing Micrografx Designer
High-Performance Design, Illustration, and Drafting

From the company that brought the IBM PC its first drawing system comes the most advanced drawing system *ever*. It combines all the features of a CAD system for an engineer with a complete set of artistic tools for a graphic artist. Its name won't surprise you. Its power will blow your doors off. We call it Micrografx Designer.



With Designer, you can load a scanned image you have sketched. Then trace over the bitmap to create a resolution-independent image which you can stretch, color, and enhance with far more detail. But Designer doesn't stop there. It includes unmatched drawing tools, such as spline and parabolic curves, freehand drawing, lines and polylines, arcs, and ellipses.

Designer allows you to edit polygons and curves, fill irregularly shaped objects, and rotate text and graphics to one-tenth of a degree. Designer's variable zoom, fully associative dimensioning, 64 layers, 5 line styles, and 15 arrow and end styles provide unlimited control over your drawings.

Designer provides extensive text handling capabilities such as merging text files from popular word processing programs and supporting graphic and bitmapped fonts. You can edit text and even stretch and rotate it. And Designer supports all Windows-compatible fonts and downloadable fonts.

For engineers, Designer includes a symbol library management system for assigning part numbers, annotating drawing files with descriptive names, and generating parts lists. It also comes with Windows CONVERT, for transferring files to AutoCAD and back.

For graphic artists, Designer includes tools for mixing millions of colors (RGB, CYM, or HLS), viewing and layout aids, a large drawing area (160" x 160"), compatibility with Aldus PageMaker, and thousands of ClipArt images.

Designer supports the most popular laser printers, plotters, and color printers. Designer's PostScript compatibility guarantees you the best possible quality output from 300 DPI on your laser printer to 2540 DPI on an Allied Linotronic 300 phototypesetter.

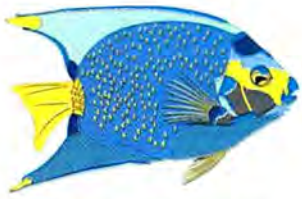
In addition, Designer is compatible with Micrografx Windows GRAPH, Windows DRAW, and In•a•Vision, plus Microsoft Excel and Windows Write. And Designer's interface is based on Windows 2.0, matching the user interface of IBM's Presentation Manager for OS/2.

For additional information, call your local Micrografx Authorized Dealer or call toll-free **1-800-272-DRAW** (in Texas, 214-234-1769), or write to Micrografx, Inc., 1820 North Greenville Ave., Richardson, Texas 75081.

Step up to Micrografx Designer and advance the state of *your* art.

MICROGRAFX

The Picture of Success



Trace a scanned sketch or photograph.

Reshape complex curves and parabolas.

All illustrations were created with Micrografx Designer.

The following listing is a trademark reference, including registered and unregistered trademarks for the companies listed. In•a•Vision, Windows CONVERT, Windows DRAW, Windows GRAPH, Micrografx, Inc. PageMaker, Aldus Corporation. Microsoft Excel, Microsoft Corporation. PostScript, Adobe Systems Incorporated. IBM, International Business Machines Corp.

Ear to the Ground

New look, new feel, new editorial, and new energy.

We've been listening to you. So that you'll continue to listen to us.

David Bunnell

You've probably noticed by now that *PC World* has a very different look and feel than it used to. Last month we changed our typography, introduced a new logo, and transformed our design to make *PC World* much more readable and accessible.

Why? We wanted to update the look of the magazine to match the changes we have made to its editorial content. And we wanted to visually convey the new energy we're feeling about personal computing.

How did we settle on this new format? We conducted extensive interviews with our readers and organized marketing focus groups composed of readers of other personal computer publications.

Some of you might ask why we would tamper with a good thing.

There are two reasons. One is that in the magazine world, redesigns are a necessary part of the business. Most major magazines undergo a face-lift every few years in order to change their focus or attract new readers.

The second reason is our desire to maintain *PC World*'s position as an ally of users and a leader in the changing world of personal computing. The PC marketplace of the future will be a complex one, not at all like the primitive chaos into which *PC World* was launched over five years ago.

PC World has changed dramatically because the technology has changed dramatically, and so have you—our readers. You've become much more technically savvy. Our research tells us that many of you now manage and influence work groups using computers. Many of you are heads of MIS departments in large corporations. A significant number of you work in, and even run, small and medium-size businesses. Our readers include numerous presidents, CEOs, and entrepreneurs. You rely on us to help you implement personal computers in your work to enhance your business. Obviously, your computing needs have become more extensive and demanding than they were when desktops were ruled by 8088 machines with 256K of memory, two floppy disk drives, and a letter quality printer.

We felt it was incumbent upon us not only to upgrade our own technology at *PC World* but also to keep pace with the changing editorial needs of our readers. We're firmly committed to positioning our magazine as an innovator and industry watcher.

(continues)

Tandy Computers:
Because there is
no better value.™

Tandy® Business Solutions

Tandy 4000

Tandy 3000

Tandy 3000 HL

Tandy 1000 TX

Tandy 1400 LT

Tandy 1000 SX

Design your system around the broadest selection of PCs in the industry.

Tandy Computers are the best-selling IBM® PC compatibles in America. From the latest 386 technology and highly expandable 286 systems to portables, we have it all.

Workgroup Solutions. Our 3Com® workgroup lets people and PCs work together, so your entire office can share information and route messages—electronically. And with IRMALAN™, up to 20 people in your workgroup can access an IBM mainframe.

Multiuser Solutions. We've had more experience with XENIX® multiuser systems than anyone. And we offer SCO™ business productivity software that's designed expressly for multiuser efficiency.

Total Support. Radio Shack Computer Centers offer the most comprehensive range of support services in the industry. The bottom line? We work hard for your business!

Radio Shack®
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

3Com/Reg. TM 3Com Corp. IRMALAN/TM Digital Communications Associates, Inc. IBM/Reg. TM IBM Corp. XENIX/Reg. TM Microsoft Corp. SCO/Reg. TM The Santa Cruz Operation.

Circle 197 on reader service card

That's why we added the independent and highly regarded National Software Testing Laboratories to our editorial team last year. As a result, we now oversee more lab testing of products than any other publication in microcomputing today.

In addition, the PC market has grown tremendously and become increasingly segmented, with more products for more platforms than ever.

So it's not surprising that our readers have developed a voracious appetite for new-product information and comparative, real-life evaluations. In the past year we have more than doubled the number of products reviewed in each issue. These are highlighted in *The Software Shelf*, *The Hardware Shelf*, and a fuller "Review" section.

Another important part of the new *PC World* is *Industry Outlook*. Our readers want to know what's going on in the microcomputer industry, especially in business developments and strategic alliances that affect them. If you know how Microsoft's OS/2 LAN Manager competes with IBM's Extended Edition, you can better plan the way you'll work, train others, and buy products.

We also know that you're looking for opinion and analysis from PC veterans. That's why in the last year, we've added columns by PC industry guru Stewart Alsop; Will Zachmann, the controversial International Data Corporation analyst; and Robert Carr, the technology expert who created *Framework II*.

(continues)

For one initial investment, the Magnavox Multimode works with all these initials:

The Magnavox Multimode is the display that is compatible with virtually every computer from PC to PS/2® – even the new MAC-II. That's because it can automatically adjust to any graphics adapter format from CGA to VGA. But there's more to the Magnavox Multimode than just compatibility. It produces an incredibly sharp high-contrast image in a rainbow of colors. And it even accepts an audio input from your PC or modem.

The Multimode computer display. Another graphic example of Magnavox technology.

CGA, EGA, PGA, MAC-II,* ATT,® MCGA, VGA, ETC.

MAGNAVOX
Smart. Very smart.

*MAC is a registered trademark of Apple Computer, Inc.
PS/2 is a registered trademark of IBM Corp.
ATT is a registered trademark of AT&T Corp.
© 1988 Philips Consumer Electronics Company. A division of North American Philips Corporation.

Circle 100 on reader service card

ALPS PRIN
HAVE THE

"...the speed, print quality, and other thoughtful features of the ALPS P2000...make this wide-carriage 9-pin matrix printer my favorite new printer of the year."

—*PC Magazine*

"The ALPS ALQ300 and P2400C are both rugged wide-carriage dot matrix printers with excellent letter quality type..."

—*PC Magazine*

"ALPS America keeps on coming back with more attention-getting dot matrix printers."

—*PC Magazine*

"To distinguish letter-quality from daisywheel output requires a magnifying glass."

—*PC Week*

It takes some awfully good PC printers to generate reviews like this.

But if you're not easily swayed by public opinion, consider this:

Since our first printers were introduced in the U.S. in late 1985, ALPS America has become one of the fastest growing printer companies in the nation.

Which should come as no surprise. After all, ALPS printers give you more for your money. Like speeds up to 400 cps. Seven-color printing. Snap-in/out, inter-

TERS EVEN BEST INK.

"...so quiet that we doubt even a library would need the 'quiet' mode."

—InfoWorld

"...its controls are the most accessible of any printer we have used..."

—InfoWorld

"In almost every phase of construction, ALPS seems to have relied on sturdier materials than it might have had to—something which is a definite advantage for the user."

—PC Products

"...a real workhorse printer that prints faster than others in its price range and is loaded with features..."

—PC Products

changeable 18- and 24-pin print heads. An array of paper feed methods. And full compatibility with most all the leading PCs and software.

But as good as the ALPS look on paper, they look even better in person.

So call us for a free demo or more information at 800-828-ALPS.

In California, call 800-257-7872.

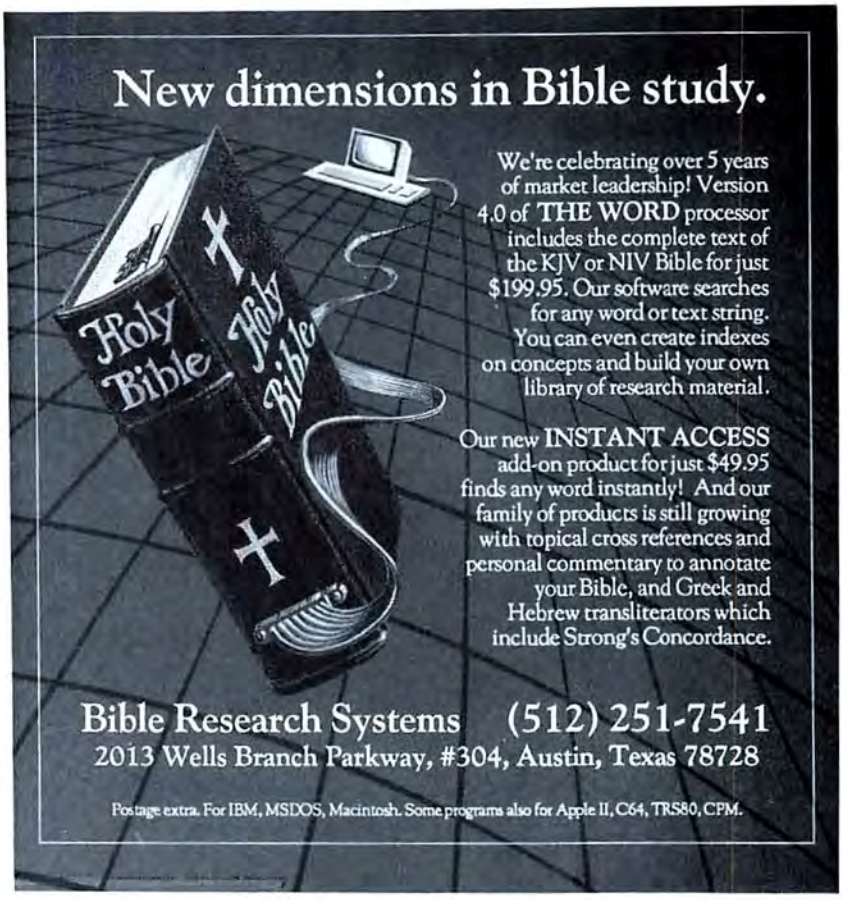
Or settle for printers of a lesser type.

ALPS
AMERICA

IT'S TIME YOU SAW THE ALPS.

Circle 2 on reader service card

© 1988, ALPS America.



Circle 20 on reader service card

Circle 122 on reader service card

Clearly, you want us to be opinionated, take stands, and set high, real-world standards for a variety of products. And you want to know exactly how those products may fall short of those standards; if a product's a dog, you want to know about it. We've beefed up our executive summaries, adding report cards to every one of our reviews. You can be sure our writers and reviewers will tell you which way the wind is blowing, and what the changes portend for you.

Another improved *PC World* feature that I find very exciting is our hard-hitting *Consumer Watch* department, which acts as your advocate. If you write to us about problems you're having with hardware or software, a hard-to-find item, or an unfulfilled mail order, we'll get on the case until the problem is resolved. *Consumer Watch* provides information on topics like advertiser obligations, what a good service contract offers, and what warranties really mean.

We're doing all this for one simple reason: We want to be known as the personal computer magazine that always goes to bat for you.

Along with our expanded product reviews, industry news, and opinion pieces, we will still run how-to articles, tips, and popular features like *Help Screen* and *Star-Dot-Star*. Those sections have a high percentage of loyal readers, who frequently clip and file material for themselves and their work groups.

(continues)

More Network Guts Than Most Network Boards

With advanced power and five times more speed, LANLink 5X™ has emerged.

Coming from award-winning, state-of-the-art technology, the new LANLink 5X™ boldly stands up to the challenge posed by costly, hardware-dependent networks.

That takes guts for a software-driven network. But we're confident.

Because we've discovered a high-speed networking channel that's already built into most PCs...the standard parallel port.

The High-Performance Alternative to Network "Boardom." Half a Megabit per second, with over 500 feet between connections. That's the astonishing rate at which LANLink 5X™ transfers data between PCs or PS/2s using ordinary parallel ports.

But you're not restricted to parallel ports. The very same sockets you'd use for modems... connect PCs at 115 Kbps. Plus, you get remote access support and multi-tasking performance under PC-MOS/386™or PC-DOS.

Superior Results at Inferior Costs. LANLink 5X™ lets network users share data, 1000s of DOS programs, files, and printers. For about the same cost as one network board, you can install a *five-user* LANLink network. Without special hardware...and in less than two hours.

Get Network Guts Without Network Boards. LANLink 5X™ is immediately available and comes with a money-back guarantee. Its price of $595 includes a server and a satellite module plus the network operating system.

Call The Software Link TODAY for complete details on the fastest software-driven network that's ever been available.

CALL: 800/451-LINK

In Georgia:	International/OEM Sales:	Resellers/VARs:	FAX:
404/441-2580	404/263-1006	404/448-5465	404/263-6474

3577 Parkway Lane, Atlanta, GA 30092 Telex 4996147 SWLINK

The Software Link/Canada CALL: 800/387-0453

LANLink 5X™

THE SOFTWARE LINK

DEALER INQUIRIES INVITED

LANLink, LANLink 5X, & PC-MOS/386 are trademarks of The Software Link, Inc. PS/2 & PC-DOS are trademarks of IBM Corp. Prices and technical specifications subject to change.
Copyright ©1988. All Rights Reserved.

Circle 76 on reader service card

ReadySetGo, the desktop publishing software that works the hardest...

now works on the PC.

For IBM Personal Computers and 100% Compatibles.

Manhattan Graphics **ReadySetGo™**

401 Columbus Avenue, Valhalla, NY 10595. (800) 451-1668.

Circle 96 on reader service card

ReadySetGo is a trademark of Manhattan Graphics Corporation. IBM® is a registered trademark of International Business Machines Corporation.

How Farsighted Executives Are Using Their PC's For The Fun Of Profit.

What can you get from your PC?
Dow Jones News/Retrieval gives you...
- Exclusive online access to the full text of *The Wall Street Journal*
- Current and historical stock quotes
- Business news as it happens
- 10-K and 10-Q data
- Leading investment analysts' reports
- Complete corporate profiles

Over 40 services including MCI Mail,® the Official Airline Guide™ and more.

By William J. Spink

For years now you've been hearing about the wonderful things personal computers will do for The Executive of the 80's—at least in theory.

But what's the *reality*? Can a PC help you enjoy your work more and show a greater profit, here and now? According to your peers, the answer is "yes."

"With just a few keystrokes," says Al Lynch, Director of Corporate Planning and Research for JCPenney Company, "I can screen companies, find possible acquisitions or 'scope-out' competitors. It's a real competitive edge."

Walt Casey, V.P. of Communications at ConAgra says, "I spend a lot of time each day poking into this and tracking that. It's *much* easier when you can immediately get the facts from a computer, rather than having to make a series of phone calls."

"One of Dow Jones News/Retrieval's services, QuickSearch, is a Godsend," adds Jim Posner, a respected retail consultant. "It gives me detailed corporate reports within minutes—I don't even have to leave the office.

Instant information: the executive advantage.

To lead in today's marketplace, you need information like *that*," Lynch says, snapping his fingers.

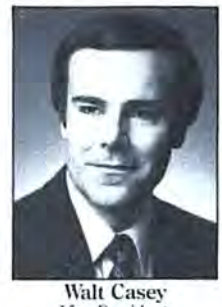
He recalls an example of how Dow Jones News/Retrieval®—the business and financial information service from Dow Jones & Company, Inc.—gave JCPenney Company a real advantage.

"Let's just say that a 'major player' in our industry was being acquired. Within a few hours we knew more about the takeover candidate than the bidder did. Honestly, we knew more than some investment bankers did.

Decision-making with the leading edge.

"Then we started getting the corporate insider trading data," Lynch continues. "It showed us some things that influenced a major deal.

Al Lynch
Director of Planning and Research, JCPenney Co.



Walt Casey
Vice President, Corp. Communications, ConAgra, Inc.

James Posner
President James Posner Assoc. Ltd.

"This service really makes a difference in the day-to-day running of your business. It can pay for itself very quickly."

Surprisingly easy.

All you need to access the service is a PC and modem. Using the service is "No problem," according to Posner.

"There's no difficulty using the service. I ask for pointed, specific information and get exactly what I need. It's much easier than manual research."

Walt Casey agrees. "Dow Jones News/Retrieval is simple enough for anyone who's at all comfortable with computers to use it effectively from their very first day online."

Making the right decision.

There are hundreds of online information services, many offering business data. How can you pick the best *one*?

"It was apparent from the first step that the most useful system was Dow Jones News/Retrieval," remembers Casey. "It offers so much of the information you're looking for—from general news and stock quotes, to data on our company and industry. It was the best single source."

"I've had other services, but Dow Jones News/Retrieval has the most useful business information in the right form," says Posner. "The time I spend 'playing' on the computer makes more money for me—and for my clients."

Now that's the *fun* of profit! ■

Get 8 FREE hours online to experience the "fun of profit" on your PC.

YES, I'm ready to experience the fun of profiting from my PC. Send me a Dow Jones News/Retrieval® Corporate Membership Kit, including multiple passwords, 8 free hours of online time, a year of *Dowline*™ Magazine, a comprehensive User's Guide and waiver of my first year's annual $12 service fee—for only $49.95.* (A $29.95 Personal Membership Kit includes: a single password, 5 free hours online, *Dowline*™ Magazine, User's Guide and waiver of $12 service fee.)*

☐ $49.95 Corporate Membership Kit*
☐ $29.95 Personal Membership Kit*
☐ Bill me later
Charge to my ☐ MasterCard ☐ VISA ☐ AmEx
Acct.# _____ Exp._____
If you pay by credit card, future charges will be billed to that account.
Signature(required) _____
☐ Check enclosed

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Daytime phone _____
Computer make and model _____
☐ Please send more information.

For faster service, call 1-800-221-7700, Ext. 302E today!

Dow Jones News/Retrieval®

The premier source of online business and financial information.

302E DJN/R Membership Kit, P.O. Box 186, Drexel Hill, PA 19026-9973

*This offer expires May 31, 1989. Free time is per account. New domestic and Canadian subscribers only. Free time must be used within 30 days after receipt of password(s). Some additional fees may apply on certain services. ©1988 Dow Jones & Company, Inc. All rights reserved. Dow Jones News/Retrieval is a registered service mark of Dow Jones & Company, Inc. MCI Mail is a registered service mark of MCI Communications Corp. The Official Airline Guide is a trademark of Official Airline Guides, Inc.

IBC has your computer replacement batteries.

In fact, that's our specialty. We are the world's largest supplier of computer batteries for IBM AT, PS2, and all other computers. So when your battery does start to die, IBC is ready to save your day. And keep *you* from being stranded. By delivering your replacement battery within 24 hours. All you have to do is pick up the phone and call us.

When do you need a new battery? Well, you can tell that time is running out when the clock and calendar begin to slow down. If you have an IBC battery on hand—and it makes sense because the shelf life of our batteries is *10 years*—your battery slowdown won't slow *you* down! With an IBC battery handy, you don't miss a beat when your present battery starts to go.

But do you have to wait until you're in an emergency situation to order your PC AT battery? Not at all. In fact, you can save the hassle of downtime and reconfiguration by changing your battery once a year. And in the process, avoid the frustration of an idle computer while you wait for a new battery.

So put us on your emergency phone list. And when your vital signs are fading, give us a call. Remember, we're your source for computer batteries. We want to keep you running!

ORDER NOW!
800/654-3790 (US)
800/225-9359 (CA)
Price only $27.50

- **Dealer inquiries welcome.**
- **Corporate discounts available.**

Tadiran, Panasonic, Varta, Saft, and Rayovac batteries are available for IBM AT, PS2, Compaq, AT&T, and all other clones and compatibles. Checks, money orders, and credit cards welcome. Add $3.00 for shipping and handling. ($14.00 for overnight shipping.)

IBC
Your number one source for all computer batteries.

International Battery Corporation
16735 Saticoy Street, Suite 111
Van Nuys, CA 91406
818/781-7515, FAX 818/781-7804

All trademarks acknowledged

Circle 121 on reader service card

We also like to give people some relief from the heavy dose of technical data they must ingest every day, which is why we've introduced the "Two-Fisted Management" cartoon strip.

Our first priority in any case is to provide our readers with a complete personal computer magazine package. We want to make *PC World* the one publication you need to keep up with the rapid changes we're seeing in the personal computer industry.

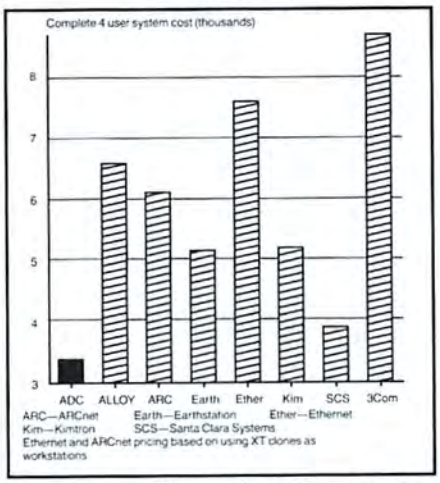
We hope you like our new look. It's bolder and more businesslike. We think it's more engaging. We've improved our charts, graphs, and technical illustrations, and we're starting to desktop publish many of our figures. You'll now find twice as many graphics and photos in our pages than in any other computer magazine.

Some people read magazines from back to front; others read only the summaries, charts, sidebars, and an occasional article. Still others devour an issue from cover to cover. We want to provide all of you with several entry points into *PC World*. Please let me know how you like our new look and feel. I would also appreciate receiving your comments and suggestions about how we can further improve the magazine. Just send them to MCI Mail PCWORLD/179-3813 or to our office at 501 Second Street, San Francisco, CA 94107. There's a chance your input will become hard copy. ●

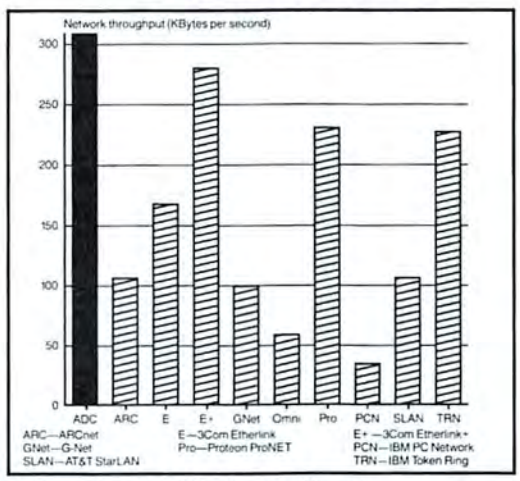
See Us At Spring Comdex In Atlanta At The Ritz Carlton Hotel

TWO WORDS OUR NETWORK COMPETITORS SEEM TO HAVE OVERLOOKED:

PRICE.



PERFORMANCE.



Test results are based on Novell's independent LAN Evaluation Report using their PERFORM™ program. Results were obtained using an 8 MHz IBM AT file server with 6 MHz IBM ATs as workstations. Six Personal Network Stations were used for the ADC test. If tests were conducted on PC workstations, other networks would test up to 70% slower. All prices are based on manufacturers' suggested retail prices.

IBM PC-XT, AT, PS/2 and PC-Network are registered trademarks of International Business Machines Corp. Novell, PERFORM, Netware and ELS are trademarks of Novell, Inc. Personal Network Station and Model 2 MG are trademarks of Advanced Digital Corporation.

These graphs tell you everything you need to know about networking price/performance. LAN's can be expensive and slow, time sharing even slower and less capable. The Personal Network Station,™ selected Product of the Year in the multi-user category by LAN Magazine (Feb. '88), is in a class by itself. Personal Network Stations give each user outstanding speed, storage capacity and data sharing benefits at approximately half the cost of networking PCs in a LAN. ADC's Model 2 MG™ Expansion Boards plug directly into the host PC-bus. With the addition of inexpensive keyboards and monitors, each board provides all the electronics necessary for two Personal Network Stations. Each has its own CPU and 512K of dedicated RAM. With additional boards, a single IBM PC,® XT,® AT,® PS/2® or compatible can support up to 32 users. Added networking software offers the option of LAN interface with software choices, including Novell's Advanced NetWare™ or ELS.™

Call your local distributor or ADC today for your Personal Network Station demo package. And find out why ADC is the only word you need to know for superior price/performance.

ADC

ADVANCED DIGITAL CORPORATION

In U.S. 5432 Production Drive · Huntington Beach, CA 92649 714/891-4004 Telex 183210 ADVANCED HTBH/FAX (714) 893-1546

In Europe, Advanced Digital (U.K.) Ltd. 21 Newman Street, London W-1 United Kingdom, (01)323-1120 Telex 266730

Authorized Distributors:
Tech Data, Micro D, Price Electronics, CSI, IMS, MP Systems, JB Marketing, MDI America, Vitek, and Thomas Data Systems.

Circle 71 on reader service card

Austin, Texas — the seat of government in the Lone Star State and the headquarters of CompuAdd™ Corp. Here, CompuAdd continues to fulfill its promise to provide quality computer products at competitive prices.

TEAR OUT CATALOG ALONG PERFORATION

San Antonio, Texas now has two CompuAdd Superstores. In addition, our retail outlet on McCarty Road provides prompt, personal service to San Antonio customers.

The 100,000-square-foot corporate headquarters in northwest Austin houses the manufacturing and assembly groups, administrative offices, and an international division, which serves customers in Europe, South America, Mexico, and Canada.

CompuAdd was established in March 1982 as a direct-response company specializing in add-on products for the growing personal computer industry.

Today, CompuAdd's own products are nationally recognized for their reasonable prices and dependable performance. *PC Magazine*, a leading industry periodical, bestowed Editor's Choice awards on CompuAdd's Standard-286/8™ and Standard-286/10™ personal computers and the FlashCard™ hard disk cards.

CompuAdd — the third fastest-growing private company in America, according to *Inc.* magazine, December 1987.

CompuAdd

"Personal Computer Products"

SUMMER
CATALOG 1988

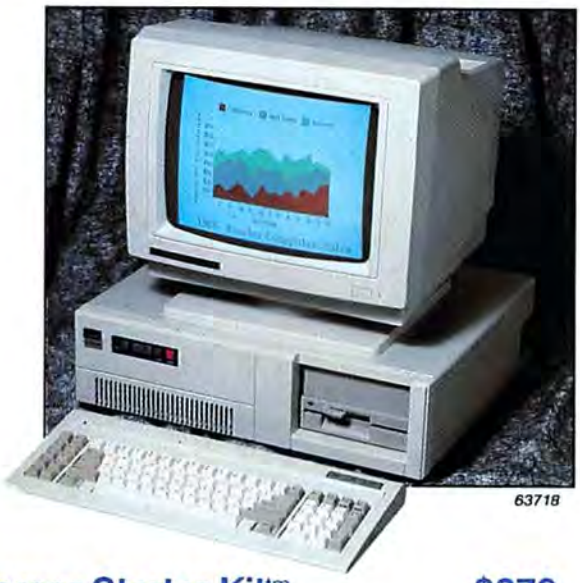
Introducing:
- IBM® PS/2™ Add-On Products
- Tandy®-Compatible Peripherals
- Office Equipment and Accessories

PC SOURCE™

CompuAdd™
"Personal Computer Products"

START OFF RIGHT WITH A STARTER KIT FROM COMPUADD!

63721



63718

Professional Starter Kit™ $1495

63720 Featuring the Standard-286/10™.
This kit gives your business computing power in a hurry.

Computer - The Standard 286/10 is a 10MHz system switchable to 6MHz. It includes 80286 processor, Phoenix® ROM BIOS , 512KB RAM (expandable to 1MB on motherboard), eight expansion slots, 200-watt power supply, 1.2MB floppy drive, keyboard, dual floppy/hard drive controller, and clock/calendar with battery backup.

Monitor - A high-resolution amber monochrome monitor with 12" display screen and monochrome graphics card with parallel port.

Hard Drive - MiniScribe® 20MB, half-height hard drive with 65ms access time.

Printer - Epson® LX-800 provides software compatibility, plus draft (150-180cps) and near letter quality printing, multiple type styles, Epson Character Graphics set, dot-graphics capability, and tractor/friction paper feed.

Career Starter Kit™ $879

63717 Featuring the Standard Turbo/10™.
The perfect starter system for the student, a new business, or the home.

Computer - The Standard Turbo/10, PC/XT-compatible computer with 8088 processor running at keyboard-selectable 4.77 or 10MHz, 640KB RAM, half-height 360KB floppy drive, floppy drive controller, 150-watt power supply, keyboard, and hardware reset circuit.

Monitor - A high-resolution amber monochrome monitor with 12" display screen and monochrome graphics card with parallel port.

Printer - Star Micronics NX-1000™ provides software compatibility, plus 120cps draft and 30cps near letter quality printing, multiple type styles, nine-pin print head, Epson LX-800 and IBM ProPrinter II® emulation, dot-graphics capability, and tractor/friction paper feed.

Professional Starter Kit EGA

63721 Professioal Starter Kit with industry standard 14" tube size EGA monitor (13" diagonal), EGA card, and I/O card with serial and parallel ports **$1895**

Career Starter Kit EGA

63718 Career Starter Kit with industry standard 14" tube size EGA monitor (13" diagonal), EGA card, and I/O card with serial and parallel port. **$1279**

Included In Both Starter Kits

Software - You'll appreciate getting MS-DOS® and GW BASIC in both kits. And in the Professional Starter Kit, you'll find PC-FullBak™ backup software for your hard disk.

Accessories - We've even added 200 sheets of continuous form paper, a printer cable, and ten blank floppies to get you started.

STANDARD BRAND™
AT® -COMPATIBLE COMPUTERS

Monitor not included. *63177*

Standard-286/12™ runs at switchable speeds of 6 and 12MHz with zero wait state. It includes 1MB RAM, internal clock/calendar with battery backup, math coprocessor socket, six 16-bit expansion slots, two 8-bit expansion slots, 200-watt power supply, 1.2MB floppy drive, dual floppy/hard drive controller, and your choice of enhanced 101-key, AT-style, or 5151 keyboard. The Standard-286/12 at 0 wait state scores 13.7 on Norton's SI Benchmark 4.0 test.
63177 *$1345*

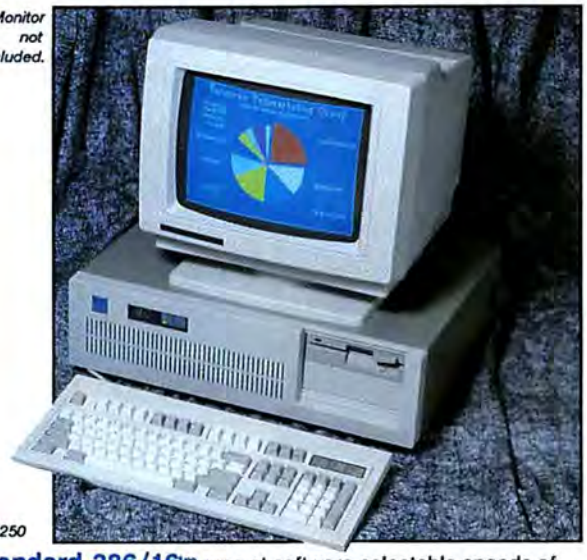
63150 *Monitor not included.*

"... comes with a good complement of manuals and software and performs precisely as you would expect. You should be happy with this one." Alfred Poor, *PC Magazine*

PC MAGAZINE Editor's Choice Feb. 16, 1988

Standard-286/10™ runs at switchable speeds of 6 and 10MHz. The system includes 512KB RAM expandable to 1MB, internal clock/calendar with battery backup, math coprocessor socket, six 16-bit expansion slots, two 8-bit expansion slots, 200-watt power supply, 1.2MB floppy drive, dual floppy/hard drive controller, and your choice of keyboard. Scores 9.4 on Norton's SI Benchmark 4.0 test.
63150 *$1095*

Monitor not included.



63250

Standard-386/16™ runs at software-selectable speeds of 16, 8, 6, and 4.77MHz. The system comes with 1MB RAM on a 32-bit high-speed memory board that is expandable to 4MB (supports up to 10MB RAM on expansion cards). For increased system throughput, the Phoenix BIOS can be relocated into high speed RAM. System includes 1.2MB floppy drive, five 16-bit and two 8-bit expansion slots, a 200-watt power supply, dual diskette/fixed drive controller, real-time clock/calendar, coprocessor support for either the 80287 or the 80387, and your choice of enhanced 101-key, AT-style, or 5151 keyboard. The Standard-386 has a Landmark speed rating of 20MHz and scores 17.6 on Norton's SI Benchmark 4.0 test.
63250 *$1995*

Monitor not included.

63105

"... its performance, features, and price are enough to make me want to take it home." Vincent Puglia, *PC Magazine*

PC MAGAZINE Editor's Choice Feb. 18, 1987

Standard-286/8™ runs at switchable speeds of 6 and 8MHz. Includes 512KB RAM expandable to 1MB, internal clock/calendar with battery backup, math coprocessor socket, six 16-bit expansion slots, two 8-bit expansion slots, 1.2MB floppy drive, 200-watt power supply, and your choice of enhanced 101-key, AT-style, or 5151 keyboard. Scores 8.8 on Norton's SI Benchmark 4.0 test at 0 wait state.
63105 *$995*

Monitor not included. 63050

PC/XT ® -COMPATIBLE COMPUTERS

Standard Turbo/10tm uses an 8088 processor with selectable processing speeds of 4.77 and 10MHz. The system includes 640KB RAM, math coprocessor socket, 360KB floppy drive and controller, eight expansion slots, 150-watt power supply, and your choice of enhanced 101-key, AT-style, or 5151 keyboard.
63050 $579

Standard Turbo/8tm offers an 8088 processor with switchable operating speeds of 4.77MHz and 8MHz. The system includes 256KB RAM, a math coprocessor socket, a 360KB floppy drive and controller, eight expansion slots, 150-watt power supply, and your choice of enhanced 101-key, AT-style, or 5151 keyboard.
63010 $449

62821

ZENITH® COMPUTERS

Z-181 boasts perhaps the most advanced LCD screen available. System includes 640KB RAM and runs at 4.77 or 8MHz. The computer has twin 720KB floppy drives and runs PC/XT-compatible software. Other features include: MS-DOS, serial port, parallel port, RGB/composite video port, interface for a hard drive, and rechargeable battery pack with AC adapter.
62810 $1575

Z-183 with 10MB hard drive offers switchable speeds of 4.77MHz and 8MHz and the same built-in, backlit, supertwist screen as the Z-181 plus 640KB RAM (expandable to 1.64MB), a 720KB floppy drive, battery options, a convenient built-in handle, a serial port, a parallel port, and an enhanced keyboard.
62820 $2095
62821 Z-183 with 21MB RLL hard drive. *$2495*

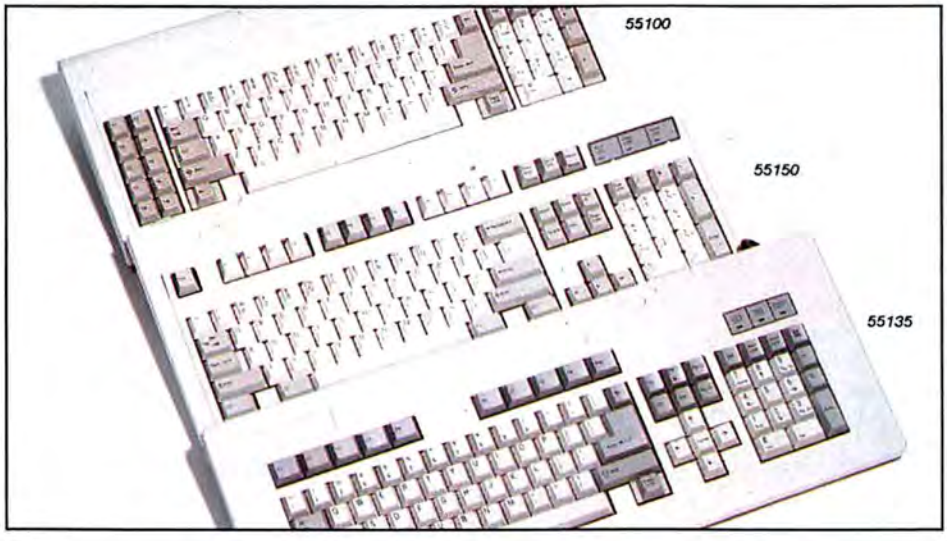
62835

Z-386 is a 16MHz system based on the advanced 80386 technology. Equipped with 1MB RAM (expandable to 16MB), a 1.2MB floppy drive, and a 40MB hard drive, the Z-386 includes such time-saving features as an enhanced page-mode static RAM and a 32-bit memory bus.
62835 $4519

62807

ZENITH ACCESSORIES

Zenith carrying case with printer pocket for models 181 and 183.
62807 $49
Zenith 360KB half-height external floppy drive for the 181 & 183 models.
62809 $299
Zenith interface cable for the 5.25" drive.
62808 $49
See page 16 for Zenith modems.



KEYBOARDS

AT-style 5060 keyboard has 84 keys and an enlarged enter and shift keys for easy operation.
55100 $69

Enhanced 101-key keyboard for AT or XT compatibles with 101 keys including 12 function keys.
55150 $69

5151 keyboard for the IBM PC/XT, AT and compatibles. Includes separate numeric and cursor key pads.
55135 $69

TANDY® -COMPATIBLE PRODUCTS

Introducing CompuAdd's new line of compatible add-on products for Tandy MS-DOS computers.

HARD DRIVES

Hard drive kits include: MiniScribe drive, drive controller, mounting brackets and hardware, cable, manual, and installation guide.

20MB half-height hard drive for Tandy 1000/A/SX/TX (65ms).
46600 $319
20MB half-height hard drive for Tandy 3000 HL (65ms).
46602 $375
40MB half-height hard drive for Tandy 1000/A/SX/TX (61ms).
46630 $395
40MB half-height hard drive for Tandy 1000/A (61ms).
46631 $395

43MB half-height hard drive for Tandy 3000 HL (25ms).
46632 $749
71MB full-height hard drive for Tandy 3000 HL (28ms).
46650 $999

MODEMS

1200 baud internal modem is a Hayes-compatible 1/2 card with 5.25" format communications software.
49525 $69
1200 baud external modem is Hayes-compatible.
49500 $89

FLOPPY DRIVES

Floppy drive kits include: drive, mounting brackets and hardware, cable, and installation guide.

360KB floppy drive for Tandy 1000/A/SX/TX.
45400 $99
360KB floppy drive for Tandy 3000 HL.
45401 $99
720KB floppy drive for Tandy 1000/A/SX/TX.
45420 $109
1.2MB floppy drive for Tandy 3000 HL.
45440 $109

CABLES

Parallel printer cable, 6', Centronics® (C36M-CE34) for Tandy 1000 models.
39628 $8.95

FLASHCARDS

The FlashCard™ simplifies fast disk storage by mounting a 3.5" drive and controller together in one compact package.

PC MAGAZINE Editor's Choice

FlashCard-20 is a 20MB drive mounted on a half card (65ms).
46603 $359

FlashCard-30 is a 30MB drive mounted on a half card (65ms).
46620 $379

PC MAGAZINE Editor's Choice

Logitech Serial Mouse is a programmable mouse with three buttons to position data, create graphics, or edit text. Includes software and manual. *PC Magazine* Editor's Choice. Serial port interface required.
55050 $79

TANDY COMPATIBILITY QUICK REFERENCE BY PART NUMBER

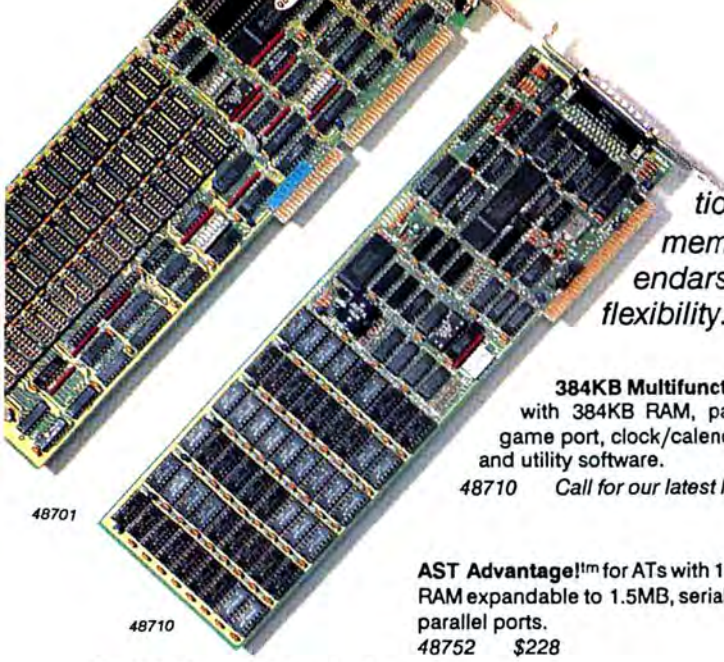
	1000	1000-A	1000-EX	1000-HX	1000-SX	1000-TX	3000-HL
20MB PC Hard disk	46600★	46600★	No	No	46600	46600	46602▪
40MB PC Hard disk	46630★	46630★	No	No	46630	46630	No
43MB AT Hard disk	No	No	No	No	No	No	46632▪
71MB AT Hard disk	No	No	No	No	No	No	46650▪
Internal modem	49525	49525	No	No	49525	49525	49525
External modem	49500✓	49500✓	49500•	49500•	49500✓	49500	49500✓
Printer cable	39628	39628	39628	39628	39628	39628	39628
5.25" 360KB Floppy disk	45400	45400	No	No	45400	No	45401
5.25" 1.2MB Floppy disk	No	No	No	No	No	No	45440
3.5" 720KB Floppy disk	45420	45420	No	No	45420	45420	No
20MB FlashCard	46603	46603	No	No	46603	46603	No
30MB FlashCard	46620	46620	No	No	46620	46620	No
Logitech serial mouse	55050✓	55050✓	55050•	55050•	55050✓	55050	55050✓

KEY

- ★ Requires Tandy 384KB RAM/DMA upgrade.
- ✓ Requires Tandy serial port upgrade.
- • Requires Tandy "Plus" style serial port upgrade.
- ▪ Includes hard disk controller card.

MULTIFUNCTION CARDS

Multifunction cards provide a variety of options including additional random-access memory (RAM), ports, and real-time clock/calendars, to increase your system's speed and flexibility.



48701

48710

384KB Multifunction card for your PC/XT with 384KB RAM, parallel port, serial port, game port, clock/calendar with battery backup, and utility software.
48710 Call for our latest low price.

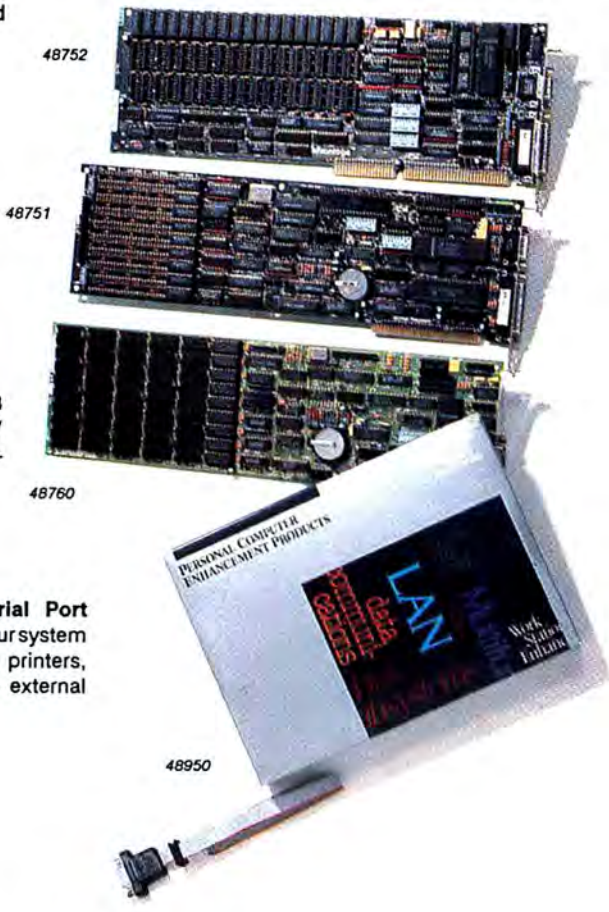
AT-Multifunction card with 0KB is expandable to 1.5MB and supports either 64KB or 256KB chips. Includes serial and parallel ports.
48701 $110

AST Advantage!™ for ATs with 128KB RAM expandable to 1.5MB, serial, and parallel ports.
48752 $228

AT-MFC Memory Piggyback with 0KB is expandable to 1.5MB RAM for increased memory storage.
48901 $25

AST SixPakPremium™ for PC/XTs with 256KB RAM expandable up to 2MB, serial port, parallel port, clock/calendar, and software. Supports Lotus/Intel/Microsoft and AST expanded memory specifications.
48751 $197

Second Serial Port Option for the AT/XT input/output or AT MFC cards provides for system expansion.
48900 $20



48752

48751

48760

AST SixPakPlus® for PCs with 384KB RAM, serial port, parallel port, clock/calendar with battery backup, and utility software.
48760 $259

48900

48901

AST Advantage Serial Port adds a serial port to your system for use with certain printers, pointing devices, or external modems.
48950 $19

48950

ACCELERATORS

Increase your PC's processing speed to turbo speeds (higher than 4.77MHz) with an accelerator card.

48601

Orchid TinyTurbo 286™ board gives your PC/XT the power of an AT.
48601 $299

Charge Card 286™ makes your PC/XT run 6.6 times faster.
48602 $269

48602

MEMORY CARDS

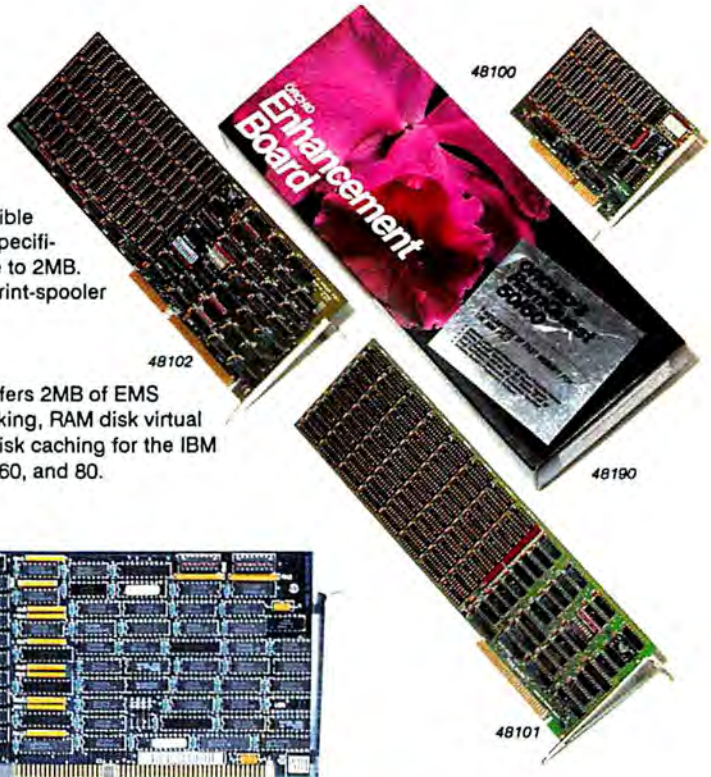
Extra memory allows you to run more powerful applications and may increase the operational speed of a program.

Mem-576 short card for the XT supports either 64KB or 256KB chips. It comes with 0KB and is expandable up to 192, 384, or 576KB.
48100 $35

EMS Card for the AT is compatible with the Lotus/Intel/Microsoft specification and has 0KB expandable to 2MB. Includes virtual RAM disk and print-spooler software.
48102 $119

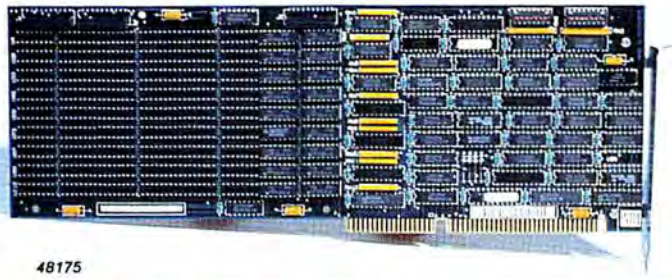
XT EMS Card (Expansion-Memory-Specification) for the XT, with 0KB expands to 2MB and is compatible with the Lotus/Intel/Microsoft specification. Includes virtual RAM disk and print-spooler software.
48101 $99

Orchid RamQuest 50/60™ offers 2MB of EMS memory, automatic parity checking, RAM disk virtual storaging, print spooling, and disk caching for the IBM Personal System/2 models 50, 60, and 80.
48190 $699



48100
48102
48190
48101

Intel Above™ Board 286 for AT/PC/XT supplies three memory boards in one: conventional, expanded, and extended. Includes 512KB expandable to 2MB.
48175 $349


48175

AST RAMpage/2™ expanded memory board comes with 64KB RAM expandable to 2MB.
48151 $229

48151

48000

48001

INPUT/OUTPUT CARDS

Add a serial or parallel port to your system with an economical I/O card.

I/O Card for AT compatibles with serial port and parallel port.
48000 $59

I/O Card for PC compatibles with serial port, parallel port, game port, and clock/calendar with battery back up.
48001 $65

RAM CHIPS

Come in sets of 9 with a one-year warranty.

50603 256KB chip set for AT (80 nanoseconds).
50600 256KB chip set (100 nanoseconds).
50601 256KB chip set for AT (120 nano seconds).
50602 256KB chip set (150 nanoseconds).
50501 64KB chip set (120 nanoseconds).
Call for our latest low prices.

MATH COPROCESSORS

Math coprocessors speed up your calculations.

8087-3 Math coprocessor (5MHz).
50200 $129
8087-2 Math coprocessor (8MHz).
50201 $159
80287-6 Math coprocessor (6 MHz).
50250 $219
80287-8 Math coprocessor (8 MHz).
50251 $269
80287-10 Math coprocessor (10MHz).
50252 $349
80387-16 Math coprocessor (16MHz).
50275 $525
80387-20 Math coprocessor (20MHz).
50277 $779

MONOCHROME MONITORS

51001

Samsung[tm] 12" flat screen amber monochrome monitor with tilt/swivel base.
51001 $95

Samsung 12" curved screen amber monochrome monitor.
51000 $89

51000

51002

51003

Amdek® 300A for Apple or IBM is a composite 12" amber monochrome monitor. It requires a color card to work in IBM compatibles.
51002 $129

Amdek 310A with a 12", high-resolution amber monochrome monitor.
51003 $135

51006

Amdek 410W black and white display, with 12" flat screen
51006 $159

Quadram Amberchrome[tm] 12" with a high-resolution 12" amber display.
51004 $119

51004

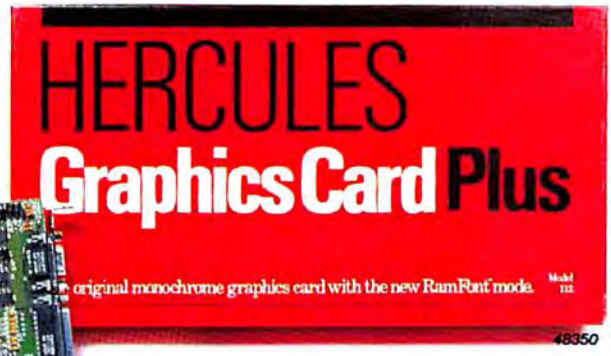
MONOCHROME GRAPHICS CARDS

Monochrome monitors require a monographics video card except where indicated.

Hercules[tm] Monochrome Graphics Card Plus is the world's best-selling graphics and adapter board. Monochrome display with high-resolution graphics and text display. Includes parallel port.
48350 $179

Monographics Card is a high-resolution monochrome graphics card. Includes parallel port.
48301 $65

48301



48350

COLOR MONITORS

Princeton® HX-12+ is a color monitor with a .28mm dot pitch, 770x200 line resolution, and 18MHz bandwidth.
51101 $399

51100

IBM-compatible color monitor with 12" screen.
51100 $239

COLOR GRAPHICS CARDS

Hercules Color Graphics Card has color graphics and printer port for the AT/PC on a space-saving half-size card.
48351 $149

Color Graphics Card is a high-resolution color graphics adapter that operates in both color and composite mode. Includes a parallel port.
48302 $59

48351

48302

EGA MONITORS

Enhance your system with either of these fine EGA color monitors that gives superior resolution and color.

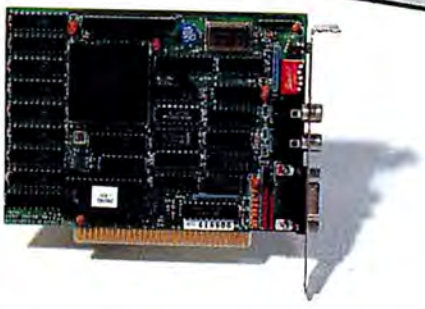
IBM-compatible 14" EGA monitor offers the best value in an enhanced color monitor. Its industry standard 14" tube with 13" (diagonal) screen offers .31mm dot pitch and high resolution.
51201 $349

51201

51202

NEC Multisync® II, one of the finest multisynchronous monitors available, adjusts to any horizontal synchronization frequency between 15.5KHz and 31.7KHz. It has a resolution up to 800x675, and supports both TTL and analog inputs. The 14" display has a 30MHz bandwidth and .31mm dot pitch.
51202 $679

48376



EGA CARDS

Performance power for your EGA monitor.

Video Seven Vega Deluxe™ is an EGA card for the IBM-PC family. Fully compatible with all popular video standards, including color graphics, monochrome and monographics cards. It supports enhanced color, regular color, and monographics displays. Capable of 37% higher resolution with the NEC Multisync II or other multisynchronous monitors and appropriate software.
48376 $249

EGA-350 Card is IBM-EGA compatible, has 256KB display memory, high-resolution (640x350) graphics mode, and displays 64 colors, 16 at a time. It supports color, enhanced color, and monochrome displays.
48303 $129

EGA-480 Card is an IBM/EGA-compatible card with 256KB display memory, and 16/64 color capability. The EGA-480 automatically configures itself to a resolution of 640x350 or 640x480, depending on your monitor.
48304 $159

VIDEO COMBOS

Upgrade or enhance your system with our quality video combos in monographics, color, or enhanced graphics.

Flatscreen Monographics Combo

Includes Samsung 12" flat screen monitor with tilt and swivel base, and monographics video card.

51700 ***$139***

Color Graphics Adapter (CGA) Combo

Includes 12" color monitor and color card.

51701 ***$329***

Enhanced Graphics Adapter (EGA) Combo

Includes a 14" industry standard tube with 13" diagonal EGA monitor and EGA card.

51702 ***$479***

Ultimate EGA Combo

Includes the NEC Multisync II monitor and a Video Seven Vega Deluxe EGA card.

51703 ***$869***

MODEMS

Modems allow your computer to communicate with other computers over telephone lines. The greater the baud rate, the more quickly your data is transmitted.

Internal Modems

1200 baud 1/2 card internal modem with software.
49500 $69
2400 baud internal modem with software.
49553 $139
Everex Evercom™ 1200 baud 1/2 card internal modem with software.
49502 $99
Everex Evercom 2400 baud 1/2 card internal modem with software.
49551 $189
Everex Evercom II 24 2400 baud internal modem designed for the Micro Channel™ architecture of the Personal System/ 2. Includes communications software.
49554 $179
Hayes Smartmodem™ 1200B 1200 baud 1/2 card internal modem with Smartcom II software.
49526 $299
Hayes 2400B 2400 baud internal modem.
49552 $449
Zenith 1200 baud internal modem.
62805 $209
Zenith 2400 baud internal modem for Zenith 181 and 183 models.
62806 $472

External Modems

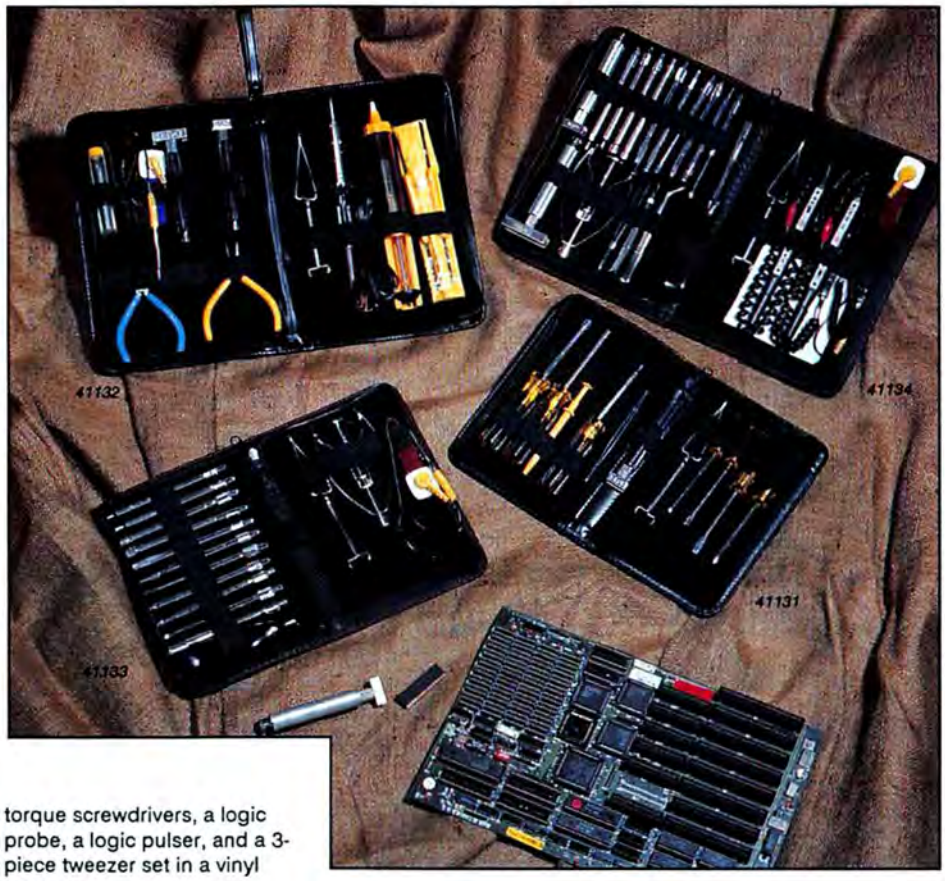
External modems require a serial port and cable.

1200 baud external modem.
49525 $89
2400 baud external modem.
49557 $159
Everex 2400 external modem.
49575 $239
Hayes Smartmodem 1200 baud external modem.
49501 $319
Hayes 2400 baud external modem.
49576 $469

COMPUTER SERVICE KITS

Computer Service kits are handy versatile kits that keep all the necessary tools for maintaining your computer right at your fingertips.

Basic Tool Kit includes chip inserter, extractor, 3-claw holder, tweezers, four screwdrivers, four nutdrivers, and torque screwdriver in a vinyl case.
41131 $14
Soldering Tool Kit includes chip inserter, extractor, anti-static wrist strap, coiled ground cord, soldering iron, desoldering tool, various solder tools, pliers, and clippers in a vinyl case.
41132 $29
Advanced Tool Kit includes chip inserter, chip and square chip extractors, anti-static wrist strap, multiple screwdriver with six extensions, two nutdrivers, and two torque screwdrivers in a vinyl case.
41133 $35
Troubleshooting Tool Kit includes chip inserter, chip and square chip extractors, anti-static wrist strap, multiple screwdriver with six extensions, two nutdrivers, and two torque screwdrivers, a logic probe, a logic pulser, and a 3-piece tweezer set in a vinyl case.
41134 $79



IBM® PERSONAL SYSTEM/2™ ADD-ON PRODUCTS

Increase the performance of your IBM Personal System/2 system with these add-on products.

Orchid RamQuest 50/60™ offers 2MB of EMS memory with automatic parity checking for the Personal System/2. Software-configurable, RAM disk virtual storaging, print spooling, and disk caching are some of its impressive features. RamQuest supports OS/2 and Lotus/Intel/Microsoft specifications.
48190 $669

Everex Evercom II 24™ 2400 baud internal modem with software is designed specifically for use with the Micro Channel™ architecture of the Personal System/2. Also included is the BitCom software which stores up to 32,000 numbers for auto-dialing. Other modem features include auto-answer, auto-sensing of tone/pulse dialing, and auto-voice switchover.
49554 $190

External 5.25" drive provides your IBM PS/2 with AT/XT 5.25" compatiblity without requiring use of an expansion slot. No external power cord needed. It installs as drive B and permits read and write bidirectional transfer of data from 360KB to 720KB format. Includes board, cable, and floppy drive. Compatible with IBM PS/2 Models 30, 50, 60, and 80.
62554 $269

POINTING DEVICES

Mouse

Essential for desktop publishing, the mouse can also be used in many programs to provide easy cursor movement.

Standard Brand™ Mouse is a three-button optical/mechanical mouse that is compatible with the Microsoft Serial Mouse and Mouse Systems PC Mouse.
55052 $55

Logitech® Serial Mouse is a programmable mouse with three buttons to position data, create graphics, or edit text. Includes software and manual. *PC Magazine* Editor's Choice (Jan. 27, 1987). Serial port interface required.
55050 $79

PC MAGAZINE Editor's Choice

Logitech Bus Mouse is a three-button optical mouse that offers high resolution (200 dpi) and maximum compatibility with most software. Includes bus interface card.
55049 $89

Microsoft® Bus Mouse is a mechanical mouse with bus interface that doesn't require the use of a serial port.
55051 $119

Joysticks

The joystick requires a game port.

55000 Standard Brand joystick. *$19.95*
55001 Mach III joystick with fire button. *$35*

48190

49554

FACSIMILES

Sharp® FO-150 facsimile machine provides dramatic half-tone transmissions with eight levels of shading, automatic contrast adjustment, and high speed transmission (7200, 6900, 4800, 2400 bps) with automatic fallback. Space-saving with its compact design and built-in phone, the facsimile is also priced to be cost-effective. Group-3 compatible.
56050 $1049

56050

Sharp FO-300 offers high-quality half-tone transmissions with 16 levels of shading, and automatic contrast adjustment. Capable of transmitting a page every 18 seconds, it includes automatic document feed and built-in phone with speed dialing, automatic re-dial, and timed transmissions. Group-3, Group-2, CCITT, and FMG1 compatible.
56052 $1499

CABLES

39625 Parallel Printer Cable 6' (DB25M to C36M). *$8.95*
39627 Parallel Printer Cable 10' (DB25M to C36M). *$11.95*
39660 AT Serial Pigtail Cable 2' (DB9F to DB25M). *$4.95*
39661 AT Serial Cable 6' (DB9F to DB25M). *$7.95*
39663 AT Serial Cable 10' (DB9F to DB25M). *$10.95*
39655 XT Serial Cable 6' (DB25F to DB25M). *$7.95*
39657 XT Serial Cable 10' (DB25F to DB25M). *$10.95*
39675 Hewlett-Packard Serial Cable 6' (DB25F-DB25M). *$7.95*
39677 Hewlett-Packard Serial Cable 10' (DB25F-DB25M). *$10.95*
39700 Full Pin Cable 6' (DB25M to DB25F). *$7.95*
39702 Full Pin Cable 10' (DB25M to DB25F). *$10.95*
39690 Full Pin Cable 6' (DB25M to DB25M). *$7.95*
39692 Full Pin Cable 10' (DB25M to DB25M). *$10.95*
39695 Full Pin Cable 6' (DB25F to DB25F). *$7.95*
39697 Full Pin Cable 10' (DB25F to DB25F). *$10.95*
39705 Centronics® Cable 6' (C36M to C36F). *$10.95*
39707 Centronics Cable 10' (C36M to C36F). *$13.95*
39710 Centronics Cable 6' (C36M to C36M). *$10.95*
39712 Centronics Cable 10' (C36M to C36M). *$13.95*
39610 Keyboard Extension Cable 6' coiled. *$6.95*
39615 Monitor Extension Cable 6' (DB9M to DB9F). *$6.95*

OFFICE SUPPLIES

CLEANERS

Keeping your equipment clean is essential to optimal operations. A clean system means that your data will be protected and your computer will serve you better.

Head cleaning kit for 5.25" disk drive.
41001 *$12*

Head cleaning kit for 3.5" disk drive.
41000 *$15*

Microcomputer cleaning kit (for complete cleaning including heads and screen).
41015 *$25*

Compuduster.
41010 *$24*

Screen cleaning kit.
41020 *$16*

Mini vacuum helps remove the dust that accumulates on your keyboard.
41025 *$9*

COPY HOLDERS

41650 Copy holder with stand 9.5x11". *$7*
41651 Copy holder with adjustable arm 9.5x11". *$11*
41653 Copy holder with stand 19x12". *$19*
41654 Copy holder with adjustable arm 19x12". *$22*
41655 Copy holder with stand 9.5x11". *$9*

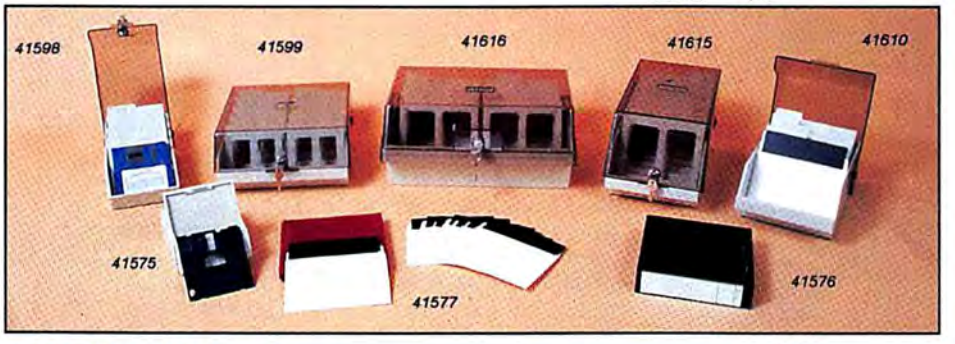
Data-Vac® is a lightweight vacuum/blower (three pounds) equipped with a 19" flexible hose, a shoulder strap, and three attachments for intricate precision cleaning of your system. Five vacuum bags are included.
41026 *$49*

MONITOR STANDS

Monitor stands help you position your computer screen for easier viewing.

12" Tilt/swivel monitor stand.
41565 *$12*

14" Tilt/swivel monitor stand.
41566 *$14*



FLOPPY STORAGE

Safeguard your floppies from accidental damage with durable file boxes that get disks out of the desktop danger zone.

File boxes for 5.25" floppies.
41610 For 50 floppies, without lock. *$4.99*
41615 For 100 floppies, with lock. *$6.49*
41616 For 120 floppies, with lock. *$7.49*

File boxes for 3.5" floppies.
41598 For 40 floppies, without lock. *$4.49*
41599 For 80 floppies, with lock. *$6.49*

Cases for 5.25" floppies.
41576 For 10 floppies. *$2*
41577 For 6 floppies. *$1.25*

Case for 3.5" floppies.
41575 For 10 floppies. *$2*

Portable carry-case with handle for 5.25" floppies.
41617 For 120 floppies, with lock. *$25*

SYSTEM STANDS

Increase your work space by putting your computer under the desk with a system stand.

Plastic vertical system stand.
41555 *$13*

Metal vertical system stand.
41556 *$19*

FOR FAST DELIVERY, CALL 1-800-727-3838

ORDERING BY PHONE

Use the order form to plan your purchases, then call the number above between 8am - 9pm Monday - Friday or 9am - 5pm Saturday, CST. We accept VISA and Master Card. COD orders ($50 minimum) must be paid for with a money order or cash.

ORDERING BY MAIL

Complete the order form and mail it to **CompuAdd, 12303-G Technology Blvd., Austin, Texas 78727**. Be sure to include your name, address and method of payment. COD orders ($50 minimum) must be paid for with a money order or cash.

SHIPPING INFORMATION

Please add 2% of your order to cover shipping and handling costs (minimum $2). Next-day or second-day UPS service is also available - call for details and prices.

Check your order carefully to ensure that all items are present and in good condition. (Any partial orders will be noted on the invoice). Claims for incomplete orders must be submitted within ten days. If there is a question about your order, contact us immediately. If your order has been damaged in transit, contact the nearest UPS office within ten days and file a claim. Keep the original shipping carton for UPS' inspection. The carrier is responsible for damage incurred during shipment.

WARRANTY INFORMATION

CompuAdd provides a limited one-year warranty on most of the products it sells. For specific warranty information, please ask our salespeople or write to the address above.

RETURNS

CompuAdd offers a 30-day money-back guarantee on hardware products. We will refund the purchase price of the product (excluding shipping and handling). All items must be shipped insurance and freight prepaid, and accompanied by a return merchandise authorization (RMA) number. All items must be in original, like-new condition, including all packaging material and documentation. We will not accept returns sent COD.

BILLING ADDRESS

PHONE NUMBER DATE

FIRST NAME LAST NAME

COMPANY NAME IF APPLICABLE

STREET ADDRESS APT/BLDG/SUITE

CITY STATE ZIP CODE

SHIPPING ADDRESS
(if different from billing address)

PHONE NUMBER

FIRST NAME LAST NAME

COMPANY NAME IF APPLICABLE

STREET ADDRESS APT/BLDG/SUITE

CITY STATE ZIP CODE

QUANTITY	PRODUCT NUMBER	PAGE NUMBER	DESCRIPTION	UNIT PRICE	SUBTOTAL

METHOD OF PAYMENT

___VISA ___MasterCard ___Check

___Cashiers' Check / COD ___Money Order

Account Number Exp. Date

Bank Name on Card_____

SUBTOTAL	
SALES TAX Texas Residents: Add 8% Sales Tax	
SHIPPING Please add 2% of your order to cover shipping and handling costs (minimum $2).	
TOTAL	

Prices subject to change without notice 5/88

TAPE BACKUP SYSTEMS

Protect the valuable data and software stored on your hard drive with regular backups. Transferred to tape, your data is safe in case of power or computer failure. Software is included with each backup system.

49505 40MB internal tape backup for the AT. *$389*

45906 40MB internal tape backup for the XT. *$389*

45950 60MB internal tape backup. *$757*

57801 20/40MB tape cartridge. *$21.99*

57850 60MB tape cartridge. *$29.95*

KEYBOARD DRAWERS

Keyboard drawers provide convenient storage and protect your keyboard from the detrimental effects of dirt.

Undercarriage keyboard drawer attaches easily under desktop or shelf.
41753 *$17*

Keyboard drawer for out-of-the-way storage under CPU or monitor.
41750 *$24*

Keyboard drawer with power center allows you to switch on your peripherals from a convenient central location.
41751 *$59*

BLANK FLOPPIES

All floppies come in boxes of 10.

5 .25" Floppies:

57000 360KB DS/DD. *$7*

57004 360KB Maxell® DS/DD. *$9*

57002 360KB Verbatim® DS/DD. *$10*

57200 1.2MB DS/HD. *$15*

57202 1.2MB Maxell DS/HD. *$18*

57201 1.2MB Verbatim DS/HD. *$19*

3 .5" Floppies:

57401 720KB Sony DS/DD. *$19*

57440 1.44MB Sony DS/HD. *$55*

STATIC MATS

Static mats dissipate static electricity before it harms your computer. Each mat includes a 10' coiled ground cord.

41075 11.5"x 22" mat. *$16*

41076 19.5"x 23.5" mat. *$19*

41077 23.5"x 25.5" mat. *$22*

EXTERNAL HARD DRIVE CHASSIS

Full-height hard-drive chassis with 45-watt power supply and cables for XT or AT.
46100 *$119*

46100
Drive not included.

EPSON

Equity™ II+ combines power, performance, and value. Its dual speed (6 and 10MHz) 80286 processor and 640KB RAM deliver ample power for a wide range of tasks. The system also features support for an 80287 coprocessor. The system has three 16-bit expansion slots, three 8-bit expansion slots, clock/calendar, AT-style keyboard, one 360KB floppy drive, MS-DOS, GW BASIC, custom Epson utilities, and documentation.
62726 *$1239*

Available in retail stores only. *62726*

ABOUT COMPUADD AND PC SOURCE:

OUR BEGINNINGS

CompuAdd Corp. was established in 1982 as a mail-order company specializing in diskette drives and hard drives for personal computers.

Since then, CompuAdd and its subsidiary PC Source have become leading distributors and manufacturers of computers, add-on products, and accessories.

THE PRESENT

In December 1987, *Inc.* magazine rated CompuAdd as the third fastest-growing privately-held companies in North America.

We've been able to achieve this phenomenal growth because we offer the best possible products and customer support, at competitive prices.

THE FUTURE

CompuAdd continues to grow, and in new directions. We have several retail outlets in Dallas, Austin, and San Antonio. The State of Texas recently awarded CompuAdd a contract to sell computers and peripherals to state agencies.

Our emphasis on price, quality, and support will continue to serve our customers in the mail-order, retail, corporate, and institutional markets.

INTERNATIONAL SALES

We welcome inquiries from dealers and companies outside the United States:

Phone: 512-258-5575
FAX: 512-250-5760
Telex: 763543 COMPUADD AUS

Sensational Software! Sensational Software Selection!

SOFTWARE

Word Processing

MultiMate Advantage II™ by Ashton-Tate is a flexible word processor with exhaustive conversion support for popular applications and printers. Includes extensive dictionary with legal/medical terms, custom dictionaries, spelling checker, list and file manager, and six math functions. Requires at least 384KB RAM and MS-DOS 2.0-3.2.
60025 *$269*

WordPerfect® by WordPerfect Corp. formats documents, prepares outlines, and generates tables of contents. Includes 115,000-word dictionary, thesaurus, and mail merge. Requires at least 256KB RAM.
60015 *$215*

Word® by Microsoft is a powerful word processor providing style sheets and macros for easy and professional-looking results. Requires at least 320KB RAM, DOS 2.0. Includes both 5.25 and 3.5"diskettes.
60000 *$229*

WordStar Professional by MicroPro, a complete word processing package including mail merge, spelling checker, and index/table of contents generator. Requires at least 192KB RAM.
60010 *$239*

Professional Write by Software Publishing is perfect for the professional who wants polished reports in minutes. Includes spelling checker, custom dictionary, thesaurus, and macro support. Optimized for speed. Requires at least 320KB RAM and DOS 2.0 (DOS 3.2 requires 384KB RAM). Includes both 5.25 and 3.5"diskettes.
60020 *$115*

Desktop Publishing & Graphics

Ventura Publisher™ page and document composition software by Xerox produces fine quality publications. Novices and experts will appreciate the handy style sheets and automatic table of contents/index generator. Requires at least 512KB RAM, DOS 2.1, hard disk, graphics controller, and pointing device.
59405 *$529*

Pagemaker® by Aldus assists you in creating distinguished reports, brochures, and newsletters with page formatting, layout, and design tools. Recommended configuration is an AT-compatible, 640KB RAM, DOS 3.0, one floppy drive, one 20MB hard disk, an EGA card and display, a pointing device, and a laser printer.
59400 *$545*

The Print Shop® by Broderbund offers a selection of 16 borders, 20 patterns and designs, and 12 type styles to create signs, banners, letterhead, and greeting cards. Choose from a library of 120 graphics or create your own. Requires at least 48KB RAM.
61050 *$38*

FONTASY® by Prosoft accentuates your documents with 28 type styles (supports over 275 fonts). Features graphics for simple illustrations, proportional spacing, reversal capability, and thorough online help. Requires at least 512KB RAM for 9-pin printers (640KB RAM for 24-pin printers), MS-DOS 2.0, a graphics adapter, and dot-matrix printer.
59420 *$36*

The Newsroom™ by Springboard makes you editor-in-chief with this word processor package that includes five type styles and sizes, automatic text layout, graphics, a clip-art collection, and modem support. Requires at least 256KB RAM, DOS 2.0 and color graphics card.
59425 *$35*

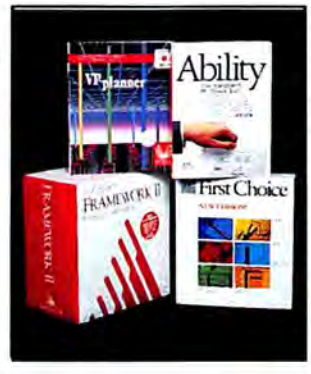
Printmaster Plus™ by Unison World creates custom fliers, banners, calendars, and stationery. You design the layout, select the type, and enter the message. Requires at least 256KB RAM, MS-DOS 2.0, a graphics card adapter. Supports most printers.
61015 *$30*

Windows "Draw !"™ with Clip Art by Micrographx creates diagrams and designs using pull-down menus. This interactive graphics program can be used alone or in conjunction with *Windows*. Requires at least 320KB RAM.
59820 *$172*

PC Paint by Mouse Systems is an easy-to-use graphics application that includes 17 fonts. Merge graphs from other programs to create comprehensive presentations. Requires at least 256KB RAM, MS-DOS, a graphics adapter card, and a mouse. Supports most printers.
59800 *$53*

Gem Draw™ *Plus* by Digital Research enhances your printed materials with charts, tables, and diagrams. Includes a 40-piece clip art library. Requires at least 256KB RAM. 3.5" diskettes available free with enclosed coupon.
59815 *$169*

Certificate Maker™ by Springboard lets you choose from over 200 styles and 24 borders to create a variety of certificates. Features a name list file to print multiple copies. Includes 36 gold foil seals and stickers. Requires at least 256KB RAM, MS-DOS 2.1, and IBM color graphics card.
61040 *$25*



Spreadsheets and Integrated Packages

Framework II™ by Ashton-Tate comes complete with word processing, spreadsheets, data management, telecommunications, and graphics. Customize and create applications with the FRED™ programming language. Requires at least 384KB RAM.
60110 *$345*

First Choice by Software Publishing provides the beginner with accessible word processing, thesaurus/spelling checker, file management, spreadsheet analysis, business graphics, and electronic communications. Requires at least 512KB RAM and DOS 2.0. Includes both 5.25" and 3.5"diskettes.
60605 *$79*

The Twin Classic™ by Mosaic is an integrated package that supplies you with a spreadsheet, file manager, and presentation graphics.
60120 *$55*

Ability™ by Migent features word processing, spreadsheet, database, graphics, telecommunication, and audio/visual presentation applications in one software package. Requires at least 384KB RAM. The audio/visusal presentation package requires a graphics card.
60102 *$59*

VP-Planner® by Paperback is a multi-dimensional database that creates user-defined spreadsheets. Conserves memory by storing only the cells that actually contain information, Features user-defined macros and background mode for printing. Requires at least 256KB RAM.
60130 *$55*

Sensational Software! Sensational Selection!

Database Management

dBASE III® Plus by Ashton-Tate includes a fully-relational database, the dBase programming language, a built-in networking system, a data catalog, the Advanced Query system, and a day-to-day management system. Designed for the new and experienced user alike. Requires at least 256KB RAM and MS-DOS 2.0.
60600 $409

Q&A™ by Symantec answers your data management needs with a powerful database that is easy to set up, a report generator that offers advanced options for professional-looking reports, and a word processor that includes a spelling checker. Requires at least 512KB RAM. 3.5"diskettes available free with enclosed coupon. Compatible with Symphony, 1-2-3, dBASE, WordStar, MultiMate, and PFS: File.
60615 $199

Reflex® : The Analyst by Borland permits you to analyze data from five different viewpoints: form, list, graph, crosstab, and report. Generates reports and mailing labels from your database. Requires at least 384KB RAM, MS-DOS 2.0, IBM Color Graphics Adapter, Hercules Monochrome Graphics Card, or equivalent.
60610 $82

Finance

Managing your Money® by Meca includes: budgeter, checkbook, tax planner and strategist, net worth tracker, financial calculator, life insurance evaluator, investment analyzer, retirement and college planner. It even prepares your accounts payable and receivable, invoices, mailing labels--the works! Requires at least 256KB RAM, DOS 2.0.
60800 $125

Sylvia Porter's Financial Planner™ by Timeworks organizes your finances with financial planning by objectives, checkbook and checkwritig, budgeting, and financial tracking. Requires at least 256KB RAM and MS-DOS 2.0.
60810 $55

Dollars & Sense by Monogram is tailored for home or small business financial management. Prepares budgets, split transactions, records, billings, and tax estimates. Not copy protected. Requires at least 256KB RAM and DOS 2.1.
60805 $105

Security

Coffee Break by MPPi keeps sensitive information secure when you are away from your desk. The program disables the CONTROL key and covers your screen with a custom display until the chosen password is entered. Requires at least 9.7KB RAM and MS-DOS.
58595 $21

Utilities

Norton's Utilities™ Advanced Edition by Peter Norton Software optimizes your disk for fast access time, locates 'lost' data, and performs all those practical utilities for which Norton is famous. 3.5" diskettes available with enclosed coupon.
58536 $79

Norton's Utilities by Peter Norton Software increases system performance by restoring lost files, speeding up searches, showing directory structure, converting batch files to interactive, and much more. 3.5" diskettes available with enclosed coupon.
58535 $50

PC Tools® Deluxe by Central Point Software interfaces with DOS to implement DOS commands from within other applications, manages files and subdirectories, and recovers deleted files. Requires at least 192KB RAM. Includes both 5.25" and 3.5" diskettes.
58566 $40

Sideways® by Funk customizes your spreadsheets with nine type sizes and spacing, margin, and column control. Compatible with 1-2-3 and Symphony. Requires at least 64KB. 3.5 " diskette available free with enclosed coupon.
58580 $40

Copy II® PC by Central Point Software lets you to create backup copies of most copy-protected software for archival purposes to protect expensive software.
58565 $23

PC-FullBak® by Westlake Data quickly backs up and restores files from your hard disk to protect your crucial data. Requires at least 128KB RAM, DOS 2.0.
58600 $49

Fastback by Fifth Generation makes backups to protect data stored on your hard disk. In four minutes, it formats diskettes and backs up a 10MB hard drive. Requires at least 128KB RAM and DOS 2.0.
58555 $92

Disk Optimizer™ by SoftLogic Solutions safely reorganizes and compresses files to continuous sectors for reduced access time. Requires at least 128KB RAM and DOS 2.0.
58560 $29

SideKick® by Borland runs an editor, phone directory, autodialer, monthly calendar, appointment calendar, calculator, and ASCII table while simultaneously running other programs like *1-2-3* or *dBASE III*. Not copy protected. Requires at least 128KB RAM, MS-DOS 2.0, a disk drive, and a Hayes-compatible modem.
58585 $50

X-TREE™ by Executive Systems simplifies file and directory management. It structures, sorts, and organizes files. Not copy protected. Requires at least MS-DOS 2.0 and 192KB RAM.
58575 $28

PathMinder™ by Westlake Data manages your computer's directories and files. Maintains a file security and systems log. Requires at least 256KB RAM and MS-DOS 2.0-3.
58598 $35

SafetyNet™ by Westlake Data is a 4KB memory resident program that allows you to recover accidentally erased files. SafetyNet maintains deleted files' allocated file space permiting recovery of files long after they have been deleted.
58596 $44

Languages

Turbo Pascal® by Borland powers up your computer with the Pascal language. Includes full-screen interactive editor, fast separate compiler, and support for: 64KB+ programs, device-independent graphics, and macros. Minimum requirements for an integrated environment: 384KB RAM, for command line: 256KB RAM.
58201 $62

QuickBASIC by Microsoft speeds up the programming process by eliminating the lengthy compile step. Supports the 8087 and 80287 coprocessors. The full-screen windowing editor aids in debugging and provides context-sensitive help. Requires at least 320KB RAM and DOS 2.1.
58235 $61

Turbo BASIC® by Borland is a high-performance, high-speed BASIC program that includes an interactive editor, a trace debugging system, and a fast compiler. Requires at least MS-DOS 2.0.
58200 $57

Sensational Software! Sensational Selection!

Communication

Crosstalk XVI by MicroStuf is a complete communications software package. The extensive prompt system makes it extremely user friendly. Supports Crosstalk, XMODEM, X.PC, Send/Capture, and Kermit protocols. Requires at least 96KB RAM and a modem.
59000 $99

Smartcom II by Hayes simplifies telecomputing by storing the phone numbers, log-on sequences, and communication parameters. Supports Hayes Verification, Stop/Start, Send Lines, XMODEM, and XMODEM CRC protocols. Requires at least 196KB RAM and a modem.
59105 $85

CompuServe Subscription Kit offers easy access to electronic services and online databases by means of a local phone call or supplemental networks such as TYMNET
59110 $21

Games

Flight Simulator by Microsoft makes you the pilot of a Cessna 182. Learn to navigate airports under various weather and flight conditions. When you've earned your wings, try your skill against enemy fighters in World War I Ace. Requires at least 128KB RAM, gaphics adapter card. Joystick/mouse usage is optional.
61500 $35

Jet by SubLOGIC puts you in the cockpit of the technologically advanced F-16 Fighting Falcon or the F-18 Hornet.

Requires at least 128KB RAM and an EGA or color graphics card. Joystick usage is optional.
61510 $35

Scenery Disks enhance your *Jet* and *Flight Simulator* programs by increasing the variety and detail of the terrain. These disks supply visible landmarks for "sight" maneuvering. Requires at least Flight Simulator 2.0 or Jet 1.3.
61511 Dallas, Ft. Worth, Houston $16
61512 Los Angeles, San Francisco, Las Vegas $16
61513 Washington DC, Charlotte, Miami $16

Where in the World is Carmen Sandiego?™ by Broderbund whisks you off on an international adventure of mystery and intrigue as you try to determine the whereabouts of the infamous thief Carmen Sandiego and her gang. Requires at least a Hercules-compatible graphic adapter.
61520 $30

Where in the USA is Carmen Sandiego? by Broderbund has the daring criminal Carmen Sandiego loose again in this equally enthralling sequel. This time you scour the United States to follow the trail of Carmen and her gang of crooks. Requires a Hercules-compatible graphics adapter.
61521 $30

Sargon III® by Hayden Software is stimulating for the chess master and helpful for the novice. Sargon III allows you to take back moves, change sides, and study classic chess problems. It even suggests moves for you, visually displays the moves it considers, or monitors a game between you and an opponent for illegal moves. Requires at least 128KB RAM.
61528 $15

F-15 Strike Eagle® by MicroProse challenges your combat piloting ability with four skill levels. Navigate dangerous missions using the sophisticated instrument panel that includes Heads Up Display. Requires at least 128KB RAM, a CGA or EGA monitor, and that drive A is 5.25". Joystick usage is optional.
61527 $25

King's Quest III, the third installment of the popular Quest series by Sierra On-Line, is a graphics-adventure program with realistic 3-D animation. Advanced design includes parser, self-mapping features, and choreographed soundtrack. Requires at least 256KB RAM and MS-DOS.
61523 $30

NFL Challenge by XOR puts you on the gridiron, coaching your choice of the 28 NFL teams. Simulation introduces chance events like individual player characteristics, fumbles, interceptions, injuries, substitutions, and penalties. Animated coverage with instant replay possible on systems with RGB color monitors. Requires at least 256KB RAM, DOS 2.0, and monochrome or color adapter card.
61524 $59

Destroyer™ by Epyx puts you in command of a Fletcher Class US Naval Destroyer in this exciting graphics-action game. Seven progressively difficult scenerios add to the realistic simulation of piloting a WWII destroyer. Minimum requirement for PC-compatibles is a color monitor.
61522 $25

Education

Learning DOS by Microsoft is a comprehensive guide to understanding the IBM PC operating system. Teaches you file management, application, and batch file skills. Requires at least 256KB RAM and MS-DOS 2.0.
61000 $32

Typing Tutor IV® by Simon & Schuster customizes lessons to your abilities. Also includes an arcade-style game that entertains as it helps increase your typing speed. Requires at least 128KB RAM, MS-DOS 2.0 (PCjr requires DOS 2.1).
61020 $32

Reader Rabbit™ by The Learning Co. makes learning to read fun. Designed for ages 4-7, Reader Rabbit keeps your child's attention with four animated games that teach reading, spelling, vocabulary, and memory skills. Requires at least 256KB RAM, MS-DOS, a color graphics adapter. 3.5 diskette available for nominal fee with purchase of this package.
61035 $25

Alge-Blaster!™ by Davidson & Assoc. helps develop a strong foundation in algebra fundamentals. Factoring polynominals and systems of equations are easy to solve with the helpful prompts provided. New problems can be inserted into the program. Requires at least 128KB RAM, DOS 2.0, and color/graphics.
61030 $26

Math Blaster Plus!™ by Davidson & Assoc. teaches basic skills in math including: addition, subtraction, multiplication, division, fractions, decimals, and percentages. Five different learning activities, animation and color, "Blasternaut" math game, and award certificates add to the fun of learning. Requires at least 256KB RAM, DOS 2.0, and color/graphics.
61025 $29

Wizard of Words by Advanced Ideas increases children's reading, spelling, and vocabulary skills through five educational games. Tailor your child's learning of the resident 38,000 words or customize the lessons with your own vocabulary lists. Requires at least 128KB RAM and a color card. 3.5 diskette available for nominal fee with purchase of this package.
61045 $25

Books

61005 ***Running MS-DOS*** by Van Wolverton. *$16*

DOT-MATRIX PRINTERS

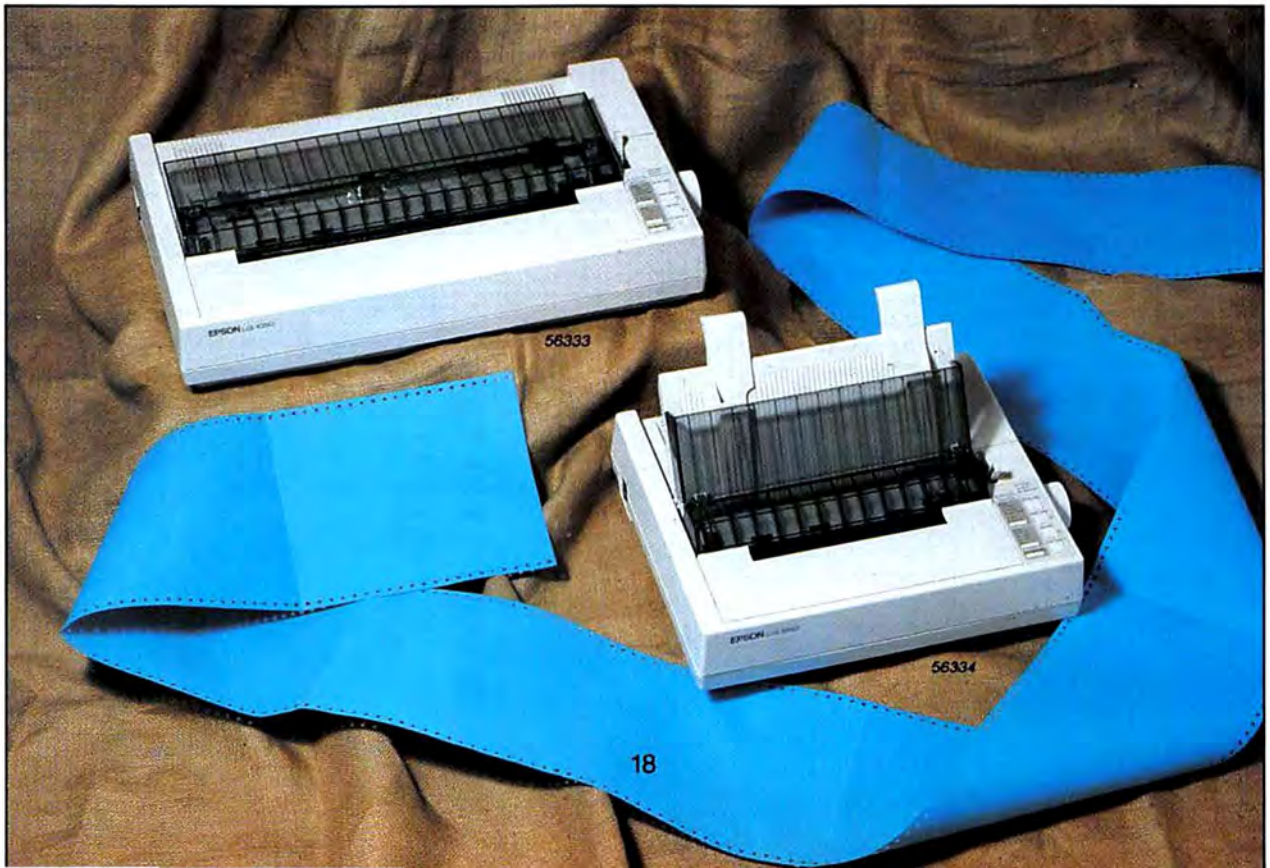
EPSON®

Model LX-800 provides the quality and software compatibility you expect from Epson plus draft (180cps) or near letter quality printing (30cps), multiple type styles, Epson Character Graphics set, and dot-graphics capability. Parallel interface. (80 columns).
56301 *$234*

The FX series dot-matrix printers have been industry standards for many years. These new additions are built with meticulous attention to detail to ensure performance durability. Printing 240cps in draft mode and 48cps in near letter quality mode, these printers can boost your printing output quickly and efficiently. Parallel interface.
56310 Model FX-86e (80 columns). *$399*
56311 Model FX-286e (132 columns). *$579*

The EX-800 dot-matrix printer is ideal when you have a large volume of printing to be done. It prints 300cps in draft mode and 60cps in near letter quality mode. A choice of type styles customizes your print jobs. Parallel/serial interface.
56320 Model EX-800 (80 columns). *$469*

The LQ series features a 24-pin print head that produces letter quality printing on a dot-matrix printer. An economical machine that creates good-looking printed material. The LQ-500 printer prints 180cps in draft mode and 60cps in letter quality mode. Includes an 8KB buffer and a Centronics-compatible, 8-bit parallel interface (the RS-232 interface is optional). The LQ-850 and LQ-1050 printers print 264cps in draft mode and 88cps in letter quality mode. Each includes a 6KB buffer and serial and parallel interfaces.
56335 Model LQ-500 (80 columns). *$379*
56334 Model LQ-850 (80 columns). *$599*
56333 Model LQ-1050 (132 columns). *$799*



OKIDATA

The 190 series maintains the sleek space-saving profile that made this series popular. Added speed, paper handling, and compatibility features make the 190 Plus printers the easiest to use in their class. Prints up to 200cps in draft mode and 40cps in near letter quality mode. Parallel interface.
192 Plus (80 columns).
56350 *$329*
193 Plus (132 columns).
56351 *$539*

The Microline® 292/293 series of printers offer high-quality dot-matrix printing with enhanced graphics capability. IBM compatible, these printers reproduce graphics, spreadsheets, and text files using a dual 9-pin printhead and a special Lotus® -compatible driver. They print 240cps in draft mode and 100cps in near letter quality mode. Parallel interface kit included.
292e Microline (80 columns).
56356 *$459*
293e Microline (132 columns).
56357 *$599*

The wide-carriage Microline 294 is faster and more versatile than many other comparably priced printers. Printing in utility mode at 400cps and near letter quality at 100cps, this printer is ideal for time-dependent applications. Handling sheets up to 16" wide, it connects by a parallel port. (132 columns).
56358 *$849*

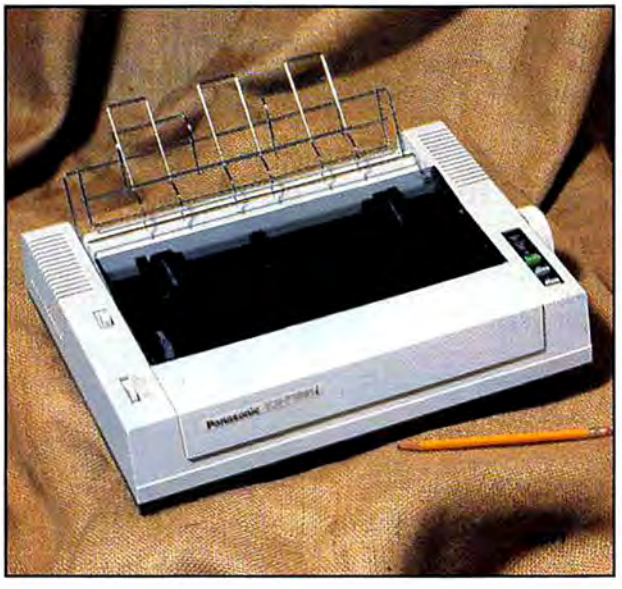
PANASONIC®

Model 1080i is a 10" printer operating at 120cps in draft mode and 24cps in near letter quality mode. Proportional spacing, print mode selector, and high-resolution graphics make this an all-around printer for everyday office needs. Parallel interface. (80 columns).
56370 *$179*

Model 1091i prints at 160cps in draft mode and 32cps in near letter quality. This 10" printer , offers all the features of the 1080i with increased speed. Parallel interface. (80 columns).
56371 *$199*

PC MAGAZINE
Editor's Choice
Nov. 10, 1987

Model 1092i prints at 240cps in draft mode and 48cps in near letter quality mode. Proportional spacing, high-resolution, dot-addressable graphics, and downloadable characters make this printer ideal for any business use. Parallel interface. (80 columns).
56372 *$349*



Model 1592 is a high performance printer that prints at 180cps in draft mode and 38cps in near letter quality mode. Parallel interface. (132 columns).
56373 *$449*

Model 1595 prints at 240cps in draft mode and 51cps in near letter quality mode to quickly meet all your printing demands. Parallel and serial interface. (132 columns).
56374 *$479*

PRINTER STANDS

Organize printer paper with a durable printer stand to create more workspace.

Roll 'N' Fold stand for 80-column printer keeps paper neat and out of the way.
38755 $24

Roll 'N' Fold stand for 132-column printer.
38756 $30

Universal printer stand is made of heavy duty plastic and holds any size printer (without tray).
38760 $6

Universal printer stand (with tray).
38761 $12

Multifunction printer stand for 80-column printer with under-printer drawer (plastic).
38765 $16.50

No Frills plastic stand for 80-column printer.
38748 $10

No Frills metal stand for 132-column printer.
38749 $24

PRINTER MUFFLERS

Kensington® mufflers control noise making your printer a more pleasant office companion.

Printer muffler for 80-column printer.
38795 $45

Printer muffler for 132-column printer.
38796 $59

PRINTER RIBBONS

37902	Epson FX-286e. *$6*	*37956*	Okidata 292e. *$10*
37901	Epson FX-86e/LX-800. *$6*	*37957*	Okidata 293e/294. *$13*
37930	Epson EX-800. *$12*	*37976*	Panasonic 1080i, 1091i, 1092i, 1592, 1595. *$12*
37915	Epson LQ-850. *$8*	*38066*	Star NX-1000. *$6*
37916	Epson LQ-1050. *$10*		
37955	Okidata 192/193. *$10*		

CONTINUOUS FORM COMPUTER PAPER

White, 9.5"x11", 250 sheets.
35010 $5

White, 9.5"x11", 1400 sheets.
35016 $11

White, 9.5"x11", 2500 sheets.
35020 $19

Green bar,15"x11", 650 sheets.
35035 $11.50

Green bar, 15"x11", 2500 sheets.
35036 $25

Pastel, 9.5"x11" (50 ea. pink, ivory, canary, blue).
35025 $7.50

Bright, 9.5"x11" (50 ea. red, yellow, green, blue).
35026 $7.50

Mailing labels, 5000 (1 across, 1"x3").
35610 $12

TRACTOR FEEDS

37850 For Okidata 192. *$49*
37851 For Okidata 292e. *$46*
37875 For Panasonic 1595. *$99*

ELECTRONIC SUPPLIES

TESTERS

Mini-Tester (M-F) tests for faulty RS-232 interfaces.
40002 *$7*

Mini-Wiring (DB25M-DB25F) permits custom configuration of the RS-232 interface.
40006 *$15*

Quick Tester RS-232 M/F has 18 LEDs to check EIA interface problems.
40007 *$14*

Loopback Tester RS-232 M/F has four LEDs to monitor leads.
40008 *$9*

Reverser RS-232 tests for the common problem of reversed transmit and receive data pins.
40050 *$6*

JUMPER BOXES

Jumper boxes custom design in-line adapters for non-standard ports.

40000 Male to female. *$4*
40001 Male to male. *$4*
39999 Female to female. *$7*

CONVERTERS

For communication between different interfaces, use a converter.

39402- DB9F to DB25M. *$7*
39401 Parallel to serial. *$39*
39400 Serial to parallel. *$39*

39401

40002

GENDER CHANGERS

Gender changers permit connections between cables with same type of connector ends.

40015 Male to male (DB9). *$4*
40016 Female to female (DB9). *$4*
40020 Male to male (DB25). *$4*
40021 Female to female (DB25). *$4*
40025 Male to male (C36). *$8*
40026 Female to female (C36). *$8*

LINE BOOSTERS

40035

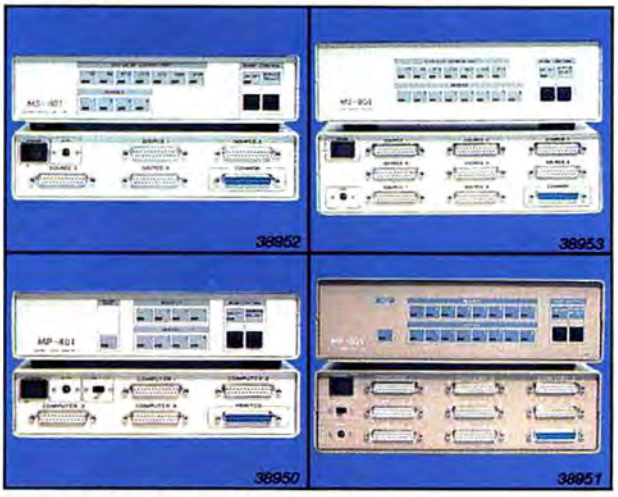
Amplify transmission signals to the receiver with a line booster.

39425 Centronics booster. *$39*
39426 RS-232 booster. *$39*

NULL MODEMS

Null modems are used for in-line connection of like devices.

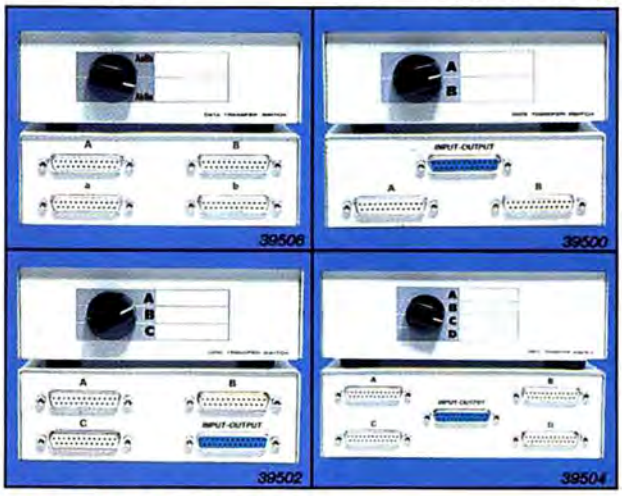
40035 Male to male. *$5*
40036 Male to female. *$5*
40037 Female to female. *$5*



AUTOMATIC SWITCH BOXES

These are ideal for offices where multiple users share peripherals. These devices automatically queue print jobs. Available with DB25F connectors. Numbers in parentheses reflect computers/peripheral.

38952 Serial auto switch box (4 /1). *$65*
38953 Serial auto switch box (8 /1). *$89*
38950 Parallel auto switch box (4 /1). *$65*
38951 Parallel auto switch box (8 /1). *$89*



MANUAL SWITCH BOXES

Multiple users can share peripherals or a single user can use many peripherals with the flip of a switch. Numbers in parentheses reflect computers/peripherals.

25-Pin (serial or parallel):

39506 X switch box (2/2). *$19*
39500 AB switch box (2/1). *$15*
39502 ABC switch box (3/1). *$19*
39504 ABCD switch box (4/1). *$23*

36-Pin (Centronics, not pictured):

39507 X switch box (2/2). *$19*
39501 AB switch box (2/1). *$15*
39503 ABC switch box (3/1). *$17*
39505 ABCD switch box (4/1). *$19*

BUFFERS

Increase productivity by printing and computing at the same time. All buffers connect with Centronics parallel interfaces. Numbers in parentheses indicate computer/peripheral.

38900

38900 64KB buffer (1 /1). *$63*

38901

38901 64KB buffer (2 /1). *$86*

38902

38902 256KB buffer (1 /1). *$99*

38903

38903 256KB buffer (2 /1). *$129*

SURGE SUPPRESSORS

Sudden surges of power can cause serious damage to your computer and erase valuable data. These accessories protect your system from surges of voltage and current.

40527

RS-232 (M-F) surge protector for serial ports.
40005 $5
Curtis® Safe Strip, 6 outlets (two switched), 7' cable.
40525 $17

4-outlet basic power strip.
40500 $7
6-outlet basic power strip.
40501 $8
6-outlet basic surge protector with circuit breaker.
40502 $9
6-outlet full surge protector with surge indicator light.
40503 $10
6-outlet full surge protector with light and noise filter.
40504 $11
4-outlet full protector with light and noise filter and EMI-RFI filtration.
40506 $14

6-outlet full protector with light and noise filter and EMI-RFI filtration.
40505 $19
Curtis Diamond® , 6 outlets, switched, lifetime warranty.
40527 $30
Curtis Diamond Plus® , includes modem protection.
40528 $42
Curtis Emerald® , 6 outlets, 6' cable, built-in circuit breaker, warranty.
40529 $37

40504

Curtis Ruby® , 6 outlets, EMI-RFI filtered, 6' cable, circuit breaker, warranty.
40530 $50
Curtis Ruby Plus® , includes modem protection.
40531 $60

40701
40700

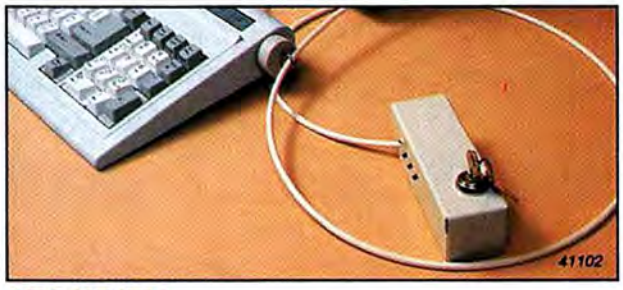
POWER SUPPLIES

Increase output with a new, effective power supply.

150-watt replacement power supply for PC/XT.
40700 $69

200-watt replacement power supply for the AT.
40701 $119
200-watt replacement power supply for the mini AT.
86010 $79

41101


41102

SECURITY

Secure valuable equipment with these tamper-resistant steel devices.

SE-KURE cylinder screw guard system for great security against equipment theft.
41101 $50

SE-KURE power-switch lock with keys ensures security for disk drives.
41100 $29
SE-KURE steel plug and cable system protects four of your most valuable peripherals with easily installed plugs.
41102 $45

COVERS

Protect your computer when it is not in use with these attractive and handy covers.

41775
41726

Dust cover for PC/XT. Clear plastic.
41775 $6
Dust cover for AT. Clear plastic.
41776 $6

Keyboard cover for PC/XT, or AT. Rigid smoked plastic.
41725 $5
Keyboard cover for 5151 or enhanced 101-key keyboard. Rigid smoked plastic.
41726 $5

41695
41696

Disk drive cover for PC/XT. Black rigid plastic.
41695 $4
Disk drive cover for AT. Black rigid plastic.
41696 $4

MASS STORAGE

HARD DRIVES

For ATs: *Hard drives for AT compatibles include: drive, data cable, mounting hardware, manual, and free PC-FullBak disk backup software. Hard drives above 30MB come with partitioning software.*

For PCs: *Hard drive kits for PC/XT compatibles include: drive, cables, mounting hardware, controller card, complete manual, and free PC-FullBak disk backup software.*

47400

47001

47002

Seagate™ 20MB half-height hard drive (65ms).
47003 $299
Seagate 40MB half-height hard drive (30ms).
47207 $459
MiniScribe® 40MB half-height hard drive (61ms).
47203 $399

MiniScribe 43MB half-height hard drive (25ms).
47204 $569
MiniScribe 71MB full-height hard drive (28ms).
47400 $799
MiniScribe 110MB full-height hard drive (28ms) using RLL encoding.
47425 $1189

Seagate 20MB half-height hard drive (65ms).
47002 $289
20MB 3.5" half-height hard drive kit for Compaq Portables.
47000 $299

MiniScribe 20MB half-height hard drive (65ms).
47001 $279
MiniScribe 40MB half-height hard drive (61ms).
47206 $395

CONTROLLERS

Floppy Controller

This card operates two PC/XT-compatible floppy drives efficiently.
Floppy controller, requires 2/3 slot.
46300 $39

46502

Hard Drive Controllers

Western Digital® AT dual floppy/hard drive controller.
46500 $149

Western Digital PC/XT hard drive controller.
46502 $79

47005

FLASHCARD™

PC MAGAZINE Editor's Choice

The FlashCards include 3.5" drive and controller shock-mounted on a bracket for easy installation. Designed for PC/XT and compatibles, they include complete, illustrated documentation, one-year warranty, and PC-FullBak software for easy backup. The FlashCard-20 and FlashCard-30 were PC Magazine Editor's Choice among hard cards, February 20, 1987.

47005 FlashCard-20™, 20MB MiniScribe, 65ms. *$319*
47104 FlashCard-30™, 30MB MiniScribe, 65ms. *$339*
47208 FlashCard-49™, 49MB Seagate, 28ms. *$549*

FLOPPY DRIVES

360KB half-height floppy drive for AT (grey).
45302 $109
360KB half-height floppy drive for XT (black).
45300 $99
360KB Teac® floppy drive for AT (grey).
45303 $109
360KB Teac floppy drive for PC (black).
45301 $109

45302

45300

45351

45301

45303

45350

45201

45200

360KB Teac floppy drive for PC (black).
45301 $109
1.2MB floppy drive for AT (grey).
45350 $109

1.2MB Teac floppy drive for AT (grey).
45351 $119
720KB half-height 3.5" floppy drive (grey).
45201 $115

720KB half-height 3.5" floppy drive (black).
45202 $109
1.44MB half-height 3.5" floppy drive (grey).
45220 $135

To Order: Call 1-800-727-3838

TEAK OFFICE ACCESSORIES

Personalize your office in style with these handsome accessories. Crafted in teak wood, these accessories will complement any executive office.

41557

41567

TEAK SWIVEL BASES

Teak turntable monitor base positions your monitor for flexible viewing, while creating more room on your desktop.
41567 *$27*

Teak turntable system stand is the attractive answer for those who share personal computer systems. The swivel base easily swings the computer to face different users.
41557 *$46*

41600 41611

TEAK DISK FILES

For 50, 5.25" diskettes, four teak wood dividers.
41611 *$20*
For 45, 3.5" diskettes, four teak wood dividers.
41600 *$15*

CONTENTS

Accelerators 6
Buffers 21
Cables 11
Cleaning kits 12
Computers 2-4, 14
Controllers 23
Copy holders 12
Covers 22
Dot-matrix printers 18-19
Electronic supplies 21
Facsimiles (FAX) 11
FlashCards 5, 23, 24
Floppy disks 14
Floppy drives 23
Floppy storage 12, 24
Hard drives 23
Hard drive chassis 14
Input/Output cards 7
Joysticks 11
Keyboards 4
Keyboard drawers 14
Laptop computers 4
Memory cards 7
Mouse 11
Modems 10
Monitors 8-9
Monitor stands 12
Multifunction cards 6
Order form 13
Paper 20
Power supplies 22
Printer accessories 20
PS/2 products 11
RAM chips & coprocessors 7
Sound enclosures 20
Security devices 22
Software 15-17
Starter kits 2
Static mats 14
Surge suppressors 22
Switch boxes 21
System stands 12
Tandy peripherals 5
Tape backup systems 14
Tool kits 10
Video cards 8-9

47208

STRIKE IT RICH WITH THE FLASHCARD-49!

When you uncover the FlashCard-49, you'll discover a motherload of high-capacity, high-speed mass storage - all on a card and at a fraction of the price of other comparable hardcards.

47208 FlashCard-49MB. *$549*

The FlashCard-20 and FlashCard-30, Winners of *PC Magazine* Editor's Choice Award Are Also Available! See Page 23.

CompuAdd™
"Personal Computer Products"

12303-G Technology Boulevard
Austin, Texas 78727

Copyright © 1988, CompuAdd Corp.

Austin, Texas retail outlets at 12034 Research Boulevard #1, 204 East 6th Street, and 3010 West Anderson Lane. Outside sales representatives at the Anderson Lane store provide service for businesses in the Austin area.

CompuAdd also offers quality computers from well-known manufacturers such as IBM®, Compaq®, Zenith®, and others. Look for monitors from Samsung™, NEC®, Princeton®, and Amdek®; hard drives from MiniScribe® and Seagate Technologies®; and printers from Okidata®, Panasonic®, and Epson®. Also see our wide assortment of office products, computer tools and accessories — all at discount prices.

Call or write for your free product catalog:

800-727-3838

In Dallas, visit one of our two CompuAdd Superstores. The largest computer showrooms in Texas, CompuAdd Superstores feature warehouse-style displays and in-store technical support.

CompuAdd Catalog Sales
12303-G Technology Boulevard
Austin, Texas 78727

CompuAdd

"Personal Computer Products"

CALL TOLL FREE:
800-727-3838
Inside U.S.A.

Service:	FAX:
800-999-9901	512-250-5760
Telex: 763543 COMPUADD AUS	Outside USA: 512-258-5575

Sharpen Your PC Skills and Build a Great Software Collection

ONLY $6.65!

Monthly Software for your IBM PC™ or Compatible Computer.

Learn From the Experts

Draw on the vast experience of our editors to provide you with carefully selected software you can use each month, from spreadsheets to role-playing games, from telecommunications to accounting to recipe programs. With easy-to-use documentation, you will master each new application with confidence and ease.

Become Experienced Inexpensively

Without investing a fortune, BIG BLUE DISK will help you to see why your PC is the most versatile and powerful tool you own. You will know more about your PC, its capabilities, and software for it, than you would have thought possible. At $6.65 a month, BIG BLUE DISK is the best value in software today.

Try our Monthly Software for Three Months

Every month your postman will bring you the latest issue of BIG BLUE DISK, contained on two unprotected 360K 5¼" diskettes, or one unprotected 720K 3½" diskette, whichever you prefer. Each issue is chock-full of great software, including utilities, games, home and business applications, and educational programs. Order now and you will receive the "Best of BIG BLUE DISK" absolutely free.

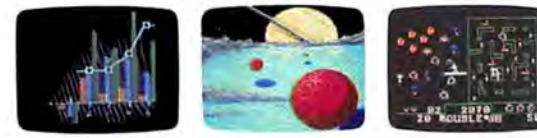
Reviewers Love BIG BLUE DISK!

". . .Big Blue Disk offers games, educational programs, product reviews, programming utilities, and even commercial programs. We had more fun than an ant at a picnic, and we're going to subscribe!. . .RATING: ■■■■ Value for Money"
. . . . . *FAMILY COMPUTING*

". . .Big Blue Disk is really a big bargain since you get a lot of different things for a reasonable price. . .Software for the whole family for one low price is something you just can't beat."
. . . . . *1001 NEWS FOR TANDY 1000 USERS*

Contents of Issue #17

- **Casino Craps** Vegas-style dice game.
- **Puzzle 15** Slide-the-tiles puzzler.
- **Label Printer** Keep your address book on file.
- **Alfredo's Hulking Hubris** Comedy digital animated cartoon.
- **Print Shop™ Images** For use with Brøderbund's® popular program.
- **A Pair of Sorts** Compare 2 popular sorting algorithms in action.
- **Diskette Cookbook** Includes Cajun recipes from Louisiana.
- ***And many more!***



IBM PC is a trademark of International Business Machines *Available at Waldenbooks, B. Dalton Booksellers, and fine bookstores everywhere (cover price $9.95). Apple II and Commodore 64/128 versions also available.*

Yes! Please rush my free "Best of BIG BLUE DISK" and start my 3 month subscription to BIG BLUE DISK for my IBM PC or compatible computer for only $19.95 postage paid. I understand that this is a **trial subscription** and that I am under no obligation to continue beyond three months. (*Overseas $27.95*)

☐ **BIG BLUE DISK™ for IBM PC and compatibles. (5¼" disk)**
☐ **BIG BLUE DISK™ for IBM PC and compatibles (3½" disk)**

Name_____
Address_____
City_____ State_____ Zip_____
Telephone_____
☐ VISA/MC ☐ AmEx ☐ Payment Enclosed
Card #_____ Exp. Date_____

Call Toll Free 1-800-831-2694
(In Louisiana call 1-318-221-8718) PW058
SOFTDISK • P.O. Box 30008 • Shreveport, LA 71130-0008

FREE the "Best of BIG BLUE DISK" – a collection of nine of the best programs from recent issues – when you order the next three issues of BIG BLUE DISK for your IBM PC or compatible computer. Contents are as follows:

Calc-Man	Political Preference
SuperDots	Laser Show
Loan Amortization	DOS Command History
Disk Indexer	(Kramden Utility #1)
Family Tree	The "COLOR" Command

Your Satisfaction Guaranteed

If you are not satisfied with your purchase for any reason, return your first issue for a full $19.95 refund. The "Best of BIG BLUE DISK" is yours to keep. You can't lose.

Circle 66 on reader service card

LETTERS

Reactions and responses from the PC World community

The Day After Christmas

'Twas the day after Christmas
And 'round the living room,
Torn gift wrap lay
Amid material boon.

In the mail it came,
My favorite mag,
But it looked quite strange,
Not the usual bag.

Disappointment set in—
No reviews that I want.
I perused it anyway,
From back to front.

Thanks to Tom Swan
I'm no longer hexed,
By TYPE DIR A: > PRN or
DIR B: >> DIR.TXT.

With his suggestion that I clean
With little cotton swabs,
And even quit smoking
As I do my jobs,

Scott Spanbauer meant well
Of that I am sure.
But my habits prevail;
Dirt and smoking endure.

From Mike Goodwin I learned
A needed BOOTSET.BAT.
Now when I see %1 anywhere,
I understand that!

Though I read it last,
'Twas definitely the most—
A bit of history
From our Publisher/Host.

Praises most high
To David Bunnell
For starting the mags
That serve me so well.

To all staff unmentioned
In the preceding rhyme,
Whose efforts all added
To my good time,

And to all still reading,
Whatever your fate,
Have a prosperous, a joyful,
A great '88.

Keep up the good work!
Stephen Ross
Fair Oaks, California

Spell It Out, Please

I bought the January 1988 issue of *PC World* because I was intrigued with what I thought was the cover story, "The Most Important People in Personal Computing." But there was no cover story! I feel like I've been ripped off—don't ever do that again!
Charles Bedard
Marlboro, Vermont

P.S. I still want to know *who* those people on the cover are—subscribers? Criminals? Government bureaucrats?

The message—which I guess didn't quite come across—is that the most important people in personal computing aren't the Bill Gateses and Mitch Kapors, but the millions of people who (continues)

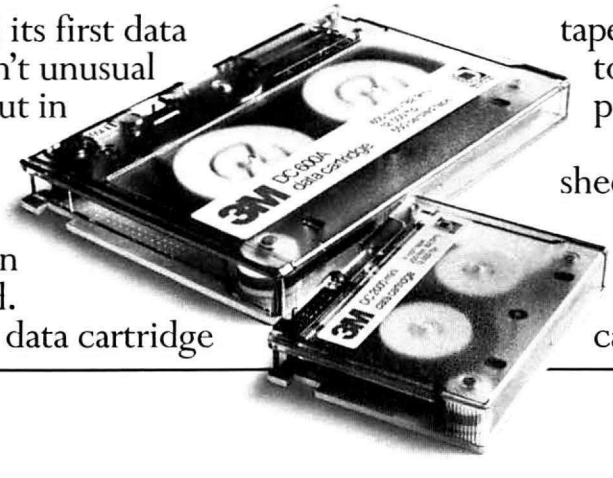
To create the world's first data cartridge tape, our engineers had to give up a lot of dreams.

To bring the world its first data cartridge tape, it wasn't unusual for our engineers to put in a little overtime on their overtime. Or occasionally miss the late show. Or even miss a tonight, period.

And even after the data cartridge tape was born, they still refused to lay low. It had to be perfected.

So, instead of counting sheep, our engineers counted patents. In fact, over ten of them are in use today.

A number no other data cartridge tape manufacturer



© 3M 1988.

can even come close to matching.

During other sleepless nights, they'd toss and turn over technological breakthroughs like proprietary Blackwatch™ backcoating, No End Play (NEP) hub designs, Dura-Stat™ drive rollers and one piece tape guides for precision tracking.

The result was the ultimate data cartridge tape.

And to this day, it's number one in the world by a long shot.

So, if you're looking for data cartridges and diskettes that offer durability, longevity and superior error performance, try one of ours.

We guarantee they'll work as hard as our engineers do. Day. And night.

For more information, call 800-888-1889, Ext. 30.

3M

Worldwide Sponsor 1988 Olympic Games

Supporting the dream.

Circle 124 on reader service card

use the PC every day. Our dedication wasn't confined to just the cover—it was the purpose of the entire issue. Hence "Unsung PC Heroes," "Eight Common Problems (And How to Solve Them)," the forum that asked, "Are users getting a square deal?" and the 50-page systems and mail-order guides.

The users on the cover were photographed at the COMDEX show in Las Vegas. As far as we know, they're subscribers, businesspeople, programmers, doctors, bureaucrats, and other law-abiding folk. —Robert Luhn, Issue Editor

Accept No Betas

Richard Landry's column ["Not Newer, but Better," *PCW*, February 1988] states, "It's an unwritten industry law not to review a product before it is available in a 'shrink-wrapped,' or final, version.... You can be certain that when a product is reviewed in our pages, we've based our judgment on our experience with the real thing."

Later in the same issue, Eric Bender's review of Lotus's *Agenda* ["Lotus Develops a Wordsheet"] informs us: "This personal information manager [is] scheduled to ship this spring...," and "The final version may vary somewhat."

Your usually excellent magazine speaks for itself, but out of which side of its mouth?

Robert P. Bolles
Elkhart, Indiana

"Lotus Develops a Wordsheet" was not a product review but rather a preview of what could turn out to be a ground-breaking product. We treat articles like this as news, and you'll find they contain no recommendations either for or against purchasing the product.

Reviews, on the other hand, involve critical evaluation of performance, ease of use, and the implementation of features—by our authors and by National Software Testing Laboratories. And reviews always offer a clear purchase recommendation. PC World*'s review policy for new products stands: If it's not shipping to the public, it won't be reviewed in our magazine. —Ed.*

And the Winner Is...

I have to commend both TJ Byers and *PC World* for Mr. Byer's

Their Series II.

Listen to Our Range of Capabilities.
Compared with the similarly priced PCPI LaserImage 1000, the HP Series II is just ho-hum.

Versatility makes the LaserImage 1000 your printer of choice. Especially when you compare software compatibility and memory.

Emulation Sensation.
The HP Series II only offers its own emulation.

Our LaserImage gives you more—HP Series II, plus downloadable emulations for the IBM Proprinter, Epson FX/80, Diablo 630, and HPGL Subset for spreadsheet graphics.

You can even get LaserImage with an optional HPGL 7475A plug-in cartridge.

This summer you will be able to upgrade to ImageScript,™ our PostScript® language emulation, with a single plug-in cartridge.

So with LaserImage, the choice is yours.

More Memorable.
HP's Series II comes with an underwhelming 512K of memory. Which is fine, if you limit yourself to simple documents.

The LaserImage gives you twice as much, with a full megabyte of memory. Standard, right out of the box. So it's a much better choice

review of 386 clones ["Surprise! Cheap 386s Deliver," *PCW*, February 1988]. I subscribe to five computer magazines, all of which derive most of their income from advertising. This is the first article I have seen that actually comes right out and recommends one product over another, and tells us why. Hallelujah!

I heartily approve of this courageous approach to product testing, and I hope you will encourage all your authors to be equally candid.

Thomas W. Stone
Panama City, Florida

Our LaserImage®.

for newsletters and presentations.

The LaserImage 1000 is one of a whole family of fine printers with even more memory, more speed, and long, reliable duty cycles.

Nationwide on-site service is also available.

Call your dealer today for a LaserImage 1000 solo. Ask about our extended warranty. And compare our LaserImage with the HP Series II for yourself.

Then, you decide which one makes the sweeter sound.

Personal Computer Products, Inc.™
Technology + Choice.

(619) 485-8411
Toll Free Information: 1-800-225-4098
In California: 1-800-262-0522

© 1988 Personal Computer Products, Inc. The following are registered and unregistered trademarks of the companies listed: LaserImage, ImageScript, Personal Computer Products, Inc., HP Series II, HPGL Subset, HPGL 7+7VA, Hewlett Packard Company, IBM Proprinter, International Business Machines Corporation, Epson FX/80, Epson America, Diablo 630, Xerox Corporation, PostScript, Adobe Systems Inc.

PCPI is a public company whose shares are traded on the NASDAQ exchange.

Circle 106 on reader service card

Objectionable Subject

I just read David Bunnell's editorial "The Participatory PC" [*PCW*, December 1987]. Why even mention the PC? I notice he tried to work the concept of personal computing into the column in a superficial sort of way, but it really served only as a platform from which to preach his political and social views to this sector of the public.

In contrast, I've really enjoyed some of his editorials concerning issues of importance to your readers, such as legislation that would prohibit software rentals, or the proposed FCC rate hike for telecommunications.

PC World should stick to its subject: PCs and PC users.

David C. Barnhart
Clemson, South Carolina

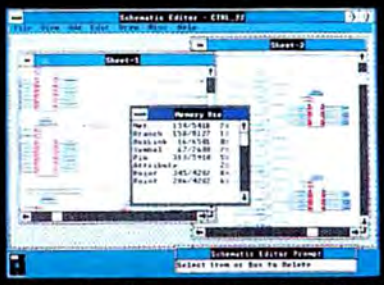
Come on! The personal computer isn't just ornamental to the kind of participatory democracy I'm urging; it's what makes it possible. Although our political views may differ, we owe one another an opportunity to speak out; anybody interested in creating a stable, prosperous, and free society must consider the opinions of all its members. I say widespread PC connectivity can bring us closer to that society. What could be a more appropriate topic? —David Bunnell

Blue Is Beautiful

Congratulations to David Bunnell for providing a truer perspective on IBM than I have seen in your magazine in a long time ["IBM: Reality Checks Versus Myths," *PCW*, February

(continues)

Applications keep pouring



Engineering Capture System,™ CAD/CAM Application, The CAD/CAM Group.

Paradox,® multi-user relational data base application, Ansa Software, A Borland Co.

Windows Mail, electronic mail application, DaVinci Systems.

The Network Courier,® electronic mail application, Consumers Software, Inc.

PC Paintbrush,® color design and graphics application, ZSoft Corporation.

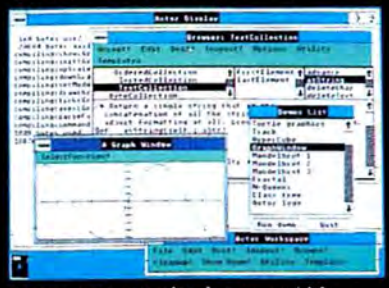
Dragnet, text retrieval application, Access Softek.

Windows Spell, spell checking application, Palantir® Software.

SnapShot, electronic photography application, Aldus Corporation.

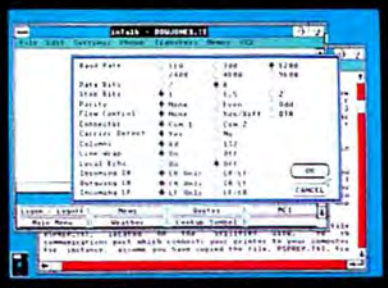
Guide, hypertext application, OWL International, Inc.

In*a*Vision,™ intermediate CAD application, Micrografx, Inc.



Actor, programming language (4th-generation), The Whitewater Group, Inc.

Windows Filer, filing and reporting application, Palantir Software.



Windows inTalk, desktop communications application, Palantir Software.

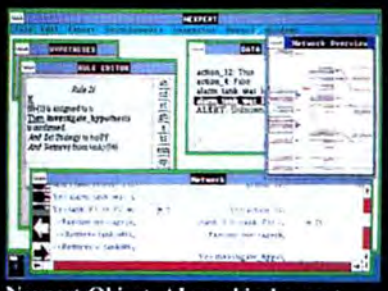
ClickStart!, applications organizer application, hDC Computer Corporation.

VIEW/PC, host data base access system application, DB/ACCESS, Inc.

For the name of your nearest Microsoft dealer, call (800) 541-1261, Dept. B90.

Microsoft is a registered trademark and the soul of the new machines is a trademark of Microsoft Corporation.

in for the Windows office.



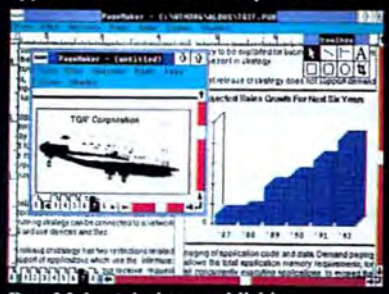
Nexpert Object, AI graphical expert, system application, Neuron Data.

Designer, CAD application, Micrografx, Inc.

Microsoft Excel, spreadsheet application, Microsoft Corporation.

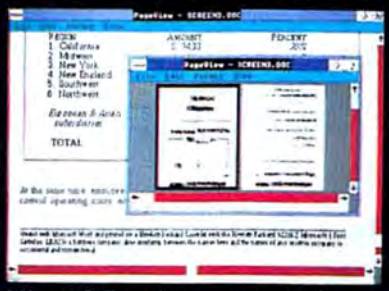
Windows DRAW,™ presentation graphics application, Micrografx, Inc.

Omnis™ QUARTZ,™ multi-user database application, Blyth Software, Inc.



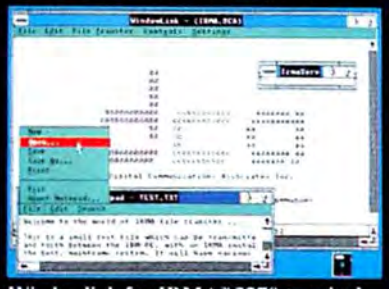
PageMaker,® desktop publishing application, Aldus Corporation.

Wave Test, GPIB test program generator, Wavetek San Diego, Inc.



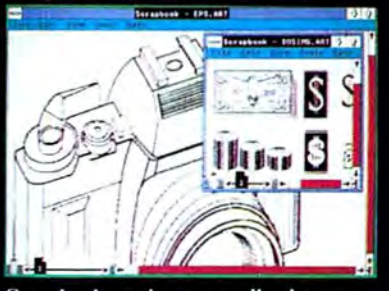
Microsoft Pageview, page preview/ graphics integration for Microsoft Word.

Opus I,™ The HyperGraphics Program, Roykore Software, Inc.

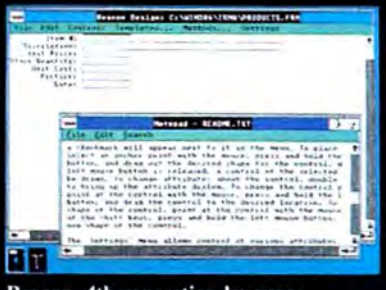


Windowlink for IRMA,™ 3270 terminal emulation, DCA, Inc.

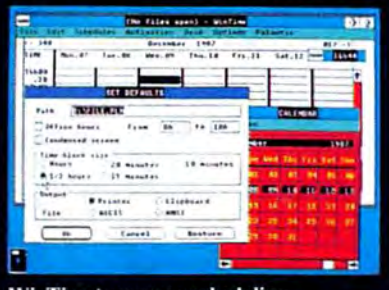
Windows GRAPH,™ business graphics/ charting application, Micrografx, Inc.



Scrapbook, art images application, T/Maker Company.



Beacon, 4th-generation language, Micro Data Base Systems, Inc.



WinTime,™ resource scheduling application, Palantir Software.

FormBase, relational data base application, Columbia Software, Inc.

Microsoft® Windows. The soul of the new machines.™

1988]. As a programmer and systems analyst on IBM mainframes since 1962 (and more recently on IBM microcomputers), I am strongly biased toward IBM. I'm tired of telling my friends that only a small portion of the anti-IBM hype they read in personal computing magazines is true.

Violet A. Devoe
San Diego, California

Brotherly Love

I was happy to see Michael Goodwin's review of the Brother M-1709 printer [*The Hardware Shelf, PCW,* February 1988], but as a proud owner of this delightful machine, I must defend it against some of his statements and add a few in its favor.

Mr. Goodwin never mentions which state-of-the-art features the printer lacks. In my estimation it possesses many. The "paper park" function that allows for easy switching between continuous forms and single sheets is an outstanding example of the printer's advanced features. Yes, perhaps the command sequence for paper parking is a bit labor intensive, but it becomes second nature very quickly.

When it comes to speed, Mr. Goodwin is right again—the printer is slow, but what quality! I could probably drink three cups of coffee, rather than the two he suggests, while waiting for my file to print out, but the three-pass print mode turns out professional-looking letters well worth the wait. I'm happy with my Brother, regardless.

Jack M. Hughes
Waldorf, Maryland

Times change, and in the computer industry, times change very fast. The Brother M-1709 may well have represented the state of the art in paper-handling features when it debuted, but now other printers do more —such as automatically rolling fanfold paper up at the end of a document to be torn off, then rolling it back down again, ready for the next job. Also, just offering a feature isn't enough if it's hard to use, as is the case

Pick.

ADOBE POSTSCRIPT SOFTWARE

Choosing a laser printer?
Easy.
Pick one equipped with Adobe™ PostScript® software. PostScript is a page description language that comes as resident software in leading laser printers. And it's the first and only standard adopted by virtually every major company in the computer industry.
Which means printers equipped with PostScript software work with any computers you now have. Or plan to get. Including IBM® PCs, Macintoshs,® minicomputers, and mainframes.
So you get complete vendor independence. And total flexibility.
Let's say you have a report, proposal or newsletter that needs printing. Just use any printer in the office that is equipped with PostScript software. From low to high resolution. Even color. It's your choice.
And only printers equipped with PostScript software can handle the most powerful electronic publishing and graphics software tools in the business.
Like the Adobe Type Library. With hundreds of typefaces to expand your range of communication.
Adobe Illustrator™ software. A program that lets anyone draw like a pro. From the simplest to the most complex art.
And Display PostScript™—system software that brings the power of PostScript to any PC or workstation display.
For details on any Adobe product, call 800-29-ADOBE. In Alaska and Canada, call (415) 962-2100.
And see how being picky actually increases your choices.

ADOBE SYSTEMS INCORPORATED

PostScript is the registered trademark of Adobe Systems Incorporated. IBM is the registered trademark of International Business Machines. Macintosh is the registered trademark of Apple Computer, Inc. Adobe Illustrator, Display PostScript and Adobe are trademarks of Adobe Systems Incorporated. All products are registered trademarks and trademarks of their manufacturers.

with the M-1709's accurate but labor-intensive paper-parking procedure. Furthermore, state of the art implies speed. You may love the printer's three-pass mode, but considering how slow it is, many readers may question its value. I agree that the M-1709 is a swell printer with some advanced features, but it lacks others currently available in the marketplace. —Michael Goodwin

Learning Our ABCs

Your computer trivia quiz ["Match Wits With PC World," *PCW*, January 1988] got off to a bad start—none of the answers listed for the first question is correct. The first electronic digital computer was developed in 1939 at Iowa State University by Dr. John Vincent Atanasoff, and was called the Atanasoff-Berry Computer (ABC).

The matter of who invented the first electronic digital computer was settled in court in October 1973 after a seven-year legal battle between Honeywell and Sperry Rand.

John Hoffman
Boone, Iowa

The reader is correct, and PC World *is just plain wrong on this one. Atanasoff, an Iowa State mathematics professor, conceived the design for an electronic digital computer while sitting in a roadside tavern and later constructed the ABC with the help of graduate student Clifford Berry. Dr. John W. Mauchly, co-inventor of ENIAC, the first large-scale electronic digital computer, met several times with Atanasoff and Berry in the early forties and was well acquainted with the design principles behind the ABC. For a more thorough account of the ABC and its designers, see* The First Electronic Computer: The Atanasoff Story *(University of Michigan Press, Ann Arbor, 1988). —Ed.*

Misbegotten Macro

I was very interested in trying out George Beinhorn's tips ["Macro Menus for WordPerfect," *PCW*, February 1988] but immediately ran into trouble. *Word-*

(continues)

And choose.

NBI, Inc.
Model 908

QMS-PS®
800 II, 810

Linotype Company
Linotronic™ 100, 300, 500

Texas Instruments
OmniLaser™ 2106

Texas Instruments
OmniLaser™ 2108, 2115

The Laser Connection
PS Jet/PS Jet+™

Dataproducts Corp.
LZR™ 2665

Qume Corporation
ScriptTEN™

Digital Equipment Corp.
PrintServer 40,™
ScriptPrinter™

AST
Turbo Laser™/PS

IBM 4216-020
Personal Pageprinter™

Varityper
VT-600

Apple Computer Inc.
LaserWriter® IINT, IINTX

Quadram
Quadlaser™ PS

Agfa-Gevaert
P400PS™

General Computer
Business LaserPrinter Plus™

Wang
LCS15™

NEC Information Systems
SilentWriter™ LC-890

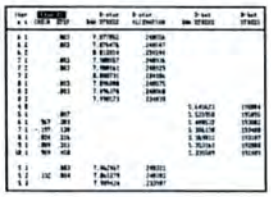
Diconix
Dijit™ I/PS

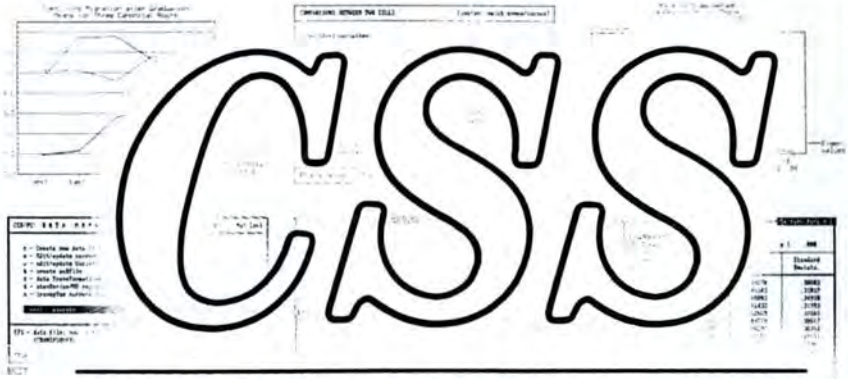
Apollo Computer Inc.
Domain/Laser 26™

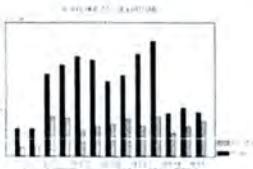
QMS-PS® 2400,
QMS® JetScript™

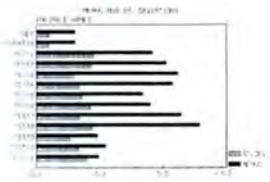
Circle 114 on reader service card

The new standard for high performance STATISTICAL SOFTWARE

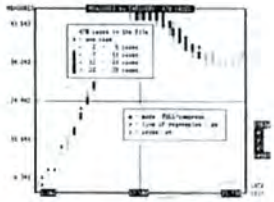


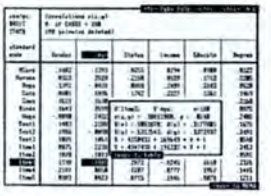




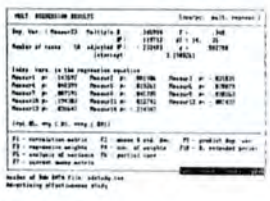


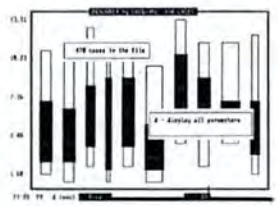
COMPLETE STATISTICAL SYSTEM WITH DATA BASE MANAGEMENT AND GRAPHICS

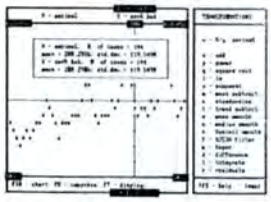


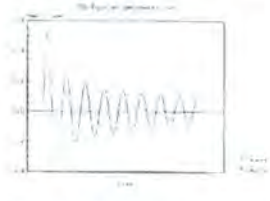


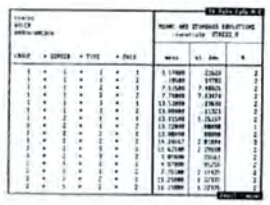
- **A powerful, comprehensive, elegant, and super-fast statistical package for IBM (PC, AT, PS/2) and compatible computers.**
- **The CSS optimized user interface with fast hierarchical menus incorporates elements of artificial intelligence; even complex analyses require only a few keystrokes (batch processing is also supported).**
- **CSS features comprehensive, state of the art implementations of: *Basic statistics, Multi-way frequency tables, Nonparametric statistics, Exploratory data analysis with analytical graphs, Multiple regression methods, Time series analysis with modeling and forecasting (incl. full ARIMA), General ANOVA-/ANCOVA/MANOVA, Contrast analysis, Discriminant function analysis, Factor analysis, Principal components, Multidimensional scaling.***
- **All statistical procedures are integrated with fast data base management and instant, presentation quality graphics; full support for all mono and color graphics boards (incl. VGA) and over 100 plotters and printers (incl. the HP and Postscript standards).**
- **All CSS screen output is displayed via customized Scrollsheets™ (i.e., dynamic, user controlled, multi-layered tables with cells expandable into pop-up windows); all numbers in a Scrollsheet™ can be instantly converted into a variety of presentation quality graphs; contents of different Scrollsheets™ can be instantly aggregated, combined, compared, plotted, printed, or saved.**
- **The flexibility of the CSS input/output is practically unlimited: CSS offers an intelligent interface (read/write) to all common file formats (Lotus, Symphony dBII, dBIII+, DIF, SYLK,...) and special utilities to easily access data from incompatible programs; graphics can be saved in files compatible with desktop publishing programs (Aldus, Ventura).**
- **CSS data files can be as large as your operating system (DOS) allows.**
- **CSS precision exceeds the standards of all common precision benchmarks.**
- ***Technical note: The CSS user interface and all I/O were written in Assembler and bypass DOS; graphics and data management were written in Assembler and C; the computational algorithms were written in Assembler and optimized Fortran.***
- **$495 (plus $5.00 sh/h); 14-day money back guarantee**

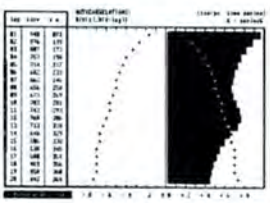


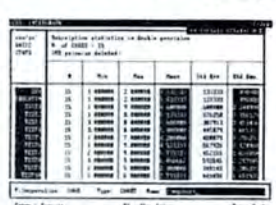


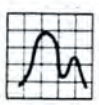












StatSoft

2325 East 13th Street • Tulsa, Oklahoma 74104 • (918) 583-4149

Overseas offices: StatSoft of Europe (Hamburg, FRG), phone: 040/4200347; StatSoft UK (London, UK), phone: 07072 71166; Hearne Software (Melbourne, Australia), phone: 613-497-4276

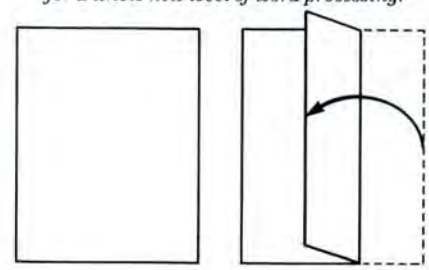
Circle 189 on reader service card

Maybe you don't think you need a new word processor.

If you answer yes to just one of these questions, you'll find that you're a prime candidate for a new, advanced level of word processing.

Yes	No	
☐	☐	Do you create any of the following types of business documents: reports, plans, proposals, presentations, manuals, contracts, documentation, specifications?
☐	☐	Do your documents call for more than words? Or have you considered a desktop publishing package to mix graphics, spreadsheets or tables with text on a page?
☐	☐	In the process of creating a document, do you or others frequently have to review and revise it?
☐	☐	Have you ever had occasion to create a document without sufficient time to turn it around?
☐	☐	Is it critical that your documents look great?

Turn this page over and fold on the dotted line to find out why you may be a candidate for a whole new level of word processing.



© 1988 Lotus Development Corporation. Lotus, Lotus Manuscript, 1-2-3, Symphony, Freelance and Graphwriter are registered trademarks of Lotus Development Corporation. PostScript is a registered trademark of Adobe Systems, Inc. AutoCAD is a registered trademark of Autodesk, Inc.
*Manuscript and Manuscript evaluation kit require 512K and a hard disk.

you do need processor.

If you answered yes to just one of these questions, you are a candidate for Lotus® Manuscript® 2.0.

Manuscript is specifically designed for documents with tables, graphics, automatic numbering and tables of contents, cross-references or indexes. It can easily handle routine correspondence, too.

Manuscript merges text with graphics created in 1-2-3,® Symphony,® Freelance® Plus, and Graphwriter® II, as well as Postscript,® .TIF, .PCX, AutoCAD® files and more. And it's great at handling tables.

Manuscript has many editing features and even provides for reviewer's comments. Our draft copies look just like the final version, with the right typefaces, graphics and tables in place.

Manuscript easily supports major revisions to text, data, and format, so that last minute changes are a cinch. Plus it can link your most current 1-2-3 or Symphony spreadsheet data to tables in your document.

Manuscript produces higher quality pages than conventional word processors, with sophisticated hyphenation and justification, plus balanced newspaper-style columns previously available only on high-end publishing systems.

Manuscript 2.0 gives you all the advantages of full-featured word processing, along with the powerful design and typesetting capabilities of desktop and electronic publishing—for the highest quality printed pages.

Try Manuscript. Order our $15 demo kit and get working software and a tutorial manual.* Call **1-800-345-1043** and ask for demo kit ACA-1450.

Lotus Manuscript 2.0

Fold back to preceding page.

Perfect 4.2 responds with 'Functions not allowed between ^O, ^P, ^S or ^G' when I run the merge macro. What gives?

Steven A. Seklir
New York, New York

The message is telling you not to use the WordPerfect *format codes for boldface, underlining, highlighting, or changing screen colors in your menus, a fact mentioned in the article but easily overlooked. Print Merge doesn't allow format codes between ^O and ^G or before ^O.*

Another problem lies with an unfortunate omission from the article that causes its menu-based macros to execute improperly. Each menu should end with ^Q, directly following the final ^G ^O combination. Though the manual doesn't explain why, macros contained within menus that do not conclude with this code will execute at the end of the document rather than at the intended location, the cursor position. —George Beinhorn

Name That Pioneer

Though William Rodarmor's "Radical Engineer" profile of me was flattering ["PC Pioneers," *PCW*, January 1988], it contained some errors that tend to give me more credit than I deserve.

I didn't form the Homebrew Computer Club; that honor belongs to Gordon French and Fred Moore. I only developed the meeting format. Nor did I "launch" the Community Memory project, but rather cofounded it with Efrem Lipkin and the late Ken Colstad. Community Memory was Efrem's idea in the first place.

In both cases I supported and contributed to the vision of those efforts. However, I refuse to go along with the "great man" theory of journalism whereby all events can be attributed to the nearest person who makes good copy.

Lee Felsenstein
Chief Engineer
UpStart Corporation

Corrections

John Grissim's story on Anthony Barcellos and the Sacramento PC Users Group ["Unsung PC Heroes," *PCW*, January 1988] contains two errors. The Sacramento group is the fifth largest PC club in the country rather than the third, trailing the Boston Computer Society's IBM PC User Group, the Houston Area League of PC Users (HAL-PC), Washington D.C.'s Capital PC User Group, and New York Personal Computer. Also, *Sacra Blue*, the Sacramento PC Users Group newsletter, is spelled without a hyphen.

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

WHEN YOU WANT THE BEST, YOU CAN ALWAYS DEPEND ON THE FIRST.

You only want the best. You want it first. And, you work hard to get it. When you choose Wells American's A★Star® microcomputers, that's exactly what you get. Not only the best, but also the first.

Wells American was the first to release a 12MHz AT class computer. The first with 14MHz. The first with a no-hassle 31 day money-back guarantee. And yes—we were even the first in business. We've been making microcomputers longer than IBM, Compaq® and Apple.® In fact, we've probably been making them longer than *anybody*.

Our A★Star computers are the only PC/AT compatibles that can run at 6, 8, 10, 12 and 14/16MHz. The press has rated them as "the best on the market." That's because they not only outperform the competition, they're also less expensive. A 14MHz model with 20MB of storage sells for under $1800. Basic unit prices start as low as $995! But being best is more than just impressive statistics and low prices. It's also a lot of little "extras". Extras like a one year factory warranty, nationwide on-site service from GE and, here's another first, *free* schematics!

What does all this mean to you? Simply put, it means we have the resources and the technology to provide you with the best. And to provide it first. And in a company with so many "firsts," it's not surprising that's how we rate our customers. As one noted computer publication said: "The effort that Wells American takes on behalf of its customers is remarkable, showing a degree of concern that a number of computer companies should copy." Of course, many have tried to do just that. But, according to our customers, no one comes close to matching our 15-year reputation for exceptional customer support. No one.

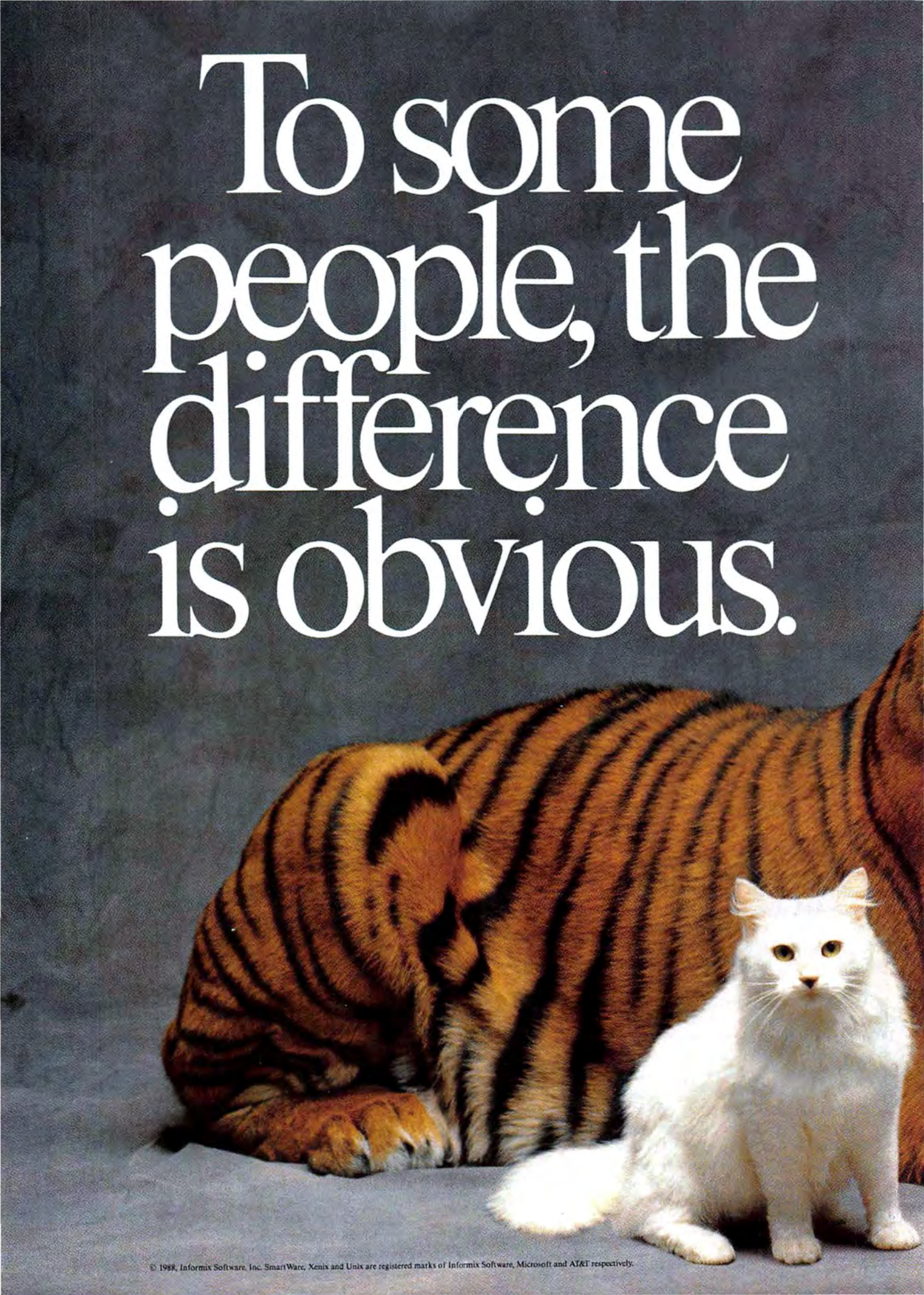
Don't you think *you* deserve the best? Call us at 803/796-7800 for details on our special one month A★Star trial offer. Do it today and you could have the "best" on your desk tomorrow morning. Isn't that what you really wanted in the *first* place?

Wells American.
3243 SUNSET BOULEVARD
W. COLUMBIA, SOUTH CAROLINA 29169

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

Circle 216 on reader service card

To some people, the difference is obvious.



© 1988, Informix Software, Inc. SmartWare, Xenix and Unix are registered marks of Informix Software, Microsoft and AT&T respectively.

"For sheer power, ease of use, speed, and flexibility, you would be hard-pressed to find a more capable product, especially if you need advanced features. It works just as well with a half-dozen spreadsheets simultaneously as it does with one."
—InfoWorld

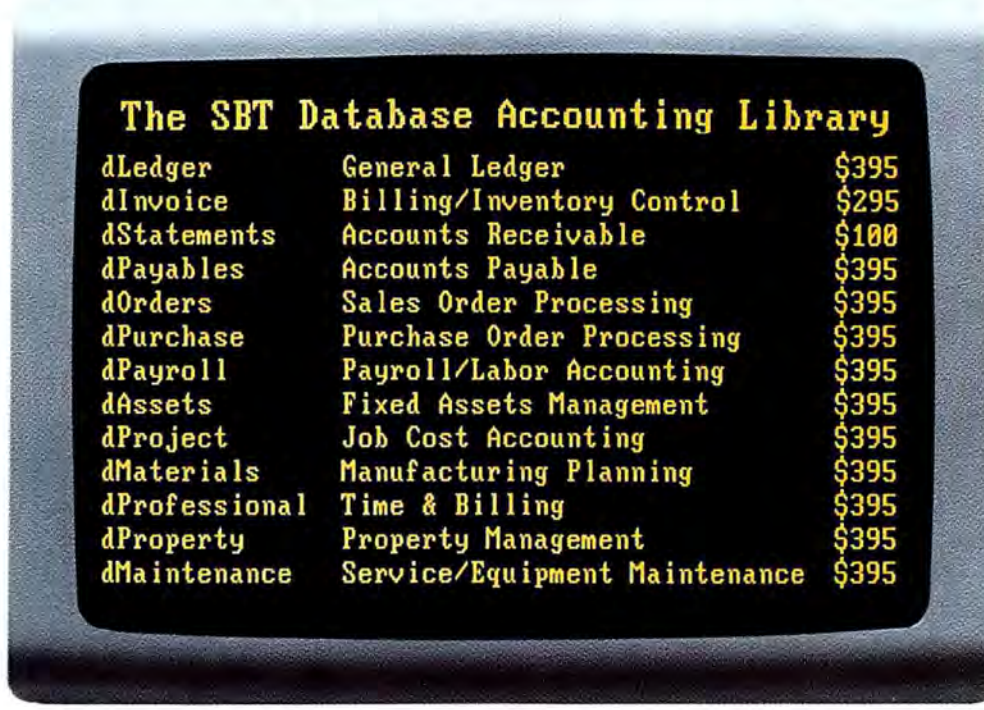
PC MAGAZINE EDITOR'S CHOICE

"Integrated systems have come a long way, and Smart has... the widest array of powerful features... strong points include intelligent data sharing and good file security, intuitive ease of use, a powerful programming language, and consistently good performance... Smart can fill the bill for a total, integrated software system."
—PC Magazine

Whether you're just getting started as a lone computer user, or you're the Manager of Information Systems supporting thousands of PC users, discover easy-to-use applications your office won't outgrow. Single user and Multi-user software for DOS, LANs, UNIX or XENIX systems: Word Processing, Spreadsheet & Graphics, Database Management and Communications. For additional information, including a Free Smart Demo, simply return the reply card or call toll-free (800) 331-1763. In Kansas or Alaska call (913) 492-3800, in Canada call (800) 233-6905.

SmartWare®
from Informix Software

How to account for everybody.



And we do mean everybody.

You see, the SBT Database Accounting Library is already accounting for more than 50,000 businesses of every conceivable description.

From law firms and construction companies. To retail stores and manufacturers. From small businesses with one PC. To major corporations with hundreds.

Available in single and multi-user versions for MS-DOS, XENIX, Macintosh, and Atari ST, the SBT Database Accounting Library is a modular system of accounting programs.

You simply pick the ones that match your needs and start accounting.

And when your needs change, you can use our **free source code** to make our software accountable to your way of doing business.

By the way, our Database Accounting Library runs with the compilers and database management systems everybody uses. Including dBASE III PLUS, McMax, Clipper, FoxBASE+, SCO FoxBASE+, Quicksilver, dBXL, and dBMAN. This means it will work with your favorite computer and database manager.

The SBT Database Accounting Library.

Everybody who accounts for anyone should look into it.

Call us today for our demo disk and information package, and get yourself accounted for.

SBT offers a complete series of product and reseller seminars as well as training in dBASE IV and computerized accounting. Call for complete seminar descriptions.

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

SBT CORPORATION

dBASE III PLUS and dBASE IV are registered trademarks of Ashton-Tate; FoxBASE+ is a trademark of Fox Software,Inc.; MS-DOS and XENIX are registered trademarks of Microsoft Corp.; Atari ST is a registered trademark of Atari Corp.; dBMAN is a registered trademark of VersaSoft Corp.; McMax and Clipper are trademarks of Nantucket, Inc.; Macintosh is a trademark of Apple Computer, Inc.; dBXL and Quicksilver are registered trademarks of WordTech Systems, Inc.; SCO is an abbreviation for The Santa Cruz Operation; SBT Database Accounting Library is a trademark of SBT Corp. ©Copyright 1987, SBT Corporation.

The Spreadsheet Makes the Interface

The real battle of the user interface isn't between Windows, character-based applications, and the Mac—

It's between Excel, Quattro, and 1-2-3.

Richard Landry

All the talk about how standardized interfaces promote ease of use seems to ignore one uncomfortable fact—users spend more time learning how a product's features work than they do learning how to navigate its menu tree. If the software world really wanted to do everyone a favor, it would help users get more power out of the applications they know by integrating them with ones they don't.

That's exactly what's happening in spreadsheets. These products are emerging as core applications, tying together data bases, word processing, micro-to-mainframe communications, and even electronic mail. More than ever, users who work mainly with numbers will find that they rarely, if ever, need to leave the confines of that single application.

This trend may come as no surprise to those of you who already benefit from the rash of *1-2-3* add-ins that erupted shortly after release 2.0 of Lotus's spreadsheet appeared. But even hard-bitten spreadsheet jockeys will be wowed by the scope of forthcoming developments. You can get a taste of what's to come by looking at one of the hottest new products of the season, *Oracle for 1-2-3*. To call this $199 software package a *1-2-3* add-in is to overlook the fact that it's a full implementation of one of the most powerful SQL data bases around. It's actually a case of the data base wagging the spreadsheet.

Oracle for 1-2-3 can be configured as a stand-alone data base, or it can be used as a SQL front end to *Oracle* on a LAN server, minicomputer, or mainframe. By storing spreadsheet data within a fully relational data base, users gain powerful data retrieval and sharing capabilities that simply don't exist with the Lotus product alone.

Yet opening a window onto data base information is only one service that spreadsheets can provide as core application environments. More significant by far is the role they're assuming as communications links between disparate products and data. In this game Borland, Microsoft, and Lotus are all potential players, though Microsoft has the most to show right now and Lotus, the most intriguing promises of things to come.

Borland, which sells the *Paradox* data base as well as the *Quattro* spreadsheet, disputes the significance of a product like *Oracle for 1-2-3*. A spreadsheet just isn't the best tool for executing complicated data base queries, argues Richard Schwartz, *(continues)*

one of the developers of *Paradox*. "You have to distinguish between a front end to another product, which you might characterize as an interface only, and a fully featured stand-alone program that has strong connections to a data base engine," Schwartz maintains. *Paradox* will use *Quattro* as a front end but won't rely on the spreadsheet's minimal data base capabilities or some general query language like SQL to get the job done. Rather, *Quattro* will be able to execute programs written in the *Paradox* PAL programming language to extract selected data from a *Paradox* data base, then pull the information into the spreadsheet for analysis.

Contrast this approach with Microsoft's strategy for *Excel*, which—at least on the surface—seems to rely on the *Windows* dynamic data exchange (DDE) capability to communicate with other applications. Although DDE is designed to be a general communications language like SQL, it turns out that applications need to know a great deal about each other in order to work effectively together, acknowledges *Excel* product manager Phil Welt. You can see evidence of this in the several sophisticated communications packages that vendors have announced to tie their mini and mainframe programs to the spreadsheet.

Excel also has another trick up its sleeve that goes beyond DDE. Using its powerful macro programming language, *Excel* can instruct other applications to perform specific actions on its behalf, such as requesting an E-mail program to send an updated spreadsheet to other users.

In fact, what effective communications between a spreadsheet and data base or E-mail package really calls for is an overall programming environment that links different applications and understands the difference between data created with a word processor, graphics program, data base, or spreadsheet. It's this kind of architecture that Lotus seems to be building into its next-generation products, starting with the distant *1-2-3/G* and *Lotus DBMS*. Although the specific details of these products remain a mystery, you can expect that at the very least *1-2-3/G* will use the dynamic data exchange capabilities of the Presentation Manager to pass messages and data between itself, *Lotus DBMS*, and other OS/2 applications.

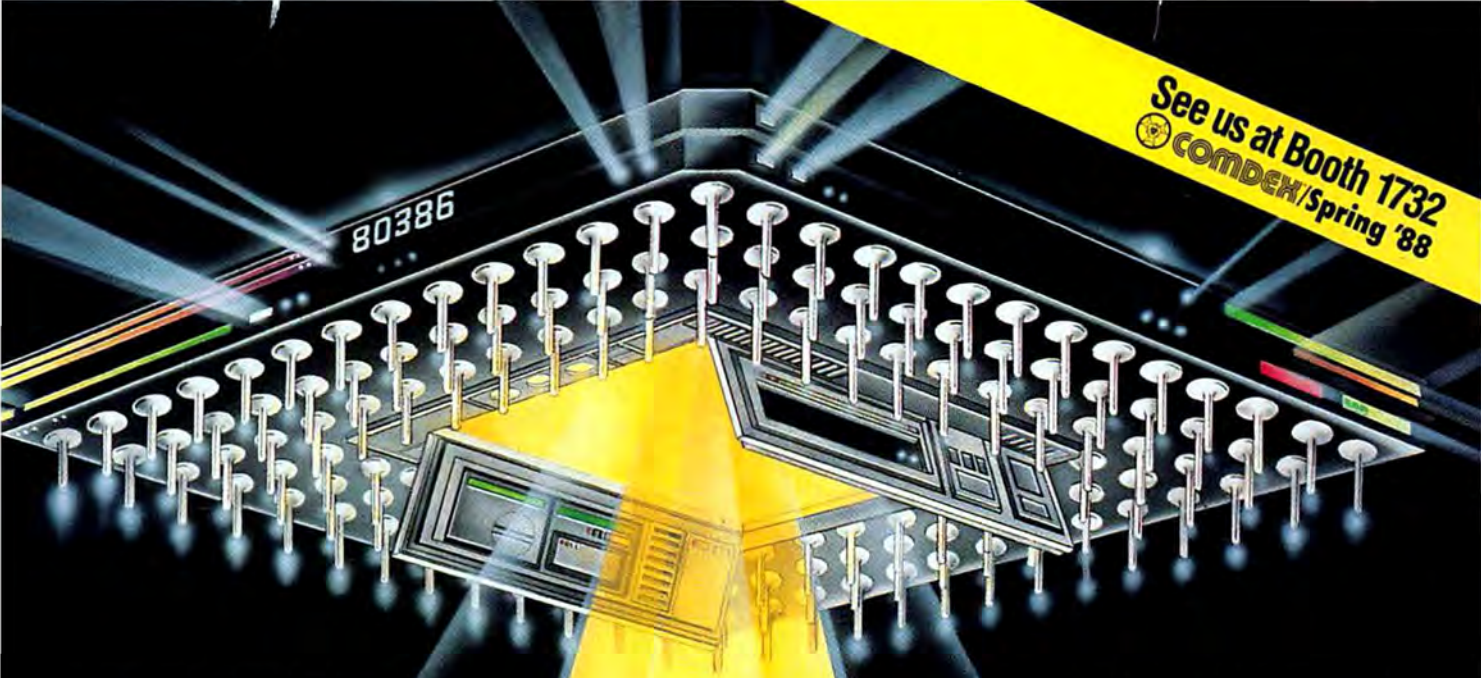
Can anyone really predict which vendor will succeed in turning its spreadsheet into the ultimate power environment?

But Lotus, which has been in the business of tying its micro applications into the IBM mainframe environment for some time, also understands that communications by means of a broad-brush protocol like DDE or even IBM's SAA has some severe limitations. That's why the company has announced plans to turn its micro-to-mainframe communications facility, called *The Application Connection*, into a fully fleshed-out standard that covers data sharing among micro and mainframe applications, and which in particular promotes communications with *1-2-3*.

The power of this kind of solution isn't lost on Lotus's competitors. "As an industry, we're all looking to take the next step beyond file exchange by drawing tighter connections between our products, whether they're data bases, spreadsheets, or word processors," acknowledges Borland's Schwartz. "The issue isn't whether you access the data by means of a spreadsheet or data base or some other front-end tool—it's the connections you make between the tools."

Given the profusion of directions the various vendors are taking and the scarcity of working examples, can anyone really predict which vendor will succeed in turning its spreadsheet into the ultimate power environment? My bet is that the laurels will go to the company whose product line offers the tightest integration, whether within *Windows* or the Presentation Manager or any other user shell. On this score, Microsoft and Lotus seem poised to butt heads in what will probably be the most momentous confrontation in PC software history. Whether Borland even figures in this contest will depend on how smoothly it merges *Quattro* with its *Paradox* data base and the communications facilities of OS/2 Extended or Microsoft's *LAN Manager*. But don't count Richard Schwartz out.

As always, I'm interested in your opinions on these or any other subjects. Write to me at *PC World*, 501 Second St., San Francisco, CA 94107, or send an MCI message to Richard Landry/301-3685. ●



See us at Booth 1732
COMDEX/Spring '88

UP TO
25 USERS.

MADE FOR
THE 80386.

RUNS DOS
PROGRAMS.

MULTI-TASKING

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

It will take PC-MOS/386.™

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

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

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

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

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

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

PC-MOS/386™
MODULAR OPERATING SYSTEM

THE SOFTWARE LINK
Developers of LANLink™ & MultiLink® Advanced

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

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

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

OEM/Dealer Inquiries Invited

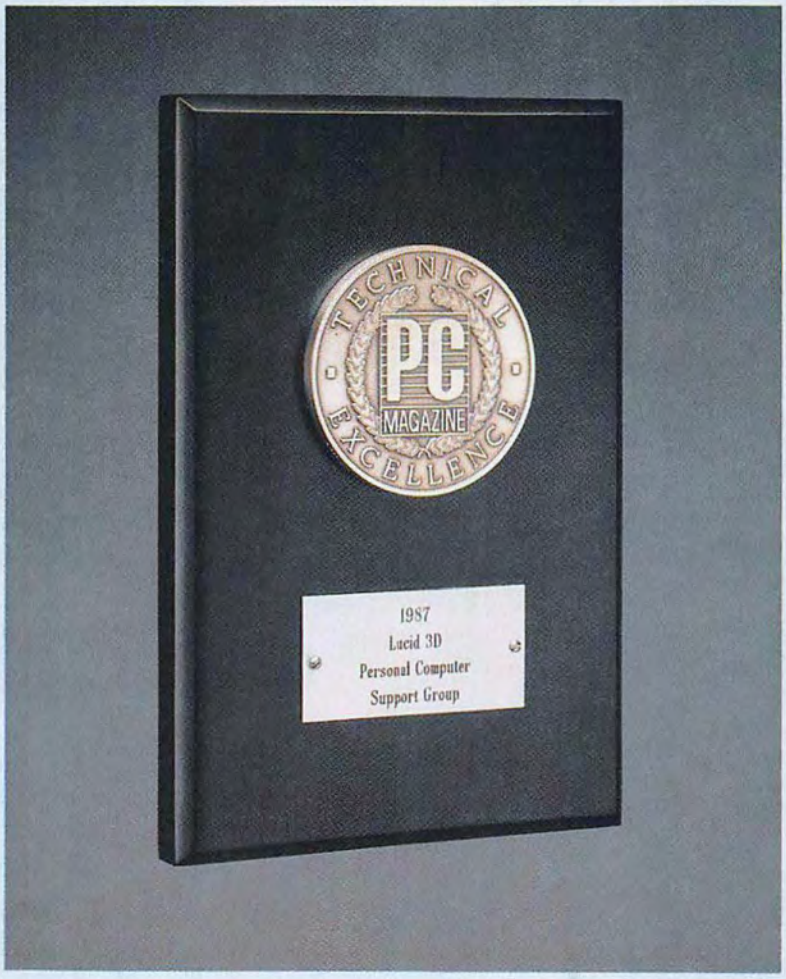
THE SOFTWARE LINK/CANADA CALL: 800/387-0453

Circle 77 on reader service card

More Than Just Windows, We've Opened Doors.

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

PCSG'S Lucid 3-D and Microsoft Excel

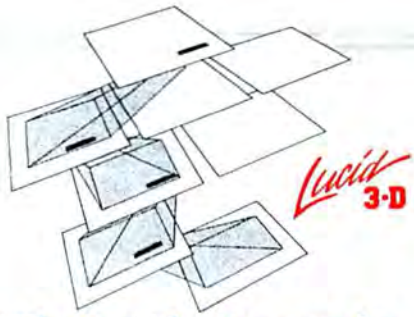


Co-Winners of PC Magazine's 1987 Technical Excellence Award

Everyone says "It's the best there is."

Lucid 3-D™ is a runaway success

Don't take our word for it. Use Lucid 3-D for 60 days. Return it for a full refund if not completely satisfied. Plus, instead of the $199 list price, an introductory spread-the-word price of $149.



"The Best idea I've seen for a spreadsheet in years"
Jim Seymour, Columnist, PC Magazine, PC Week

Lucid is as simple as the pictures show. And you don't have to write formulas to do that. All you do is look at the other file, navigating through easy, point and shoot directories. When you come back up (with one key) the link is made automatically for you.

Everything about Lucid works that way. Users say "*It is so intuitive that I really don't need a manual.*" That's because we use something we call a visual command menu. Jim Seymour, the noted PC columnist, talking about Lucid in a recent article said, "*If there ever was an interface idea so good it ought to be stolen and widely used, this is it.*"

Memory Resident

You can pop Lucid up instantly while working in your word processor or any other program. You can cut anything on the screen and paste it right into Lucid, or cut anything from a Lucid worksheet and paste into the application below. You can even run Lucid on top of 1-2-3 if you like, and cut and paste information from one to the other, including formulas.

Notepad Behind Every Cell

Another 3-D feature is that any cell can also contain a multiple page note window that you instantly access with a single keystroke. You can write notes, memos or letters that relate to your work, save them as individual files and even print them separately or with your spreadsheet.

Other Features

Lucid has over 100 innovations that cause users to say it is the best of all the spreadsheet offerings! Things like: **Speed** - background, minimal and visible recalc. **Macros** - learning macros, autoexecute macros, macros work between spreadsheets, user defined macro menus. **Mouseability** - total Mac-like mouse access, but easy keyboard control as well. **Color or Mono** - 17 user controlled color displays. **Audit** - six displays and printouts. **Windows** - multiple sheets on screen at same time. Multiple views of the same sheet. Pop-up windows of function formulas, range names, favorite labels, macro names, filenames, even a calculator. All let you select and insert right into your spreadsheet. All windows (even notes) resize and move where you want them. **Cut and Copy** - between spreadsheets, documents and between sessions. **Help** - press F1 anywhere, you get help specific to what you are doing.

Fig. 1. Let's get the detail on those ad costs, just move the widebar to that cell and press one key (grey +).

Fig. 2. Here we are instantly. Notice the lower left corner showing we are on level 2. Grey – takes you back. There is no limit to the levels you can go. Move right down to transaction level if you like.

Co-Winner of the 1987 PC Magazine Award for Technical Excellence
The other winner: Microsoft's Excel

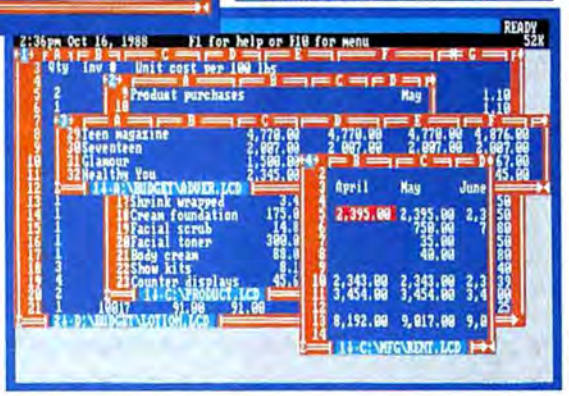


Fig. 3. Of course, Lucid does multiple windows. Notice, you can simultaneously open windows in different directories, different drives, even down as many 3-D levels as you like. No one else can do that.

Masterwork

Lucid is more than a bag of features. It is a masterwork. The overall feel is tight and polished. In fact, Paul Somerson, executive editor of PC *Magazine*, used one word to describe it, "*Slick*".

PCSG has built an excellent reputation as a developmental laboratory. Now those who have worked with Lucid 3-D tell us "*you have done it again. This is software everyone should have.*"

Even if you don't plan to abandon 1-2-3, Lucid makes sense. Files are converted between them with ease so there's not an interoffice compatibility problem. This means you can have the power and fun of Lucid 3-D, without having to upset your present systems.

Take us up on our 60 day full refund offer. This $149 offer will end as soon as our dealer network is fully stocked.

Ask your dealer or
Call 1-800-544-4699
In Texas 214-351-0564

Lucid 3-D

Exceptional spreadsheet for the IBM PC, PS and Compatibles.

Makers of LIGHTNING™ disk speed up software, and BREAKthru 286 Accelerator Board.

11035 Harry Hines Blvd. • Building 206 • Dallas, TX 75229

VISA MasterCard AMERICAN EXPRESS

© COPYRIGHT 1987 PERSONAL COMPUTER SUPPORT GROUP INC

Circle 201 on reader service card

Beat The Clock With LetterMaster™

4:30 "Susan—Send our sales letter to all buyers of apples and cherries in Washington and oranges or bananas in Florida, in time for today's 5:00pm pick-up.—Mr. Wermer."

4:32 Mailing lists sorted. Our new LetterMaster mailing software is a lifesaver. It sorts any list according to any criteria in its own internal database and our dBASE® III files. **4:33 Lists merged and purged.** LetterMaster merges lists and purges duplications in a matter of seconds. It's incredible! I can create instant custom mailing lists with a few keystrokes! **4:38 Personalized sales letters printed.** With LetterMaster, all I do is name the list, name the letter, activate the printer, and "go do." It's that simple! **4:41 Labels printed.** LetterMaster prints off any list onto leading brand address labels. It prints Rolodex cards and file folder labels, too. **4:45 Mailing complete and ready for pick-up.** LetterMaster operates with all the popular word processing programs. About the only thing it doesn't do is lick the envelopes!

Only $149

Multi-user systems: $249.00

Runs on your IBM PC or 100% compatible, or your IBM PS2. Trademark/owners: LetterMaster/ Accent Apartment Locators, Inc.; dBase III/Ashton-Tate Corp.; IBM PC & IBM PS2/International Business Machines Corp.

5:00 "Susan—Good work on that mailing. Have an apple. —Bob"

Call for your LetterMaster today

1-800-338-9181

30 Day Money Back Guarantee

Research Development Systems, Inc. / P.O. Box 110216 / Arlington, Texas 76007

Circle 61 on reader service card

Portrait of the Great American Investor

She'll go wherever the story takes her. She invests her time in her work and her money in U.S. Savings Bonds. Bonds now pay competitive rates, like money market accounts. Find out more, call 1-800-US-BONDS.

U.S. SAVINGS BONDS
THE GREAT AMERICAN INVESTMENT

Bonds held less than five years earn a lower rate.

Next in

PC WORLD

June

LAN Server Roundup
Is a dedicated network server a better choice than a clone manufacturer's plain vanilla 386? Exhaustive benchmark tests from National Software Testing Laboratories yield some surprising results.

LAN Data Bases
Everyone looks at performance and speed in choosing a network data base, but data integrity, security features, and the user's ability to easily perform ad hoc queries are probably all more important in the long run. *PC World* pits three top network data bases against the current data base champ—*dBASE III Plus*.

LAN Promises
It used to be simple. Users could choose high-performance proprietary network operating systems from vendors such as Novell and Banyan or low-performance DOS-based networks from IBM and 3Com. Now that OS/2 has emerged as the base for the LAN operating system of the future, which companies will be the dominant players? And will proprietary operating systems still be the best choice?

Funny, they run the same engine, but the QMS KISS*plus* gets better mileage.

	QMS KISS*plus*	HP LaserJet Series II
Engine	Canon SX 8 ppm/300 × 300 dpi	Canon SX 8 ppm/300 × 300 dpi
Emulations	4, 6, or 7	1
Resident fonts	24 or 34	6

Think of it as a form of supercharging. The new QMS KISS*plus* laser printer takes you further with the higher-resolution Canon® SX® engine than the Hewlett-Packard® LaserJet Series II®. Because where HP restricts growth to simple memory upgrades, QMS expands both memory and capabilities. As a result, QMS KISS*plus* sets new standards of value and performance, standards first set by QMS with the QMS KISS™ laser printer.

Three ways up QMS KISS*plus* is the first laser printer that lets you choose the level of functionality you need, by offering three personality modules.

So if you're working with text and business graphics only, personality module 10 gives you 24 resident fonts, 512K RAM and four printer emulations (ANSI X 3.64, Epson® FX 80, Diablo® 630 and QUME® Sprint II®).

To combine text with more sophisticated graphics, personality module 20 moves you up to 34 fonts, a full megabyte of memory and six emulations (IBM Proprinter™ and HP LaserJet+™, plus the four from module 10).

For text and full-page graphics, the 2.5-megabyte memory and HP-GL™ plotter emulation of personality module 30 handle the most complex projects. Also included are the same 34 fonts and six emulations from module 20.

There's more. An easy-to-read, easy-to-use front control panel. Two font cartridge slots for using a wider variety of fonts. An easy-to-maintain design for clean, simple upkeep. And the new Canon SX print engine gives you richer-looking printouts.

A better route Put it all together and you'll find the QMS KISS*plus* gives you more standard equipment. And more options.

The QMS KISS*plus* is sold by Laser Connection dealers. Laser Connection is a sales and marketing subsidiary of QMS. For a test drive, call **1-800-523-2696** for the Laser Connection dealer nearest you. And be sure to ask for *The Sourcebook*™—our exclusive catalog filled with the latest laser printer products and enhancements.

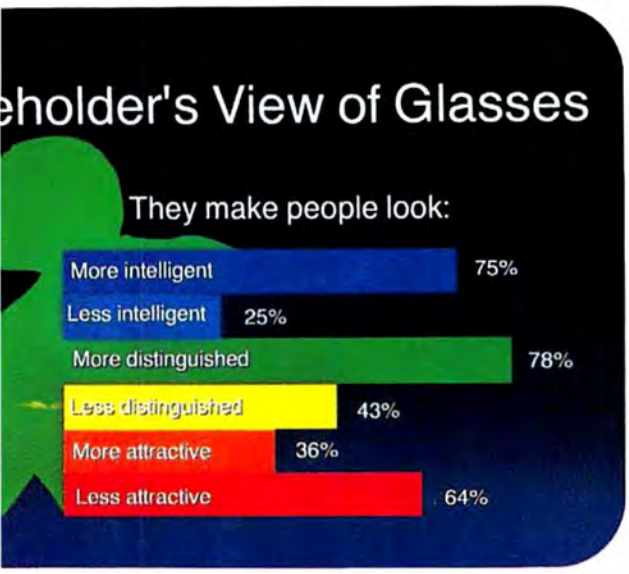
LASER CONNECTION™

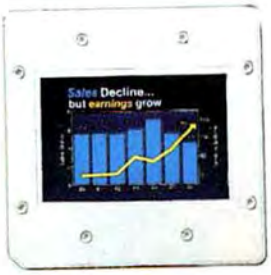
A QMS® Company

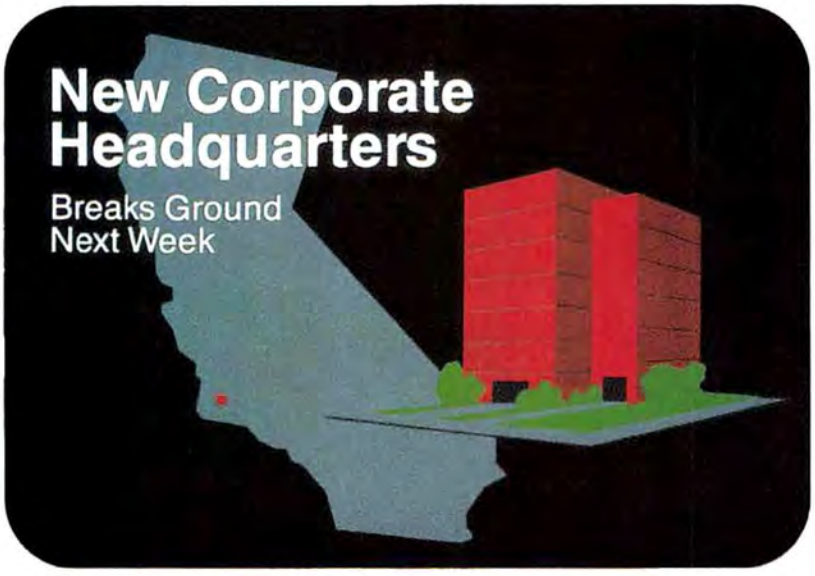
The following are trademarks or registered trademarks of their respective companies: QMS, QMS KISS, Laser Connection of QMS, Inc. Hewlett-Packard, LaserJet Series II, LaserJet +, HP-GL of Hewlett-Packard. Epson of Epson America, Inc. Diablo of Xerox. Canon SX of Canon USA, Inc. QUME and Sprint II of QUME Corp. IBM Proprinter of International Business Machines Corp.

©1987 Laser Connection.

The state-of-the-







-art of persuasion.

Today, having a good idea isn't good enough.

You also have to convince other people it's a good idea.

And nothing gives your ideas more power and impact than DRAW APPLAUSE™ from Ashton-Tate.®

It's the state-of-the-art presentation tool for IBM®'s new PS/2™ family and other 286/386 based computer systems. Because its amazing array of graphics capabilities takes you far beyond conventional business charts and graphs. To a whole new level of persuasion.

DRAW APPLAUSE lets you integrate graphics, text and data. Quickly and easily. To produce dynamic overheads. Impactful full-color slides. Impressive printed documents. Everything you need to create winning presentations. Without spending a cent or a minute on outside graphic design services.

DRAW APPLAUSE transforms dull numbers into powerful charts and graphs. At the touch of a key or the click of a mouse. It also lets you integrate text and graphics in seconds. And you can quickly change typefaces, type sizes, and colors to create the exact visual effect you want.

DRAW APPLAUSE also gives you a ready-to-use library of professionally-drawn, full color pictures and graphic images. Everything from a house to a hamburger.

Easy-to-use drawing tools allow you to customize charts and graphs. Or create your own original images. And bring them to life with a choice of over sixteen million colors.

You can also enhance your visuals with some very special, special effects.

Like graduated backgrounds, shadows and halos to make words or images stand out. Everything you need to draw people into your presentation.

DRAW APPLAUSE can also draw on other programs for input. Like Ashton-Tate's dBASE III PLUS™ and PRESENTATION PACK.™ Or Lotus® files and Harvard Graphics.™ You can even import DIF and CGM files.

DRAW APPLAUSE lets you project the most polished professional image possible. With 35mm color slides, overheads or hard copy you can produce yourself. Or we can process and ship to you. All that's required is a modem and our Ashton-Tate Graphics Service.™

For more information about DRAW APPLAUSE or the Ashton-Tate Graphics Service, just call 1-800-437-4329, ext. 209.*

DRAW APPLAUSE from Ashton-Tate.

When it comes to persuasive presentations, it deserves a standing ovation.

ASHTON·TATE®

*In Colorado call (303) 749-4900, Ext. 209. Trademarks/owner: DRAW APPLAUSE, dBASE III PLUS, PRESENTATION PACK, Ashton-Tate Graphics Service, Ashton-Tate, Ashton-Tate logo/Ashton-Tate Corporation; IBM, PS/2/International Business Machines Corporation; Lotus/Lotus Development Corporation; Harvard Graphics/Software Publishing Corporation. ©1988 Ashton-Tate Corporation. All rights reserved.

Circle 16 on reader service card

Get the lion's share online with GEnie.™

"GEnie changed my mind about what an online service can do for me! I always knew that GEnie offered a princely selection of Special Interest Groups featuring thousands of software files, dynamic bulletin boards, lively discussions and "tips" from the experts. But now GEnie gives me more than my share of valuable information services like NewsGrid and USA Today Decisionlines, American Airlines EAASY SABRE℠ personal reservation system, new and exciting multi-player games and access to Dow Jones News/Retrieval.® And the people on GEnie are so friendly and helpful they make me feel like a member of royalty!

You don't need to pay a king's ransom to get the lion's share, because only GEnie offers you so much online, for less."

B. A. King

Services Available	Compare & Save	Pricing*			
		Registration Fee	Monthly Minimum	Non-prime Time Rates	
				300 baud	1200 baud
Electronic Mail • CB • SIGs/User Groups • Travel • Shopping • Finance • Reference Professional • Leisure • Games • News	**GEnie†**	**$29.95**	**None**	**$5.00**	**$5.00**
	CompuServe	$39.95	None	$6.00	$12.50
	Other	$49.95	$10.00	$8.40	$10.80

***Get 2 Free Hours with Sign-Up.*

Just $5 per hour. Get online today!

1. Have your major credit card or checking account number ready.
2. Set your modem for local echo (half duplex)—300 or 1200 baud.
3. Dial 1-800-638-8369. When connected, enter HHH
4. At the U#= prompt enter **XJM11828,GEnie** then RETURN.

Need help or more information? No modem yet? We can help. In U.S. or Canada call **1-800-638-9636.**

We bring good things to life.

*Basic rates and services in effect 9/87 apply in U.S. only. †Non-prime time rates apply Mon.-Fri. 6 PM-8 AM local time and all day Sat., Sun., and nat'l. holidays. Subject to service availability. Some services offered on GEnie may include additional charges.
**$10 credit applies.
© 1987 General Electric Company, U.S.A.

The New IBM

IBM has shed its old ways of doing business in favor of a more competitive approach. Does this spell trouble for Apple and Compaq?

Stewart Alsop

I want to tell you about the two-day trip I took to Florida last February.

Now that you're finished admiring my good midwinter fortune, I'll tell you that I spent those two days inside a meeting room at IBM's engineering facility in Boca Raton. I arrived thinking that I was wasting some good beach time. I left glad that I had made such a tremendous sacrifice.

The reason I'm glad is that I saw arrayed before me the new IBM. The meeting was called a press briefing—two days for IBM to talk to a turnout of about 30 members of the computer and business press. The agenda included talks by IBM PC chief Bill Lowe, Microsoft CEO Bill Gates, IBM distribution czar Ned Lautenbach, IBM PC development chief Frank King, system software chief Dick Hanrahan, Micro Channel–bus evangelist Chet Heath, and a host of other IBM PC executives. It even included a tony dinner cruise up the Intracoastal Waterway where we were joined by George Conrades, IBM executive vice president, Personal Systems.

This was the new IBM in action. The new IBM is a remake of the old, tired, less competitive IBM, a remake that seems, in this analyst's view, to throw out the old, tired things about IBM while maintaining the good things that made IBM such a formidable competitor in the first place. The visible introduction of the new IBM was a reorganization of the company announced in late January.

Don't misunderstand me. IBM people still wear white shirts and narrow ties. They still talk in a strange, compressed language about DASDs (pronounced *das-dees*), planars, and SQL (pronounced *sequel*). They still give you business cards that haven't been updated and have interminable titles.

But suddenly IBM is acting like other companies by telling us what it plans to do, why it's doing it, and how it would like events to transpire. And, for the first time in a long time, IBM people don't seem embarrassed by their desire to be competitive and aggressive. (After a long and torturous but unsuccessful government suit charging IBM with monopolistic practices, IBM people became very sensitive to accusations of unfair competition. Not any more.)

In essence, IBM seems to have recognized that the rules of the computer game have changed. And the company is changing the way it works so it

(continues)

To increase company profits, screen your security operation.

You know computers. You have security needs. Put them together with a CASI-RUSCO computer-based access management system and you can expand your security capabilities substantially.

Why computerize security? Because, today, industrial espionage is a business reality. And computer technology is the best protection against it.

Why CASI-RUSCO? Because you'll have centralized management of your total security structure. Including capabilities to expand the system as your company grows. Benefits that 85 of the Fortune 100 companies now enjoy with CASI-RUSCO.

Call us today and let's discuss it. You're overdue for a screening.
CASI-RUSCO 552 N.W. 77th Street, Dept. M,
Boca Raton, FL 33487 800-556-1234, ext. 67.
In CA 800-441-2345, ext. 67.

CASI—RUSCO
A FIGGIE INTERNATIONAL COMPANY

*The Future Belongs To Those Who Can See It.*SM

© 1988 CASI—RUSCO. All rights reserved.

Circle 3 on reader service card

As American as...

It's true, our Consumer Information Catalog is filled with booklets that can answer the questions American consumers ask most.

To satisfy every appetite, the Consumer Information Center puts together this helpful Catalog quarterly containing more than 200 federal publications you can order. It's free, and so are almost half of the booklets it lists on subjects like nutrition, money management, health and federal benefits.

So get a slice of American opportunity. Write today for your free Catalog.

Consumer Information Center
Department AP, Pueblo, Colorado 81009

U.S. General Services Administration

can play by the new rules, competing more on technology and product development than on sales and manufacturing power.

At the top level, what IBM has done is to reorganize along product lines so that mainframes, minicomputers, PCs, and communications products are all managed by their own team. More significantly, the company has placed new product and pricing authority within each product group instead of in a centralized management committee. That means each product group can respond to market conditions without necessarily having to justify its actions to a bunch of old-time mainframe jockeys.

In addition, like other large companies in other industries, IBM has been in serious danger of being taken over by the bean counters, the financial people. In its reorganization, IBM has wisely made the financial people subject to the product group managers.

Taken together, these moves free up each product group to act independently and aggressively. Take this meeting I just sat through as an example. The meeting itself was unusual. It's the first time, to my knowledge, that IBM has ever invited the press to its own overnight briefing. (Companies like Apple, Compaq, Microsoft, and Lotus are constantly briefing the press on something or other.)

More significant, IBM laid its cards on the table for the first time. Here are IBM's product plans for the next two years:

- By the end of 1989, IBM will have produced its last 80286 machine. It has already produced its last 8086 machine.

(continues)

The best ad for Key Tronic keyboards is a close look at the competition.

Last spring a certain quality conscious consumer purchased what he thought was a Key Tronic KB 5151 Professional Series keyboard from a local retailer.

Look for the Key Tronic Professional Series label on the keyboard's top left hand corner.

This same consumer later returned the keyboard to Key Tronic with a letter of complaint. The product, shown above, was used for just over a year, though it looks like it was abused for much longer. Some of the keycap legends had worn away, and had to be replaced by the stick-on labels you see here.

Truth is, while the above product was sold as a Key Tronic keyboard, a Key Tronic label never appeared on the product. There is no way it could have. Because only keyboards bearing the leading name in keyboard technology offer the quality behind that name.

Close examination will tell you immediately if the keyboard you are purchasing is from Key Tronic. First, look for the Key Tronic Professional Series label in the top left hand corner. Look also at the keyboard's legs to see if they have a rubberized non-skid covering, just another of the Key Tronic extras that ensure better performance.

Of course there are other features, not initially apparent, that separate a great keyboard from a mediocre one. Take Key Tronic's double shot molding, for example, a process that prevents the keycap legends from wearing away (which proves that the keyboard shown above is not from Key Tronic but rather the handiwork of a lesser manufacturer). And then there is Key Tronic's limited three-year warranty: a reliability guarantee that is backed by over eighteen years' experience making over eight million keyboards.

Double shot molding embeds the keycap legend in colored plastic, so it won't wear off.

Other manufacturers use a less permanent printing process.

Key Tronic's full service network and toll-free line mean there's always someone to assist you.

None of which, we might add, ever looked like this.

To find out more, contact your Key Tronic dealer. Or call toll-free 1-800-262-6006.

In Washington state, call 1-509-927-5515.

key tronic

Professional Series

Circle 99 on reader service card

FINALLY!

EASYFLOW

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

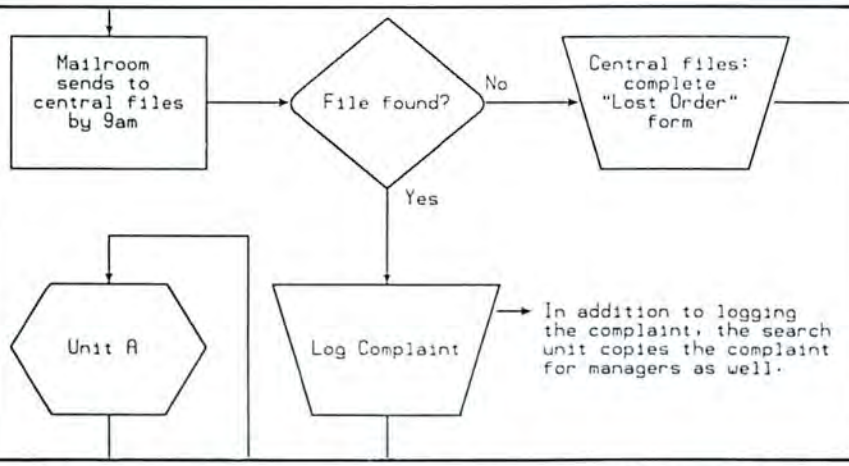
- **Automatic:** Fully automatic text centering within shapes, both horizontally and vertically. Fully automatic line routing & re-routing.
- **Fast:** Written in assembly language for speed.
- **Large:** Charts up to 417 columns wide by 225 lines high. Chart too large for your printer? *EASYFLOW* automatically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

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

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

* March 10, 1987 issue, page 278

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



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

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

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

Circle 79 on reader service card

• By the end of 1989, IBM will have introduced a version of OS/2 that uses the 80386 native instruction set and operations.

• By mid 1989, IBM will have integrated the now-optional 8514 video controller into the system board as standard equipment.

• Likewise, IBM will introduce a new optional video controller designed around a powerful, proprietary graphics coprocessor.

• IBM will also upgrade its existing systems to have minimum configurations of fast, 40MB hard disks and 2MB of memory.

• IBM has made clear it believes that at least 95 percent of you, the users, need the functions incorporated in OS/2 Extended Edition (due out in July). It also intends to be the primary supplier of such extensions.

To those of us who have been watching the PC industry for several years, this level of openness is unprecedented for IBM. And underlying it all is the sense that IBM is serious about owning the PC business. It is unabashedly defining for itself a leadership role in the PC business.

IBM wants to be seen as the company setting standards and moving the computer industry forward. It doesn't like being a follower of Apple's technology or Compaq's engineering. And it's about time. It has been a long time since IBM has played such a forthright role in the industry.

The beach, by the way, was great. ●

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

ALL CLONES ARE CREATED EQUAL....BUT CMO MAKES THE DIFFERENCE
GREAT PRICING • EXPERT CONSULTATION • ONE YEAR WARRANTY

BASIC SYSTEM CONFIGURATION:

- Intel 8068, 12 MHz Speed
- 640K Mother Board Memory
- 8 I/O Expansion Slots
- 360K Floppy Disk Drive
- Floppy Disk Drive Controller
- Clock Calendar with Battery Backup
- 150 Watt Power Supply
- IBM Compatible BIOS
- 4 Half Height Front Storage Slots
- 100-Key AT-XT Switchable Keyboard
- 24 Hour Burn-In

BASE SYSTEM PRICE: No. CAPC12-01 **$629**

Monitor Optional

BASIC SYSTEM CONFIGURATION:

- 8 MHz 80286 16-Bit Microprocessor
- 512K Motherboard Memory Expandable to 1 MB
- 12 I/O Expansion Slots (6 16-Bit & 2 8-Bit)
- Clock Calendar with Battery Backup
- 1.2 MB Floppy Disk Drive
- Hard Disk//Floppy Controller Card
- 238 Watt Power Supply
- Fully Compatible High Speed BIOS
- 84 Key 5151-Type Style Keyboard
- 5 Half-Height Front Storage Slots (4 exposed)
- 24 Hour Burn-In

BASE SYSTEM PRICE: No. CA5170-01 **$999**

Monitor Optional

BASIC SYSTEM CONFIGURATION:

- 10 MHz 80286 16-Bit Microprocessor
- 512K Motherboard Expandable to 1 MB
- 12 I/O Expansion Slots (6 16-Bit & 6 8-Bit)
- Battery Backed-up/Real-Time Clock
- 1.2 MB Floppy Disk Drive
- Dual Hard Disk/Dual Floppy Controller Card
- 238 Watt Power Supply
- Fully Compatible High Speed BIOS
- 5 Half-Height Front Storage Slots (4 exposed)
- 101-Key Enhanced Keyboard
- 24-Hour Burn-in

BASE SYSTEM PRICE: No. CA5191-01 **$1199**

Monitor Optional

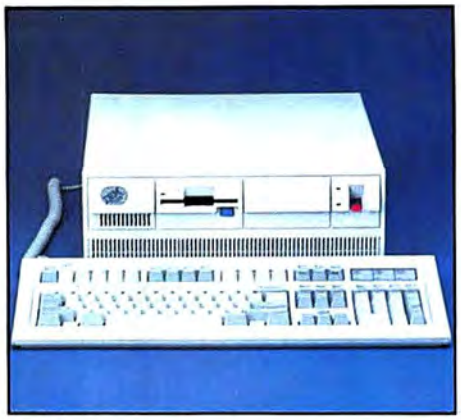
COMPUTER MAIL ORDER

477 East Third Street, Dept. B2, Williamsport, PA 17701
All Major Credit Cards Accepted

JOIN OVER 350,000 SATISFIED CUSTOMERS
CALL 1-800-233-8950
Outside the U.S.A. 717-327-9575
FAX 717-327-1217

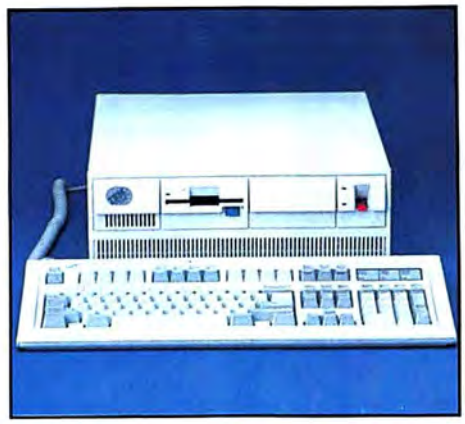
B205

FOR FAST, FRIENDLY, KNOWLEDGEABLE SERVICE CALL CMO 1-800-233-8950



IBM
PS/2 Model 30
- 720KB 3½" Disk Drive
- 640K RAM, 8MHz
- 20 MB Hard Drive
- 101 Enhanced Keyboard

No. IBS32 **$1699**



IBM
PS/2 Model 50
- 80286, 10 MHz Micro Processor
- 128K ROM, 1 MB RAM
- 20 MB Hard Drive
- 1.44 MB 3.5" Disk Drive

No. IBS50 **$2799**

IBM
PS/2 Model 60
- 80286, 10 MHz Micro Processor
- 1 MB RAM, VGA Display Interface
- 40 MB Fixed Disk Drive
- 1.44 MB 3.5" Disk Drive

No. IBS60 **$3499**

AST
Premium Model 140
- 1.2 MB Floppy, 101 Keyboard
- FastRAM 1MB
- 80286, 10MHz, Zero Wait
- AST 3 G Plus Board

No. ATP140 **$2499**

COMPAQ
DeskPro 386/20 Model 60
- 80386 Processor, 20 MHz
- 1 MB RAM, 1.2 Floppy
- 60 MB Hard Drive
- Parallel and Serial Ports

No. CQ145 **$5699**

NEC
PowerMate II
- 1.2 MB Floppy Drive
- 640K RAM, 10 MHz
- 40 MB Fixed Disk Drive
- MS-DOS 3.2 & GW-Basic

No. NIH501K **$2399**

TOSHIBA
T-1000 Lap Top
- Fully IBM compatible
- 512K RAM
- 720K 3½" Disk Drive
- 640 x 200 Pixels

No. TB1000 **$779**

NEC
Multispeed EL
- Dual 3½" 720K Floppies
- 640K RAM, 512K ROM
- Backlit LCD Screen
- 9.54 MHz CMOS V-30

No. NIMSB **$1599**

COMPAQ
Portable 386 Model 40
- 80386 Processor
- 1 Megabyte RAM
- 40 MB Fixed Drive
- 1.3 MB Diskette Drive

No. CQ114 **$5999**

MOUNTAIN
Drivecard

- 20 Meg, No. MB20 **$449**
- 30 Meg, No. MB30 **$499**
- 50 Meg, No. MB50 **$699**

MOUNTAIN
Beta Series

- 20 MB 5¼" Internal
- Bernoulli Technology
- AT Compatible

No. MBB4199 **$1369**

MOUNTAIN
TD-4000

- 40 MB Formatted Capacity
- 3½" Pocket Size Cartridges
- 500 Kbits/Sec. Transfer Rate

No. MBTD5720 **$489**

POLAROID
Pallette Plus

- Computer Image Recorder
- 35mm and 3x4 Film Unit
- 8 Pallette Software included

No. PO01P **$2499**

SEAGATE (Controller Optional)
Hard Drives

- 20MB ½ Ht No. ST-225 **$249**
- 30MB ½ Ht No. ST-238 **$399**
- 40MB ½ Ht No. ST-251 **$439**

EVEREX
Excel-Stream 60-8

- 60 MB Cassette Back-up
- Backs up 5 MB per minute
- Built-in Formatter

No. EV60E **$729**

IRWIN
10 MB Tape Drive

- 10 MB Formatted Capacity
- 8 Minute Back-up Time
- Half-height Internal

No. IW110D **$219**

CMS
Drive Plus 21

- 21 MB Expansion Card
- 3½" Rigid Disks
- 5 MB/sec. Transfer Rate

No. CH20DP **$319**

HAYES
Smartmodem 1200

- 300/1200 Baud External
- Automatic Speed Selection
- Voice/Data Transmissions

No. HY1200 **$289**

HAYES
Smartmodem 2400

- 300/1200/2400 Baud External
- Non-Volatile Memory
- Stored Number Dial

No. HY2400 **$429**

PRACTICAL PERIPHERALS
Practical Modem 2400 SA

- 100% Hayes Compatible
- 300/1200/2400 Auto Answer
- 5 Year Warranty

No. PG24005A **$199**

U.S. ROBOTICS
Direct 2400 PC

- 300/1200/2400 Baud Internal
- Carrier detect override
- Audio phone line monitor

No. UR2400 **$179**

ZUCKERBOARD
The Nude Modem

- 1200 Baud Half Card
- Fully Hayes Compatible
- PC Talk III Software

No. HX **$79.99**

ANCHOR
2400E

- 100% Hayes Compatible
- 2400/1200/300 Auto Dial/Answer
- 5 Year Limited Warranty

No. AN2400E **$169**

EVEREX
Evercom 920

- 300/1200 Baud Half-Size
- Bell 103/212A Compatible
- Auto Answer/Auto Dial

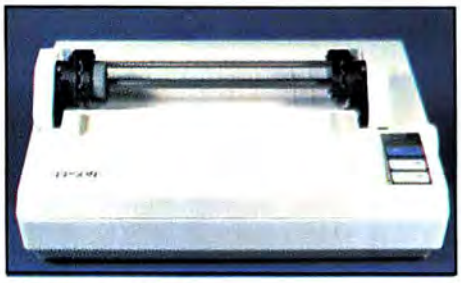
No. EV920 **$89.99**

EVEREX
Evercom 945

- 300/1200/2400 Baud External
- "AT" (Hayes) Command Compatible
- Status Indicator LED's

No. EV924E **$239**

WE SHIP 90% OF ALL ORDERS WITHIN 24 HOURS CALL CMO 1-800-233-8950



EPSON LX-800

- 150 cps Draft/30 cps NLQ
- 9 Pin Dot Matrix, 80 Column
- Built-in Tractor Feed

No. EPLX800

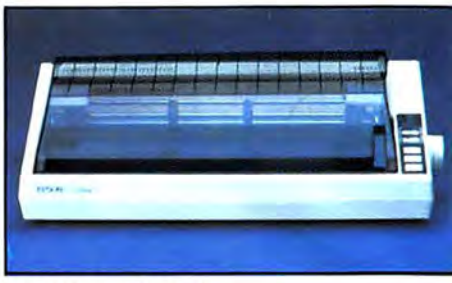
$179

EPSON FX-86E

- 240 cps Draft/40 cps NLQ
- 9 Wire Dot Matrix
- Selectype Control Panel

No. EPFX86E

$299



EPSON FX-286E

- 240 cps Draft/40 cps NLQ
- 132 Column, 8K Buffer
- Friction/Tractor Feed

No. EPFX286E

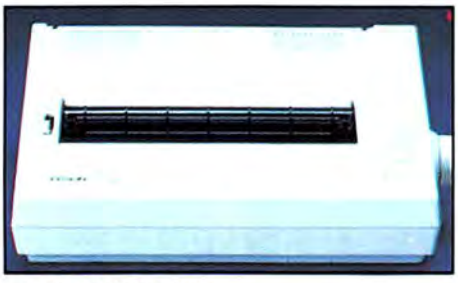
$449

EPSON LQ-500

- 24 Pin Dot Matrix
- 180 cps Draft/60 cps NLQ
- 8K Input Buffer

No. EPLQ500

$329



EPSON LQ-850

- 330 cps Draft/60 cps NLQ
- 24 Pin Print Head
- Parallel/Serial with 6K Buffer

No. EPLQ850

$529

EPSON LQ-2500

- 324 cps Draft/108 cps NLQ
- 24 Pin Print Head, 136 Column
- Parallel/Serial with 8K Buffer

No. EPLQ2500

$869

DICONIX INKJET 150P

- AC/DC Powered Portable
- Centronics Parallel 8 Bit
- 150 cps Draft/50 cps NLQ

No. KD150

$319

SHARP FO-300 NEW

- Fax/Tel each 70 Auto Dial Numbers
- Relay Broadcasting Function
- Confidential Transmission Function

No. SHF0300

$1499

CANON PC-25 Personal Copier

- 8 copies per minute
- Wait time 20 seconds
- Copy size up to 356x216 mm

No. CC25

$899

OKIDATA ML-193 Plus

- 200 CPS Draft, 40 CPS NLQ
- 8K Print Buffer
- 9 Wire, 132 Column

No. OK193I

$469

OKIDATA ML-293

- Dual 9 Pin Dot-Matrix
- 240 cps Draft/100 cps NLQ
- 136 column, 8K Buffer

No. OK293

$529

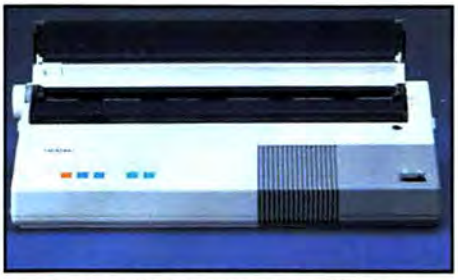
OKIDATA ML-393 Plus

- 450 cps Draft/180 cps NLQ
- 24 Wire Dot Matrix
- Personality Module Concept

No. OK393

$989

ONE OF THE OLDEST AND LARGEST COMPUTER MARKETERS. CALL 1-800-233-8950

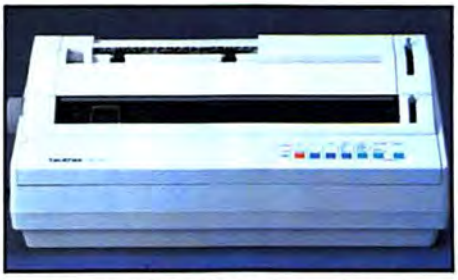


BROTHER M-1509 Dot Matrix

- 180 CPS Draft/45 CPS NLQ
- Auto Paper Loading
- Friction and Pin Feed

No. BRM1509

$389



BROTHER HR-40 Daisywheel

- 40 CPS, 136 Columns
- 2 Color Printing
- Friction and Forms Tractor

No. BRHR40

$499

BROTHER HR-60 Daisywheel

- 60 CPS, 136 Columns
- Diablo 635 compatible
- Standard Parallel Interface

No. BRHR60

$739

NEC 2200

- 24-Wire Dot Matrix
- 170 cps Draft/55 cps NLQ
- 360x360 Dots per inch

No. NIP2200

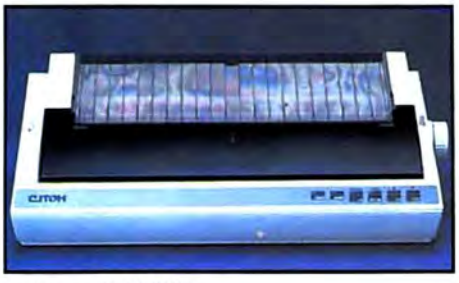
$379

NEC P760 Pinwriter

- 24-Wire Print Head
- 216 cps Draft/65 cps NLQ
- 136 Column Carriage

No. NIP760

$659

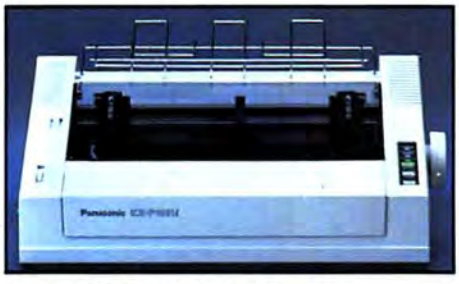


C.ITOH 315XP

- 300 cps Draft/50 cps NLQ
- 15" Carriage Width
- IBM/Epson compatible

No. TE315XP

$559



PANASONIC KX-P1091I-II

- 194 CPS Dot Matrix
- 9-Pin Print Head
- IBM Pro Printer Emulation

No. PA1091

$189

STAR MICRONICS NX-1000

- 144 cps Draft/35 cps NLQ
- 4K Buffer, 80 column, Auto feed
- Friction and Tractor Feed

No. SGNX1000

$189

STAR MICRONICS NX-15

- 120 CPS Draft, /50 CPS NLQ
- 5K Buffer, 132 Column
- Friction & Tractor Feed

No. SGNX15

$319

TOSHIBA P321SL

- 24 Wire Print Head
- 216/180/72 cps
- Character font cartridges

No. TB321SL

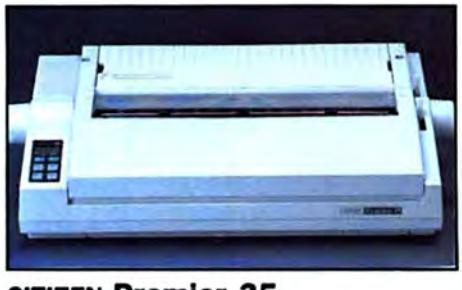
$529

TOSHIBA P351-SX

- 24 Wire Print Head
- 360 cps Draft/120 cps NLQ
- 136 column, Parallel/Serial

No. TB351SX

$999



CITIZEN Premier 35

- 35 cps Daisywheel
- Built-in clock/calendar display
- Error messages in English

No. CZMSP35

$489

WE WILL MEET OR BEAT ANY COMPETITIVE PRICE. CALL CMO 1-800-233-8950

MAGANAVOX
Monochrome Monitor
- 12" Amber or Green Display
- 1000 Lines
- Dark Glass CRT

No. NAP613 Green
No. NAP623 Amber
$89.99

MAGNAVOX
RGB/Composite/TTL
- 640 x 240 Resolution
- Green Text Switch
- 14" Tube

No. NAP8762
$269

MAGNAVOX
Enhanced Display
- Up to 690 x 350 Resolution
- 64 Colors in EGA Mode
- Text Display Function

No. NAP053
$369

MAGNAVOX
Multimode Display
- Digital and Analog
- 926 x 580 display
- 15 KHz to 34KHz

No. NAP873
$489

AMDEK
Video 410 Series
- 12" TTL Amber, Green, White
- Up to 960 lines
- Flat non-glare screen

No. AM410A, G, or W
$159

AMDEK
Color 722
- 13" In-Line etched screen
- Supports 64 Colors
- 720 x 350 Display

No. AMC722
$429

AMDEK
Monochrome/432
- PS/2 MCGA & VGA Compatible
- 640 x 480 Pixel Resolution
- 31.48 KHz Scan Frequency

No. AM432
$179

AMDEK
Monitor/732
- Palette of 256,000 colors
- 12" Etched Glass, Non-Glare
- 640 x 480 MCGA Compatible

No. AMC732
$479

PRINCETON
MAX-12
- 12" Amber TTL
- 720 x 350 Display
- 16 Shades

No. PNM12
$149

PRINCETON
Ultrasync
- 12" Analog/TTL .28mm Dot Pitch
- 800 x 600 Resolution
- IBM PS/2 & Mac II Compatible

No. PN12U
$549

ZENITH
ZMM-149 VGA
- IBM VGA Monochrome
- 14" High Resolution
- 31.49 KHz Scan Frequency

No. ZVA149 Amber
No. ZVW149 White
$209

ZENITH
ZCM-1490 VGA
- 14" Analog/TTL, .31 Dot Pitch
- 64 Available Colors
- 25 MHz, 640 x 480 Resolution

No. ZEC1490
$699

THOMPSON
Model 4120
- 14" RGB/Comp/Analog
- 560 x 240 Pixel Resolution
- 51 Dot Pitch, 12 MHz

No. TPC4120
$239

SEIKO
Model CM-1430
- 14" Raster Scan
- 1024 x 768 Multi-Scan
- IBM PS/2 Compatible

No. SNCM1430
$699

NEC 1402
Multisync II
- Multisync RGB
- 800 x 560 Display
- 6 Text Switchable

No. NEC1402
$599

NEC
Multisync Plus
- 15" Flattened CRT
- 960 x 720 Resolution
- 3-Way Text Switch

No. NEC1501
$999

BOCA
Multi-EGA
- 640 x480 Resolution
- 16 Color/64 Palette, 132 Column
- 256K of Video Memory

No. BOEGAM **$149**

BOCA
BocaRam AT
- 16 Bit, Runs to 16 MHz
- 0 MB - 4 MB Memory
- Expanded, Extended, LIM

No. BOAT00 **$149**

VIDEO SEVEN
VEGA Deluxe
- 752 x 410 Display
- EGA, CGA, MGA, HGC
- 256K-DRAM Screen Buffer

No. VSEGAD **$229**

VIDEO SEVEN
VEGA V•G•A
- 800 x 600 Resolution
- 256 Simultaneous Colors
- Supports Both Analog & Digital

No. VSVGA **$319**

NEC
GB-1 Graphics Board
- 640 x 480 Resolution
- 16 Colors, 64 Color Palette
- MDA, CGA, and EGA

No. NECGB1 **$229**

EVEREX
Autoswitch Enhancer
- Autoswitch EGA
- 132 Column Operation
- Parallel Printer Port

No. EV657 **$149**

EVEREX
RAM 3000 Deluxe
- 0K-3MB Memory
- EMS, Extended, BASE for AT
- Utility Software

No. EV159 **$99.99**

QUADRAM
Quad 386 XT
- IBM-XT Upgrade to 80386 Processor
- 1 MB of Onboard Memory
- 16 MHz, Single Slot

No. QU3861 **$799**

INTEL
Above Board/286
- 512K Expandable to 2 MB
- Conventional, Expanded & Extended Memory
- AT&XT to 12.5MHz

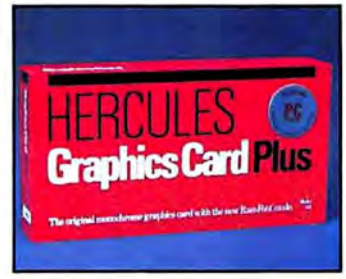
No. IN4020 **$349**

INTEL
Inboard/386/PC
- Converts PC to 16MHz
- 80386 Microprocessor
- 1MB On Board Memory

No. INIB1200 **$799**

INTEL Math Co-Processors

No. IN8087 PC	$129
No. IN80287-8AT	$299
No. IN80287-10AT	$319
No. IN80387	$539



HERCULES
Graphics Card Plus
- 720 x 348 Bit Mapped Graphics
- RAM Font Software Included
- Parallel Port

No. HEGCP **$159**

ZUCKERBOARD PS/2
50/60 Multifunction Board
- 512K to 2 MB Simm Memory
- Parallel and Serial Ports
- EMS and Diagnostic Software

No. HX15 **$289**

IDEA 5251
Terminal Emulation
- Local Twinax Communication
- IBM 34/36/38 Compatible
- Printer Support, Hot Key

No. IE5251 **$579**

DCA
IRMA Board 2.2
- Native Mode Coaxial Link
- IBM 3270 Controller Compatible
- SNA/SDLC or BSC

No. IRMA2 **$799**

FIFTH GENERATION
The Logical Connection
- 4 Serial, 2 Parallel in, 2 Parallel out
- Daisy-chainable up to 315 devices

No. ICFI02 256K **$289**
No. ICFI03 512K **$369**

MOST MAJOR CREDIT CARDS ACCEPTED **CALL CMO 1-800-233-8950**

LOTUS 1-2-3

No. ICLO01 **$299**

d-Base III +

No. ICAH03 **$399**

Word Perfect 4.2

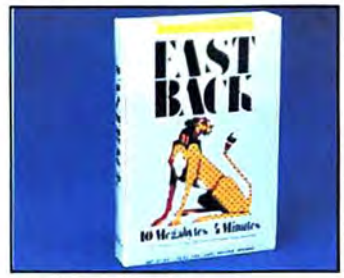
No. ICSS01 **$209**

Symphony

No. ICLO02 **$439**

Copy II Option Board

No. ICCP02 **$84.99**



Fast Back Plus

No. ICFI04 **$89.99**

Microsoft Mouse w/ Paintbrush

No. ICMR02 **$129**

IMSI Optimouse w/Dr. Halo

No. ICIM04 **$89.99**

MECCA Managing Your Money

No. ICMD01 **$129**

Multimate Advantage II

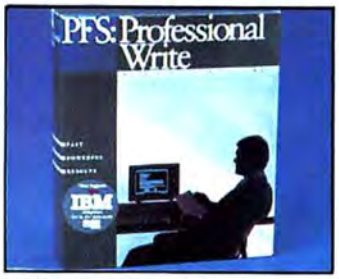
No. ICMM02 **$299**

DAC Easy Accounting

No. ICDA02 **$65.99**

Logitech Mouse W/Plus Soft.

No. ICLG03 **$79.99**



PFS: Professional Write

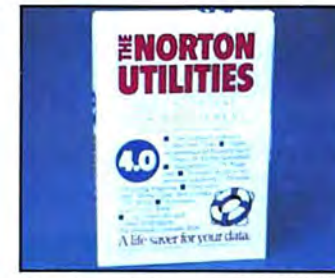
No ICPF11 **$129**

MICROLYTICS Gofer

No. ICMY01 **$39.99**

Xerox Ventura

No. ICXE01 **$569**



Norton Advanced Utilities

No. ICNO03 **$89.99**

KENSINGTON Master Piece Plus

No KEM08 **$109**

CMO POLICIES

- Next Day Shipping on all in-stock items.
- No Surcharge on Visa or Mastercard orders.
- Credit Cards are NOT Charged until order is shipped.
- Add 3% (minimum $7.00) shipping/handling on all orders.
- All items subject to availability and price change.
- Returned items may be subject to a restocking fee.
- PA residents add 6% Sales Tax.

CURTIS Computer Tool Kit

No CUTK1 **$22.99**

An Assessment of OS/2

Just how useful is OS/2 without the Presentation Manager? And once it arrives, will the Presentation Manager be the answer you've been looking for?

William F. Zachmann

Last fall IBM made quite a show of announcing the "early" delivery of OS/2, promising shipment of the IBM OS/2 Standard Edition 1.0 in the first week of December 1987. At the same time, IBM announced delivery dates of July 1988 for the Extended Edition 1.0, October 1988 for the Standard Edition 1.1, and November 1988 for the Extended Edition 1.1. But if you dig a little deeper, you'll discover we're still months away from getting the genuine article, an operating system that will bring us into the next generation of computing.

The primary difference between version 1.0 and version 1.1, in both the Extended Edition and the Standard Edition, is the OS/2 Presentation Manager (or Windows Presentation Manager, as the folks at Microsoft like to call it). Version 1.0 of each edition lacks the Macintosh-like graphics user interface included in version 1.1.

In both instances, version 1.0 is simply a temporary expedient. Had the Presentation Manager been ready, it would have been included in the first version of OS/2. The 1.1 versions are intended to be complete replacements of the 1.0 versions. They carry the same prices as the initial 1.0 versions, and purchasers of 1.0 versions will receive free 1.1 upgrades from IBM.

It may therefore be said that the 1.1 versions constitute the "real" OS/2. The command line, 1.0 versions are simply a way for IBM to get something out the door while development work on the Presentation Manager continues.

In fact, IBM and Microsoft's continued delays in providing developers with prerelease code of the OS/2 Presentation Manager leads me to suspect that they had pretty much used up their slack time in the development schedule by early this year. It seems to me that IBM will be hard-pressed to meet the announced delivery dates for the release 1.1 versions.

The sad truth is that IBM OS/2 Standard Edition release 1.0, rather than providing a software breakthrough that will open the door to exciting new applications, offers little of practical value. Aside from the curiosity factor, it is not at all clear that IBM OS/2 Standard Edition 1.0 is worth the bother.

In the first place, it requires a minimum 1.5MB of memory and occupies about 2.5MB of hard disk space. If you want to run DOS applications as well, the minimum amount of memory you'll need is 2MB. To make use of OS/2's multitasking capabil-

(continues)

ities, however, you will probably want 3MB to 4MB.

And the DOS compatibility mode isn't really completely compatible. Communications programs, many device drivers, and network-dependent programs aren't likely to run well, if at all. What's more, there's a good chance you'll run into problems with add-in boards.

Then, too, there is the messy complexity of the thing. Even users who are reasonably comfortable with DOS are likely to find OS/2 rather daunting. IBM OS/2 Standard Edition 1.0 is more comfortable territory for an old IBM operating system programmer like myself than it is for any normal person.

All of that, however, could be overlooked if there were compelling rewards for using the new operating system. So far, however, there are none. Virtually *everything* of any practical value to the personal computer user that is currently to be derived from IBM OS/2 Standard Edition 1.0 is already available more economically and in a more usable form from other sources.

Microsoft's own *Windows 2.0* and *Windows/386* already offer the graphics user interface that OS/2 won't provide until late this year (if then). A growing number of ways to use the full address space of a 286- or 386-based system are available from multiple sources. Products like Quarterdeck's *Desqview*, The Software Link's PC-MOS/386, and Microsoft's *Windows/386* all deliver practical multitasking capabilities in one form or another.

Even if IBM keeps all its delivery commitments for the final 1.1 versions of OS/2, it will be year-end before users can really evaluate the product. That means, at best, it will be nearly another year before OS/2 has any substantial impact on real life.

One likely consequence is that Apple Computer's Macintosh will continue its advance into corporate accounts. IBM's own representatives have been touting the OS/2 Presentation Manager by telling customers that it is like the Macintosh, offering the same benefits—ease of learning and ease of use. Given that "Apple has it Now!" and the OS/2 Presentation Manager remains beyond the horizon, it isn't surprising that the Mac has been rapidly gaining respectability (to say nothing of market share) in corporate America.

At the same time, the delay of

(continues)

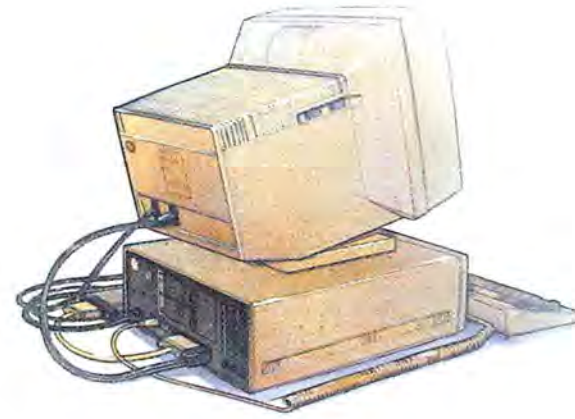
Dysan CORPORATION
Orders Accepted Worldwide
5¼" D·Side D·Density 11.95
5¼" HIGH Density 13.95
RX 50 Format 13.95
5¼" S·Side 96 tpi 12.95 D·Side 96tpi 13.50
8" S·Side D·Den. 17.95 D·Side D·Den. 19.95 D·Side D·Den. 22.95
QUANTITY DISCOUNTS
Delaware 1-800-451-1849
Oklahoma 1-800-654-4058
Nevada 1-800-621-6221
Diskette Connection
Telex #4933362 • Fax #405-495-4598

Verbatim A Kodak Company
5¼" DISKS 5 BOX 10 BOX
D·Side 9.50 8.50 7.95
D·Den.
High Den. 17.50 16.50 15.95
3½" Diskettes
S·Side 11.95 D·Side 16.50 H·Den. 39.95
8" Diskettes
S·Side 15.40 S·Side 17.95 D·Side 20.95
S·Den. D·Den. D·Den.
International Orders Accepted
Delaware 1-800-451-1849
Oklahoma 1-800-654-4058
Nevada 1-800-621-6221
Diskette Connection
Telex #4933362 • Fax #405-495-4598

Circle 60 on reader service card

Prevent Computer Theft!
Käblit Systems
Unique Käblit fasteners attach to equipment without drilling, using existing screws. Cable passes through fasteners preventing removal. Cable is then locked. When ordering multiples, specify locks keyed differently or alike. Installs in 10 min. Over 80 college installations.
Heavy duty 10' steel cable secures computer, other equipment, up to 6 units.
Käblit works with: •Computers •Printers •Disk Drives •Typewriters •Stereos •Monitors •Lab Equip •Televisions •Other
$54.95 postage paid. Quantity pricing also avail. for schools, institutions, businesses, etc. Send P.O. Money back if returned in 30 days.
EXCLUSIVE! Proprietary components prevent removal of mounting screws. (Pat. Pend.)
SECURE-IT Inc. 10 Center Square • E. Longmeadow, MA 01028
800-451-7592 413-525-7039
Dealer Inquiries Invited

Circle 31 on reader service card



New Hope for Unsociable Computers.

Just a few short minutes with CROSSTALK® Mk. 4 can start your PC communicating with most anyone.

You can open up a world of new possibilities for your PC through our advanced communications software–and you don't have to be a genius to do it.

With a phone line and modem, CROSSTALK Mk. 4 can get your PC into a dial-up information service like CompuServe® with a single command. Our scripts make it as easy as filling in a few blanks on a screen.

Want to exchange words with other PCs? You can create your own command scripts to simplify and automate entire communications sessions.

When you're ready for bigger worlds, you can break down barriers between your PC and minis and mainframes with CROSSTALK Mk. 4. It emulates over 20 popular terminals, supports the most-used protocols, and helps drive IRMA™ or Smart Alec™ interface boards through a single set-up screen.

For advanced communicators, CROSSTALK Mk. 4 handles concurrent sessions with multiple devices. Its high-level programming language, CASL,™ helps you create customized, menu-driven user interfaces and other applications programs.

As you see, we make communication as simple or sophisticated as you need to get the most out of your newly compatible PC. See your dealer, or contact us.

CROSSTALK Mk.4

CROSSTALK COMMUNICATIONS / 1000 Holcomb Woods Parkway, Roswell, Georgia 30076 / (800) 241-6393

A Division of Digital Communications Associates, Inc. dca

CROSSTALK is a registered trademark of Digital Communications Associates, Inc. / CASL, IRMA and Smart Alec are trademarks of Digital Communications Associates, Inc. / CompuServe is a registered trademark of CompuServe, Inc., an H&R Block Company

Circle 271 on reader service card

The difference between having power and putting it to work.

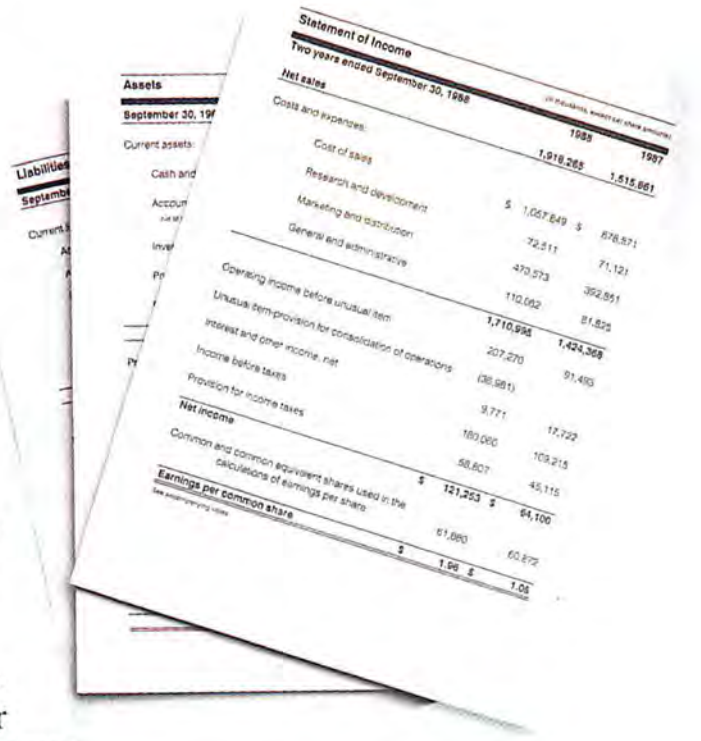
Today's new hardware has the power to let you do more with numbers than ever before.

But only if you have software that's smart enough to put all that power to work.

Enter Microsoft® Excel.

It's the first spreadsheet explicitly designed to transform new heights of PC power into new heights of analytical power.

With the kind of difference you can see on the bottom line.



The powerful difference.

Microsoft Excel works faster than any other spreadsheet. It's intelligent enough to recalculate only updated cells. And responsive enough to let you interrupt at any time with new entries.

Microsoft Excel works smarter too. You can display and link multiple worksheets right on your screen for a more realistic view. You can even link your sheets into a three-dimensional model–without locking them into it.

Perform any of 131 functions or easily customize your own. Manipulate arrays of data as simply as a single cell. Check your work with a complete set of built-in auditing tools.

Benchmark Results*
The numbers show why Microsoft Excel does the numbers faster.

	Microsoft Excel 2.0	Lotus 1-2-3 2.01	Quattro 1.0
Recalculate Addition File	**0:03**	0:06	0:07
Recalculate Multiplication File	**0:03**	0:07	0:06
Recalculate Mixed-Formula File	**0:04**	0:42	0:24

And produce annual-report-quality spreadsheets and charts that illuminate the most important part of any analysis. The point.

What's more, you can do all this with files and macros created in Lotus® 1-2-3®. Because the power of Microsoft Excel is meant to be shared.

You've read the ad. Now see the movie.

Now you can preview Microsoft Excel on a TV near you. To get your copy of our action-packed video, just call **(800) 541-1261 ext. C98.** Ask for the video. It's only $10, but you'll get that back when you get Microsoft Excel.

Or just ask for our free product literature.

You can also stop by your Microsoft dealer and give Microsoft Excel an analytical workout of your own. Find out why every copy of Microsoft Excel comes with a money-back guarantee.

And discover what a powerful difference Microsoft Excel will make to you.

Microsoft Excel

The soul of the new machines.™

*Excerpted from *InfoWorld*, January 11, 1988, Volume 10, Issue 2, page 55. Times are shown in seconds.

Money-back guarantee good on purchases made through June 30, 1988, and valid only in the USA and Canada. Some restrictions apply. Microsoft and the Microsoft logo are registered trademarks and The soul of the new machines is a trademark of Microsoft Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Company names and data used in the output are fictitious.

USERS SELECT ACT 1 ACCOUNTING SERIES AS "BEST BUY OF THE YEAR" FOR 1986 & 1987.

NOW IMPROVED with "LOOKUP" WINDOWS

ONLY $139.50 + Shipping & Handling

In an annual poll thousands of readers of COMPUTER SHOPPER magazine voted ACT 1 the BEST BUY OF THE YEAR for 2 consecutive years!!

Here's a number of reasons those discerning users have selected, and are changing to, ACT 1: ACT 1 is upgradeable to ACT 2 which is multiuser w/record & file lock, supports 3.1 DOS, & all data files are automatically upgradeable.

GENERAL FEATURES
"LOOKUP" Windows throughout.
Menu driven with 2 help references.
Multi company and report generator.
Sample data files included.
Complete audit trail.
All modules can post to multiple profit centers.
Fully integrated with single source entry.
Date sensitive user-defined fiscal calendar.
User defined financial reports.
User can design checks, invoices, statements & W-2s.
User defined chart of accounts, account numbers & stock numbers up to 15 alphanumerics.

GENERAL LEDGER
Allows for multi company ledgers.
Unlimited multi-level accounts for departmentalized reporting.
Allows recurring journal entries.
User can process transactions 2 periods into next year.
Allows budgeting.

ACCOUNTS RECEIVABLE
Open invoice and/or balance forward.
Allows unapplied payments.
Prints statements.
Handles recurring accounts receivable.
Supports partial payments & finance charges.
Allows unapplied credit memos.
Up to 5 user-defined aging periods.
Mailing labels & reports with 7 different sorts.

INVENTORY
Supports: LIFO, FIFO, weighted averages & standard cost.
Supports markup, margin or list.
Allows up to 4 places to right of decimal for unit cost & price.

SALES INVOICING
Supports service or product oriented businesses.
User defined tax tables including multiple sales taxes.
Prints packing slips.
Prints invoices.
Alerts user to customer exceeding credit limit.
Sales history reports.
Automatic updating of inventory daily.
Allows return credit memos.

ACCOUNTS PAYABLE
Can post to 200 general ledger expense accounts per invoice.
Prints checks.
Automatically prepares payments.
Supports partial and handwritten checks.
Processes credit and debit memos.
Computes discounts and records discounts taken.

PAYROLL
Generates automatic payroll.
Provides up to 8 user-defined rates.
Allows post facto payroll.
Allows distribution of payroll expenses to user-defined departments.
Benefits and deductions are calculated on fixed amounts.
Hourly amounts, percentage of gross or variable.
Allows additions to gross which may be taxable, nontaxable or partially taxed.
Handles 401K & cafeteria.
All tax tables easily updated by the user.
Handles payroll draws, per diem pay, contract & piece work, hourly and salary.
Handles tip accounting.
Prints checks and W-2s.

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

TO ORDER CALL (800) 344-2540
8:00-5:00 MST Monday-Friday

UNCONDITIONAL 30 DAY MONEY BACK GUARANTEE
applicable on all products bought directly from COUGAR MOUNTAIN SOFTWARE. Products must be returned in resaleable condition. Restocking fee applicable.

Technical support is available via our Toll-Free Telephone Number.
Training seminars available.

To order by mail send $139.50 plus $11.50 S&H to:

COUGAR MOUNTAIN SOFTWARE
2609 Kootenai, Box 6886, Boise, ID 83707, 208-344-2540

Trademarks:
IBM - International Business Machines
MS - DOS Microsoft, Inc. PC - DOS IBM

Circle 127 on reader service card

the OS/2 Presentation Manager isn't likely to build much momentum for IBM's PS/2 sales. There seems to be little incentive for users to pay premium prices for IBM's proprietary products.

The bottom line is that more and more users are going to start wondering just what kind of clothes this particular emperor is wearing. The longer it takes to deliver the Presentation Manager in the 1.1 versions of OS/2, the more users are likely to conclude that alternatives offer more economical, more efficient, or more effective solutions to their problems.

For current users of older systems who want the benefits of a graphics user interface, *Microsoft Windows 2.0* clearly delivers more, sooner and cheaper, than OS/2 Presentation Manager will. For those fortunate enough to use newer 386-based systems, *Windows/386* is a more practical alternative, is available now, and is able to run multiple concurrent DOS tasks (OS/2 can run only one DOS task at a time).

On the other hand, users who have let more than a year go by without taking advantage of *Windows* are equally unlikely to be interested in the Presentation Manager. *Windows 2.0* and *Windows/386* offer a user interface virtually identical to that of the OS/2 Presentation Manager.

Ultimately, user response to the OS/2 1.1 versions may more closely resemble the so-what attitude recently displayed toward OS/2 1.0 than the apocalyptic rejoicing at the arrival of a new millennium in personal computer software that so many seem to expect. ●

William F. Zachmann is senior vice president at International Data Corporation.

COMDEX/Spring
Atlanta, GA Booth #3602

THE MASS STORAGE WORLD OF CMS ENHANCEMENTS

CMS understands that enhancing your personal computer can make a world of difference! That's why we offer personal computer users a complete line of enhancement products. Our superior quality and exceptionally low prices are unparalleled anywhere on the globe—we're even confident enough to stand behind every product we sell with a full one year warranty.

Whether you use Apple, Compaq, DEC, IBM including PS/2, AT&T, any of the laptops or their compatibles, our state-of-the-art line of hard disk drives can provide anywhere from 20MB to an unbelievable 2.6 Gigabytes of additional storage.

And the world of CMS doesn't stop spinning there. Because we've put ourselves on the map by providing a full range of products to meet any of your enhancement needs. We've got you covered with everything from floppy disk drives and tape back-ups to add-in boards, surge suppressors and media. We've got it all! And you can count on CMS to continue bringing you the best today as well as tomorrow, with the same commitment to excellence that has made us a leader worldwide.

So call one of our dealers today, or phone CMS directly at 714-259-9555 for more information or the dealer nearest you. And remember. When it comes to your mass storage needs . . . we can give you the world.

CMS Enhancements, Inc.

CMS

1372 Valencia Avenue, Tustin, CA 92680 (714) 259-9555
Telex (023) 371-8711 FAX (714) 549-4004

Circle 94 on reader service card

Announcing

PagePerfect™

By IMSI

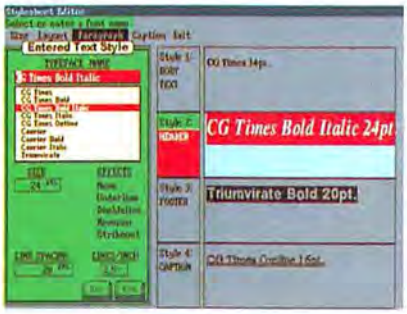
Word Processing, Desktop Publishing and Graphics in one program.

Now, with PagePerfect™, creating fabulous-looking documents can be as easy as word processing. Which means you can turn out everything from a memorable memo to a persuasive proposal, in minutes instead of hours!

Word Processing. PagePerfect's full-function word processor lets you use WordStar or MultiMate commands. Or import text directly into PagePerfect. It even includes a spelling corrector and thesaurus!

You see, PagePerfect combines powerful word processing, desktop publishing, and graphics into one integrated, extremely easy-to-use product. The result? You can combine text and graphics fast. And quickly adjust margins, columns, headers, footers, and more, for maximum flexibility.

PagePerfect also lets you zoom in to nine different document levels, view a full page layout, and interactively change text and layout, at any time!

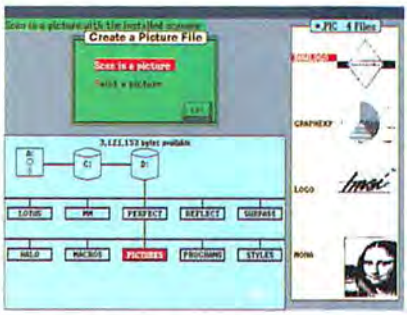


Style Sheets. Choose a PagePerfect style sheet or create you own. The choice of fonts, layouts, paragraph styles, and more, is yours.

PagePerfect is so easy to use, we make this guarantee: You'll start creating page-perfect documents in 30 minutes or we'll refund your money! PagePerfect retails for just $495 and includes a free Desktop Publisher's Graphics editor (a $195 value).

Call today for the name of the nearest dealer. 800-222-GRAF, (in California call 800-562-GRAF, or (415) 454-7101.)

Circle 83 on reader service card

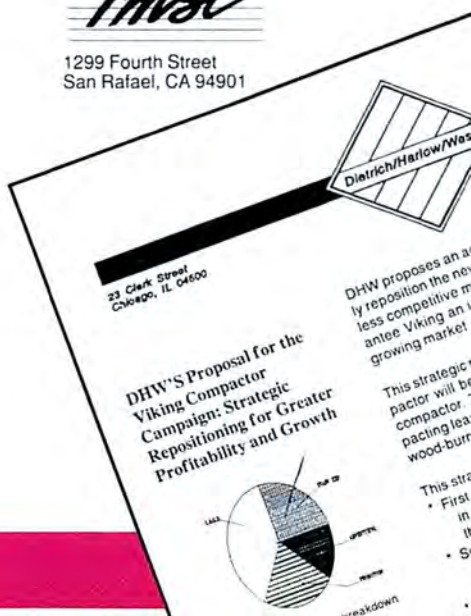


Graphics. PagePerfect puts pictures at your fingertips. Desktop Publisher's Graphics is built right in so you can quickly scan, draw, and edit images.

System Requirements: IBM PS-2 or AT (with EGA), 640K, and hard disk.

Imsi™

1299 Fourth Street
San Rafael, CA 94901



PagePerfect and Desktop Publisher's Graphics are trademarks of IMSI. MultiMate and Wordstar are registered trademarks of Ashton-Tate and MicroPro International respectively.

Edited by ERIC BENDER

Users Applaud Speed, Capacity

Ventura Zooms to the Head of the Pack

Xerox Lets Start-Up Run Lean

MONICA LEE

Ventura Publisher's speedy development and robust performance paid off for creators Don Heiskell, John Grant, Lee Lorenzen, and John Meyer (left to right).

Ventura Publisher, which now clearly leads the market in PC desktop publishing packages, began life in the fast lane.

Developers Don Heiskell and Lee Lorenzen began work in the early fall of 1985. "Within three-and-a-half weeks, we had a demonstrable product," recalls John Meyer, Ventura Software's cofounder and chief executive. When the prototype was shown privately at COMDEX/Fall, its snappy performance startled the experts. Favorable reports began to spread, and *Ventura* began to move out ahead of the desktop publishing pack.

Most fledgling firms would have quickly added staff at that point, but Ventura wanted to avoid getting top-heavy. "So we farmed out as much work as we could," Meyer says. "Ultimately, we decided to farm out marketing as well."

In March 1986 the firm signed an exclusive marketing deal with Xerox, "which wasn't in our original business plans at all," Meyer says. "They have done a wonderful job of shielding us from the bureaucracy. We've continued to have all the fun of a raw start-up, and to develop at breakneck speed."

Ventura Publisher shipped in October 1986, "virtually one year to the day after the company started," Meyer notes. As sales took off, developers began cramming more than 80 new features into the next release.

While Meyer won't disclose the number of products shipped, he acknowledges that 70,000 is a good estimate for last year's sales. "We have the leading product in the PC market, and we're probably neck and neck overall in the publishing race with Aldus."

Pioneer desktop applications on the Macintosh targeted mostly short, high-gloss, thoroughly illustrated output. But that approach missed much of the market, Meyer says.

"Those newsletters and brochures make for really sexy-looking ads, but no one I know can produce a document like the ones in the ads," he insists. "I *can* produce a typographically correct, simple newsletter or technical manual, and that's maybe 95 percent of what people want to do. Most people aren't willing to be page designers. Most things that are taken to typesetters are fairly long."

While mainstream word processor manufacturers are presently bundling in desktop publishing features, "as long as the word processors are text-based, they're not true competition," says Meyer. *(continues)*

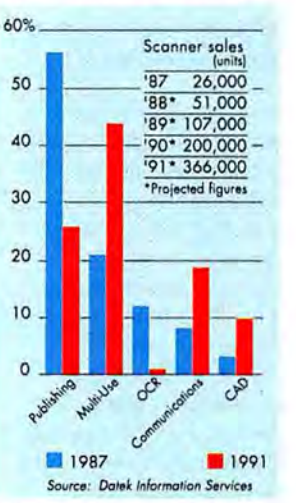
Scanners on the Threshold

Facsimile, CAD, Other Applications to Double Market

In scanning parlance, *thresholding* refers to the cutoff point at which pixels are interpreted as either black or white. This year, many scanner companies may be crossing a threshold of their own—stepping boldly into the black.

Datek Information Services in Newton, Massachusetts, predicts that *(continues on page 112)*

Changes in Scanner Use



Sales of desktop scanners should double annually for the next several years, driven by desktop publishing, facsimile transmissions, computer-aided design, and other applications. But use of scanners dedicated to optical character recognition will decline, predicts Datek Information Services.

Readying for Release 3

The Biggest Upgrade Since Color TV?

There have always been competitors and good products in spreadsheets," comments Peter Simon, Lotus Development's marketing manager for analytic products. "What's different this time is that the competitors are big, well known, and well funded."

As Lotus prepares to deliver *1-2-3* release 3 (see "1-2-3 Enters the Third Dimension" in this issue), the dominant spreadsheet supplier is concerned not just with challenges from Microsoft, Borland, and other vendors. At least as important is keeping those 3.5 million registered *1-2-3* users happy.

Lotus's Irfant Salim aims to minimize upgrade pain during the massive rollout of the next release of 1-2-3.

Release 3's features were frozen early in the first quarter, Lotus executives say. Now comes beta testing, quality assurance, documentation, preparing the distribution channels and other constituencies, and myriad other tasks.

Even beta testing gets tricky, as more than 200 users tackle the package, notes Irfant Salim, vice president for analytic products. Lotus has tapped its *Lotus Express* electronic mail package to let users send the company buggy files for postmortem and has set up numerous visits between beta testers and Lotus staff. "It's like a military exercise," remarks Frank Ingari, vice president for business development.

Lotus made an effort to bring in third-party vendors of add-in packages, whose current products won't work with the new release. As *1-2-3*'s basic architecture was redrawn, there was no way to avoid that problem, Salim says. But he expects the third-party houses to console themselves with the demands of the release 3 market. "In the history of the industry, they're probably not going to see an opportunity like this again," Salim says.

Most third-party vendors are "comfortable that Lotus is not grabbing all the most popular add-in features," Ingari adds. "That's not because we're Santa Claus; we want the core product to stay lean and mean."

1-2-3's last major upgrade, from release 1A to 2, turned into a high-decibel experience that no one wants to repeat, and Lotus struggled to find the optimum mix of gain versus pain for release 3. "I've implemented upgrades in 14 countries, with 10 different languages," Salim notes wryly. "Believe me, it's not something we do for fun."

In this case, a few of those 3.5 million customers may get a trifle impatient. "There are hundreds of thousands of people out there who will want the new release the same day they hear about it," Simon says.

A day or two later, the support hot lines will light up at Lotus headquarters. But Marty Falaro, national sales manager for the retail channel, emphasizes that since the last upgrade Lotus has beefed up its hot line with experienced people, an improved phone system, and an electronic technical reference system stored on optical disk. Additionally, "We forecast very accurately the number of phone calls and are able to move personnel from other support duties into the *1-2-3* pool so we can handle a big push." And yes, Falaro says, he knows that push has just about come to shove.
—*E. B.*

Ventura

(continued)

"They give you ways to clip things together, but they're crude compared to an interactive graphics environment."

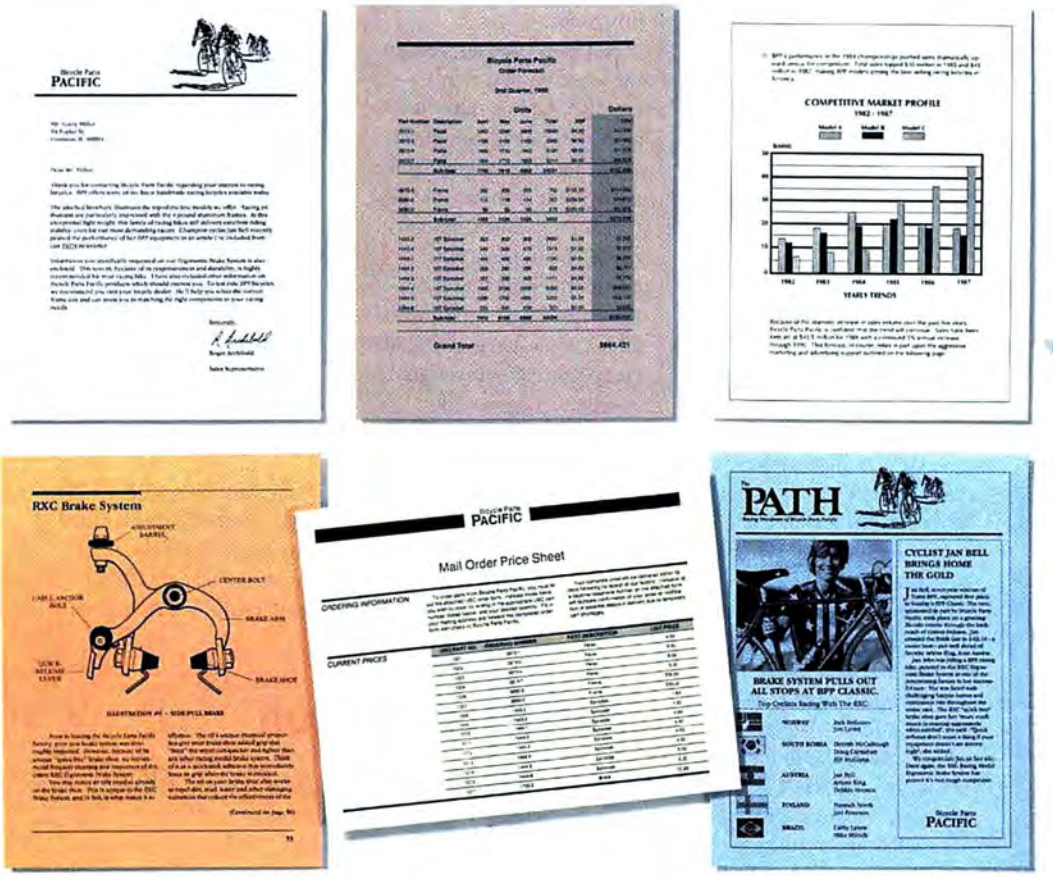
For *Ventura*'s next version, Meyer notes, customers are asking for style-sheet printouts and for expanded undo capabilities. Beyond that, release 2.0 will be "much easier to use and will include features that allow us to do documents that we can't do well or at all now." One example is legal documents, which often must be typeset but pose special problems, such as extremely long footnotes.

Meyer expects a big push toward "data base publishing" of phone lists, business information, catalogs, and other material. "This is a huge area for desktop publishing that no one talks about very much, because the output isn't very interesting [graphically]."

In hardware, the next big step will be full-page displays, Meyer suggests. "Once you've experienced a full-page display, it's hard to go back." If IBM defines a standard, you could see an explosion in display sales on the order of laser printers. He'd like to see such a fast, noninterlaced, 19-inch monitor and adapter selling for $1000; currently such systems cost at least twice that.

Ventura remains small, boasting a grand total of five employees. And desktop publishing's potential hasn't dimmed at all, in Meyer's eyes. "It has really changed the nature of how a lot of businesses produce documents of all different types. Some companies can't even conceive of what it would be like to go back again."
—*E. B.*

How to look good from start...



to finish.

The HP LaserJet Series II Printer.

Nothing brings your ideas to life like the HP LaserJet Series II Printer—from office memos to forms to newsletters. As the leading laser printer, it works with all popular PCs and PC software packages. And, with a wide range of fonts, you get more options to create superior looking documents.

With additional memory you can even print sophisticated 300 DPI full-page graphics. And with HP's ScanJet scanner, you can also easily add photographs, illustrations and text.

No wonder more people choose the original over all other laser printers combined.

So call 1 800 752-0900, Ext. 900D for your nearest HP dealer.

HEWLETT PACKARD

© Hewlett-Packard 1988

Print samples were created using Microsoft Word, Microsoft Excel, and Aldus PageMaker

Circle 26 on reader service card

Thanks a Billion

Compaq Smashes All the Records Once More

Compaq Computer executives didn't plan it, didn't even see it coming, admits President Rod Canion. But when the numbers were all in for 1987, Compaq had doubled revenues, tripled profits, and passed the $1 billion sales mark (to $1.2 billion) faster than any other company in history.

STEVEN PLAHN/HEY

Rod Canion planned for stable growth, but Compaq hit $1 billion in sales in five years.

"The irony is that we never intended to set growth records," says Canion. "We have always been out to build a good, stable, slow-growth company. But then the PC market provided us with a tremendous opportunity, and we were poised to take advantage of that opportunity."

It's been a charmed life for a company born on a restaurant napkin—with a sketch of a brainstorm by Canion and Engineering Vice President Jim Harris. Compaq sold 53,000 Portables and logged a record-breaking $111 million in sales during 1983, its first full year of business.

The initial strategy was to give IBM PC users a way to take work home. But when IBM couldn't meet demand for the PC, Compaq reaped a windfall in IBM's unfilled orders. As it turned out, portability proved less important than 100 percent IBM compatibility.

On the other hand, Compaq wouldn't be where it is today if all it offered were clones, asserts Canion. "We have never played the game of being just like IBM but cheaper," he says. "In a nutshell, our strategy is to be better, and at a reasonable price."

In fact, Compaq list prices are often higher than those of comparable IBM models. The pricing works because, while careful never to stray from industry hardware and software standards, Compaq pushes the technology farther and faster than IBM—or anyone else.

The Houston firm launched the first IBM-compatible portable with the first dual-mode text/graphics monitor. It delivered the first IBM XT–compatible desktop with twice the performance of IBM's and four disk drives. It also delivered the first AT compatible with an 8-MHz clock instead of a 6-MHz one, and the first internal tape backup. More recently, Compaq became the first to bring out a 20-MHz processor.

Not everyone agreed on the wisdom of a September 1986 launch date for an 80386-based computer, seven months before IBM put its imprimatur on the technology. But Compaq made the market for 80386 machines, and by the end of 1987 still held a 70 percent share of 80386-computer sales through resellers, reports the Dallas-based market research firm Storeboard. "The 386 product is where we clearly launched the company into the forefront of the industry," asserts Canion.

The Compaq Deskpro 386, Deskpro 386/20, and Portable 386 boosted the company's market share to 15.4 percent of all personal computers shipped through resellers in 1987, says Storeboard chief operating officer JoeAnn Stahel. IBM's share slipped to 37.4 percent.

Compaq is one of the few companies doing in-house design and manufacturing its own BIOS, bus, custom silicon, and other crucial components. While Canion won't admit to ambitions to overtake IBM, analysts note that if IBM stumbles with its Micro Channel Architecture strategy, Compaq is the most obvious choice for leadership. —*Mike Hogan*

Mild Acceleration

Turbo Boards to Profit From OS/2 —If They Run

On the surface, OS/2 may seem to be the best thing that ever happened to the accelerator board suppliers.

After all, the market has grown to annual sales of $300 million largely on the strength of users' desires to keep pace with increasingly demanding applications. AST Research rules the crowded field with annual accelerator sales of $100 million, estimates Steve Nickel, an analyst for the Technology Group in Chicago. His figures show AST followed by Intel ($50 million) and Quadram ($40 million).

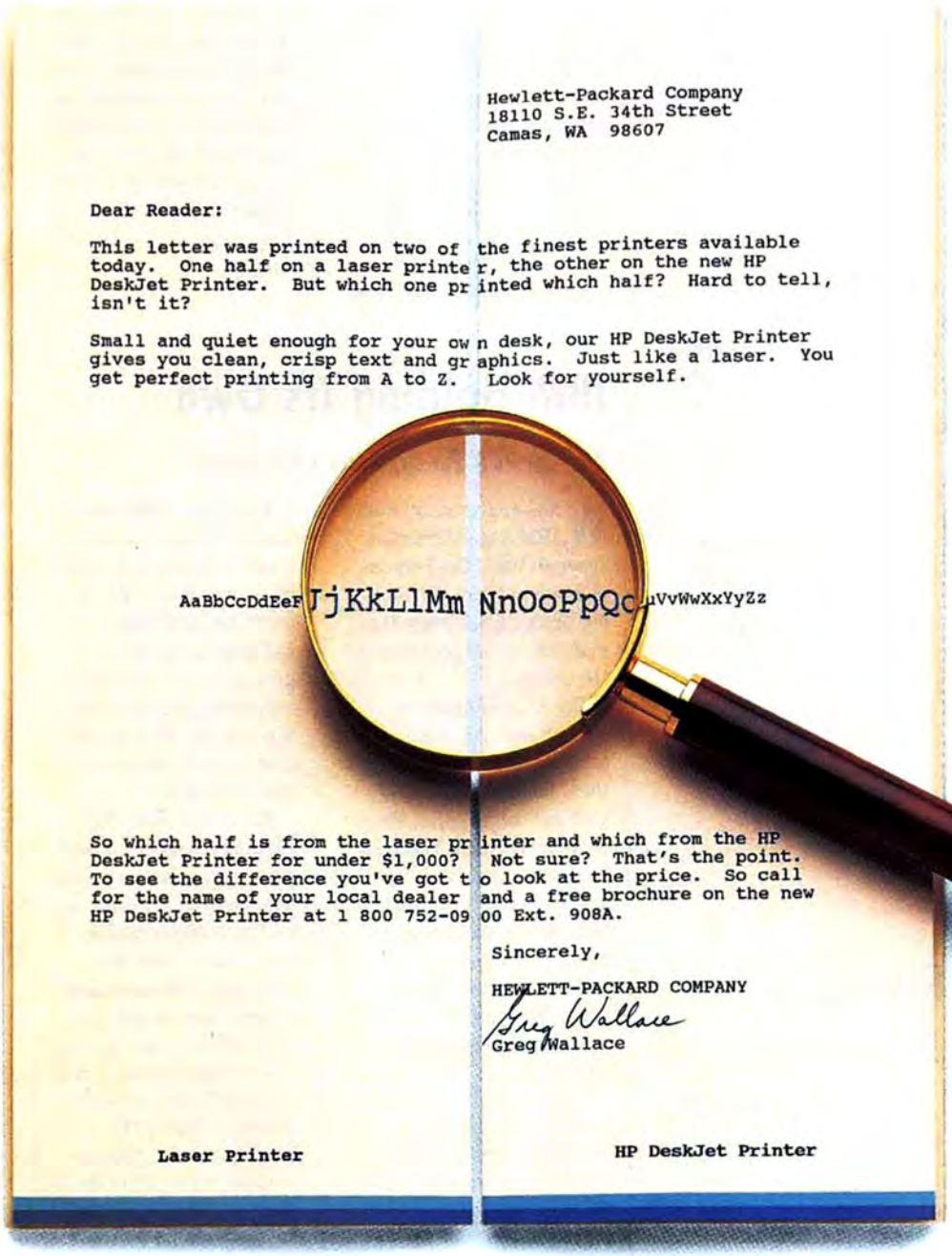
Now comes OS/2, an operating system that leaves some 10 million PCs out in the cold. But it could spell big trouble for the makers of accelerator boards.

"I'm skeptical of the market's potential for extensive growth," says John McCarthy, director of professional computing services for the Forrester Group in Cambridge, Massachusetts. "Accelerators just don't seem to provide a comfortable path to OS/2."

While users know that you can't run OS/2 without an 80286 or 80386 microprocessor, all too many mistakenly assume that's where the hardware requirements end. OS/2 also demands 3MB or 4MB of memory and a 20MB hard

(continues)

If you can see the difference, you must be looking at the price.



The New HP DeskJet Printer. Laser-Quality Output for Under $1000.

HEWLETT PACKARD

©Hewlett-Packard Co 1987

Circle 29 on reader service card

Acceleration

(continued)

disk. The Presentation Manager adds a mouse and an EGA or VGA video system to the list.

"So when you add up the total cost, that $900 accelerator doesn't seem like such a bargain anymore," says Jonathan Yarmis, program director for the Gartner Group in Stamford, Connecticut.

MARC ROSENTHAL

Some analysts doubt that accelerated PCs will run OS/2. "Accelerator boards were temperamental enough in DOS systems," McCarthy says. "What kind of fluky incompatibilities are we going to see when we start mixing the suspect BIOS's found in a lot of clones with the suspect engineering of a lot of accelerator boards?"

Board makers loudly insist that their products will be OS/2 compatible. Almost as loudly, they bicker over why their competitors' products won't. AST, for instance, bills its $845 Xformer/286 motherboard replacement as the safest upgrade route. The company warns that Intel's In-Board 386 lacks the proper AT BIOS for OS/2. Intel, however, promises to release a special version of OS/2 for its products. Quadram has disclosed similar plans.

Installing the boards, which ranks as major surgery for the PC, remains a daunting task. The chore isn't helped by documentation that still leans toward the techie.

Another cloud on the horizon is the steadily shrinking price tag for new 286 systems. Tim Bajarin of Creative Strategies predicts that low-cost 80286 clones will sell for an average of under $1200 by year's end. By late 1989, he says, similar 80386 systems could reach the $1300 range. "At that point, the advantages of an accelerator board become a lot less apparent," Bajarin says.

Most 286 boards currently range in price from $350 to $650, and vendors doubt those low-margin prices will drop much. 386 boards run from $995 to $1995, prices that may dip slightly if 386 chips become more plentiful.

Still, accelerator boards can offer a fivefold speed-up or better for processor-intensive tasks on an XT and can at least double AT performance. "If you want to give DOS one last little kick, an accelerator might be the right move," Yarmis says. "Otherwise, it looks like a false economy." —*Daniel Brogan*

Gold Hill Still Rising

AI Supplier Committed to LISP

Like many artificial intelligence (AI) start-ups, Gold Hill Computers opened its doors only a few blocks from MIT's famed AI lab. Unlike most of those firms, though, Gold Hill has steadily prospered, growing in less than five years to 105 employees.

Formed by three MIT hotshots, Gold Hill has concentrated on supplying PC tools based on the LISP symbol-processing language. The software firm rose on two ground swells. The first was Common LISP, which is as close to a language standard as the AI community has seen and probably ever will see.

(continues)

IBM Holding Its Own

PC Sales Rebound Overseas

While analysts say that IBM lost PC market share in 1987, the Personal System/2 was still looking pretty good when the giant manufacturer closed the books.

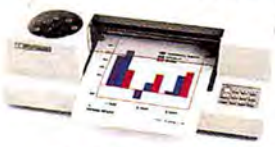
Big Blue's annual report doesn't list PS/2 sales separately, lumping them instead into a workstation category that also holds other small business computers and typewriters. But IBM notes that revenues in this group increased 10.6 percent, to $10.4 billion, and attributes that directly to the new personal computer family.

Total workstation sales, however, did not quite match the 1985 results. And slightly over half of these revenues came from overseas. Overall, the giant posted sales of $54.2 billion, up from $51.3 billion the year before, and earnings of $5.3 billion, up from $4.8 billion. Staff slimmed to a mere 389,000 employees.

Last year IBM quietly sold off the investment it made in Intel a few years back. Big Blue made a profit but also helped itself and the industry by giving Intel a cash infusion during hard times—allowing the chip maker to forge ahead with products like the 80386.

Early this year, IBM announced one of its periodic reorganizations, this one aimed at pushing day-to-day decision making down a level from the chairman's management committee to a newly created "IBM United States." The changes didn't directly affect Entry Systems Division, IBM's PC branch, but did promise to speed up product development. "Decisions that formerly would take a month now will take a few days," says Frank King, ESD's vice president for development. —*E. B.*

Every presenter wants to make a compelling, persuasive case. And color, you'll agree, makes all the difference. It's more eye-catching. More readily understood. More memorable. In short, color makes any desktop presentation more effective. And research proves it.



All you need is a Hewlett-Packard ColorPro Plotter like we used here, or the HP PaintJet Color Graphics Printer. Together with a PC—IBM compatible or Apple Macintosh—you can use all the popular graphics software like Lotus Freelance Plus, Cricket Presents, HP's Graphics Gallery (used below), Microsoft Chart and Harvard Graphics.

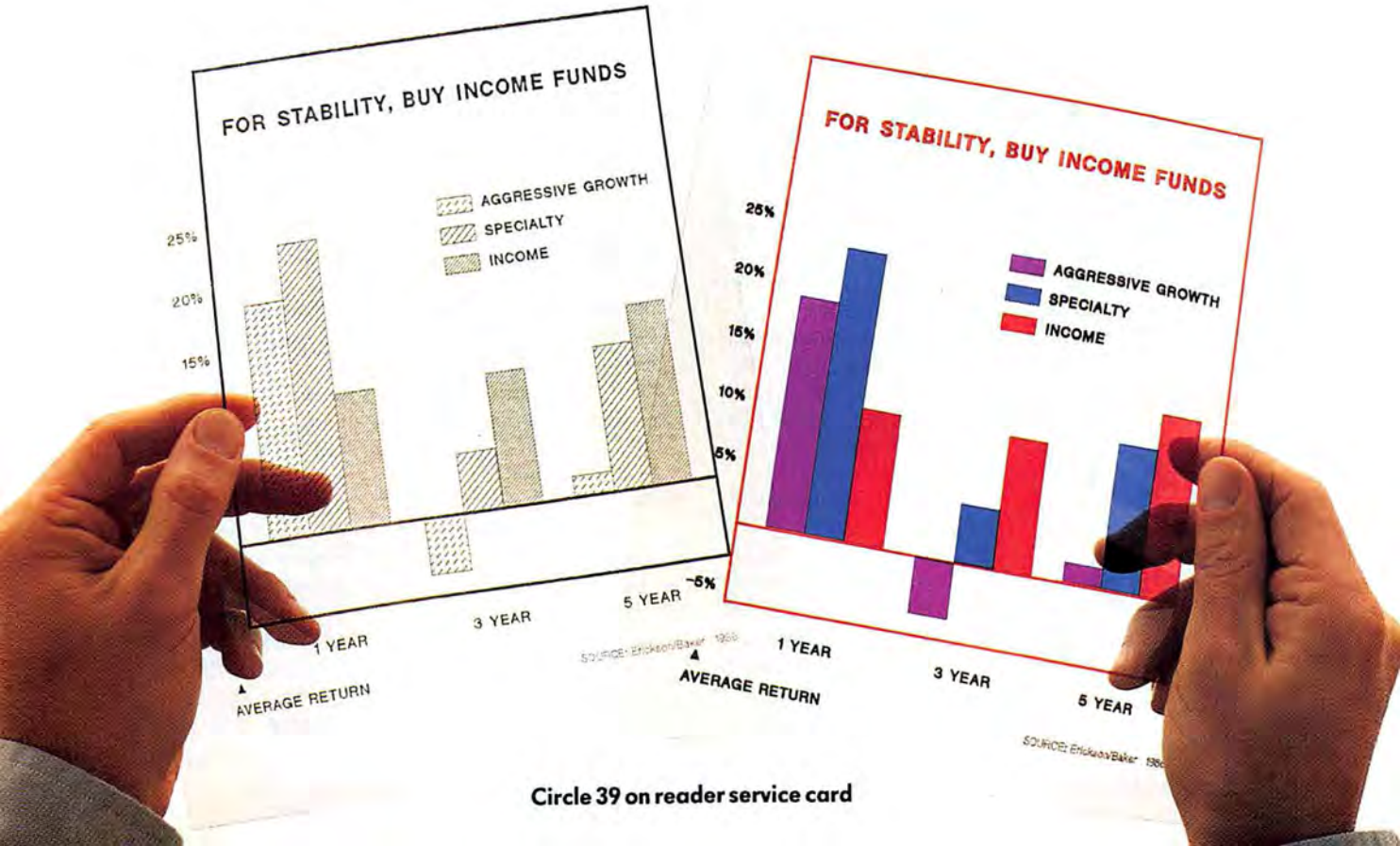
At under $1,300, the HP ColorPro Plotter may be just where you want to start. It will turn your ideas into colorful, easy-to-grasp visuals. Or, if you need to combine near-letter quality text with color graphics, you can rely on the HP PaintJet Color Graphics Printer for under $1,400. Whichever you choose, you'll create desktop presentations with startling color and greater impact.

For a colorful sample overhead and the name of your nearest dealer, call 1 800 752-0900, Ext. 903A.

Freelance Plus® and Lotus® are U.S. registered trademarks of Lotus Development Corporation. Microsoft® is a U.S. registered trademark of Microsoft Corporation.
© Hewlett-Packard 1988

HEWLETT PACKARD

Guess which presentation made the sale.



Circle 39 on reader service card

Gold Hill

(continued)

The second, more crucial event was the rapid shift toward running AI applications on powerful new PCs.

Gold Hill's founders succeeded "because they had a much better focus than almost any of their competitors," suggests Harvey Newquist, editor of the *AI Trends* newsletter in Scottsdale, Arizona. "They also addressed every level of AI that could be done at the PC level."

The first product, Golden Common LISP, appeared in 1984, along with a tutorial that Gold Hill hoped would proselytize for LISP. The following

Gold Hill's Eugene Wang hopes to double sales in 1988—despite turmoil in the AI industry.

year, the founders brought in industry veteran Carl Wolf as chief executive, and Gold Hill really began to pan out. Since then, the firm has steadily strengthened and refined its AI tools and surrounded them with a family of products.

Most important, last year Gold Hill plunged into the expert system generator market with *GoldWorks*, which now accounts for half of revenues, says Marketing Vice President Eugene Wang. Targeting the corporate market, Gold Hill has built up a consulting group and a direct sales force that numbers over 30, Wang notes.

But Newquist points out that Gold Hill can expect tougher competition in expert system tools from Neuron Data, Texas Instruments, Intellicorp, Inference, and other firms. "I think they've done a very good job with *GoldWorks*, but it's priced way too high at $7500," he adds. He also sees a widespread turn among expert system customers away from LISP toward more general-purpose languages. Though Gold Hill is expanding aggressively, says Newquist, "it's not yet breaking even."

Still, Gold Hill neatly avoided the bloodshed among AI firms in the past year. It posted revenues somewhere in the range of $10 million and hopes to double that this year, Wang says. In the long run, the firm remains committed to LISP and its commercial promise. "We're trying to build a $100 million company," he says. —*E. B.*

Scanners

(continued)

unit sales for scanners will jump from 26,000 in 1987 to 51,000 in 1988 and to 366,000 by 1991. But the market is crowded.

The scanner game is dominated by OEM vendors with Far Eastern connections, starting with Canon (selling to Hewlett-Packard and others), then Ricoh (supplying Datacopy and others), and Microtek (AST and Abaton). According to International Data Corporation (IDC), however, end-user sales are led by HP (23 percent), followed by Datacopy (12.5 percent) and Dest and AST (tied at 10.4 percent).

Partly due to this competition, Datek predicts a 10 percent compounded price decline between 1986 and 1991.

The scanner boom follows the popularity of desktop publishing packages that integrate text with digitized graphics. Vendors are addressing this market with scanners that recognize up to 256 levels of gray. Although these scanners are still quite expensive, ranging from $3000 to $9000, most entry-level scanners ($1500 to $2500) now offer 16 levels of gray.

Gray-scale recognition represents a big step in the reproduction of photographs (see "Imaging Becomes Electric" in this issue). Although image quality is still limited by printer resolution, you can produce a reasonably good halftone by sending a 256-level gray-scale image to a PostScript typesetter. Gray-scale scanners will play more important roles when gray-scale editing programs arrive on PCs.

IDC predicts that 75 percent of scanners will weigh in at 600 dpi by 1991. Several firms have developed color scanners, but their introduction may have to hang fire until low-cost color printers arrive.

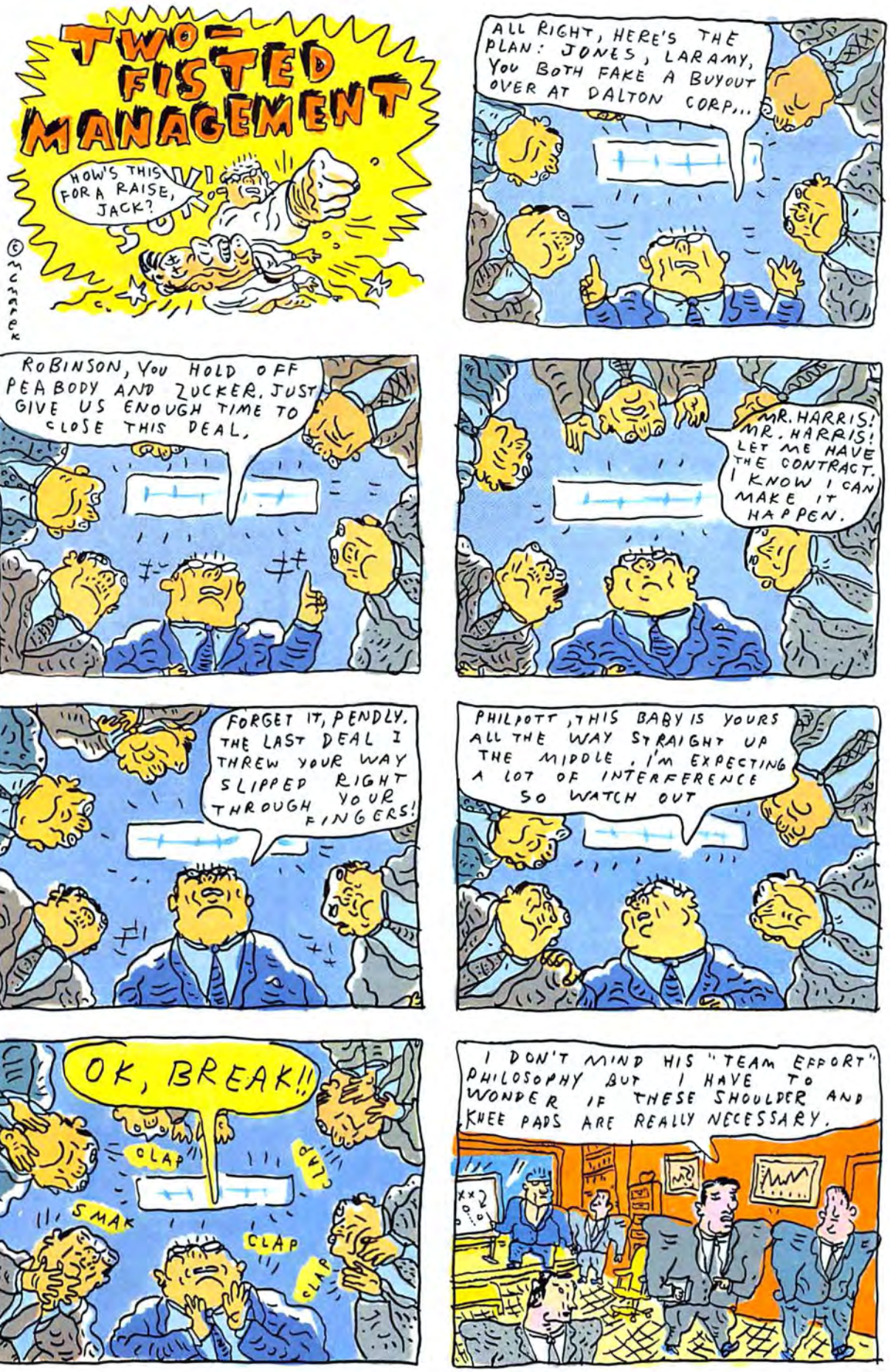
However, new applications are pushing the scanner market harder than new technology is. Scanners are increasingly employed as input devices for PC-fax systems, which combine a fax communications board and software to send text and images to Group 3 fax machines.

In contrast, sales are less than brisk for optical character recognition (OCR) systems that let you translate printed pages into editable text.

Nevertheless, OCR is expected to fit into mixed-use environments where image scanning, computer-aided design, and fax chores will also be performed.

The CAD market is snapping up droves of desktop scanners, although these lack the resolution and image size necessary for most CAD tasks. Scanners may find their vocation as input devices for image data bases, which are expected to blossom in the 1990s when erasable optical storage devices come of age. —*Eric Brown*

Daniel Brogan writes a column on personal computing for the Chicago Tribune, *Eric Brown is a* PC World *contributing editor, and Mike Hogan is* PC World's *news editor.* ●


TWO-FISTED MANAGEMENT
HOW'S THIS FOR A RAISE, JACK?
©SCHRECK
ALL RIGHT, HERE'S THE PLAN: JONES, LARAMY, YOU BOTH FAKE A BUYOUT OVER AT DALTON CORP...
ROBINSON, YOU HOLD OFF PEABODY AND ZUCKER. JUST GIVE US ENOUGH TIME TO CLOSE THIS DEAL.
MR. HARRIS! MR. HARRIS! LET ME HAVE THE CONTRACT. I KNOW I CAN MAKE IT HAPPEN.
FORGET IT, PENDLY. THE LAST DEAL I THREW YOUR WAY SLIPPED RIGHT THROUGH YOUR FINGERS!
PHILPOTT, THIS BABY IS YOURS ALL THE WAY STRAIGHT UP THE MIDDLE. I'M EXPECTING A LOT OF INTERFERENCE SO WATCH OUT
OK, BREAK!!
CLAP
CLAP
SMAK
CLAP
CLAP
I DON'T MIND HIS "TEAM EFFORT" PHILOSOPHY BUT I HAVE TO WONDER IF THESE SHOULDER AND KNEE PADS ARE REALLY NECESSARY.

Bulldog Gets You Out of the High Price Doghouse...

PRINTERS

EPSON

LX 800 180 CPS, 30 NLQ	$189
FX 86E 240 CPS, 40 NLQ	299
FX 286E 240 CPS, 40 NLQ	439
LQ 500 180 CPS, 60 NLQ	319
LQ 800 w/tractor	319
LQ 850 260 CPS, 88 NLQ	479
LQ 1050 260 CPS, 88 NLQ	659
LQ 2500 324 CPS, 108 NLQ	849
EX 800 300 CPS, 60 NLQ	399
EX 1000 300 CPS, 60 NLQ	469

OKIDATA

182 Plus 180 CPS, 30 NLQ	229
192 Plus 200 CPS	305
193 Plus 200 CPS	439
292 Plus 240 CPS, 100 NLQ	439
293 Plus 240 CPS, 100 NLQ	575
294 Plus 400 CPS, 100 NLQ	809
393 450 CPS, 120 LQ	925
Laser Line 6	1450

TOSHIBA

321 SL 216 CPS, 72 NLQ	469
351 SX 350 CPS, 100 NLQ	950
341SL 216 CPS, 72 NLQ	615

NEC

2200	359
P6/P7	435/619
P5XL/P9XL	850/1030
3550/8850	725/1020

PANASONIC

1080i Model II	185
1091 Model II	199
1092	309
1592	405
1595	469

HEWLETT-PACKARD

Laser Series II	1695

DICONIX 150 ..... **325**

OTC 850 CPS **1875**

HARD DRIVES

Seagate 20mb w/contr. ST225	$279
Seagate 30mb w/contr. ST238	299
Seagate 30 mb for AT ST4038	489
Seagate 40 mb for AT ST251	399
Micropolis 70 mb	695
IOMEGA BERNOULLI	
10 mb w/card	1039
10 + 10 w/card	1450
20 + 20 w/card	1925
BERNOULLI PLUS	3450
BERNOULI BOX II 5¼"	
20 mb internal	955
20 mb external w/card	1195
dual 20 mb external w/card	1795
SYSGEN Durapack single	925
dual external/internal	1695/1395
Plus Hard Card 40	709
Plus Hard Card 20	525
Priam 60 mb AT	819
Priam 43 mb AT	685

MODEMS

Everex 1200 int./ext.	89/115
Everex 2400 int./ext.	179/249
Hayes 1200/2400	279/419
Migent Pocket Modem	125
US Robotics 2400 direct internal	169
Ventel Half Card 1200 w/Crosstalk	259
Vental Half Card 2400 w/Crosstalk	359
Ventel 1200 Plus	239
Ventel 2400 Plus	359

MONITORS

AMDEK

410	$145
Color 722	435

PRINCETON

MAX12	149
HX12	419
103HX12E	449
HX9	415
Ultrasync	499

IBM

Mono 8503	$199
Color Display 8512	449
Color Display 8513	515
Color 8514	1150
Magnavox RGB80	259

NEC

NEC Multisync 11	589
NEC Multisync Plus	869
NEC Multisync GS	199
NEC Multisync XL 19"	2075

SOFTWARE

Aldus Pagemaker	$459
Chartmaster	209
Clipper	379
Corefast	99
Crosstalk XVI	99
D Base III	379
DBXL	89
Enable 2.0 w/Perspective	379
Fastback Plus	115
Foxbase +	199
Freelance Plus	329
Framework II	309
IBM Display Write IV	289
Lotus	309
Lotus Hal	109
Managing Your Money 4.0	125
Microsoft Word 4.0	229
Microsoft Excel	329
Microsoft Works	129
Multimate Advantage II	269
Multiplan	119
Office Publisher	589
Office Writer 5.0	259
Peachtree II Complete	149
PFS Prof Write	119
PFS Prof File	145
PFS 1st Choice	89
Quantro	125
R Base fpr DOS	419
Revelation	469
Super Calc IV 1.0	269
Symphony 1.2	439
Ventura Desktop Publishing	499
Volkswriter III	149
Word Perfect 4.2	199
Wordstar 2000 + 3.0	239
Wordstar Pro 4.0	209

TAPE DRIVES

Everex 60 m.b. internal	$550
external	635
Genoa Galaxy 60 mb internal	799
external	929
Achives 40 mb internal	339
Sysgen Quic 60 internal	895
external	949
Sysgen 20 mb internal	575
external	650

Prices Subject To Change

For Orders Call: **1-800-438-6039**

BULLDOG

COMPUTER PRODUCTS

For shipping & technical call: **(404) 860-6905** or **(404) 860-7364**

...and On Top of Savings!

IBM

PERSONAL SYSTEM/2

Model 30 w/2 floppy.....**$1250**
Model 30 w/1 floppy & 20 mg. **1725**
Model 50.....**2695**
Model 60 - 40/70 .....**3425/3650**
Model 80 - 40/70 .....**4450/4875**

90 day warranty through Bulldog

COMPAQ

386 Desk Pro 40/60/130 **$4599/5575/6950**
286 Desk Pro 12 mhz.....**1795**
Compaq II Model IV.....**2879**
Compaq Port. 386 Model 40/100 **5999/7399**
Compaq III 20mb/40mb.....**3695/4195**
VGA Monitor.....**549**
VGA Card.....**469**

90 day warranty through Bulldog

MATH COPROCESSORS

803-87-20.....**$750**
803-87-16.....**475**
802-87-8.....**249**
80287-10.....**299**
8087-3.....**119**
8087-2.....**149**

COMPATIBLE

TURBO XT

8 mhz, 1 floppy, 640K, AT style keyboard, game port, clock calendar, monographics card, mono monitor.....**$750**
Color System add **$150** w/20mb add **$279**, w/30 mb add **$299**
90 day warranty through Bulldog

Club AT

10 mhz, 1 mb Ram, 1.2 floppy.....**$1095**
Club 386 16 mhz, 1 mb Ram, 1.2 floppy.....**$1850**

Wyse AT Systems

8 mhz, 1.2 floppy, 1 m.b. Ram, serial/parallel port, clock calendar, DOS.....**$1195**
12 mhz - 0 wait state, 1.2 floppy, m.b. Ram, serial/parallel port, clock calendar, DOS **$1895**
Wyse 386 system, 1.2 floppy, 1 m.b. Ram, serial/parallel port, clock calendar, DOS **$2595**

All Wyse Systems carry a 1 year manufacturers warranty — parts and labor.

LAPTOPS

NEC Multispeed.....**$1410**
NEC Multispeed EL.....**1625**
NEC Multispeed HD ...**2299**
Toshiba 1000 .....**810**
Toshiba 1200.....**2395**
Toshiba T1100 Plus....**1450**
Toshiba 3100.....**3169**
T3200.....**3895**
T5100.....**4995**

GRAPHICS CARDS

ATI VGA.....**$269**
EVEREX MICRO ENHANCER.....**135**
EVEREX THE EDGE.....**189**
GENOA SUPER HI RES.....**179**
HERCULES GRAPHICS **181**
HERCULES IN COLOR.....**289**
ORCHID EGA.....**259**
PARADISE Auto Switch 480 .....**159**
PARADISE VGA Plus.....**245**
QUADRAM EGA PLUS **169**
QUAD PRO SYNC.....**209**
SIGMA COLOR 400 .....**299**
NEC GB-1 Multisync **199**
NEC MVA **795**
STB CHAUFFEUR HT **135**
STB Multi Res. II **169**
VEGA DELUXE.....**189**
VEGA VGA.....**265**

MULTI FUNCTION BOARDS

AST Advantage w/128K.....**$239**
AST Advantage Premium w/512K **449**
AST 6 PACK PLUS w/384K.....**225**
AST 6 PACK PREMIUM w/256K **199**
AST 5251-11 PLUS Enhanced **625**
AST RAMPAGE 286 .....**320**
AST HOTSHOT.....**355**
EVEREX MAGIC CARD II w/384K.....**175**
EVEREX MINI MAGIC w/o K.....**59**
FAST 88/V20 w/Switch.....**89**
INTEL Above 286 w/512K.....**319**
INTEL Above PS286 w/512K.....**349**
INTEL Inboard 386 w/Adapter **1040**
INTEL Inboard 286 for PC w/mb.....**699**
INTEL Above Board II for PS/2 w/o K **259**
IRMA BOARD II.....**699**
J RAM III for PC w/o K.....**169**
J RAM III for AT w/o K.....**229**
J LASER PLUS PC/AT **489/589**
ORCHID JET 386 w/adapter.....**975**
ORCHID PC Net Starter Kit **735**
ORCHID Tiny Turbo 286 .....**269**
ORCHID Ramquest 50/60 w/2mb **659**
ORCHID Twin Turbo.....**389**

MICE &MISC

GENIUS MOUSE w/Dr. Halo **$63**
MICROSOFT w/windows **145**
MICROSOFT MOUSE w/PC paint brush.....**119**
MOUSESYSTEMS MOUSE.....**89**
LOGITECH MOUSE C7 Plus **74**
LOGITECH HI RES.....**99**
KODAK DATA SHOW w/Cooling Fan....**750**
MICROFAZER II w/64K.....**229**

Sales Hot Line 1-800-438-6039

BULLDOG

COMPUTER PRODUCTS

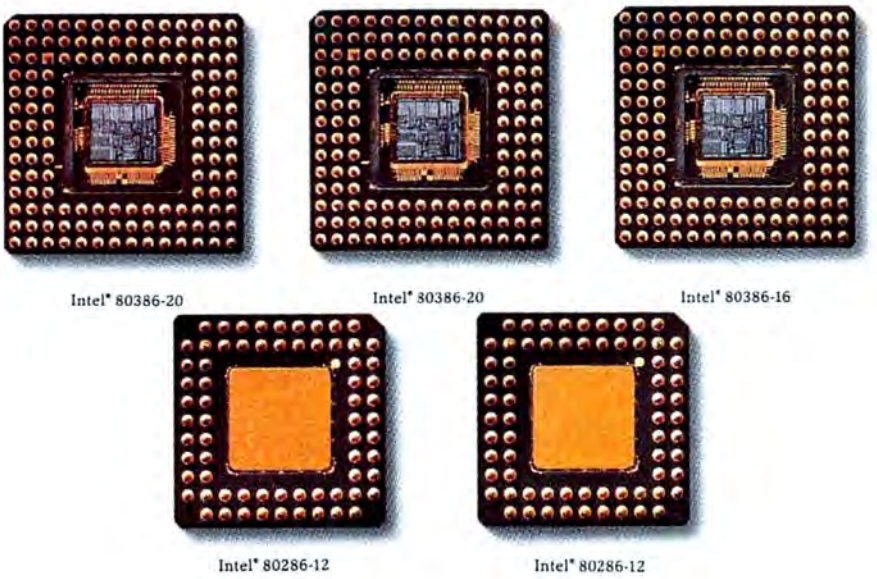
We accept VISA, MasterCard, American Express

3241-E Washington Road • Martinez, Georgia 30907

For returns call **(404) 860-6899** *In Georgia call* **(404) 860-7364**

Circle 24 on reader service card

These give you high-performance personal computers.



Intel* 80386-20 Intel* 80386-20 Intel* 80386-16

Intel* 80286-12 Intel* 80286-12

COMPAQ personal computers offer far more than advanced, high-speed microprocessors. Each offers a combination of innovative features which work with the processor to maximize overall system performance. So there's nothing to slow you down.

Take system architecture, for example. The COMPAQ DESKPRO 386/20 and COMPAQ PORTABLE 386 are built around an advanced 32-bit concurrent bus architecture which exploits the speed of the computers' 20-MHz 80386 microprocessors. Two buses—one for memory and one for peripherals—eliminate information bottlenecks, allowing each component to run at its maximum speed. This ensures the highest system performance without sacrificing compatibility with industry-standard hardware and the world's largest library of business productivity software.

Similar performance enhancements are engineered into each subsystem of every COMPAQ personal computer. Each component is then optimized individually, yet designed to work as part of the total system.

For instance, COMPAQ Fixed Disk Drives deliver both high capacity and high performance. You can install up to a 300-megabyte fixed disk drive in the COMPAQ DESKPRO 386/20 and up to a 100-megabyte drive in the COMPAQ PORTABLE 386. More importantly, you can get to that data almost instantly thanks to some of the industry's fastest access times—averaging less than 30 milliseconds. When you combine this speed and capacity with disk caching, the result is the highest-performance storage subsystem in the industry. To take it one step further, Compaq helps you protect that data with internal high-

Based on an independent study of major brands. COMPAQ, COMPAQ DESKPRO 386* and COMPAQ DESKPRO 286* are registered trademarks of Compaq Computer Corporation. *Registered U.S. Patent and Trademark Office. COMPAQ DESKPRO 386/20™ COMPAQ PORTABLE 386™ and COMPAQ PORTABLE III™ are trademarks of Compaq Computer Corporation. IBM* is a registered trademark and IBM PS/2™ is a trademark of International Business Machines Corporation. Intel* is a registered trademark of Intel Corporation. ©1988 Compaq Computer Corporation. All rights reserved.

These give you the highest-performance personal computers.

speed fixed disk drive tape backup systems.

Another graphic example of Compaq total system performance comes from the COMPAQ Video Graphics System. This system supplies VGA graphics with high-resolution COMPAQ Color and Monochrome Monitors along with speed enhancements from the COMPAQ Video Graphics Controller Board. When the board is used in a 16-bit slot, it makes screen updating 50% faster than the IBM® PS/2™ Video Graphics Array and other comparably equipped systems.

Uncommon performance innovations like these are common to all COMPAQ desktop and portable personal computers. That's clearly why each one is the best in its class, and why together, they represent the most powerful line of personal computers in the world. That's also why Compaq consistently earns the highest performance and quality ratings from computer experts. And unsurpassed satisfaction ratings from computer users.*

Any computer can use a fast microprocessor. But it takes high-performance subsystems surrounding the processor to achieve the highest system performance in the world. The kind achieved by Compaq.

For more information and the location of the Authorized COMPAQ Computer Dealer nearest you, call 1-800-231-0900, Operator 49. In Canada, 1-800-263-5868, Operator 49.

COMPAQ

It simply works better.

PRODUCT OUTLOOK

118 PRODUCT OUTLOOK

SupersPort, SupersPort 286, TurbosPort 386
Laptop market leader Zenith takes up the gauntlet and produces three new powerful, fast, and feature-packed computers.

MultiSync MonoGraph
NEC's extra-large screen displays full-size newsletter and tabloid pages, with room to spare for tools and menus.

Ten Time
Konan's disk controller is a speed reader and writer; its 1:1 interleave and disk caching may boost your throughput tenfold.

Snapshot
Desktop publishing takes a great leap forward with new capabilities to capture, edit, enhance, and reproduce images from television and videotape.

VenturPlan
This simple package takes you by the hand and leads you painlessly through each critical step of creating a small-business plan.

Designer VGA and Designer VGA-2
Compatibles manufacturers were quick to join IBM's VGA graphics game. Now they are leapfrogging over the originator, offering even greater capability at a much lower price.

124 BRIEFLY NOTED

Hyundai Super-286, PC Terminal
Hyundai's AT-compatible file server and diskless workstation lay a sound foundation for LAN, CAD/CAM, and data base applications.

MultiSync GS
For budget-minded users, NEC brings mode switching and 64 shades of gray to monochrome monitors.

BocaRAM/30
PS/2 Models 25 and 30 users can now add LIM EMS in generous 2MB chunks, and speedy disk access is thrown in with the deal.

Numerikeys
This auxiliary numeric keypad has a tiny appetite for power but can boost your accuracy and speed, especially on a portable.

S.F.E. Utilities
For a modest price, Bourbaki ties ten frequently used utilities into one neat bundle with Something for Everyone.

Force Stick
Not your standard joystick, it's a pressure-sensitive, high-precision device designed with CAD, CAM, and CAE applications in mind.

128 UPDATE

Q&A 3.0
Beefed-up *Q&A* has new natural language ability and LAN support, yet it runs 30 percent faster.

Paradox 386
A solid data base cashes in on the 386 chip, becoming five times faster and able to tackle masses of data with hardly a blink.

Manuscript 2.0
With a pack of new desktop publishing features, Lotus substantially advances its word processing program.

Tapestry/8
Torus has an eight-user version of its large-network software at a more affordable price.

QuadMEG PS/Q
Quadram's updated add-on board combines LIM 4.0, a RAM disk utility, and a print spooler and comes up multitasking.

Accpac BPI Accounting
Computer Associates' full-function accounting series for the small-to-medium-size business offers new features at half the former price.

Mike Hogan

SupersPort, SupersPort 286, TurbosPort 386

Quest for Power

Ever since computer makers first decided to put PCs in laps, they've been trying to create machines that match the state of the art for desktops. Trouble is, desktop features and performance have been improving much faster than laptop screen and processor capabilities. Taking up the challenge, laptop market leader Zenith Computer has fielded yet another generation of hot-rod portables that combine bright screens, fast hard drives, muscular processors, and thrifty power usage.

Zenith maintains that a PC isn't really portable if it needs to be plugged in, so its SupersPort, SupersPort 286, and TurbosPort 386 all sport a variety of power-conservation features that let you rev them up for 3 to 5 hours between recharges. Not only can you adjust LCD screen brightness on all models, you can turn off backlighting completely and shut down power to your hard disk and ports when they aren't in use. As with a screen-blanking utility, power returns automatically when needed.

These Zenith portables are power misers by virtue of their CMOS and zero-wait-state designs. You can switch to slower speeds—down to 4.77 MHz from 8 MHz for the 80C88-2–equipped SupersPort, and from 12 Mhz down to 6 MHz for the 80C286-based SupersPort 286 and the 80386-based TurbosPort 386. A variable-size memory cache reduces the number of calls to your hard disk.

With the SupersPort and the SupersPort 286, you can choose a dual-floppy model and later replace one floppy with a hard disk. The SupersPort comes with its motherboard maximum of 640K of memory and either two 720K 3½-inch floppy drives or one floppy and a 21.4MB formatted hard disk. It has dedicated slots for both a 1MB memory add-in and a modem. It also accepts an 8087 coprocessor and a 23-key upgrade to its 78-key keyboard.

The SupersPort 286 comes standard with 1MB of memory and your choice of 1.44MB 3½-inch floppies or 28ms 20MB or 40MB hard drives. You can add a 24-key keypad to its 79-key keyboard as well as another 1MB of memory, a modem, and an 80287 coprocessor. Even the hard-disk–equipped SupersPort and SupersPort 286 models weigh under 12 pounds. Both systems are equipped with backlit supertwist screens.

TurbosPort 386's most striking feature is its new fluorescent-backlit LCD screen, which combines double-scan CGA resolution of 640 by 400 with a contrast ratio equal to that of gas plasma screens. Based on an innovative technology that Zenith calls page-white, the screen displays true black characters on a white background for easier viewing.

Zenith has employed a variety of power conservation techniques so that you can rev its TurbosPort 386 (top), SupersPort 286 (bottom), or SupersPort (not shown) for 3 to 5 hours between recharges.

The TurbosPort 386 runs at 12 MHz with zero wait states—faster than a 16-MHz counterpart with one wait state, according to Zenith. It comes with 2MB of system memory (expandable with a 1MB add-in board), a 28ms 40MB hard disk, and the same keyboard as the SupersPort 286, but offers an 80387 coprocessor option. It weighs 16 pounds.

The SupersPort ships with a 2.5 ampere-hour battery, the SupersPort 286 with a 4 amp-hour battery, and the TurbosPort 386 with an enhanced 1.5 amp-hour battery. All the batteries are detachable, so you can leave them behind to save weight if you'll have access to AC. The SupersPort and SupersPort 286, with 20MB hard disks, sell for $3599 and

$4899, respectively. The TurbosPort 386 with 40MB hard disk retails for $7499. Zenith Data Systems, 1000 Milwaukee Ave., Glenview, IL 60025; 312/699-4839.

MultiSync MonoGraph

The Big Picture

Desktop publishing always feels a little uncomfortable on the standard PC display. You just can't squeeze a newsletter page (much less a tabloid page) into an 8-inch window and expect to get the whole picture during editing.

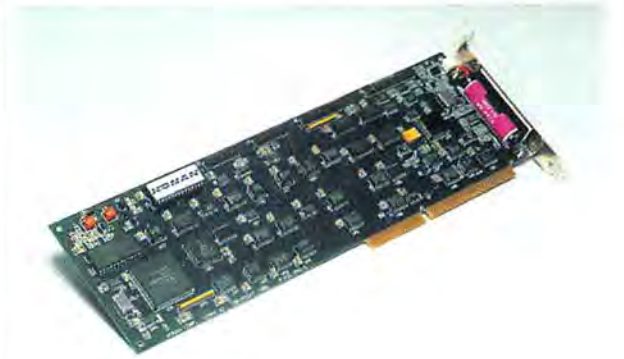
But NEC Home Electronics solves that problem with a jumbo desktop-publishing–specific display that puts more what-you-see in your WYSIWYG. NEC's MultiSync MonoGraph displays a full-size newsletter page or tabloid page on its 16-inch-square screen with a resolution of 1024 by 1024 pixels. In fact, using horizontal, or landscape, mode, you can display the double page of Aldus's *PageMaker* with plenty of room in the margin for icons, tools, and menus. *Ventura Publisher* runs in vertical, or portrait, mode with icons and associated paraphernalia on the side.

In fact, the MonoGraph's graphics standards are so high that DOS can't recognize them, so the adapter emulates the CGA during system start-up. Running CGA applications, the monitor displays in 640-by-400 double-scan mode, giving you twice the vertical resolution and an 8-by-16-dot character cell for near-EGA quality. When you switch between CGA applications and your desktop publisher, the monitor automatically adjusts in true MultiSync fashion.

The MultiSync MonoGraph's controller card, which sits in either an 8-bit or a 16-bit slot, includes an Intel 82786 graphics coprocessor to speed screen drawing, freeing the main processor for other tasks. Finally, the MultiSync MonoGraph features a 1:1 aspect ratio for rounder circles, 100-dpi screen density for higher-resolution characters, and a flicker-free display achieved with 70-Hz vertical refresh.

The MultiSync MonoGraph can display a full-size newsletter page as well as a larger newspaper page with a resolution of 1024 by 1024 pixels.

The MultiSync MonoGraph System sells for $1999. NEC Home Electronics, 1255 Michael Dr., Wood Dale, IL 60191; 800/447-4700 for literature; 800/NEC-SOFT for technical details.



Ten Time is a 16-bit intelligent controller that employs a 1:1 interleave, zero latency, and disk caching to reduce your disk I/O to eye blinks.

Ten Time

Squeezing Through the I/O Bottleneck

The new family of 386 processors is setting a blistering pace for other system components and focusing more attention on the slowest link in the processing chain—reading or writing to disk. If you're among those demanding PC users to whom 65ms seems an eternity and sub-30ms is barely tolerable, you'll be interested in a new floppy/hard disk controller from Konan Corporation.

Ten Time is a 16-bit intelligent controller that employs a 1:1 interleave, zero rotational latency, and disk caching to reduce your disk calls to eye blinks.

Konan's proprietary software places more than 90 percent of the data you'll need in a 128K battery-backed memory cache. That lets you retrieve even large worksheets, data bases, or desktop publishing files in as little as 1ms. Similarly, most disk writes go directly to one of Ten Time's cache memory buffers, so the CPU is seldom tied up while the disk does its thing. Ten Time's on-board processor automatically writes data to the disk in background mode, letting your CPU busy itself with more immediate tasks.

Of course, there's still a small percentage of data that's not cached and requires disk access, and Ten Time employs several techniques to minimize the milliseconds here too. For example, Ten Time's 1:1 interleave enables it to grab a track of data in

Disk Optimizer™. The original un-fragment software now has un-format. Un-believable!

It's still the safest, most effective way to put the zip back in hard disk performance.

For more than two years now, Disk Optimizer has helped PC users everywhere safely restore and maintain the smooth, slick, fast performance of their hard disks.

And now there's a new and improved Disk Optimizer that un-fragments files even more effectively. And includes enough additional disk management tools to make it one of the best software values anywhere.

So, who needs Disk Optimizer, anyway?

Simply everyone who owns a hard disk and relies on the speed and convenience it gives them.

That's because DOS is constantly slowing your hard disk down. It does it by breaking files up into pieces. Storing different chunks in different places. And that makes everything slower – loading, sorting, retrieving, backing up – because your hard disk has to chase all around to read and write different pieces of your file.

Disk Optimizer restores the speed of your hard disk by putting files back together in one contiguous piece – where they belong.

Disk Optimizer is absolutely, positively "disaster proof."

It's sad but true. Some other un-fragmenting software could lose your data if something goes wrong in the process. Like a routine reading or writing error. Or even a power failure.

But have no fear with Disk Optimizer. Nothing will go wrong because nothing *can* go wrong. Even if you yank the plug from the wall in the middle of the program. It's because only Disk Optimizer copies each file, piece by piece, then checks the newly un-fragmented version for completeness. Only then does it go back and erase the fragmented version. Not power spikes, disk failures or DOS errors – not even earthquakes – can cause data loss. And only Disk Optimizer makes you that promise. So why trust your disk to anyone else?

It's like a precision tune-up for your disk.

In addition to un-fragmenting, Disk Optimizer also lets you quickly choose the optimum layout for your disk. So your most-used files have the fastest access. And program and other unchanging files can be permanently un-fragmented and set aside on their own area on the disk.

The simple menu makes it a snap.

Un-format – one of the powerful new reasons to buy Disk Optimizer

Oops! Make a simple mistake at the keyboard and you could wipe out your hard disk with a DOS Format command. But don't worry. "Un-format" will recover your entire disk, and all your data, in just moments. It's included with your new Disk Optimizer.

Plus, you get the new "Analyze" program with a graphical display that shows your disk's condition so you'll always know when it's time to optimize again. You also get "Sorts" for organizing directories for the best appearance and sequence. "Findfile" for searching out hard to find files. "Delfile" for locating and erasing unwanted files. "Lock" and "Unlock" for file security. And more.

You could spend hundreds on other utilities and still not get all the functionality packed into Disk Optimizer at no extra charge.

Use it once and you'll discover what nearly 200,000 users already know – $69.95 is a small price to pay for the speed, convenience and safety you get only with Disk Optimizer.

Look for the new Disk Optimizer at software dealers everywhere. Or order directly from SoftLogic Solutions by calling us toll-free.

Just a few of Disk Optimizer's rave reviews:

Selected PC Magazine's "Best Of The Best" utilities.
–June 1987

"I find Disk Optimizer excellent. Disk access, even at 4.77MHz, is much faster. And loading 100 Fontasy fonts now takes seconds."
–Elizabeth Joan Doyle, Indiana

"I feel this is essential software for anyone with a hard drive."
–D. Sorenson, Texaco, California

"Easy to install, use, and most importantly, it works!"
–Dan Neilsen, General Electric Information Systems, NY

9146

Disk Optimizer $69.95

SOFTLOGIC SOLUTIONS

SoftLogic Solutions, Inc.
One Perimeter Road
Manchester, NH 03103
800-272-9900 (603-627-9900 in NH)

Call 800-272-9900 8

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

Circle 18 on reader service card

one spin of the disk instead of the three required by hard disks with the standard 1:3 interleave. Ten Time also boasts "zero rotational latency"—it doesn't wait until it gets to the beginning of a track to start reading data. It picks up wherever the disk head lands, rearranging the data in cache memory. "Elevator seeks" reorder disk calls in the most efficient manner possible.

Overall, you can expect at least a threefold improvement in disk performance and probably a tenfold boost in throughput. Ten Time is available as a hard disk controller that supports up to two ST506-compatible Winchester drives, or in a hard/floppy version that controls and caches two 360K/1.2MB floppy drives. Since Ten Time's time-saving techniques also reduce head movement and data seeks by as much as 80 percent, you can expect longer life for your storage devices.

The Ten Time hard disk controller is $595. The hard/floppy controller is $695. Konan Corp., 4720 S. Ash Ave., Tempe, AZ 85282; 602/345-1300.

Snapshot

Freeze Frame

Desktop publishing has been in fast-forward motion ever since the rough concept emerged a few years ago. Now Aldus Corporation offers a page-making add-on that represents a giant step even for this expansive genre.

Snapshot opens a new chapter in the desktop publishing chronicle by offering you the ability to capture and edit images from any RS-170 video source, including a television set, video camera, or camcorder. The resulting images can be saved on disk as camera-ready halftones (with 256 levels of gray) and added to any of the most popular page makeup programs, like Aldus's *PageMaker*.

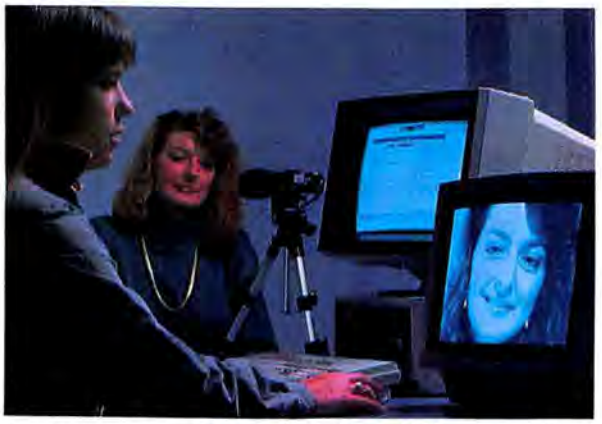
Snapshot freezes frames from a variety of color or black-and-white video sources, letting you capture images as clearly as your TV or video recorder does and even enhance their contrast and brightness. Once you have digitized the analog signal, you can use *Snapshot*'s comprehensive set of image-editing tools to further refine the images.

The program includes electronic filters for stripping out colors to produce sharper black-and-white images, and a "stretching" tool that lets you heighten contrast between two contiguous shades of gray. Alternatively, you can "blend" to reduce those differences. Special photographic effects like posterization and solarization pose no problem.

You can touch up your images using *Snapshot*'s electronic paintbrush or airbrush. The software lets you reduce an image to its outline or retouch it in increments of 1 to 128 pixels. You also can airbrush over a foreground or background to isolate a face or object, or "spray" areas with image patterns. *Snapshot* can repeat a portion of an image to create a pattern, or make composites of several isolated images from different frames. Images can be flipped both vertically and horizontally; an undo command corrects mistakes.

To conserve disk space, *Snapshot* saves images in 4 bit (16 levels of gray), 6 bit (64 levels) or 8 bit (256 levels) in either Microsoft's Tagged Image File Format (TIFF) or the Encapsulated PostScript Format (EPSF).

Snapshot requires an IBM AT or compatible with 640K of memory, a 20MB hard disk, an analog monitor, a video image conversion board, *Microsoft Windows*, and a *Windows*-compatible mouse or pointing device. The program retails for $495. Aldus dealers sell a black-and-white closed-circuit TV camera, an analog monitor, an image processing board, and cabling. The price of the total package ranges from $2500 to $2700. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104; 206/622-5500.



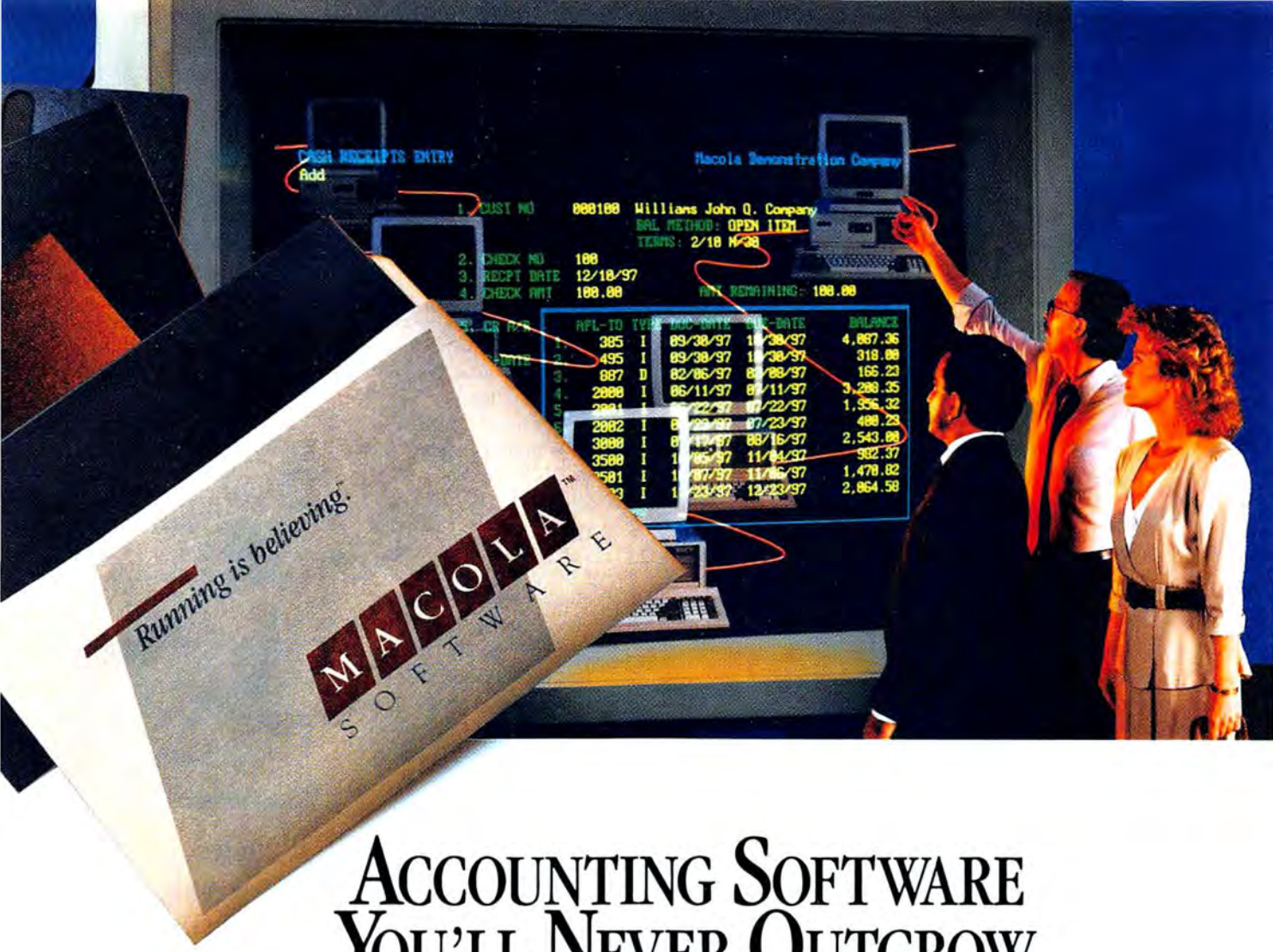
Snapshot opens a new chapter in the desktop publishing chronicle by letting you capture and edit images from any RS-170 video source, including a television set.

VenturPlan

Shortcut to Success

Plan your work and work your plan, goes the old saw. But most small businesses don't—that's one reason why four out of five fail within three years of opening their doors, according to Department of Commerce figures. Planning is difficult, time-consuming work, so it's not surprising many businesspeople sidestep the process. But Venture Software offers an easier way to draw this all-important road map to success.

VenturPlan combines data base, spreadsheet, and word processing functions to let you create a comprehensive business plan complete with goals, timetables, strategies, policies, and financials. The program steps you through the entire planning process painlessly by asking you questions. The answers form a central data base from which the necessary worksheets and reports are built.



ACCOUNTING SOFTWARE YOU'LL NEVER OUTGROW.

Business managers now are projecting their accounting software needs well into the future. That's smart. The software you choose must meet the demands of your evolving business and provide management information to help fuel growth.

In the words of PC Magazine, Macola Accounting Software "is at the top of its class . . . a flexible, powerful system that is well suited to many different businesses."

13 Integrated Modules

Accounting General Ledger—Accounts Receivable—Accounts Payable—Payroll—Assets/Depreciation

Distribution Inventory Management—Customer Order Processing—Purchase Order and Receiving

Manufacturing Bill of Material Processor—Material Requirements Planning—Master Scheduling—Shop Floor Control*—Job Costing*

Plus there's a Report Writer that allows customized reporting and can easily transport data files to popular spread sheet, word processing and data base programs.

Proven Network Compatibility. Macola Software reflects 15 years of maturity in mini and micro LAN environments. No other software can say the same. So when your business is ready to add more workstations, your software is ready as well. With no limitations.

Speed and Data Integrity. Macola Software is written in Micro Focus COBOL for maximum speed and data integrity (source code available.) IBM has licensed Micro Focus COBOL as its SAA standard for the new PS/2 and OS/2.

Comprehensive Support. PC Magazine also determined "Macola's technical support, documentation and customization assistance meet the high standards set by the software."

Running Is Believing. Your choice of Macola Software is a one-time solution for the life of your business. For detailed information, "live" demonstration modules and an authorized reseller in your area, call today:

1-800-468-0834 (USA)
1-800-468-0833 (Ohio)

MACOLA™
SOFTWARE

P.O. Box 485
Marion, OH 43302
(614) 382-5999

Powerful accounting for successful companies.

*Call for availability. IBM, PS/2, OS/2 are registered trademarks of IBM. Micro Focus is a registered trademark of Micro Focus Corp. PC Magazine is a publication of Ziff Davis Communications Co. Macola is a registered trademark of Macola, Inc.

Circle 252 on reader service card

You move logically from the goal-setting module to modules for marketing, promotion, location selection, personnel policies, finances, and funding. Then *VenturPlan* helps you write your personal résumé and plan summary and fill in the appropriate bank forms. The program finishes with an evaluation module, which monitors certain issues raised by your plan and provides a "to do" list for attacking them.

You can follow the tutorial or move through the program as you will using the topic outline. A context-sensitive business adviser with several levels of information is available at the touch of the <F2> key.

Most important, *VenturPlan* eliminates much of the trauma of building worksheets, lining up report columns, and keeping number totals straight from one section of your plan to the next. Data entered in one module is automatically replicated in other modules when appropriate. Since amortization, depreciation, and other tables are built in, such calculations are automatic.

VenturPlan stores and processes up to 4000 interdependent variables, permitting you to perform "what if" analysis on financial data and create alternative scenarios for your business over a three-year period. Real and alternative balance sheets and income and cash-flow statements are created automatically.

This first version is tailored for small to midsize retail businesses and professional firms of up to 50 employees. Future releases are planned for service organizations and manufacturing concerns. *VenturPlan*, which sells for $495, requires 640K, 1.6MB of hard disk storage, and DOS 2.10 or a later version. Venture Software, 222 Third St., Cambridge, MA 02142; 617/491-6156.

Designer VGA, Designer VGA-2

Graphics Leapfrog

Few features of IBM's PS/2 line have been accepted as readily as the Video Graphics Array (VGA). While compatible-system manufacturers agonize over the PS/2's proprietary bus and resist the switch to 3½-inch floppy drives, graphics board and monitor manufacturers have been quick to leapfrog VGA graphics in capability and affordability.

Orchid Technology, for example, has just released two VGA adapter boards —Designer VGA for classic PCs and Designer VGA-2 for Micro Channel–equipped PS/2s—that take advantage of Tseng Labs' single-chip graphics processor to offer a wider range of graphics modes, resolutions, and colors at much lower prices than Big Blue's lineup.

In addition to the standard IBM VGA modes of 256 colors at 320 by 200 resolution and 16 colors at 640 by 480, these boards provide up to 256 colors at either 640 by 480 or 800 by 600 (an intermediate resolution that IBM doesn't offer), as well as up to 16 colors at the 1024 by 768 resolution favored by CAD/CAM and desktop publishing aficionados.

Designer VGA-2 costs $600 to $800 less than IBM's 8514/A Video Display Adapter. VGA-2 supports both IBM's 8514 interlaced display and noninterlaced compatibles at 1024 by 768, so you can trim system costs further by using one of the lower-cost multiscan monitors.

To produce 1024 by 768 resolution, the less-expensive Designer VGA must be used with an interlaced monitor, but it works with noninterlaced monitors at lower resolutions. Its single-chip solution makes available on a half card the functionality of an enhanced VGA board costing at least $100 more.

The Designer VGA, which retails for $445, is a half-slot card for XT- and AT-class machines and PS/2 Models 25 and 30. The Designer VGA-2 is a $699 Micro Channel–compatible card for PS/2 Models 50, 60, and 80. Both cards come standard with 512K worth of dynamic RAM rather than the usual 256K, enabling them to support more colors and modes. Orchid Technology, 45365 Northport Loop W, Fremont, CA 94538; 415/683-0300.

BRIEFLY NOTED

Hyundai Super-286, PC Terminal

Hyundai has introduced an AT-compatible file server and a diskless workstation that are the building blocks of a low-priced network. In terms of processor performance, Hyundai's Super-286 is an

The Super-286 is an AT-compatible file server that Hyundai offers as a building block for use with a low-cost LAN.

LET'S GET Graphic!

with the award-winning* PC Paintbrush® product family . . . the graphic standard for desktop publishing.

If the graphic side of desktop publishing has you befuddled, talk to a ZSoft dealer. Meet our family of graphic packages. You'll find just what you need to capture and improve existing images, create new images, and publish them with ultimate ease and clarity.

Family traditions.

PC Paintbrush, winner of the PC World 1987 World Class award, established the family reputation for creativity. All of its famous features – such as flip, rotate, shrink, grow, instant shapes and borders, variable width lines, and unsurpassed peripheral support – have been kept in the family.

With PC Paintbrush+, you can also capture B/W or gray-scale images with a scanner and then add your own creative flair – such as color.

If you have Microsoft® Windows, get PC Paintbrush for Windows or PC Paintbrush+ for Windows. Both let you take full advantage of multi-window, multi-task applications.

The next generation.

Publisher's Paintbrush™ opens new frontiers of graphic support for desktop publishing. Now you can edit a laser printer page dot by dot and produce flawless 300-dpi, WYGIWYE (What You Get Is What You Expect) images – even full color images. Zoom in for pixel-precise editing. Or zoom out for on-screen editing of the entire image. Produce text with small, large or huge characters. Adjust leading, kerning, character width, type sizes, italic slant, and text slope. Export your images to the leading desktop publishing packages. Get all this plus instant scanner support.

Call us today for a dealer near you.

Publisher's Paintbrush, our top-of-the-line product, has it all: zoom-out editing . . . scanner support . . . superior typography . . . and speed. You'll need 2MB of RAM to edit an 8½ x 11 page.

PC Paintbrush+ reduces your memory requirements to 512K by trading off zoom-out editing and some typographic features. Like Publisher's Paintbrush, it supports gray-scale and B/W image scanners.

Any product in the family can capture clip art or original creations from other systems, conveniently edit them, and export the finished images to your page layout program.

Both PC Paintbrush and PC Paintbrush+ are now available as Windows applications. They have all the features of our DOS products and the ability to "communicate" seamlessly with other Windows applications.

* 1987 PC WORLD WORLD CLASS AWARD

Z-SOFT

ZSoft Corporation
450 Franklin Road/Suite 100
Marietta, Georgia 30067
(404) 980-1950

PC Paintbrush is a registered trademark, and Publisher's Paintbrush is a trademark of ZSoft Corporation. Microsoft is a registered trademark of Microsoft Corporation. PostScript is a registered trademark of Adobe Systems, Inc.

Circle 219 on reader service card

upright, floor-standing version of the Super-286C small-footprint desktop. Like the desktop, the Super-286 has a zero-wait-state 80286 processor switchable to either 8 MHz or 10 MHz and a 1.2MB 5¼-inch floppy drive. But with a full 1MB complement of memory, six 8-bit and six 8/16-bit expansion slots, and room for up to five half-height drives, the Super-286 is much better suited for use as a LAN file server or for high-end data base or CAD/CAM applications. Hyundai offers a choice of 30MB, 40MB, 60MB, and 70MB fixed and removable hard drives. Other system components include two serial ports, a parallel port, a 101-key keyboard, MS-DOS 3.20, and GW BASIC version 3.20. An 80287 math coprocessor is optional. The Super-286 sells for $1695 without a monitor or video card so that you can configure it to fit your LAN plans.

Hyundai's PC Terminal is a diskless workstation with an Ethernet interface on the motherboard. Based on an 8088-2 processor switchable from 4.77 MHz to 8 MHz, it comes with 256K, four 8-bit expansion slots, a monochrome or color monitor, and an 84- or 101-key keyboard. The system, with monochrome monitor and 84-key keyboard, sells for $795. All Hyundai systems include an 18-month warranty. Hyundai Electronics America, 4401 Great America Pkwy., Santa Clara, CA 95054; 408/980-7561.

MultiSync GS

NEC Home Electronics has announced an intelligent gray-scale monitor that offers the same kind of mode switching in monochrome that NEC's popular MultiSync II multiscan monitor does in color. The MultiSync GS is for those concerned with price and satisfied with monochrome graphics. It provides up to 64 shades of gray in place of color images for every kind of graphics board from MDA through VGA and supports the Hercules 720 by 350 mode for extended-column spreadsheets. MultiSync GS accepts either digital or analog input signals, automatically adjusting its vertical and horizontal scanning frequency to match the video signal. It has a 14-inch, flat-screen CRT on a tilt-and-swivel base for enhanced contrast and minimal glare and comes with both a 9-pin adapter and a 9-to-15-pin adapter for connecting to IBM PS/2s. The MultiSync GS sells for $279, is compatible with classic PCs and all IBM PS/2 models, and comes with green, amber, or paper-white lettering on a black background. NEC Home Electronics, 1255 Michael Dr., Wood Dale, IL 60191; 800/447-4700 for literature, 800/NEC-SOFT for technical details.

BocaRAM/30

Boca Research has introduced an add-on board for IBM PS/2 Models 25 and 30 that provides 2MB of Lotus/Intel/Microsoft expanded memory specification 4.0 (LIM 4.0) memory. BocaRAM/30 is a full-length board using 150ns RAM chips in 256K increments. BocaRAM/30 also runs LIM 3.2 software and comes with menu-driven installation and diagnostic software. Also included is a print spooler for buffered printing and a RAM-disk utility. BocaRAM/30 comes in a no-memory version for $175, with 256K for $225, with 1MB for $345, or with 2MB for $545. Boca Research, 6401 Congress Ave., Boca Raton, FL 33487; 305/997-6227.

NEC's MultiSync GS offers up to 64 shades of gray in place of color images plus compatibility with graphics standards from MDA through VGA.

Numerikeys

You can speed data entry with an auxiliary numeric keyboard from Genest Technologies. Numerikeys, which uses only microwatts of power from the computer, should prove particularly handy for use with portables. It includes a separate 10-key keypad as well as cursor, symbol, and function keys, which are grouped differently than on a standard 84-key or 101-key keyboard and separated to enhance data entry accuracy. The keyboard attaches between the parallel port and printer cable and works even while printing is underway. Numerikeys sells for $129. Genest Technologies, 1331 E. Edinger Ave., Santa Ana, CA 92705; 800/826-9641, 714/547-0880.

S.F.E. Utilities

Bourbaki has a $69 bundle of ten frequently used utilities called *S.F.E. Utilities* (Something For Everyone). Some are eminently simple, such as R.E. Boot, an alternative to <Ctrl>-<Alt>-<Delete> for system restart, or E.Z. Print, a RAM-resident print configuration utility. Most of the other utilities are oriented toward disk and file management, including H.D. TuneUp, which improves the performance of a hard disk by restructur-

"The Breakthru 286 performed flawlessly with every application we handed it, including copy-protected programs and nine memory-resident utilities at once."
Stephen Manes, PC Magazine

"...the Breakthru 286 was the card of choice."
PC BusinesSoftwareview (Rated #1)

"...Breakthru 286 is a good value and a quality product backed by effective support."
Dan A. Griffin
The Newsletter of the AutoCAD User's Group

"The PCSG Breakthru 286 achieved the best performance results of the caching boards tested."
Ted Mirecki, PC Tech Journal (Rated #1)

"The 12-MHz Breakthru 286-12 speedup board is the fastest of those tested, but not the most expensive. On a dollar per-horsepower basis, it could be called the cheapest boost available for an XT."
Mark Welch, InfoWorld (Rated #1)

Think You Need an AT?

Make Your IBM PC Faster Than an AT in Just 5 Minutes!

Accelerator Cards: Speed and Value

Speed figures are consolidated results from 10 tests of CPU performance (See Accelerator Boards Special Report, December 1, 1986.)

		Increase in speed over the Intel 8088	Cost per percentage increase in speed
☐ Microspeed Fast 88	$149	85%	$2.29
☐ Microsoft Mach 10	$395	79%	$4.97
☐ Univation Dream Board	$512	131%	$3.91
☐ Orchid Turbo EGA	$945	202%	$4.68
☐ ST&D Standard 286	$995	237%	$4.20
☐ Classic Speedpack	$995	280%	$3.55
☐ Orchid PC-Turbo 286e	$1,195	321%	$3.72
☐ **Breakthru 286-12**	$595	333%	$1.79

REPRINTED FROM INFOWORLD, APRIL 27, 1987

Breakthru 286-8MHz-$395
Breakthru 286-12MHz-$595

LIGHTNING™—FREE with Breakthru speedup hardware—$89.95 purchased separately

We are excited about our three speedup products. You probably know about our Lightning disk access speedup software that was awarded PC Magazine's Best of 1986 award (see box). After the smashing success of Lightning, in late '86, we guaranteed the Breakthru 286 board to be literally the most advanced, fastest, most feature-rich board available. The runaway success it has enjoyed truly proved that assertion. Now we go ourselves one better with the Breakthru 286-12. This new board has the clock speed cranked up from 8 to 12 MHz for speeds up to 10.2 times faster than an IBM PC. It is 50% faster than an 8MHz IBM AT, and up to a whopping 1,000% faster than a regular PC.

But, no speedup board cuts disk access time in half

LIGHTNING™

software can - $89.95 or FREE w/Breakthru

"Lightning is almost mandatory...." - Steve Manes, PC Magazine
Best of 86 review

Loads with the DOS - always ready as a background program to accelerate disk access. You do nothing - everything is automatic. Programs that frequently access the disk (hard or floppy) are made instantly up to 2 to 4 times faster. Uses a principle greatly enhanced from mainframe technology called caching. Fully exploits Above Board memory.

LIGHTNING is the standard against which all our competition measures itself because we achieve universal compatibility with other software. Data is never lost. Order ***LIGHTNING*** separately or get it free with your Breakthru 286 board.

PC MAGAZINE EDITORS' CHOICE — THE BEST OF 1986

HERE'S WHY THESE TWO BOARDS ARE SO SPECIAL.

First, they install so easily. A half-slot card means you don't even have to give up a full slot. What's more, unlike competing products it works in the Compaq Portable and most clones. Easy diagrams show how you just place the card in an open slot, remove the original processor and connect a single cable. There is no software required. From that moment you are running faster than an AT.

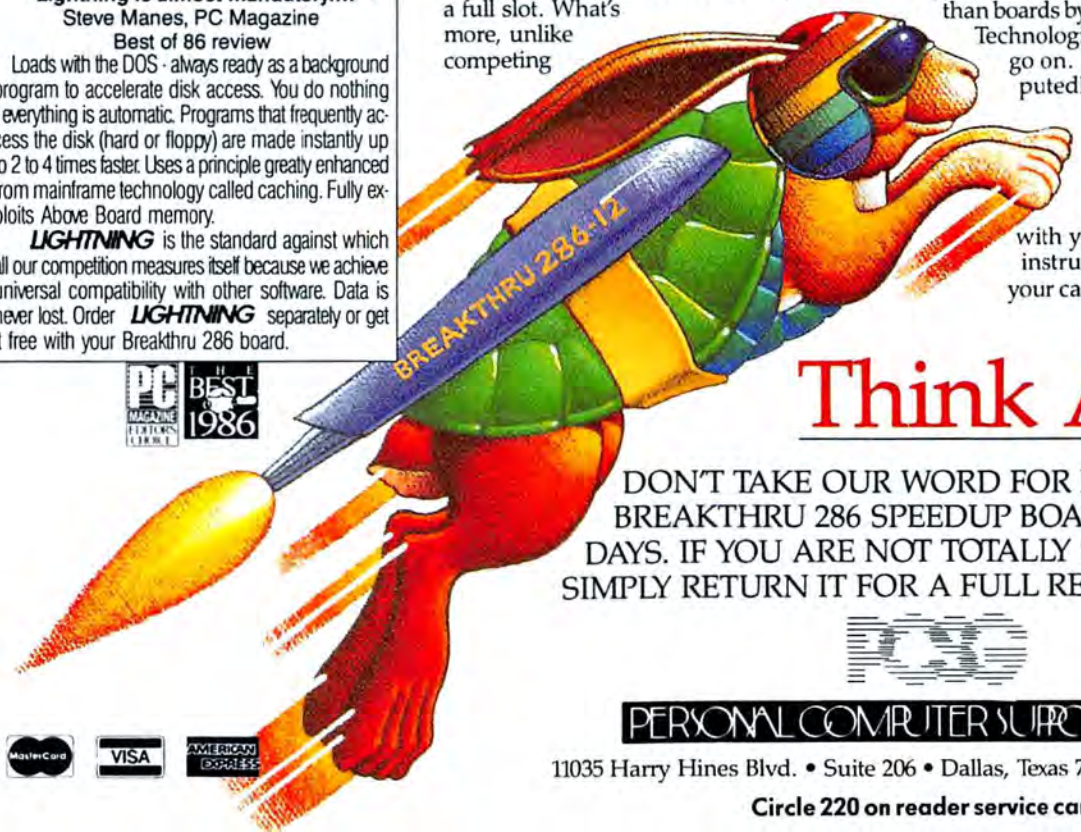
Second, they are advanced. The BREAKTHRU 286 replaces the CPU of the PC or XT with an 80286 microprocessor that is faster than the one found in the AT. Has a 80287 math coprocessor slot for numeric intensive applications. A 16K cache memory provides zero-wait-access to the most recently used code and data. Speed switching software allows you to drop back to a lower speed on the fly for timing sensitive applications.

Third, you have full compatibility. All existing system RAM, hardware, and peripheral cards can be used without software modification. Our boards operate with LAN and mainframe communication products and conform to the Expanded Memory Specification (EMS). Software compatibility is virtually universal.

Faster and smarter than an AT - PCSG guarantees it.

Fourth, these are the best. There are several other boards on the speedup market. We at PCSG have compared them all, but there simply is no comparison. Many cards offer only a marginal speedup in spite of their claims and others are just poorly engineered.

We are really excited about these products. PCSG makes the unabashed statement that the BREAKTHRU 286 card represents more advanced technology than boards by Orchid, Quadram, P.C. Technologies, Phoenix...we could go on. Breakthru 286 is undisputedly the turbo board with the biggest bang for the buck. And we include FREE the $89.95 acclaimed Lightning software. Call today with your credit card or COD instructions and we will ship your card the very next day.



Think Again.

DON'T TAKE OUR WORD FOR IT. USE EITHER BREAKTHRU 286 SPEEDUP BOARD FOR 60 DAYS. IF YOU ARE NOT TOTALLY SATISFIED SIMPLY RETURN IT FOR A FULL REFUND.

PCSG
PERSONAL COMPUTER SUPPORT GROUP

11035 Harry Hines Blvd. • Suite 206 • Dallas, Texas 75229 • **(214) 351-0564**

MasterCard VISA AMERICAN EXPRESS

Circle 220 on reader service card

ing fragmented files into contiguous blocks. P.M. Map displays a map of memory-resident programs, showing loading order, size, beginning and ending memory addresses, and allocation holes. K.B. Pacer speeds up the keystroke-repeat rate. U.P. Today lets the user change the date on any file without altering the file. W.S. ASCII converts *WordStar* files to ASCII files. For security, E.N. Crypt uses a 12-character key to encrypt and decrypt files. P.C. Lockup locks the keyboard and blanks the screen when you are away from your PC. M.T. File erases a file—permanently. *S.F.E. Utilities* is available for $49 to registered *1dir+* users. Bourbaki, 615 W. Hays St., Boise, ID 83701; 208/342-5849.

Force Stick

Tactron Scientific has a new high-precision input device that looks like a joystick but operates differently from joysticks, mice, or graphics tablets. Tracton's Force Stick uses force transducers that sense how hard you push on the stick—rather than potentiometers that measure the distance the device moves. The Force Stick is intended for high-precision CAD, CAM, or CAE applications that call for greater control over rotation, zooming, and panning than other input methods provide. It's particularly well suited for remote manipulation applications, such as production line robotics, where you want to control the rate at which objects move as well as their direction. The harder you push, the faster the cursor moves; cross-screen response is quick since you move only your fingertips, not your hand. Soft touches move the cursor pixel by pixel. The Force Stick supports three mice protocols—from Microsoft, Summagraphics, and Mouse Systems—and sports six fingertip switches that act as mouse keys or programmable function keys. The Force Stick connects to a standard RS-232C serial port, requires no independent power supply, and has 9-to-15-pin converters for IBM PS/2s. Tactron offers two models: The $765 F3-2 is a single-stick device able to move along two axes, and the F3-4 is a four-axis device equipped with two sticks that sells for $965. Tactron Scientific, 7265 Mountain Trail, Dayton, OH 45459; 513/434-4117.

Force Stick looks like a joystick but uses force transducer technology for extreme sensitivity in high-precision CAD, CAM, or CAE applications.

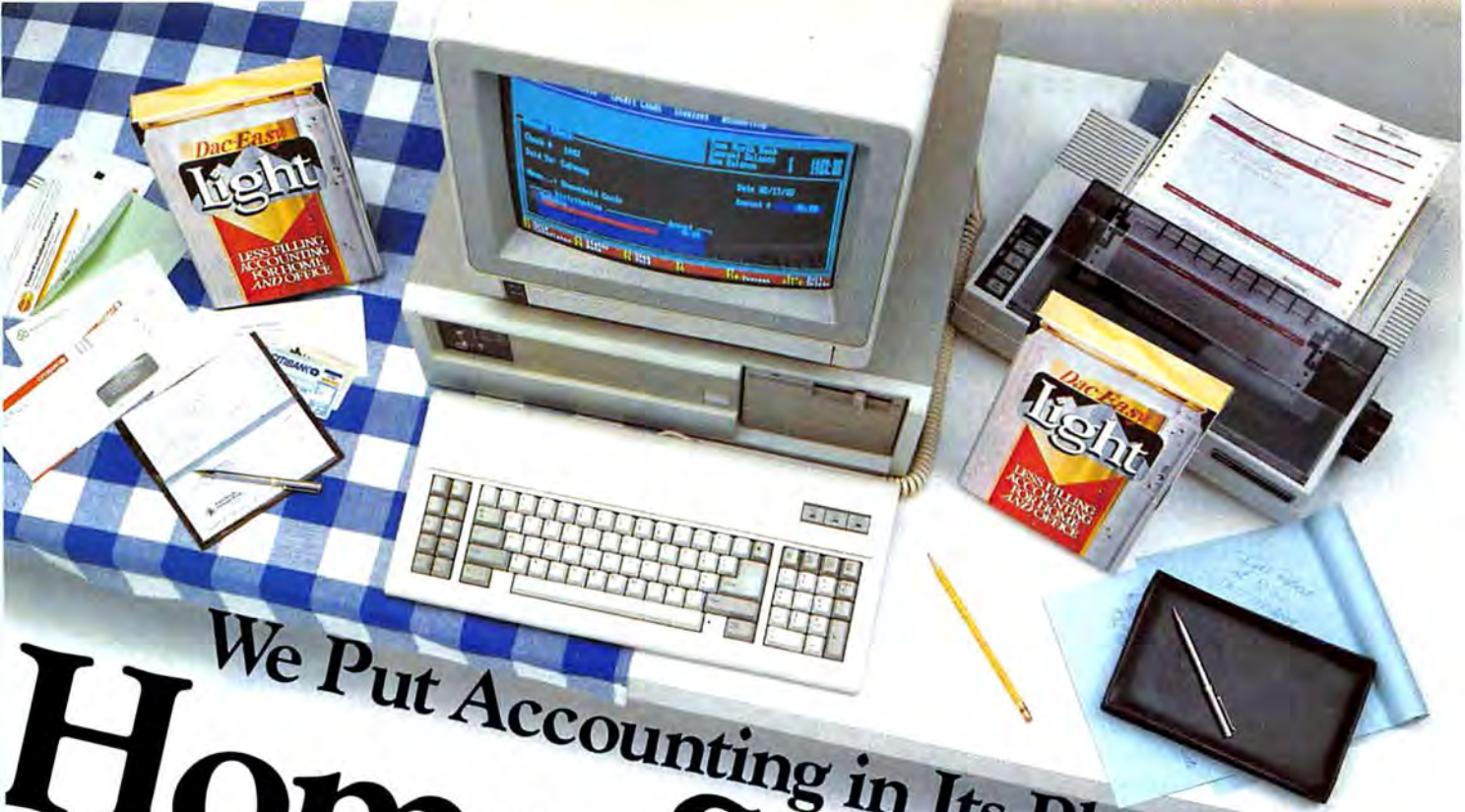
UPDATE

Q&A 3.0

Symantec has added quasi-relational capability, LAN support, and other features to its popular *Q&A* data base/word processor. *Q&A 3.0* lets you search on a field across multiple files in up to seven data bases, pulling the information into a file or report. You can use *Q&A 3.0*'s natural language query facility to program a sequence of searches of several fields in multiple files one field at a time, or add similar programming statements to forms by means of the customized menu. *Q&A 3.0* can lock data base files at the record level, allowing more than one user on a LAN to browse or read data but only one user to edit it. *Q&A 3.0*'s word processor lets you use up to nine fonts in any document on a letter-by-letter basis and has a simplified mail merge function. Search and replace has been enhanced so you can hunt for nonalphanumeric characters like page breaks and carriage returns. *Q&A 3.0*, which retails for $349, is more than 30 percent faster than previous versions. Upgrades from 2.0 cost $79, and you can buy a $199 LAN Pak for three additional users if you have *Q&A 3.0*. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600.

Paradox 386

Taking advantage of the 80386 processor, Borland International has made its *Paradox* relational data base up to five times faster at sorting, querying, and reporting. Incorporating PharLap Software's DOS Extender technology, *Paradox 386* teams up with the 80386 processor's 32-bit instruction set to speed operations and directly addresses up to 16MB of memory. Designed for users of large data bases such as massive order-entry systems, *Paradox 386* employs a virtual memory manager that caches files to reduce disk access and further enhance performance. Compatible with past versions, *Paradox 386* requires 640K and a hard disk and comes in both 3½-inch and



We Put Accounting in Its Place
Home & Office

Your Home. A Great Place for Dac-Easy Light.™ Take the simplicity of Dac-Easy Light home and you'll be amazed at how fast you can perform your personal financial tasks. Dac-Easy Light is designed for the non-accountant, yet it gives you complete information that will make your home accounting fun. Quick to install, Light provides a Personal Chart of Accounts setting up an accounting structure for immediate data input. And there's room to modify! You can set up as you go – whether you begin writing checks or posting credit and balances. Light debits and credits your revenues and expenses, transparent to you. For example, the bank feature allows you to select one of your bank or savings accounts. Then, a pull-down check screen a recognizable format lets you indicate manual or computer check entry, and you can print computer checks one at a time or by batch. End-of-month bank statements are easily reconciled with Light. This feature has an on-line adjustment for withdrawals, deposits and service charges. For better credit card management, Light automatically updates current card balances as you post receipts. You'll really enjoy the 12-month budget feature that tells you how much your actual expenditures are by month and year-to-date versus budget. Personal net worth reports are readily available, too. Light includes other features like pop-up calculator and user-defined color selections. Dac-Easy Light. A perfect place in your home for personal use.

$69.95

Your Sole Proprietorship. A Great Place for Dac-Easy Light.™ The professionalism of your company is best portrayed to your customers with Dac-Easy Light invoices, statements and checkwriting features. And you'll spend less time performing necessary office accounting while retaining more accurate and current information – on screen! With the non-accountant in mind, Dac-Easy Light quickly installs a predefined Business Chart of Accounts that allows you to start immediately invoicing customers or writing accounts payable checks. There's always room to modify, too! Dac-Easy Light performs as an integrated General Ledger, Accounts Receivable and Accounts Payable system. Light's checkwriting feature allows you to print computer checks one at a time or by batch. Post manual checks while a pop-up window debits and credits accounts by category. Your customers will be impressed with the detail shown in Light's invoice feature, and they'll never know how simple it was! Management of customer and vendor information is a snap with Light. Light gives you more reports to make the decision-making process easier, whether it's a Balance Sheet, Income Statement, Customer Statement or Variance Report, all data is up-to-date. The 12-Month Budget feature is extremely useful for the bottom line actual expenditures versus budget. Other handy features include mailing labels, password protection, pop-up calculator that pastes results to screen, and user-defined color selection. Dac-Easy Light. An accounting system ideal for the sole proprietor.

See Your Local Retailer or To Order Direct

Call 1-800-992-7779

(Canadian toll-free # 800-387-9674).

To order Dac-Easy Light™ by mail, send $69.95 to Dac Software, 17950 Preston Road, Suite 800, Dallas, TX 75252-5740. (Plus $7.50 shipping/Texas residents add sales tax/$17.50 shipping outside U.S.) 214-248-0205.

dac software, inc.

Insilco

30-Day Money Back Guarantee: Unconditional guarantee on all products bought directly from Dac Software (less shipping charges). **Minimum Hardware Requirements:** IBM PC or 100% compatibles. 1 disk drive, MS-DOS or PC-DOS 2.0 – or later, 80 column printer able to print 132 column in compressed mode, color or monochrome monitor, 256K memory. Trademarks: IBM, PC-DOS, MS-DOS. Dac-Easy and Dac-Easy Light are trademarks of Dac Software, Inc., 17950 Preston Road, Suite 800, Dallas, TX. 75252-5740. 5-1/4" & 3-1/2" disks available.

Code #203

5¼-inch formats. It retails for $895; an upgrade costs $125 for registered owners of *Paradox 2.0*. Borland Int'l, 4585 Scotts Valley Dr., Scotts Valley, CA 95066; 408/438-8400.

Manuscript 2.0

Lotus Development Corporation has added desktop publishing features and other enhancements to the latest release of its *Manuscript* word processor. *Manuscript 2.0* supports winding columns, sophisticated hyphenation, justification rules, and paragraph and word-spacing control. It easily downloads fonts to a laser printer and supports a wider array of industry-standard graphics file formats in addition to those of Lotus products. Other major new features include macros, a thesaurus, a screen-capture utility, math functions, and phrase libraries for frequently used text or tables. *Manuscript 2.0* automatically imports *1-2-3* worksheets, readily mixes graphics with text, constructs sophisticated tables, and supports inter-document management for tables of contents, indexes, cross-references, and footnotes. Markers replace the backslash commands of release 1.0, simplifying and speeding the incorporation of pictures, worksheet data, equations, cross-references, screens, and other elements into documents. *Manuscript 1.0* documents are compatible with the new release. A stand-alone utility converts release 2.0 documents to the release 1.0 format. *Manuscript 2.0* retails for $495. Upgrades for registered *Manuscript 1.0* users are $75. Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142; 617/577-8500, ext. 1281.

Tapestry/8

Torus Systems has released a less expensive version of *Tapestry*, its icon-based, NETBIOS-compatible local area network system software. *Tapestry/8* is identical in function to the original large-network–oriented program, but whereas you used to pay $2500 for an eight-user configuration, *Tapestry/8* comes packaged for eight users for $795. Those who want to reconfigure *Tapestry/8* for more than eight nodes can pick up an upgrade pack for $2495. Torus charges $295 for each workstation added. In *Tapestry*, any node can be a file server. One of *Tapestry*'s most attractive attributes is its icon-based pulldown menus, which make it easy to use. The software includes an E-mail system and facilities for sharing network peripherals. Torus Systems, 240B Twin Dolphin Dr., Redwood City, CA 94065; 415/594-9336.

Mix text, graphics, and worksheet data on the same page with Lotus's Manuscript 2.0 word processor, then preview the page layout before printing.

QuadMEG PS/Q

Quadram has updated its QuadMEG PS/Q add-on board to provide LIM 4.0 expanded memory for IBM PS/2 Models 50 and 60. Previously, PS/Q supported LIM 3.2; with 4.0 it can now address larger increments of memory and perform multitasking operations. The new capability comes with the QuadMaster IV software supplied with the board, which also includes a RAM disk utility and a print spooler. Owners of existing PS/Q boards can get the new software free. QuadMEG PS/Q adds 4MB of expanded memory to PS/2 Models 50 and 60 and is compatible with OS/2 and programs using the protected mode of the Intel 80286 chip. The board includes three Micro Channel Architecture identification numbers, avoiding conflict with other cards. QuadMEG PS/Q comes in a 512K configuration for $545, 2MB for $1095, and 4MB for $1995. Quadram, One Quad Way, Norcross, GA 30093-2919; 404/923-6666.

Accpac BPI Accounting

Computer Associates is shipping an enhanced, less expensive version of the *BPI Accounting* series the company acquired last year. Designed for small to medium-size businesses with general accounting needs and no need for vertical-market or specialized applications, *Accpac BPI Accounting* is a full-function series that includes separate modules for general accounting, accounts payable, accounts receivable, payroll, and inventory control. The old price has been cut in half, to $395 per module. For those just starting out, *Accpac BPI Accounting*'s general accounting module includes a general ledger and limited versions of accounts receivable, accounts payable, and payroll. You can choose 12- or 13-period accounting, and you can keep 10 periods open at one time. A suspend function enables you to switch between tasks and programs without losing data. *Accpac BPI Accounting* requires 512K, a hard drive, and DOS 3.00 or a later version. Computer Associates Int'l, 2195 Fortune Dr., San Jose, CA 95131-1820; 408/432-1727. ●

MORE COSTS LESS

PEACHTREE COMPLETE™ II:

Complete Accounting Is Still Just $199.

You know what you're looking for in an accounting system. Power. Flexibility. Ease of use. Now **Peachtree Complete II: The Business Accounting System** offers more. More features. More functions. And an enhanced user interface that not only looks great, but makes accounting easier and more efficient than ever before. All at a price that's substantially less than you'd expect. The first Peachtree Business Accounting System sold for $4,800. Now at just $199, Peachtree Complete II is a value you can't afford to ignore.

More Power, More Flexibility. We cut the price, but we certainly didn't cut corners. Today, Peachtree Complete II: The Business Accounting System is the most comprehensive accounting system you can buy at virtually any price. We've made enhancements to each of the eight modules that make up Peachtree Complete II. You can use them individually, or integrate them for maximum control and efficiency. You can even distribute them among separate computers. Over 250,000 Peachtree customers have already put these modules to work in their businesses.

- General Ledger
- Accounts Receivable
- Invoicing
- Accounts Payable
- Payroll
- Inventory
- Fixed Assets
- Job Cost

More New Features. Peachtree Complete II has a brand new look and an entire range of state-of-the-art features to make your accounting procedures easier and more effective than you thought possible. Peachtree's Complete II's latest features include:

- **Windows and Pop-Up Menus** make it easy to see what you're doing and where you want to go next. When you get ready to make a choice, just "aim and shoot."
- **Smart HELP** on-line, all the time. One keystroke gives you a pop-up rescue window full of context-sensitive information.
- **Quick and Easy Error Handling** gives error messages in plain English along with suggested solutions. No more complicated error codes.
- **Enhanced Report Capabilities.** Range printing allows you to print only what you need, only when you need it. A great feature for starting and stopping long reports. And now Complete II can produce over 450 reports.
- **Increased Numeric Capacities** to $999,999,999.99 in key areas. Plus, an unlimited number of companies.
- **Ongoing Tax Updates.** Complete II allows you to update your accounting tax files or you can order updates directly from Peachtree.
- **Service Invoicing,** the perfect addition to our product invoicing. Enter information free form on service invoices or store predefined paragraphs.

*"...best documentation...superb manuals ...head and shoulders above the manuals for other low-priced systems..."**

More Confidence. Peachtree Complete II includes comprehensive documentation to get you started and help you along the way: a separate quick-start Installation Guide, Accounting Primer, eight-volume Reference Library, and extensive Tutorials on each application—all at no extra charge! Plus, we stand behind all our products with a toll-free hotline for technical support ($1 per minute, $20 minimum) and an established network of support centers across the country.

COMPARE FEATURE FOR FEATURE

System-Wide Features
- Over 450 reports
- Unlimited number of companies and consolidations
- Automatic menu-driven conversion of your existing Peachtree Business Accounting data files
- Increased numeric capacities to $999,999,999.99 in key areas

General Ledger
- Chart of Accounts includes 76 suggested and 26,000 user-defined accounts
- 1 to 13 user-defined fiscal periods
- Repeating journal entries
- Financial statement comparisons may include current period and year-to-date with budget and/or prior period comparison
- Reversing journal entries

Accounts Receivable/Invoicing
- Open item or balance forward customers
- Up to 14,400 customers
- Supports partial payments
- User-defined terms codes and aging periods
- Automatic transactions with monthly, bi-monthly, quarterly, semi-annual, and annual frequency options

Accounts Payable
- Up to 14,400 vendors
- Partial payments of invoices
- Cash requirements forecasting by due date
- User-defined billing cycle on automatic invoices
- Checks printed with unlimited invoice listing on stub
- Ability to void and reprint checks

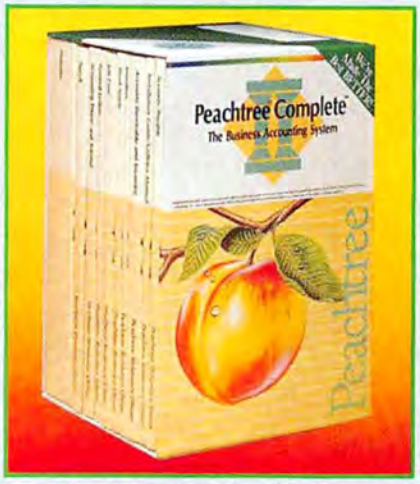
Inventory
- Supports average, last purchased and standard costing methods
- Up to 19,500 inventory items (SKUs)
- Automatic price change on multiple items by percent or amount

Fixed Assets
- Handles 13,000 assets and 13 methods of depreciation
- Updated to handle current tax laws

Job Cost
- Tracks costs and profitability on a job-by-job basis
- Compares estimated costs with actual costs for specific tasks

Payroll
- Built-in current year federal, state, city and county tax tables for all 50 states with automatic calculation capabilities
- Automatic payroll processing supporting hourly, salaried, commission or draw-against-commission pay types
- New tax laws incorporated into program
- Processes up to 3,900 employees
- Supports Cafeteria Plan
- User modifiable tax tables with updates published regularly by Peachtree Software
- Printed and magnetic media W-2s generated automatically

More Satisfaction or Your Money Back. We stand behind all our products with a **30-day money-back guarantee** when you buy directly from Peachtree. If you're not satisfied, simply return the product in saleable condition within 30 days and receive a prompt refund. (A $20 restocking fee applies to all returns.)



Less Money. Peachtree Complete II gives you more for less. More power, more flexibility, more features, more options, and more confidence for a low, low $199. Call today to begin enjoying the benefits of Peachtree Complete II, the accounting system you can count on.

*"The wide range of modules, low price, and solid documentation make this a top choice."**

More Power with PDQ II and Timeslips. Extend the power of Peachtree Complete II with **Peachtree Data Query II.** PDQ II lets you transfer your valuable Peachtree accounting information to Lotus 1-2-3®, dBASE® and other databases and spreadsheets for further analysis. Plus, PDQ II allows you to create custom reports such as invoices and statements. All for **just $199.**

And now Peachtree Complete II is compatible with **Timeslips III™**, a leading time and expense tracking program. With Time-Link: Plus III™, you can integrate your time and billing with your Peachtree accounting for total efficiency. Order Peachtree Complete II with Timeslips III now for just $399 and receive the accounting link (reg. $79.95) FREE.

**InfoWorld*, December 1987.

Hardware Specifications: Requires PC/MS-DOS version 2.0 or higher with 384K of usable memory and a minimum 10 MB hard disk. For use with the IBM® PC, PC XT, PC AT, Personal System/2™ and compatibles. 3½" media optionally available. Not copy protected.

Lotus 1-2-3 is a registered trademark of Lotus Development Corporation. dBASE is a registered trademark of Ashton-Tate Corporation. Timeslips and Time-Link: Plus III are trademarks of North Edge Software Corp. IBM is a registered trademark and Personal System/2 is a trademark of International Business Machines.

Call Now to Order or for a Dealer Near You

1-800-247-3224

In Georgia, call 1-404-564-5800

Circle 144 on reader service card

To Order by Mail, Add $12.50 Shipping and Handling and Send to: (In Georgia, add applicable sales tax)

Peachtree Software

A Member of the Intelligent Systems Family

4355 Shackleford Road, Dept. PCW, Norcross, GA 30093

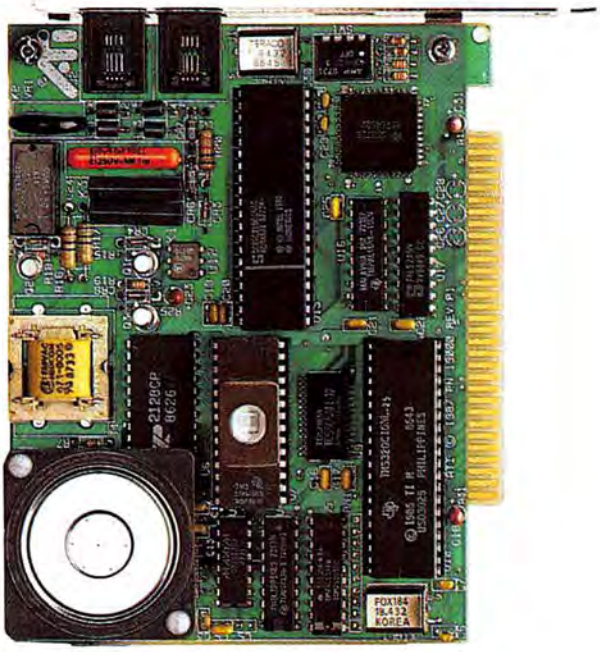
With Modems you can Get Smart

...or Get Smarter

2400etc

The Next Generation in Modems

- A Custom designed 2400 Baud Internal PC modem by the makers of the world-famous **EGAWONDER**, means high performance & reliability.
- Built-in microprocessor & digital signal processor ensures 100% error-free data using MNP-5.
- Data compression increases throughput to 4800bps.
- Background data spooling or Electronic Mail.*



$239.00 Suggested List Price

Smart price to pay for Smart technology

*Full package of MIRROR II software included, *Free.*

ATI TECHNOLOGIES INC.

Technology you can Trust.

ATI Technologies Inc., 3761 Victoria Park Ave.
Scarborough, Ontario, Canada M1W 3S2
Tel: (416) 756 0711, Tlx: 06-966640 (ATI TOR)
Fax: (416) 756-0720

ATI is a registered trademark of ATI Technologies Inc.
MNP is a trademark of Microcom Corporation. Mirror II is a trademark of Softklone Distribution Corporation.

Circle 302 on reader service card

1-2-3 Enters the Third Dimension

Lotus revamps its franchise spreadsheet with three-dimensional worksheets, fancier graphics, more powerful data base functions, and greater ease of use.

Eric Bender

History's most successful software application will be relaunched this fall. Release 3 of Lotus Development's *1-2-3* will boast three-dimensional worksheets, enriched graphics, enhanced data base functions, stronger auditing safeguards, and other improvements designed to speed use.

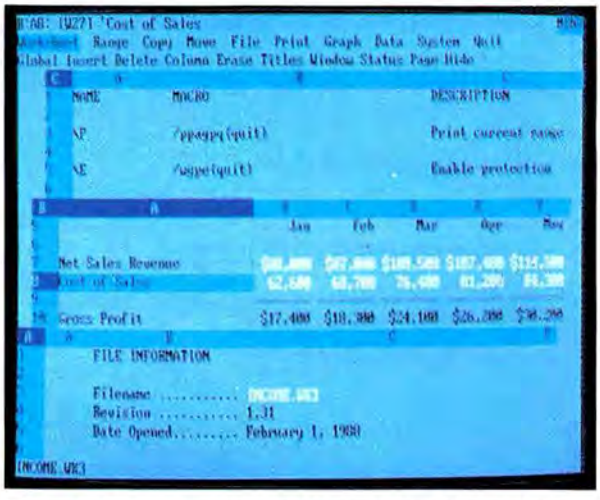
Release 3 will maintain the franchise spreadsheet's look and feel and will accept files and macros from earlier releases and export files to them. The $495 program will look essentially identical under DOS and OS/2 and will ship in one package with one set of documentation. The 2½-year-old release 2.01 will still be sold.

Adding a Dimension

Are three-dimensional spreadsheets just a fad, like 3-D movies? No, because the added dimension has major advantages for all but the simplest worksheets.

"The main benefit is structure—the ability to organize a worksheet in a sensible way," explains Scott Tucker, Lotus's product design manager for PC spreadsheets. If you separate multiple activities into different worksheets, says Tucker, "you don't have to worry so much about organization." For example, you can place macros on a second worksheet and delete rows on your first without jeopardizing the macros.

The 3-D architecture also drastically simplifies the process of consolidating multiple worksheets. Rather than having to reference all the appropriate cell ranges in a number of linked worksheets (as with *Excel*), users can simply select a three-dimensional range, or "cube," of data from all worksheets loaded into memory at the same time. Release 3 users will also be able to create links between separate worksheet files, as with *Excel*.



Working in three dimensions lets you divide a large worksheet into smaller, linked ones. Here, title page, calculations, and macros have been placed on individual worksheets.

Release 3's opening screen is familiar and two-dimensional; the clue to the added dimension is the presence of an extra 'A' in the top left corner. This designates sheet A; so the top-left cell is A:A1. If you open a second sheet, the top left cell is called B:A1.

You can open up to 256 sheets per file and load multiple files into memory, and you can view three consecutive sheets at a time.

Navigation is straightforward: <Ctrl>-<Page Up> and <Ctrl>-<Page Down> are the keystrokes you need to know to use three dimensions. Beyond that, procedures for entering commands, formulas, values, and labels all remain unchanged, making it easy to link a formula on one sheet to data on another. If all linked sheets are in

memory, they're updated automatically when a change is made.

You can adjust column width and other parameters individually or globally. Once you're finished, you can store all the sheets together in a single file (the new format is dubbed .WK3). You also can split the sheets into multiple files or join multiple worksheet files into one.

You must follow some rules of the road to ensure proper updating of data between files: If you always want to have the correct value, either make all your links one-way, Tucker advises, or bring all files with two-way links into memory, since linked files that remain on the disk aren't updated.

Release 3 is written in C rather than assembler but counteracts C's slowness by using minimal recalc (recalculating only those cells affected by changes since the last recalculation) and background recalc (releasing the cursor while the worksheet finishes crunching numbers off screen).

The OS/2 code exploits up to 16MB of memory. The DOS version pushes that barrier even further —to 32MB—with the Lotus/Intel/Microsoft (LIM) expanded memory specification 4.0. More practically, it exploits all available memory (conventional or expanded).

Upgraded Graphics, Data Base

Graphs are much easier to create (and save) than in earlier versions, Tucker says. They can be displayed next to worksheets or data bases, with changes automatically reflected in the graph, and a graph can be printed from within a worksheet via standard menu print commands.

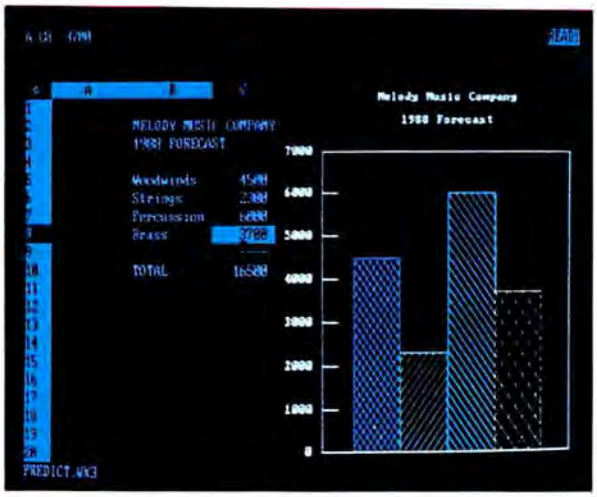
New chart types include text, open/high/low/close, mixed line and bar, area, and horizontal. Control over hatching patterns, color, and text fonts has been greatly enhanced. Release 3 can print text and graphics on the same page, supports PostScript, and provides print queuing.

The new release's enhanced data base functions will allow it to handle many more data base applications, Tucker claims. You can sort on up to 256 keys. And while individual data bases remain limited to 8192 records, "a limited relational capability lets you join two data bases that share a common field."

Lotus also is adding direct access to external data base managers such as *dBASE*.

Maintaining Control

Users who invested heavily in *1-2-3* add-ins will be disappointed to learn that release 3 won't work with them. Tucker expects a new crop of add-ins to begin appearing a few months after the package ships.



1-2-3 release 3 can display charts on the same screen with a worksheet or data base. If the worksheet is updated, the chart will be redrawn.

The new version does borrow a few niceties from the *HAL* add-in, including an undo feature and automatic cell formatting. This last aids tasks like plugging in quarterly dates, formerly a real pain.

Among auditing features, the Worksheet Windows Map gives a compressed view of a worksheet using separate symbols to represent numbers, formulas, and labels and thereby pinpointing, for example, a label lurking where a formula should be. Additionally, you can annotate number formula cells with a note of up to 512 characters, or annotate range names and display those in a table.

Release 3 also includes search and replace functions, a keystroke recorder, supplemental macro commands, the ability to switch instantly between two screen display modes, and a flexible system of network file locking. And, unsurprisingly, release 3 adds layers of context-sensitive help.

At press time, release 3 was scheduled to be available in the fourth quarter for $495. Registered owners of release 2.01 will be able to upgrade for $150, and release 1A owners can step up for $200. Release 3 will require 512K and either DOS 2.00 or a later version, or OS/2; a hard disk is recommended. Release 3 will not be copy protected. ●

Eric Bender is PC World's *East Coast editor.*

1-2-3 release 3
Lotus Development.
55 Cambridge Pkwy.
Cambridge, MA 02142
800/345-1043

For more information, see Products Featured in This Issue.

THE ACER FAMILY.

PERSONAL VALUES HAVE ALWAYS HAD A PLACE IN CORPORATE SETTINGS.

♦ *At Acer, we recognize the importance of personal values. And have developed a few of our own. Which is why we've been able to achieve that balance between ingenuity and devotion needed to create the sort of PCs and peripherals that push technology to the limits. On a daily basis.*

♦ *What else drives us? Another set of values: more performance, less price. For over a decade we've manufactured a complete line of quality products, in both the US and Taiwan, and distributed them worldwide in 67 countries.*

♦ *The Acer Family. First, there's the new Acer 1100/20. Running at 20 MHz, it's the 386-based system designed for the power user. Next, meet Acer's 900, a 286-based wonder named "Editor's Choice" by PC Magazine. Our newest version runs at 12/8 MHz and is fully PC/AT compatible. But 50% faster. With our 710 & 910 systems, we've conquered time and space. Both are fast, yet boast small footprints.*

♦ *Plus, we have valuable connections with complete LAN systems and modems. Multi-user systems. Laser printers. And much more. All serviced and supported on-site by TRW, throughout the entire United States.*

♦ *To find out more about our values, and the power behind them, call us at (800) 538-1542. In California, call (800) 782-1155.*

♦ *We're Acer.*

THE WORD FOR VALUE.

Acer Technologies Corporation
401 Charcot Avenue
San Jose, CA 95131
(408) 922-0333

Acer 710 Acer 1100 AcerStation

The 12/4/8 warranty program includes 12 months of total coverage: 4 months on-site service by *TRW and 8 months depot service through any Acer Authorized Service Center or TRW service location.
©1988, Acer Technologies Corporation. Acer 1100/20, Acer 900, Acer 710 and Acer 910 are all trademarks of Acer Technologies Corporation. IBM, PC/AT is a trademark of International Business Machines Corporation. TRW is a trademark of TRW, Inc. Race System Office environment by SunarHouserman. Orbis Lamps by Ron Rezek Lighting. Software shown on Acer systems include: AutoShade by Autodesk Inc., DESQview by Quarterdeck Office Systems, Wordstar by MicroPro International Corp., Gem by Digital Research Inc., dBASE III by Ashton-Tate Inc. and Windows/386 by Microsoft Corporation. *On-site service offered within a 50-mile radius of any TRW service location.

Circle 49 on reader service card

WordPerfect Desktop Publisher

WordPerfect 5.0 will offer a whole new universe of features. Top-notch desktop publishing capabilities will allow you to create better output than ever before.

Ralph Blodgett

WordPerfect 5.0 is no *PageMaker*, but the new release of the popular word processor crosses the line between word processing and desktop publishing. With advanced support for graphics and fonts, as well as leading and kerning control, page preview capabilities, and PostScript support, *WordPerfect 5.0* is clearly geared to users who want superior output. But the program's new features mean a big boost in system requirements: 512K is mandatory; 640K is recommended.

Graphic Improvements

If you've been hoping for better graphics support, you're in luck. Version 5.0 imports images created in *PC Paint*, *Publisher's Paintbrush*, *Dr. Halo II*, and *Windows Paint*, as well as CGM metafiles, HPGL plotter files, *1-2-3* and *Symphony* .PIC files, *GEM* files, and TIFF scanner files.

Imported images can be resized horizontally or vertically, cropped, and even rotated—a capability missing from high-end desktop publishing programs such as *Ventura Publisher* and *PageMaker*. You can treat text as an image, place it inside its own box, and add a gray screen (the percentage of gray is user definable). Version 5.0 draws boxes automatically for figures and tables, and you will be able to create horizontal and vertical lines of varying thicknesses and shades of gray to separate sections of text.

As in *Ventura Publisher*, text flows around images automatically. You will be able to specify that a given section of text and graphics remain together; if you later decide to modify the layout, the text and graphics unit will still be linked.

When it's time to take a look at your document, you will be able to preview images and fonts on a single page or on two facing pages, either full-size or magnified 200 percent. But you won't be able to edit in preview mode.

Font Formatting As You Like It

WordPerfect 5.0 boosts font support dramatically. In addition to bold, italic, outline and shadow, superscript, subscript, small caps, redline, strikeout, and single- and double-underline font styles, version 5.0 provides six automatically formatting fonts: fine, small, regular, large, very large, and extra large. Or you will be able to select your own—up to 250 per document. At press time, WordPerfect announced it would ship version 5.0 with several Bitstream disk-based fonts, including Dutch and Swiss. Once you specify which printer(s) you're using, *WordPerfect* keeps track of available built-in fonts, font cartridges, and downloadable fonts and automatically formats the document to match the printer and its fonts.

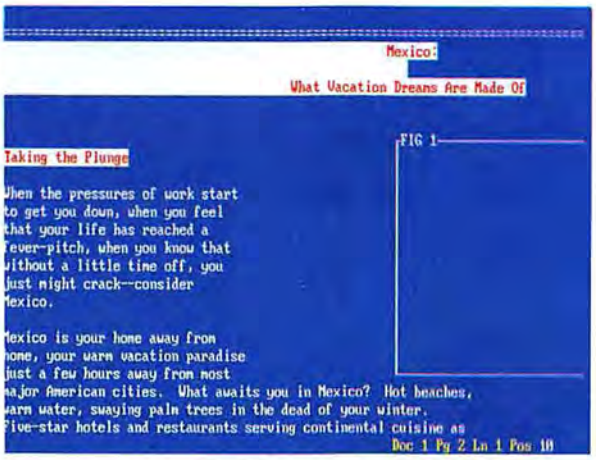
If, for example, you move a document formatted for the LaserJet II to a system with an Epson dot matrix printer, *WordPerfect 5.0* will reformat the entire document's fonts to match the Epson's fonts. Similarly, if you create a document using Helvetica but later decide to print the document in Times Roman, *WordPerfect* will adjust all settings.

If you use a Hercules InColor Card or Graphics Card Plus and a multiscan monitor, you will be able to view all the font styles on screen during editing. Without a Hercules card, the text is color coded to indicate different sizes and styles.

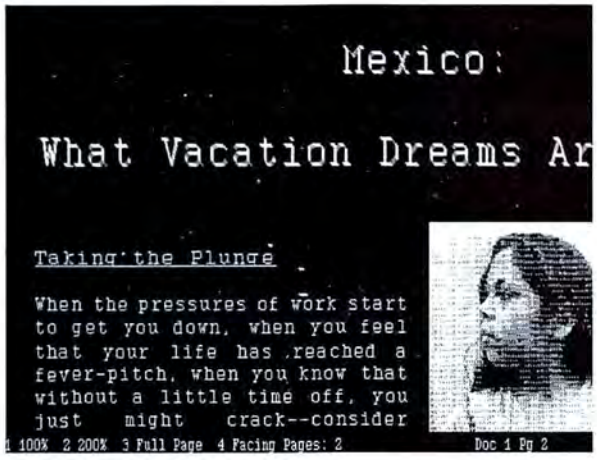
To the Mac and Back

Tabs and margin settings are now measured in inches, centimeters, points, or characters. This makes using *WordPerfect* files on both IBM-compatible and Macintosh computers easier, because the Mac version also uses inches or centimeters. To use *WordPerfect 5.0* files with the Macintosh, Apple II, or Amiga versions of *WordPerfect*, you will have to save those files in version 4.2's format. If you own a LaserWriter or one of the new breed of PC-compatible PostScript printers, note that *WordPerfect 5.0* provides full PostScript support.

The new *WordPerfect* also offers widow and orphan control and precise control over leading (line spacing). The program



In editing mode, different fonts appear in different colors (unless you have a Hercules card), and the graphic is represented by a box.



In WordPerfect's preview mode, you can view the document shown in the screen above as it will appear in print.

kerns text automatically, and you will be able to modify the kerning function to increase or decrease the space between specific letters.

Better Menus and Macros

Desktop publishing tools are not *WordPerfect*'s only improvements. The menus will let you select many items by using mnemonics, such as *G* for *Graphic*. With version 5.0 you will be able to use up to 1500 different characters, compared to the old ASCII limit of 256. Several new character sets are now supported, including Greek, Hebrew, Math, and Symbol.

Additions to the macro function include a built-in editor and the ability to assign macros to any key or set of keys. You will be able to redefine all the function keys if you wish, nest macros, add input statements, and create conditional macros. However, macros created with version 4.2 won't be compatible with the new *WordPerfect*—you'll have to recreate them from scratch.

For work groups, an interesting feature is version 5.0's ability to compare an edited document on screen with an unedited version on disk, and display (with redlining and strikeout) every editorial addition and deletion. With version 4.2 you had to print the document to see redlining changes.

WordPerfect 5.0 was due to be shipped as of press time. Version 5.0 lists for $495; an upgrade from version 4.2 costs $60. If you purchased *WordPerfect 4.2* between January 31 and April 30, the update is free. ●

Ralph Blodgett is the author of Using WordPerfect: Macintosh Version *(Que Corp., Carmel, Indiana, 1988) and the forthcoming* Advanced WordPerfect Version 5.0 *(Scott, Foresman & Co., Glenview, Illinois).*

WordPerfect Corp.
288 W. Center St.
Orem, UT 84057
801/225-5000

For more information, see Products Featured in This Issue.

Eight Great Reasons To Use NewsMaster II

Powerful new features
NewsMaster II's new layout, graphics and printing abilities allow even more versatile and useful designs.

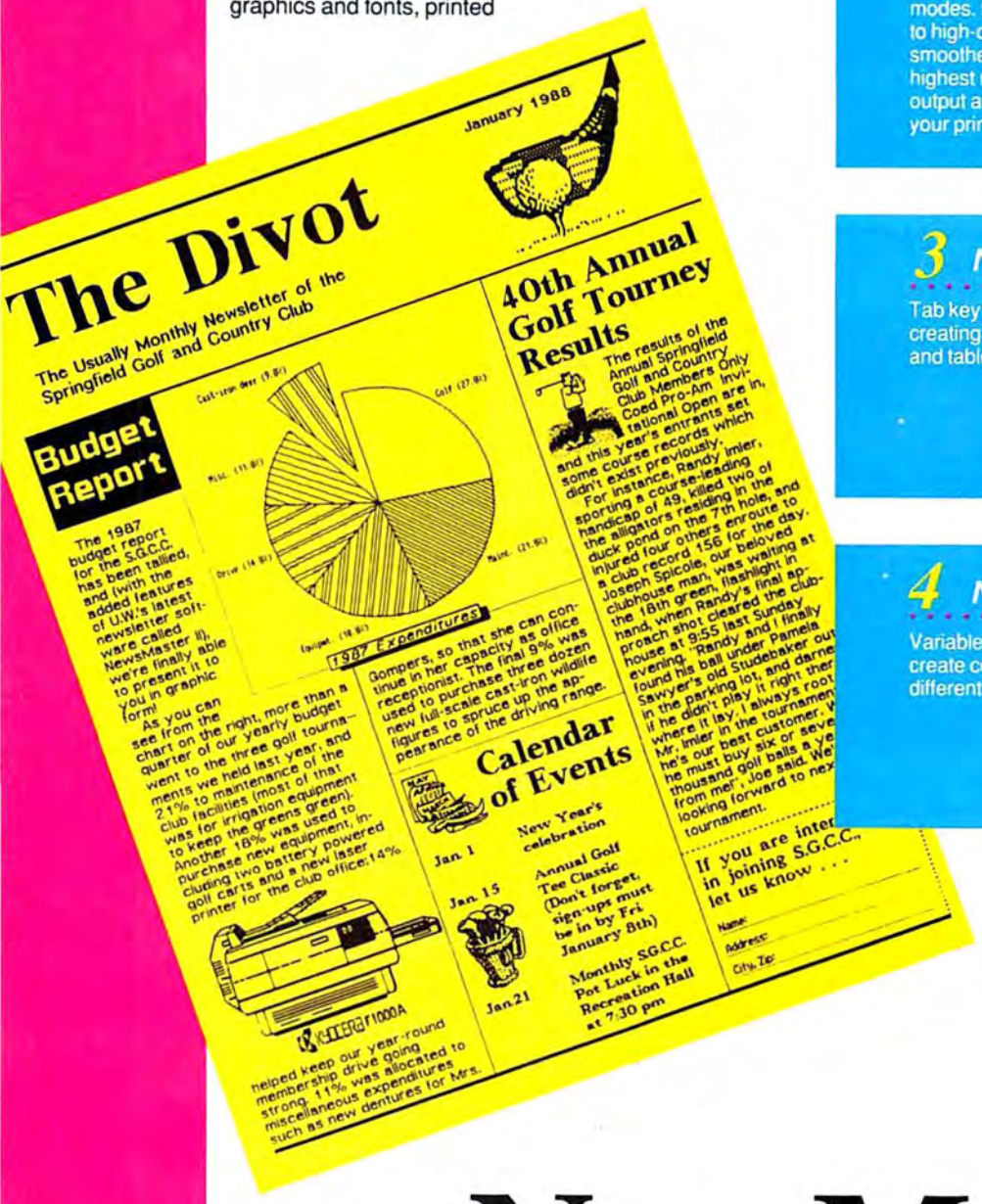
Easy to use
The mouse-less icon menu takes you from mode to mode quickly and easily. Text and graphics are integrated automatically with no fuss.

Beautiful results
Well-rendered, imaginative graphics and fonts, printed in high-quality mode, create professional looking output.

Expandable
Our Art Galleries (available separately) contain more eye-catching, one-of-a-kind graphics that are easily used with NewsMaster II.

Ask your dealer for NewsMaster II today.
Or call us at :
1-800-443-0100, ext.238

Unison World
Easily the best.



1 New!
"Screen capture" grabs a screen image from other programs (Lotus 1-2-3, PC Paintbrush, etc.) and formats it as a NewsMaster graphic.

2 New!
Multiple printing modes, from draft to high-quality smoothed, give the highest resolution output available on your printer.

3 New!
Tab key makes creating columns and tables easy.

4 New!
Variable margins create columns of different sizes.

5
Over 250 pieces of eye-catching, original art and 30 imaginative fonts are included.

6
You can choose from 1 to 10 columns per page.

7
Vertical, horizontal, and box lines can be any width and filled with any of 30 patterns.

8
Affordable low price.

NewsMaster II™

Unison World

Circle 102 on reader service card

OVER 15,000 DESKTOP PUBLISHERS MADE MICROTEK #1.

More sophisticated desktop publishers are using Microtek desktop scanners with their IBM-PCs and Macintoshs than any other. This was true in 1985, 1986, and is still true in 1987! Several independent surveys have verified this.* Over 15,000 have chosen Microtek manufactured scanners.

Why do more people choose Microtek? One reason is Microtek's product "family." You can choose from four different image scanners; plus Optical Character Readers; plus Fax communication tools; plus Raster to Vector conversion software.

*International Data Corp. and Dataquest reports.

Macintosh is a registered trademark of Apple Computers, Inc.
IBM is a registered trademark of International Business Machines Corporation.

Our family gives you room to grow with the confidence that all members will work together.

Another reason why over 15,000 desktop publishers have made us #1 is that Microtek products are more reliable, and more feature-rich than others. You can count on receiving more capability for your money with Microtek. We are the choice of the serious user! Contact your local Microtek Dealer or call us to see why.

MICROTEK

16901 South Western Ave.
Gardena, California 90247
213-321-2121 800-654-4160

Dealers circle 111 in reader service card
End Users circle 110 on reader service card

PostScript Printers' Progress

Affordable PostScript printers have finally arrived, promising typographic muscle, gangbuster graphics, and LaserJet compatibility. PC World scrutinizes five PostScript printers to see if they meet expectations.

Daniel Miles Kehoe

Laser printers have traditionally been segregated into two camps. The Hewlett-Packard LaserJet and its clones huddled under the PC's banner, while the Apple LaserWriter, the sole PostScript printer, hoisted the flag of the Macintosh. With the release of a battalion of moderately priced PC-oriented PostScript printers, such distinctions have crumbled for good—and users on both sides will be the beneficiaries.

The HP LaserJet single-handedly redefined the notion of letter quality output, rendering the daisy wheel printer an anachronism. Now the desktop publishing boom threatens the LaserJet with the same fate. Programs such as *PageMaker* and *Ventura Publisher* can quickly use up the LaserJet Series II's 512K of RAM and meager collection of internal fonts. You can add more memory, font cartridges, and nonscalable downloadable fonts, of course, but that would raise the cost higher than that of the cheapest PostScript printer reviewed here—and without gaining the unique advantages PostScript offers.

If the LaserJet forces font-hungry users to dine à la carte, a PostScript printer provides prix fixe convenience. In addition to speaking Adobe's versatile PostScript page description language, which provides software developers with a variety of graphics and typographic features, the reviewed printers pack at least 1.5MB of RAM and 35 built-in scalable fonts from Times Roman to Century Schoolbook. (By contrast, all fonts for the LaserJet are fixed and usually can't exceed 36 points.) PostScript fonts also include kerned letter pairs, allowing publishing programs that feature automatic kerning, such as *PageMaker*, to generate far more readable text.

Perhaps just as important, these new PostScript printers step out of the shadow

PHOTO: WES GOWEC

The Silentwriter LC890's durable LED engine and reliable PostScript printing make it ideal for office duty. (Note: The LC890's faceplate confusingly reads "NEC Silentwriter LC800 PostScript Page Printer.")

of the Apple LaserWriter. They can easily fit into a PC-dominated office, because they emulate the LaserJet and other popular printers and feature parallel ports for plug-and-print operations. At the same time, the Apple Macintosh across the hall isn't excluded—serial and AppleTalk connectors are standard on all but the IBM model.

Of course, LaserJet partisans are quick to point out the competition's disadvantages. *Cheap* PostScript printers still cost $2000 more than a basic LaserJet Series II and are currently limited to 3MB of RAM. And though PostScript printers can adroitly print complex graphics, the Series II is faster at outputting text and large bit-mapped images. Software support for PostScript in the PC world is also rather limited.

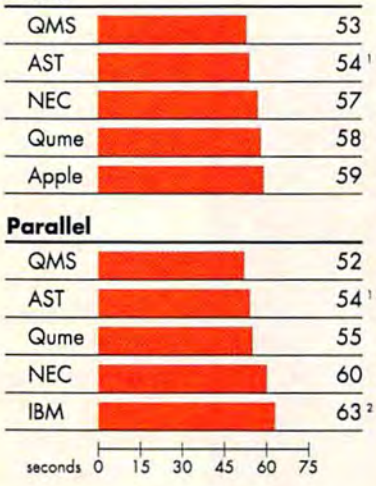
But the software drought is ending as *1-2-3* release 3, *Excel*, *Quattro*, *WordPerfect 5.0*, and other major applications with PostScript drivers come to market. And

NSTL TEST REPORT

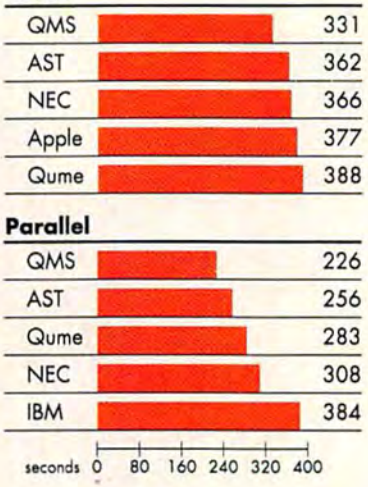
PostScript Printers Roundup

Other printers are faster, but the NEC Silentwriter's steady performance, durable engine, and dependable paper handling make it the best buy.

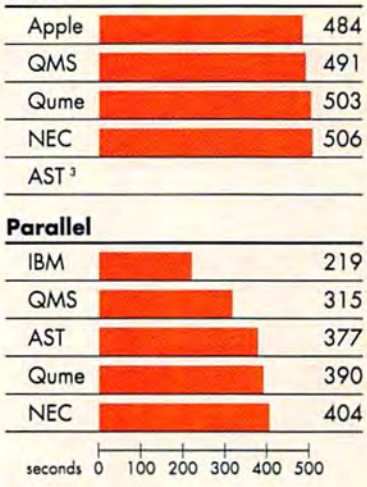
Text, one font



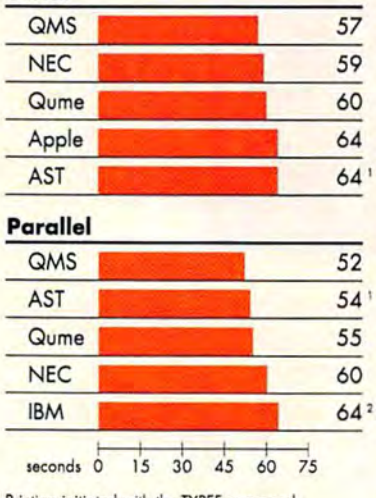
Complex images/fonts



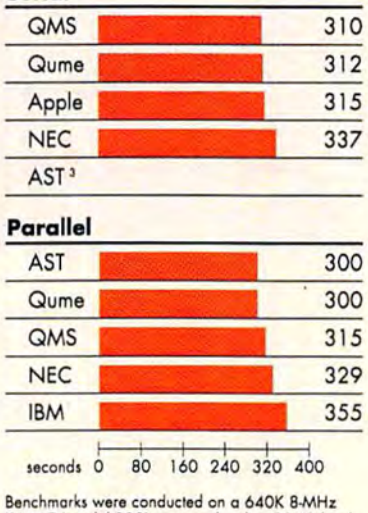
Full-page image



Text, four fonts



Newsletter



[1] Printing initiated with the TYPEF command
[2] Printing initiated with the PPPRINT command
[3] Would not print PageMaker documents properly through serial port.

Benchmarks were conducted on a 640K 8-MHz IBM AT (Model 339) equipped with a 30MB hard disk, an IBM Enhanced Graphics Adapter, and an IBM Enhanced Color Display. Text printing, typical of everyday word processing, was tested using *XyWrite III 3.52* (text, one font and four fonts). A mixture of desktop publishing tasks were performed using *Ventura Publisher 1.1* (complex images/fonts) and, running under *Microsoft Windows 2.03*, *PageMaker 1.0a* for the PC (newsletter and full-page image). Timing began when the command to print was issued and ended when the last page came to rest in the output tray.

Text, one font
This benchmark timed the printing of four 50-line pages in 12-point Courier.

Text, four fonts
This benchmark timed the printing of four 50-line pages of 12-point Times, Bookman, Helvetica, and Courier typefaces.

Complex images/fonts
This benchmark timed the printing of five pages consisting of a scanned photo, a line drawing, a raster graphics image, and text in different typefaces and sizes.

Newsletter
This benchmark timed the printing of eight pages made up of elements typical of a newsletter, including various type sizes and fonts. The original document was created on an Apple Macintosh with *PageMaker 2.0* for the Macintosh and then sent to the AT over a TOPS network.

Full-page image
This benchmark timed the printing of a 6½-by-9-inch digitized photograph at 300 dpi.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

you can't beat the radical change in the price/power ratio: A PostScript printer that cost $8000 last year can now be had for $5000. This may not be a steal, but you can't buy more printer for the money.

Accordingly, *PC World* evaluated the first round of PostScript printers in that price range: the NEC Silentwriter LC890, the AST TurboLaser/PS, the Qume Scripten, the IBM Personal Pageprinter, and the QMS-PS 810. Image quality and speed tests conducted by National Software Testing Laboratories (NSTL) helped answer the question: Do these printers deliver on PostScript's promise of convenience and versatility?

Installation Pitfalls

A laser printer engine dictates not only a printer's durability, paper handling talents, and sharpness of output but also its ease of installation and maintenance. For example, the QMS-PS 810 uses a Canon engine, which combines toner cartridge and image system (an organic photoconductor, or OPC) in a single unit that pops into place in minutes. Flip open the printer's cover, slide the unit into a bay in the hood, pull out a plastic tab, close the printer, add paper to the tray, and you're ready to go. You don't have to worry about spilling toner or damaging the light-sensitive but fully shielded imaging unit.

The AST TurboLaser/PS, the NEC Silentwriter LC890, the Qume Scripten, and the IBM Personal Pageprinter use separate toner and OPC cartridges. In-

NSTL BENCHMARK TESTING

The exclusive test facility for *PC World*, **National Software Testing Laboratories (NSTL)**, is an independent organization that specializes in evaluating personal computer hardware and software. A recognized pioneer in state-of-the-art test design, **NSTL** believes that the most useful benchmark tests measure how well products perform when executing typical business tasks. **NSTL** testers follow detailed test plans that simulate normal operating conditions. A controlled testing methodology ensures objective, accurate, and consistent results and gives consumers a sound basis for making purchase decisions. **NSTL** publishes its test results in *Software Digest Ratings Report*® and *PC Digest*.™ Neither publication accepts advertising. **NSTL** is located in Philadelphia, Pennsylvania.

FEATURES EVALUATION

PostScript Printers

The NEC Silentwriter LC890 and the QMS-PS 810 combine ample features with versatile printing.

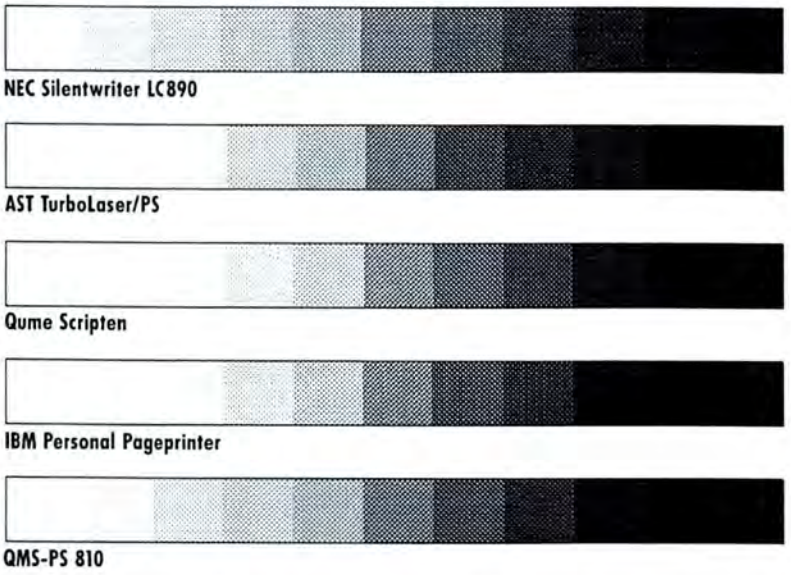
● Yes
○ No
◒ Deficient

	Apple LaserWriter Plus	AST TurboLaser/PS	IBM Personal Pageprinter	NEC Silentwriter LC890	QMS-PS 810	Qume Scripten
Configuration						
PostScript version	42.2	47	47	47	47	47
Processor speed (MHz)	11.8	12.5	10	10	16	12.5
RAM (MB)	1.5	3	2	3	2	3
Number of internal fonts	35	35	43	35	35	35
Engine	Canon LBP-CX	Ricoh 4081	Ricoh 4216	NEC LC800	Canon LBP-SX	Hitachi SL-100
Warranty (parts & labor)	n/a	90 days	1 year	1 year	1 year	60 days
Rated speed (ppm)	8	8	6	8	8	10
Rated engine life (thousands of pages)	180	600	180	600	300	300
Cost per page (cents)	6	4	3	3	4	6
Centronics parallel port	○	●	●	●	●	●
Serial port	●	●	○	●	●	●
AppleTalk port	●	●	○	●	●	●
Paper handling						
Paper capacity (sheets)	250	500	250	1000	500	250
Single-sheet feeder	●	○	●	●	●	●
Prints legal-size paper	○	○	●	●	●	●
Prints envelopes	○	○	○	◒ [1]	●	○
Emulation						
HP LaserJet Plus	○	◒ [2]	○	●	◒ [3]	●
Supports downloadable LaserJet Plus fonts	○	◒ [2]	○	●	●	●
Diablo 630	●	◒ [2]	○	●	●	●
IBM Proprinter XL	○	○	●	○	○	○
HPGL plotter	○	◒ [2]	○	●	●	○

[1] Test unit jammed on envelopes.

[2] HP LaserJet Plus, Diablo 630, and HPGL emulations are available only on optional boards.

[3] Some fonts not recognized.



If shades at either end of the gray scale blend together, dark areas in scanned images will be muddy and highlights washed out.

stalling the OPC in one of these printers is a challenge, because it is not shielded yet will deteriorate if touched or exposed to strong light. The OPC fits into a slot inside the printer, and you must ensure that it's properly aligned so you don't scratch it when you close the cover. Adding a toner cartridge is even more ticklish—you slip the rectangular plastic case into a matching trough, pull out a tab, and toner pours into the trough. If you're a little too exuberant or rock the printer, clouds of toner may also fill the inside of the machine.

Setting up the TurboLaser/PS and the Personal Pageprinter is particularly irksome. The drawer that holds the TurboLaser/PS's OPC cartridge can easily leave its track, damaging the unit. And in the why-did-they-do-that category, IBM pulls the controller circuitry out of the printer and puts it on an expansion board you must install in your computer. This approach also compels you to download the PostScript interpreter and fonts to the controller's memory every time you turn on the computer. This is one printer newcomers shouldn't tackle.

Once these printers are set up, making the PC connection simply involves hooking the appropriate cable to each device's parallel port.

Looking Like LaserJets

As with hard disks, a PostScript printer's personality and performance are largely determined by its controller circuitry. A PostScript controller is essentially a sophisticated dedicated computer, complete with a Motorola 68000 microprocessor (which converts application-generated PostScript code into a page image); 1.5MB or more of RAM (for page images and fonts); and ROM chips holding the PostScript interpreter, typefaces, and printer emulations written by the manufacturer. As you might expect, the faster the processor (and to a lesser extent, the more RAM), the faster the printer—something to keep in mind when you're evaluating printers using the same engine but different controllers.

If you plan on running something besides *PageMaker* or *Ventura*, make sure the printer in question offers emulations your programs support. HP LaserJet Plus emulation is standard on the NEC Silentwriter LC890, the QMS-PS 810, and the Qume Scripten; AST TurboLaser/PS owners must purchase an HP-emulation board for $695.

The LaserJet simulations built into the three printers are surprisingly complete, including all Times Roman, Helvetica, and Courier cartridge fonts in all sizes; the LaserJet's internal Courier font; and all HP and compatible third-party downloadable fonts. The masquerade isn't perfect—font widths aren't identical, so a document produced on a LaserJet and on one of these printers will look slightly different. (Purists take note: The Silentwriter LC890, QMS-PS 810, and Scripten accept HP-compatible downloadable fonts.) In NSTL HP-emulation tests, the LC890 and Scripten played the LaserJet role flawlessly. The QMS-PS 810, however, sometimes printed text in the wrong font, inserted nonsense characters, or failed to print text at all.

IBM, which should know better, offers only IBM Proprinter XL emulation with the Pageprinter. Older programs such as *dBASE* and *WordStar* hit the market before the Proprinter appeared—so check your inventory before buying.

Output Up Close

People buy PostScript printers for one reason—to look good on paper. Looking good—producing razor-sharp text, graphics, and other images—is largely a function of the print engine's ability to precisely position tiny particles of toner on paper and fuse them in place. Although the controllers in the reviewed units can resolve images at 300 dpi, not every engine can maintain that level.

NSTL used the *PS BenchMark* PostScript printer test program to gauge each unit's ability to reproduce 32 shades of gray and lines 1 pixel wide. If a printer can lay down such fine lines unerringly, it will undoubtedly reproduce details in drawings made with drafting programs such as *AutoCAD*. As part of the evaluation, text was also printed out and compared. If a printer's fine lines are inconsistent, clarity suffers, and misshapen serifs on letterforms make text harder to read. The gray-scale test verifies an engine's knack for accurately reproducing scanned images, especially photographs. If the shades at either end of the scale blend together, the printer isn't printing all 32 levels of gray—and for that reason dark areas in scanned pictures will be muddy and highlights washed out.

The test results may surprise you: The all-around winner is the IBM Pageprinter. Step out of the winner's circle, however, and the jostling begins. In the fine-lines test, the Qume Scripten and the AST TurboLaser/PS come in a close second, followed more distantly by the QMS-PS 810 and the NEC Silentwriter LC890.

The silver medal for text output goes to the QMS, which printed crisp, evenly black characters. The NEC Silentwriter LC890, which formed some rough-edged letters, takes the bronze, followed by the Scripten, which printed jagged diagonals and sometimes filled in letters. Bringing up the rear is the TurboLaser/PS, which produced smeared, shadowy type.

The results of the gray-scale contest fall along similar lines. The QMS-PS 810 equaled the Pageprinter in differentiating all 32 shades of gray. The rest of the crowd tended to print near-black shades as black. And dead last, once again, is the TurboLaser/PS, which was uneven at both ends of the gray-scale spectrum.

Speed Limits

Desktop publishers know the value of patience, for printing is a waiting game—especially with PostScript printers. If you know what factors to consider, however, you can pick a PostScript printer with some oomph. Print engine speed doesn't make much difference, as long as it's in the range of 3 to 4 pages per minute. But a controller with a swift 68000 can easily shave minutes off print time. Thus it's no surprise that the QMS-PS 810, with its 16-MHz 68000, beats all comers at printing any kind of page.

EXECUTIVE SUMMARY

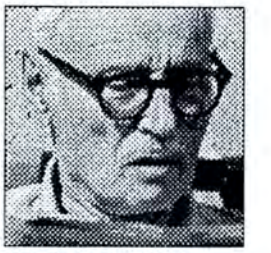
NEC Silentwriter LC890

PostScript laser printer

BEST BUY

The LC890 is the price/performance/reliability winner. The NEC LED engine is rugged, and the no-holds-barred warranty, dual paper bins, and a convenient LCD front panel set the printer apart. Two faults: The LC890 chokes on envelopes, and the type suffers from "jaggies."

	EXCELLENT	GOOD	FAIR	POOR
Configuration	●			
Paper handling		●		
Emulations	●			
Text quality			●	
Graphics quality			●	
Speed		●		
Overall value	●			



NEC Silentwriter LC890

AST TurboLaser/PS

Qume Scripten

IBM Personal Pageprinter

QMS-PS 810

The QMS-PS 810 and the IBM Pageprinter were tops at printing the 32 levels of gray required for scanned images.

The PostScript Pack: AST TurboLaser/PS (upper left), Qume Scripten (upper right), IBM Personal Pageprinter (lower left), and QMS-PS 810 (lower right).

Printer memory is also critical because of the way PostScript handles fonts. When a page requires a font, the printer creates a bit map of each character and stores it in RAM. This technique, known as font caching, explains why PostScript printers produce second and subsequent pages faster than a first page: The fonts you used the first time around are already waiting in RAM. If memory is limited, some bit maps are purged to make room for new ones. With less restricted memory, fewer fonts are bumped, and fewer need to be recreated.

Available RAM also dictates the number of downloadable fonts that can be accommodated and the size of the printed page. Because PostScript always dedicates about 1.25MB for the page image and its fonts, the more memory the printer has, the better.

PRINTERS LAID BARE

NEC Silentwriter LC890

If any machine can fill the dual role of general office printer and desktop publishing tool, it's the LC890. LaserJet and Diablo 630 emulations are solid, image reproduction is surefooted, and engine life is a whopping 600,000 pages. Such specs are all the more impressive when you consider that the LC890 doesn't rely on a laser but rather on an array of light-emitting diodes (LEDs).

Perhaps because NEC designed the engine itself, the LC890's warranty is the best of the bunch—one year parts and labor and free on-site service during the first 90 days (within 50 miles of an NEC service center). Budget-conscious users will also appreciate the LC890's estimated cost: 3 cents per page. Though the printer looks downright homely, you'll grow to love its liquid crystal display front panel and dual paper bins. The LCD not only displays status messages but also serves as a window into a multilevel menu system for selecting parallel and serial printer ports, paper trays, printer emulations, and so on. To switch to LaserJet Plus emulation, for example, you press the panel's Menu, Next, and Select buttons in sequence and then cycle through the choices until 'LaserJet' appears. Press Select, and the emulation is active—no muss, no fuss, and no software commands. You can also print out a page listing the PostScript version, available fonts, number of pages printed to date, and current printer emulation. The Silentwriter manual guides you step-by-step through installation and clearly details how to use the LCD front panel. Users, however, may be confused by references to a technical manual that isn't included with the printer.

The LC890's dual paper trays can accommodate both letter- and legal-size sheets. Look between the trays, and you'll find a manual feeder that the printer activates as soon as paper is entered. In short, the LC890's paper handling is superior on all counts but one—the test printer choked on envelopes.

AST TurboLaser/PS

The AST TurboLaser/PS is built for heavy use and has an estimated engine life of 600,000 pages. It's also one of the fastest printers in the group, but as NSTL's tests show, its output is nothing to brag about. Other limitations abound: The printer is restricted to letter-size paper, lacks a manual feed tray, and can't handle envelopes. The only external control is a switch on the back of the unit that selects a serial, parallel, or AppleTalk port.

Front panel lights indicate low toner level, paper jams, empty paper trays, and the like. Every time you turn on the printer, it spits out a page listing resident fonts, the version of PostScript, the hardware interface in use, and the current printer emulation. Of all the printers reviewed here, the AST has the best manual. It's well designed, comprehensive, and copiously illustrated. AST sells a LaserJet/Diablo emulation board for $695. For another $995 you can add 1.5MB of memory and Epson, HPGL, and Lasergraphics language emulation.

EXECUTIVE SUMMARY

AST TurboLaser/PS

PostScript laser printer

AST erred in using the Ricoh 4081 engine for a PostScript printer. Toner splatter makes for messy type and graphics output. Offering HP LaserJet Plus emulation as an expensive upgrade adds up to another minus. The product's documentation is the best of the lot, however.

	EXCELLENT	GOOD	FAIR	POOR
Configuration				●
Paper handling				●
Emulations (n/a)				
Text quality				●
Graphics quality				●
Speed	●			
Overall value			●	

EXECUTIVE SUMMARY

Qume Scripten

PostScript laser printer

No single attribute warrants acclaim or infamy. The Qume Scripten is fast and functional, but text quality is mediocre. One glaring oversight: There is no light to indicate whether data is being received.

	EXCELLENT	GOOD	FAIR	POOR
Configuration			●	
Paper handling		●		
Emulations		●		
Text quality			●	
Graphics quality		●		
Speed		●		
Overall value		●		

Qume Scripten

The Scripten's massive Hitachi engine makes it the largest and heaviest printer reviewed. Its life expectancy is also half that of the NEC and AST printers. In addition to its separate imaging units and toner cartridge, the Qume requires a third component, a developer cartridge.

The Scripten's image quality and speed are adequate. Its print is very consistent from page to page, with none of the intermittent ghosting, streaking, and fade-out that occasionally mar pages produced by the other printers. Unfortunately, the Scripten also consistently muddies type. For example, the letter *e* in 9-point Courier Bold is always filled in.

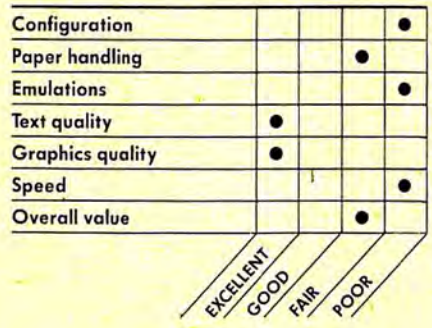
The Scripten does offer a smattering of conveniences and two user manuals—a guide to operations and a PostScript supplement. The documentation is exceptionally clear but has one hitch: The operations guide says that the Scripten doesn't emulate the LaserJet Plus, while the sup-

EXECUTIVE SUMMARY

IBM Personal Pageprinter

PostScript laser printer

Instead of delivering on PostScript's promises of convenience and versatility, IBM serves up inconvenience and delays. The controller's placement on a PC expansion board requires a host of device drivers and utilities. This aggravation is all the more galling because the printer produces excellent text and graphics.



plement correctly states that it does. There's a manual-feed tray triggered by a front panel button, a formfeed button for ejecting pages when a LaserJet program fails to issue an end-of-page message, a print density knob, an interface selection switch in the back, and a self-test button that issues a page noting printer port, available emulations, and resident fonts. The Scripten prints letter- and legal-size paper, but not envelopes. One notable omission is an indicator light to show that the printer is receiving or processing data. Since some PostScript files can take half an hour to print, users might easily wait that long only to discover the printer isn't working.

IBM Personal Pageprinter

The Pageprinter is a double-edged sword. As NSTL's tests show, it produces top-notch text and graphics; but installing and using the Pageprinter is too complicated for novices or even intermediate users.

Prospective buyers should also consider the printer's potential staying power. The Pageprinter's 6-ppm Ricoh engine is small, light, and rated at 180,000 pages. Curiously, the printer fails to provide HP LaserJet Plus emulation, and it's the only unit reviewed that lacks both serial and AppleTalk interfaces.

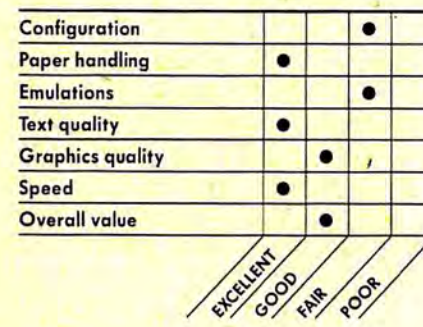
IBM's bus-based controller certainly complicates everyday operations. Every time you turn your computer on, you must run a utility that copies the PostScript interpreter and the desired fonts into the controller's RAM. You must also run a separate font-caching utility if you hope to achieve acceptable performance. IBM has spread the Pageprinter documentation across three manuals, each of which is well written and very detailed. However, flipping back and forth to find information doesn't help in learning to use this already complex printer. The Pageprinter clearly isn't for those who are new to PostScript, who use Macintoshes, who need a rugged office printer, or who are simply in a rush. Question is, who is the Pageprinter for?

EXECUTIVE SUMMARY

QMS-PS 810

PostScript laser printer

The QMS-PS 810 is the speedster in the group and the second most expensive. Output is crisp and clean. However, QMS didn't deliver all the goods: LaserJet Plus emulation is faulty, controls are hard to use, paper capacity is paltry, and the 1MB memory upgrade is costly.



QMS-PS 810

The QMS-PS 810 is a superior product that seems to have left the drawing board a little early. It's the fastest printer in the group and its output is superb, but LaserJet emulation is wobbly—and that calls into question its reliability as a general office printer. The QMS-PS 810 is a snap to set up and comes with a full complement of printer interfaces and three emulations. Yet front panel controls are missing, and status lights indicate only whether the printer is running, out of paper, or jammed.

There's nothing flashy about the QMS-PS 810 manual, but the appendix details the differences between the printer's HP LaserJet Plus emulation and genuine HP fonts. The manual also contains sample PostScript programs that you can download to the PC to, for example, print error messages for help in pinpointing malfunctions during a print job.

The QMS-PS 810 prints letter- and legal-size paper and handles envelopes better than any other printer tested. A manual paper-feed tray is conveniently located at the front of the printer. Users will find output disappointing for the first 500 pages, but after that text and graphics output become comparable to the Pageprinter's.

PostScript Picks

Which PostScript printer you should buy depends on what you're willing to live with—and without. At this point, the QMS-PS 810 is the top recommendation for desktop publishers who are concerned mostly about speed and sharp output with PostScript-based packages. It doesn't, however, deserve a spot in most offices until complete LaserJet compatibility is assured and a set of user-friendly controls makes its way to the front panel.

Until that happens, the NEC Silentwriter LC890 is the leader of this pack. It's not a glamorous machine—just a solid, easy-to-use printer that's fast, durable, and competent. Just as important, the LC890's excellent HP emulation will enable users to take advantage of PostScript without sacrificing their existing applications. And in a market where users must still contend with too many standards, that's the name of the game. ●

Daniel Miles Kehoe is a product manager at The Printer Works, a laser printer retailer in Hayward, California. His PS BenchMark *program and* PostScript Buyers Report *are distributed by Peachpit Press, Berkeley, California.*

WHERE TO BUY

AST TurboLaser/PS
AST Research
2121 Alton Ave.
Irvine, CA 92714
714/863-1333
List price: $4595, toner $96 (5000-page duty cycle), OPC $180 (10,000-page duty cycle)
Accessories: HP LaserJet emulation and Diablo 630 emulation board $695; 512K memory upgrade $395; 1.5MB memory upgrade, Epson and HPGL emulation, Lasergraphics language $995

IBM Personal Pageprinter
IBM
Information Systems Group
900 King St.
Rye Brook, NY 10573
201/358-5689
List price: $4999, toner $29 (1500-page duty cycle), OPC $199 (20,000-page duty cycle)

NEC Silentwriter LC890
NEC Information Systems
1414 Massachusetts Ave.
Boxborough, MA 01719
617/264-8000
List price: $4795, toner $20 (3000-page duty cycle), OPC $110 (7000-page duty cycle)

QMS-PS 810
QMS Inc.
P.O. Box 81250
Mobile, AL 36689
205/633-4300
List price: $5495, toner cartridge $130 (4000-page duty cycle)

Qume Scripten
Qume Corp.
2350 Qume Dr.
San Jose, CA 95131
800/223-2479
List price: $5595, toner $80 (5000-page duty cycle), OPC $475 (30,000-page duty cycle), developer $550 (50,000-page duty cycle)

For more information, see Products Featured in This Issue.

Imaging Becomes Electric

What's desktop publishing without high-quality graphics? Image scanners from Datacopy, Dest, Hewlett-Packard, Microtek, and Advanced Vision Research offer different approaches to putting pictures on line.

Richard Jantz

For desktop publishers allergic to cutting and pasting, the only way to integrate hard copy art with text is by using an image scanner. These increasingly affordable input devices devour photos, drawings, diagrams, and any other hard copy; then—with the aid of accompanying software—they generate 300-dot-per-inch (dpi) image files that you can drop into a page layout program or send directly to a laser printer.

This review evaluates five leading low-cost scanners: the Datacopy Model 730, the Dest PC Scan 2020, the Hewlett-Packard ScanJet, the Microtek MSF-300C, and the Advanced Vision Research (AVR) MegaScan II. In all cases, software plays a key role in performance—from determining the quality of scanned images and the way you edit those images to supporting file formats readable by such programs as *PageMaker* and *Ventura Publisher*.

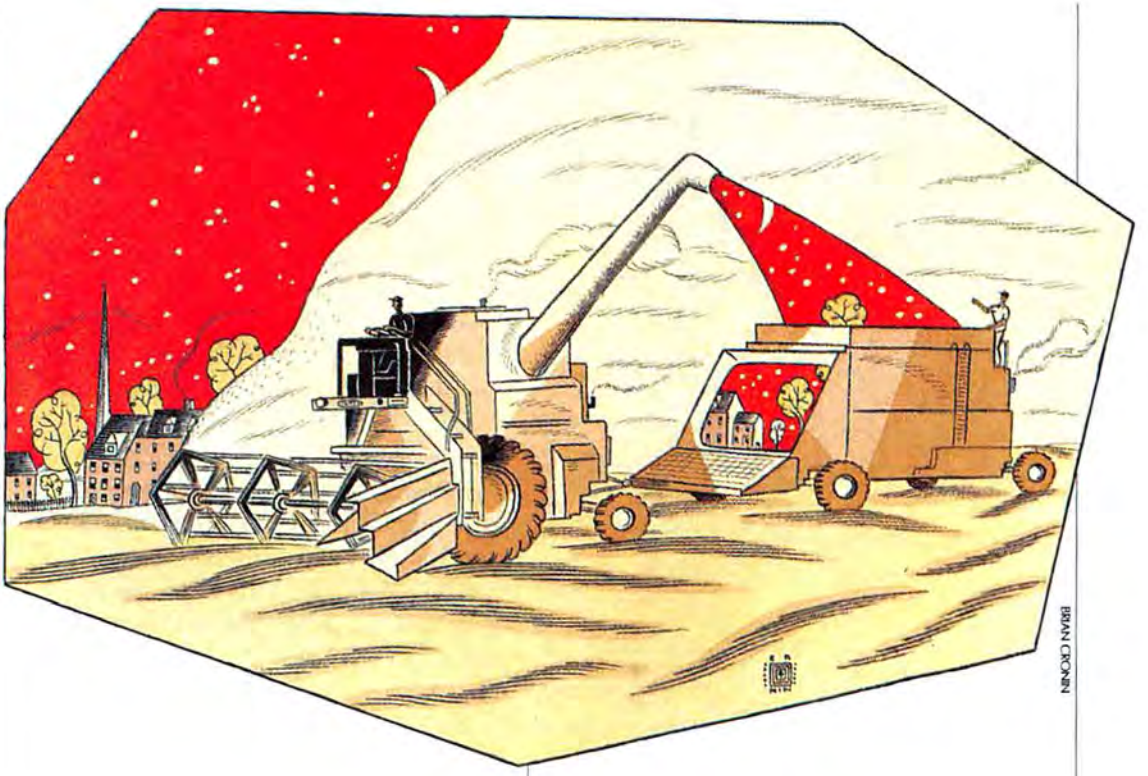
The Graying of Desktop Scanners

With black-and-white line art, such as a logo or drawing, all five scanners produce fine results. However, the quality of scanned photos and other continuous-tone images is another story.

In the printing industry, a photo is converted into a *halftone* by rephotographing the image through a fine screen that creates different densities of black-and-white dots, which we perceive as gray. A scanner's job is to emulate this process. Until recently, most desktop scanners could create halftones only by *dithering*—grouping equal-size dots in cells and then arranging the cells in different patterns to simulate gray.

But with the emergence of *gray-scale* scanner systems—which capture and manipulate multiple bits of data, or levels of gray, for each dot—a PC-generated halftone can be as striking as a camera halftone. When a gray scale and a dithered halftone are printed on a 300-dpi laser printer, the difference isn't that great, but with a high-resolution typesetter, such as a PostScript-compatible Linotronic at 1270 or 2540 dpi, there's no comparison. Some gray-scale images look so good it's impossible to tell them from a camera halftone without a magnifying glass.

Gray scaling is a function of both hardware and software. For instance, the Datacopy Model 730 hardware supports gray scaling, but its software cannot produce gray-scale image files. Conversely, neither the Microtek MSF-300C nor the MegaScan II can benefit from gray-scal-



BRIAN CRONIN

ing software, because they both lack gray-scaling hardware. Of the scanners reviewed here, only the Dest PC Scan 2020 and the Hewlett-Packard ScanJet can produce gray-scale image files right out of the box.

In addition to having superior quality, gray-scale images can be resized without worry, whereas dithered images often produce messy interference patterns when enlarged or reduced. But gray scaling also has its share of minuses. It requires at least AT-class processing power and about 4MB of storage for each full-page, 300-dpi, 16-shade image, and the final image must be printed on a typesetter to make the process worthwhile. Moreover, although most scanning software can compress image files to save disk space, gray-scale files—which are much larger—can't be compressed. Clearly, gray scaling isn't for everyone, especially those who use scanners primarily for line art and don't mind the lack of tonal quality or the computerized look of an occasional dithered photo.

Scanning the Field

The most obvious distinction between scanners is basic physical design. Most scanners are either flatbed or paper fed. A flatbed scanner resembles a small photocopier; the hard copy image lies flat while the scanner's photo mechanism moves back and forth underneath. With paper-fed scanners, a pair of rollers pulls the page over the unit's stationary scanning mechanism.

FEATURES EVALUATION

Leading Scanners Compared

Gray-scaling capabilities are key to high-resolution image quality

● Yes
○ No
◒ Deficient

	Datacopy Model 730	Dest PC Scan 2020	HP ScanJet	Microtek MSF-300C	AVR MegaScan
Scanning options					
Gray scaling	◒ [1]	● [2]	● [3]	○	○
Resolution (dpi)					
300	●	●	●	●	●
200	●	●	○	●	○
150	●	○	●	●	○
Other	●	●	●	●	○
Dithering patterns	3	4	3	2	3
Contrast/brightness settings	3/1	1/63	3/1	3/5	4/1
Image editing					
Cut, copy, paste	●	◒	●	●	●
Invert, Flip, Rotate	◒	○	◒	●	●
Undo command	●	○	○	●	○
Views (enlarged or reduced)	5	3	3	8	6
Pixel editing	●	○ [4]	○ [4]	●	●
Drawing tools	○	○	○	●	●
File compatibility					
TIFF	●	●	●	●	●
.PCX	●	●	●	●	●
EPSF	○	●	○	○	○
GEM	○	○	●	○	●

[1] 16 levels of gray, supported in hardware only.
[2] Offers 256 levels of gray.
[3] Offers 16 levels of gray.
[4] Pixel editing is only available with the bundled PC Paintbrush Plus.

While paper-fed models are generally cheaper and more durable, flatbeds excel at scanning images from bound volumes and oversize originals. With flatbeds it's also much easier to adjust the original image to correct alignment problems. With the exception of the Dest PC Scan 2020, all the scanners reviewed here are flatbeds.

Each system tested comes with an interface board and cable. Depending on your system setup, you may have to reconfigure the board for a different interrupt, DMA channel, or I/O port address using either jumpers or DIP switches. Happily, the boards' default settings worked flawlessly in all cases with the IBM AT used for testing.

Each package comes with a batch installation file that automatically copies the scanning software to your hard disk. Most of these installation programs also conveniently add any required statements regarding devices, paths, and buffers to your computer's CONFIG.SYS and AUTOEXEC.BAT files. Four of the scanner programs run under *Microsoft Windows*, and all but one include run-time versions of *Windows*.

But a scanner's most important software feature may be the assortment of file formats it supports. While virtually any scanning program can send an image file directly to the printer, the ability to transfer the file to a page layout program is paramount. Two image file formats are de facto industry standards: the tagged image file format (TIFF), which is compatible with *PageMaker;* and *PC Paintbrush*'s .PCX format, which is compatible with both *PageMaker* and *Ventura Publisher.* Both of these formats support (but are not restricted to) gray scaling; all the scanners reviewed can produce files in either TIFF or .PCX format.

Aside from merely cranking out image files, nearly all scanner software enables you to edit images. Software functionality varies widely, from crude cleanup capabilities to feature sets as robust as those of any paint program. Most packages also

enable you to reduce scanning resolution from the maximum of 300 dpi to 150 dpi or less—a must for quick-and-dirty jobs where you need to save time and disk space.

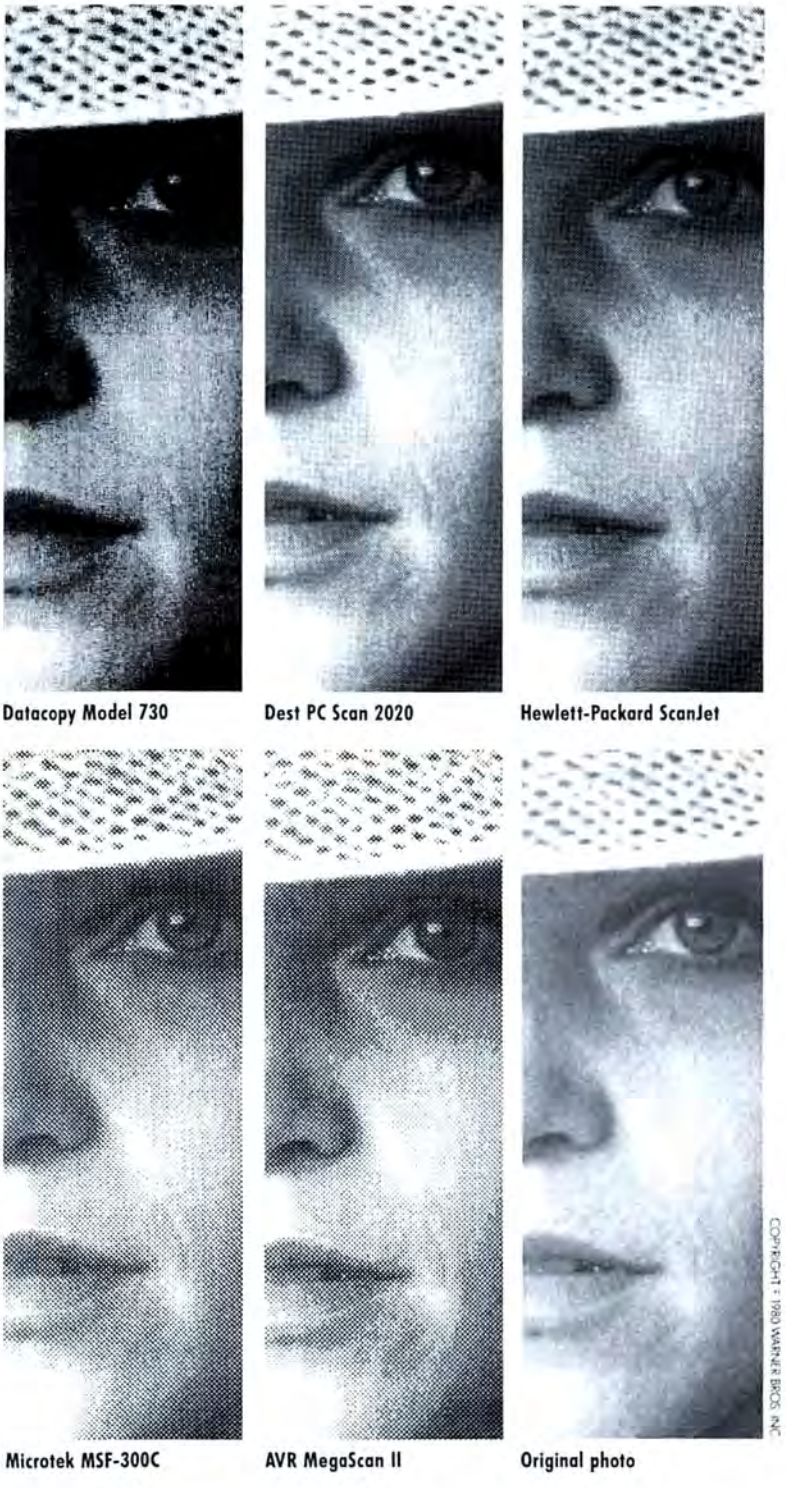
At the bottom of the list of scanner buying concerns is speed. Even though scanner speed varied widely in our tests (see **FIGURE 1**), resign yourself to the fact that scanning is time-consuming, and that gray scaling—one of the most desirable features—will probably multiply the time involved by a factor of 4.

Datacopy Model 730

The $2495 Datacopy Model 730 is a scanner in transition. Although the hardware has the potential to capture up to 16 gray levels, Datacopy's scanning software isn't yet up to the task, and its image-editing capabilities are second-rate. Fortunately, Datacopy includes a copy of *PC Paintbrush Plus*, which you can use in place of the company's lackluster software.

The Datacopy Model 730's scanning software, PC Image, has only three pull-down menus and a modicum of features. The program provides three contrast settings and a choice of 300-, 240-, 200-, or 150-dpi resolution. Other commonplace features include the ability to invert an image (positive to negative), mirror an image (flop it horizontally), and scan part of a page (with a scalable window). Only two dithering options are offered. Unlike the other *Windows*-based scanners reviewed, the Datacopy doesn't come with a run-time version of *Windows*.

After scanning, you can use the Datacopy's software to display the image in several views and zoom in by a power of 4 to 8 to edit the image at the pixel level. However, you're better off using the popular and versatile *PC Paintbrush Plus*. It includes a device driver for the Model 730 scanner (which means you can use the program also to control scanning), along with a full complement of editing tools. Best of all, by the time you read this, Datacopy Corporation will probably be bundling the latest version (1.50) of *PC Paintbrush Plus* with the Model 730,



These five scanned images were printed on a 1270-dpi Linotronic (the original photo is at the bottom right). Note the superior quality of the images produced by the only two gray-scaling scanners in the roundup, the Hewlett-Packard ScanJet and the Dest PC Scan 2020. Output from the remaining scanners was produced with the best dithering pattern offered by each scanner's native software.

STAN MUSILEK

The Datacopy 730 boasts a big price and 16 gray scales but has second-rate software.

which should enable you to create gray-scale halftones with the unit.

Although *PC Paintbrush Plus* supports only the .PCX file format, PC Image offers .PCX plus TIFF and Datacopy's own image format, which is supported by *PageMaker*. File compression is available only in Datacopy's native format.

For the gray-scale market, Datacopy intends to introduce two new systems. The $3395 Model 830, which will read 64 levels of gray, and the $5495 Model 840, which will handle 256 levels, may already be available by the time you read this. In the meantime, the appeal of the rather pricey Datacopy Model 730 is limited to those content with line art and dithered halftones.

Dest PC Scan 2020

It's hard to find a more persuasive argument for using a scanner than the superior image quality offered by the new sheet-fed Dest PC Scan 2020. Able to record 8 bits of data per pixel for a total of 256 levels of gray, the $2885 PC Scan 2020 is by far the most powerful gray-scale system reviewed.

Publish Pac, Dest's image processing software, provides an intuitive, *Windows*-based user interface. You can choose one of four dithering patterns in addition to gray scaling. *Publish Pac* automatically adjusts the contrast, but you can override it with one of three manual settings.

A quick preview mode is useful for selecting the precise scanning area. You can scan at 75, 150, or 300 dpi and even create custom resolutions. And unlike the other systems tested, the Dest unit has optical character recognition (OCR) built into both software and hardware—an outstanding value.

Understandably, scanning at 256 levels of gray takes longer than scanning at 16 levels; *printing* a large gray-scale image can take as long as reading the Sunday *New York Times*. But the biggest concern is managing the system's voracious appetite for memory. For example, because *Publish Pac* needs 8.4MB of storage space to create a temporary file for a full-page, 300-dpi, 256-shade image—and another 8.4MB to save it—you need a whopping 16.8MB of free space just to get in the door.

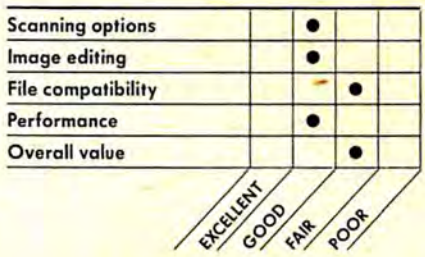
After scanning an image, you can use *Publish Pac*'s editing capabilities to cut,

EXECUTIVE SUMMARY

Datacopy Model 730

Desktop scanner

Datacopy's Model 730 reads 16 gray levels, but the unit's image processing software lacks gray-scale functions. Tapping this flatbed scanner's real power requires PC Paintbrush Plus 1.50 (an earlier, non-gray-scale version of this package was included with the unit tested). Considering its high price and modicum of features, this scanner is the least attractive of those tested.



copy, paste, clear, and crop the image and zoom in up to eight times to display detailed views. Like its Datacopy counterpart, the Dest package includes a copy of *PC Paintbrush Plus*. In addition to the .PCX format, you can choose TIFF; Dest's proprietary image format; or Encapsulated PostScript Format (EPSF), an increasingly popular standard that enables you to send files directly to any PostScript device. Handily, *Publish Pac* lets you save images in different file formats and convert them from one format to another.

For all of its strengths, however, the PC Scan 2020 suffers from a major weakness: its physical design. Because it's a small sheet-fed model, you can't scan bound volumes, oversize originals, or delicate artwork. Worse still, the input tray accepts 8½-by-11-inch paper only in portrait position, so you can't scan common 8-by-10 photos in landscape orientation. Although you can try to rotate the image 90 degrees in another program, such as *Publisher's Paintbrush*, desktop publishers might be wise to wait until Dest releases a flatbed version of this otherwise superb system.

EXECUTIVE SUMMARY

Dest PC Scan 2020

Desktop scanner

The most powerful gray-scale scanner reviewed, Dest's PC Scan 2020 recognizes 256 gray levels. The image processing software features OCR capability, and PC Paintbrush Plus is included for extensive image editing. Aside from disk-hungry images and high price, the unit's biggest drawback is its paper-fed design, which prohibits scanning books or large materials.

	EXCELLENT	GOOD	FAIR	POOR
Scanning options	●			
Image editing		●		
File compatibility		●		
Performance	●			
Overall value	●			

STAN MUSILEK

Dest's scanner offers sharp images, 256 gray scales, and Windows-based software.

Hewlett-Packard ScanJet

At $1990, the Hewlett-Packard ScanJet is the least expensive unit in this roundup, yet it fully supports 16 levels of gray. Bundled with this unit is Hewlett-Packard's *Windows*-based image processing software, Scanning Gallery; an excellent user guide; and a handy test program that verifies whether the board and scanner are correctly installed.

Scanning Gallery uses two windows: one for scanning and one for editing. The scanner window lets you save images in different file formats, convert images from one format to another, and change scanner settings. Each time you scan an image, you can choose a preview scan or a final scan. With either mode, you can pick one of three intensities, decide whether or not you want gray scaling, and invert the image to make it camera ready for a photo negative.

The final scan mode lets you pick from resolutions of 75, 150, or 300 dpi. As with the Dest PC Scan 2020, you can select a custom resolution and even choose separate horizontal and vertical resolutions. For the best image quality, the resolution should match that of your printer.

In addition to gray scaling, the ScanJet offers four dithering patterns. The user

STAN MUSEK

HP's scanner bargain: superb halftones, great image software, and a hot price

guide takes pains to explain the advantages and disadvantages of each option and provides instructions on how to handle scanned images with *PageMaker*, *Ventura Publisher*, and other applications.

But the real joy is the software's easy-to-use preview mode. In this mode, the ScanJet scans very quickly and displays a scaled-down likeness of the image in the scanning window. Selecting only a portion of this image for the final scan is fast and trouble free.

Scanning Gallery's editing window offers cut, copy, paste, clear, crop, and undo features; unfortunately, you can't edit on the pixel level. When printing gray-scale images, you can opt for a fast but rough draft version.

In addition to offering TIFF and .PCX formats, Scanning Gallery offers the *Ventura*-compatible GEM format as well as the .MSP format used by *Windows Paint*. As an added convenience for *PC Paintbrush* users, you can save .PCX images in one of three formats: black and white, 4 shades of gray, or 16 shades of gray.

When printed on a Linotronic typesetter at 1270 dpi, a ScanJet gray-scale halftone was quite impressive. On a PostScript-based LaserWriter Plus, tests of the scanner's dithered halftones produced some of the best results in the roundup. If your publications demand quality halftones at a bargain price, the HP ScanJet is the scanner system to beat.

Microtek MSF-300C

Except for its lack of gray-scale capabilities, the $1995 Microtek MSF-300C is the most fully functional scanner system reviewed. What puts this system at the head of the class is Microtek's highly regarded image processing software, EyeStar Plus, which offers an abundance of scanning and editing features.

Like Scanning Gallery, the *Windows*-based EyeStar Plus centers on two windows—but with different contents than Gallery's. The Normal View window shows the scanned image at full resolution, while the Reduced View overlays the first with a full-page version of the image. Each of these windows contains a tool palette and a menu bar chock-full of options. The Reduced View window lets you control the scanner and its attributes, save and load scanned images, magnify a fixed area for viewing, create a text file to add

EXECUTIVE SUMMARY

Hewlett-Packard ScanJet

Desktop scanner

With Hewlett-Packard's ScanJet, you can create halftones with 16 levels of gray. The Linotronic gray-scale halftones stand as the best-looking images produced by any of the five scanners. If you don't need gray-scale images, the flatbed ScanJet also produces excellent dithered halftones and line art. Well-documented software rounds out this bargain-priced system.

	EXCELLENT	GOOD	FAIR	POOR
Scanning options	●			
Image editing		●		
File compatibility	●			
Performance	●			
Overall value	●			

to an image, and perform basic image editing functions like cut, copy, paste, invert, undo, and so on.

The Microtek MSF-300C offers only two scanning modes: line art and halftones. But the control that EyeStar Plus gives you over the light and dark areas of the image is truly impressive. When you scan a photo, you can choose from three contrast settings, five brightness intensities, eight dithering patterns, and seven scaling options. Fortunately, the EyeStar Plus user guide amply illustrates the different combinations of attributes.

The Normal View window's capabilities are similar to those of *Windows Paint*. In fact, the painting and drawing tools are so complete, a separate paint program would be redundant. You can even display different reductions of a scanned image in yet a third window and select one of five views in either line art or halftone mode.

Images scanned with the MSF-300C scanner can have a resolution of 75 to 300 dpi (with five levels in between) and can be saved in four file formats: TIFF, .MSP, .PCX, and .IMG—EyeStar Plus's native format. File compression is available for .PCX and .IMG formats.

STAN MUSILEK

Microtek's scanner has first-rate editing features, but no true gray scaling.

The MSF-300C's outstanding editing features establish it as a solid entry. Of course, lack of true gray-scale capabilities make it history as far as the latest high-quality systems are concerned. But if you're willing to pay the price, don't fret: Microtek's new MSF-300G is a 256-gray-level flatbed scanner that should be available for under $4000 by the time you read this.

AVR MegaScan II

The AVR MegaScan II is well suited to desktop publishers who use *Ventura Publisher*, *GEM Publisher*, and *The Office Publisher*, because AVR's image processing software, MegaScan, runs under the GEM environment. Although the MegaScan II lacks gray-scaling capability, it provides an impressive range of scanning and processing effects for both line art and photos. The scanner's biggest drawback is its fixed resolution of 300 dpi—a nuisance if you want to create many full-page images but lack storage space.

Like EyeStar Plus's, MegaScan's editing functions resemble those of a paint program, though EyeStar has a slight

EXECUTIVE SUMMARY

Microtek MSF-300C

Desktop scanner

Microtek's reputation for first-class scanner systems is borne out by this well-engineered flatbed scanner, which includes excellent image-processing and editing software. Though it's not a gray-scale image scanner, you won't find a richer assortment of adjustments and controls for line art and dithered halftones than this versatile system offers.

	EXCELLENT	GOOD	FAIR	POOR
Scanning options	●			
Image editing		●		
File compatibility	●			
Performance	●			
Overall value	●			

STAN MUSILEK

AVR's Ventura-oriented scanner—nifty effects marred by a fixed 300-dpi resolution

edge. You can scan 8.5-by-11.7-inch originals and then use the program's editing tools to erase, reverse, mirror, move, copy, and scale the images. The width of drawing tools can be adjusted from 1 to 99 pixels.

One of the program's most interesting components is MegaWrite, a text editor that enables you to create text files of up to 30K and place them next to a scanned image. You can also import and position small ASCII text files. Another appealing feature is the ability to place MegaScan's embedded codes in a text file to create rules, boxes, and other graphics for enhancing text.

Best of all are the options you use to retouch scanned photos and line art. You can scale, lighten, darken, reverse, posterize, and otherwise enhance images; an exotic outline option eliminates details, leaving a skeletal image of all major shapes. For even more variety, you can apply the line art effects to photos, and vice versa. MegaScan uses file compression and saves scanned images in GEM, TIFF, and .PCX formats, as well as in its own proprietary format.

MegaScan includes a two-disk supplement that actually rewrites *Ventura Publisher*, enabling you to run the scanner from inside this popular publishing package. MegaScan adds an AVR scan option to *Ventura*'s Desk menu and provides dialog boxes that control the scan and save the file. Obviously, this approach has an edge in turnkey operations.

At $2695, the MegaScan II package is the most expensive non-gray-scale unit reviewed. One reason for this price is the MegaBuffer, an interface board that holds 1.3MB of RAM. Unlike most scanner systems, which store images on a hard disk as they're scanned, MegaScan stores a full-page, 300-dpi image on its interface card, hastening the initial scanning process. Moreover, with an optional ($495) adapter from AVR, you can use MegaBuffer like a JLaser card and send files directly to Canon-based laser printers.

In addition to the MegaScan and MegaWrite, you get MegaDisk (a RAM disk utility for MegaBuffer) and MegaFreeze (a snapshot utility that captures screen images for MegaScan). Be prepared to make room for this full-function system on your hard disk—the software requires as much as 1.5MB.

EXECUTIVE SUMMARY

AVR MegaScan II

Desktop scanner

The Megascan II is an excellent flatbed scanner system for 300-dpi line art and dithered halftones. It's a natural for Ventura Publisher users, who can run the scanner from within this popular package with the aid of a special patch program. The scanner's interface board has 1.3MB of RAM for holding scanned images, but you can also use this RAM to expand the memory of Canon-based laser printers.

	EXCELLENT	GOOD	FAIR	POOR
Scanning options		●		
Image editing	●			
File compatibility	●			
Performance		●		
Overall value		●		

Although a bit pricey, the MegaScan II's editing features and various extras make it an excellent scanner system for line art and dithered images. If your documents don't require gray-scaled images and you use *Ventura*, this substantial system deserves serious consideration.

The Scanners Are Coming

The ability to produce a commercial-looking halftone with a PC-based system should be especially exciting for desktop publishers who currently use—or are thinking of moving up to—professional typesetting services. Thanks to the gray-scale units reviewed here, scheduling time on a Linotronic may soon rival buying tickets to *The Phantom of the Opera*.

With 256 levels of gray, solid editing software, and built-in OCR capability, the Dest PC Scan 2020 is clearly the most powerful gray-scale scanner in this roundup. Nonetheless, if an entrée into gray-scale scanning is your main concern, several factors make the HP ScanJet the best buy—beginning with a price $900 cheaper than the Dest and a flatbed, rather than paper-fed, design. Moreover, even with Linotronic output you'll have trouble distinguishing 256 gray levels, especially in the darker range. Though limited to 16 gray levels, the ScanJet produces fine results on a typesetter and requires less space and less time to process a gray-scale halftone image.

If you use *PageMaker* and don't need gray scaling, and if creative control over the image is paramount, consider the *Windows*-based Microtek MSF-300C. *Ventura* users should investigate the AVR MegaScan II for its tight integration with the GEM environment and editing features that are almost as complete as those of the MSF-300C. Even with the MegaScan II's monster buffer board, however, the system's high price makes the Microtek MSF-300C a better deal.

Bringing up the rear is the Datacopy Model 730. This scanner lacks gray scaling and offers limited dithering capabilities. The inclusion of *PC Paintbrush Plus* is probably this unit's best value, especially when it's bundled with the new gray-scale version of the package.

Even if you use a 300-dpi laser printer exclusively, picking a scanner with gray-scale capabilities is a smart choice. Future, higher-resolution desktop laser printers promise output that clearly shows the gray-scaled image's superior quality. And because gray scaling offers the only viable way to integrate quality photographic images with typeset quality text (short of cutting and pasting), a gray-scale scanner may open new doors. Gray-scale scanning technology is another step helping to bridge the gap between professional and desktop publishers. ●

Richard Jantz, a desktop publishing consultant and freelance writer in Berkeley, California, is the author of The Complete Scanner Handbook *(Peachpit Press, Berkeley, California, 1988).*

WHERE TO BUY

Model 730
Datacopy Corp.
1215 Terra Bella Ave.
Mountain View, CA 94043
800/821-2898
List price: $2495, automatic document feeder $595
Requirements: 512K, two disk drives (hard disk recommended), DOS 2.00 or later version

PC Scan 2020
Dest Corp.
1201 Cadillac Ct.
Milpitas, CA 95035
408/946-7100
List price: $2885, automatic document feeder $695
Requirements: 362K (640K recommended), hard disk, DOS 2.00 or later version

ScanJet
Hewlett-Packard Co.
3000 Hanover St.
P.O. Box 10301
Palo Alto, CA 94303
415/857-1501
List price: $1990, automatic document feeder $595
Requirements: 512K (640K recommended), hard disk, DOS 2.10 or later version

MSF-300C
Microtek Lab Inc.
16901 S. Western Ave.
Gardena, CA 90247
213/321-2121
List price: $1995
Requirements: 384K, two floppy drives (hard disk recommended), DOS 2.00 or later version

MegaScan II
Advanced Vision Research, Inc.
2201 Qume Dr.
San Jose, CA 95131
408/434-1115
List price: $2695, laser printer controller $495
Requirements: 384K, hard disk, DOS 3.00 or later version

For more information, see Products Featured in This Issue.

Byline—For Better Business Documents

Need to create polished output—without high-end desktop publishing? Byline makes it easy to create attractive documents.

Lan Barnes

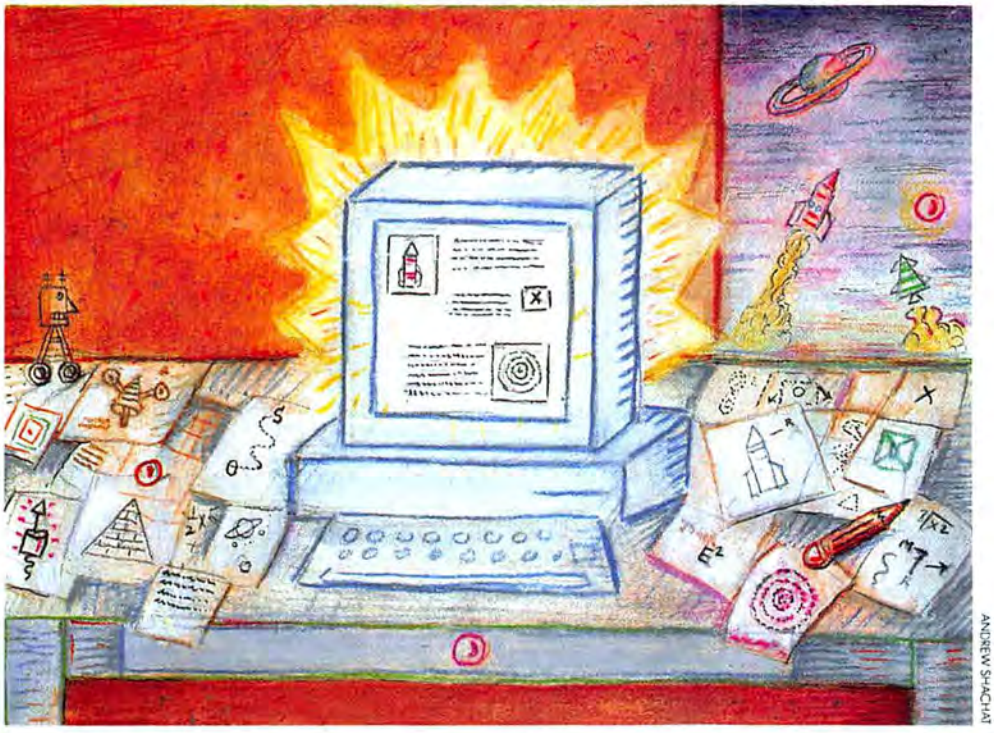
Because business documents need to look smart, desktop publishing programs have surged in popularity. But for many users, heavyweights such as *Ventura Publisher* and *PageMaker* offer too much, too soon. *PageMaker* is a designer's tool; *Ventura* is geared to users who deal with long documents and are proficient at desktop publishing. If you simply want to produce handsome business reports, these programs are overly specialized.

Enter *Byline*, Ashton-Tate's new desktop publishing software. With its emphasis on ease of use and its hooks to *dBASE*, *1-2-3*, and a host of word processors, *Byline* is aimed at professionals who view desktop publishing as a useful adjunct to their main job responsibilities. And at $295, *Byline* is much cheaper than *Ventura* or *PageMaker*.

Demands Are Few

Even if you have fairly low-end equipment, *Byline* is likely to work on your system; its minimum requirements are 384K, two floppy drives, and DOS 2.00 or a later version. (Using *dBASE III Plus* requires a hard disk and 512K.) Since *Byline* supports EGA, CGA, and monochrome Hercules video adapters, just about any monitor will work. However, at press time *Byline*'s printer support was sparse: It included the Epson FX and LQ series, the Toshiba 3-in-1, the Hewlett-Packard LaserJet B and F cartridges, and PostScript printers. Drivers were in the works for Okidata and C. Itoh dot matrix printers, according to Ashton-Tate.

Byline installs without a hitch in a little over a megabyte of hard disk space, not including a tutorial subdirectory that uses about 373K. But like *Ventura Publisher*, *Byline* uses space efficiently. Instead of creating huge master documents containing text and graphics files and formatting information, *Byline* creates a small merge file with pointers to the files you need. As a result, if you change your source text files, the change is automatically reflected in your *Byline* document—and vice versa. The advantage of this approach is that you can set up a report format once—say, for a catalog or a budget that you issue frequently—and when you make subsequent changes in your source files, your *Byline* document will automatically reflect them.



ANDREW SHACHAT

A Program for Beginners

The nice thing about *Byline* is that it targets publishing newcomers. The documentation includes a thorough tutorial, a reference section, a glossary, an index, and a welcome primer on page design. Context-sensitive on-line help instructs you when you enter data, and explanatory error messages pop up if your entry is invalid.

When you start *Byline*, the display is split vertically, with a page shown on one side and a menu area on the other. The page area displays the default 8½-by-11-inch page compressed to fit its half of the screen, but even so, 12-point type is almost legible. Of course, you can also work with a page using the entire screen.

To create a *Byline* document, you first define a *text element* or a *photo element* (*photo* means *graphic*). An element is essentially a frame for the formatting you desire. Every element can contain different formatting specs, which you specify on the menu for that element.

Once you've defined the element, you load the actual text or graphics file and it pops up on screen. *Byline* isn't as accommodating as *Ventura*, but you can pull in ASCII, *dBASE III Plus*, *1-2-3*, *Symphony*, *MultiMate*, *WordStar*, *WordPerfect*, *XyWrite*, *PC Paintbrush*, *Publisher's Paintbrush*, and *1-2-3* and *Symphony* .PIC files, among others, without any conversion.

After loading the appropriate file, you manipulate the text or graphic element, either by typing sizing information into the menu area (say, to position a picture

FEATURES EVALUATION

Byline Meets Ventura and PageMaker

Byline doesn't aim to compete with Ventura Publisher or PageMaker, but a comparison shows that it offers a good set of basic tools.

Pagination and layout controls	Byline 1.0	PageMaker 1.0a	Ventura 1.1
Style sheets/templates	◒[1]	○	●
Automatic text flow across pages	◒[2]	○	●
Separate left- and right-page formats	●	●	●
Automatic page numbering	●	●	●
Adjustable widow and orphan control	○	○	●
Automatic column balancing on last page	○	○	●
Automatic table-of-contents generation	○	○	●
Automatic index generation	○	○	●
Automatic footnotes	○	○	●
Graphics anchored to text	○	○	●
Captions anchored to graphics	○	○	●
Master headers and footers	●	●	●
Typographic features			
Automatic hyphenation	○	●	●
Manual hyphenation	○	●	●
User-expandable exception dictionary	○	●	●
Automatic kerning	●	●	●
Manual kerning	●	●	●
Tracking control	○	○	●
Automatic horizontal rules	●	○	●
Automatic vertical rules	●	○	●
Tab stops per paragraph	n/a	20	16
Measurement units			
inches	●	●	●
millimeters	●	●	●
picas and points	●	●	●
fractional points	●	○	●
Automatic first-line indents	○	○	●
Reverse type	○	●	◒[3]
Supports LaserJet font cartridges	◒[4]	●	◒[5]
Supports third-party downloadable fonts	○	◒[6]	●
Supports PostScript	●	●	●

[1] Automatic formatting can be achieved by copying a page or using macros.

[2] To make text to flow across pages, you must copy a page format or define a new text element.

[3] Using font color option.

Text/Graphics handling	Byline 1.0	PageMaker 1.0a	Ventura 1.1
Undo command	◒[7]	●	◒[7]
Word wrap	●	●	●
Cut and paste	●	●	●
Global search and replace	●	○	○
Macros	●	○	○
Mouse support	○	●	●
Automatic text flow around graphics	○	○	●
Graphics tools (line draw, box draw)	○	●	●
Scales graphics	●	●	●
Rotates graphics	○	○	○
Crops graphics	●	●	●
Imports text files			
ASCII	●	●	●
DCA	○	●	●
dBASE	●	○	○
1-2-3 release 1A	●	○	○
1-2-3 release 2.0	●	○	○
MultiMate	●	●	●
WordStar	●	●	●
WordPerfect	●	●	●
Word	○	●	●
XyWrite III	●	●	●
Imports graphics files			
EPS	○	●	●
GEM	○	○	●
MAC	●	●	●
MSP	●	●	●
PCX	●	●	●
PIC	●	●	●
TIFF	○	●	○

● Yes ○ No ◒ Deficient

[4] B and F cartridges only; built-in fonts include Times, Swiss, Bookman, Courier, and dBASE.

[5] F cartridge only; built-in fonts include Swiss (Helvetica), Dutch (Times-Roman), Symbol, and Courier.

[6] Using installation utility.

[7] Applies to deletions and insertions only.

on the page) or directly, using the cursor keys. Both approaches may seem klutzy at first if you've ever used a mouse to size and move on-screen objects, but most keyboard-oriented users will find the process intuitive. Surprisingly, *Byline* doesn't support a mouse.

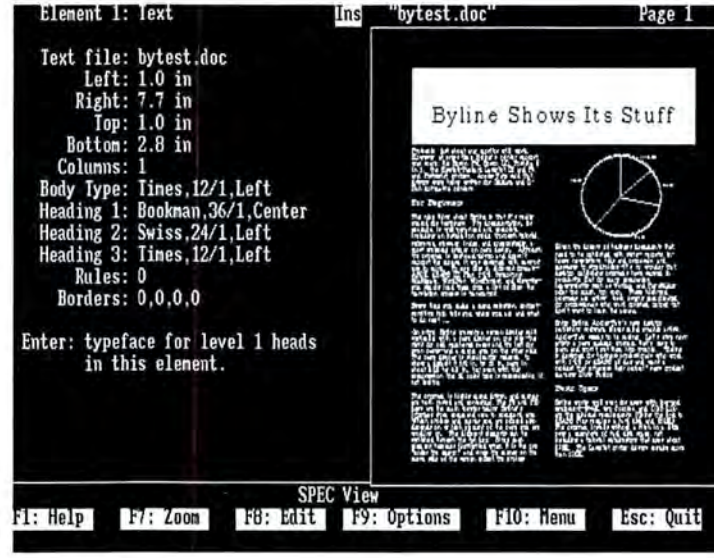
To perform further desktop publishing tasks—choosing a font, selecting a point size, adjusting the text right, left, center, or even mirrored—you simply position the cursor in the element's menu area and press <F9>. You can then select the desired action from a list of available options. *Byline* comes with five fonts—Times, Swiss, Bookman, Courier, and dBASE, a monospace serif type with a boxy look. Third-party fonts are not supported.

Text and Graphics Editing

Ventura Publisher and *PageMaker* have rudimentary text editors; *Byline* goes them one better. When you press <F8> (the word processing key), the menu area disappears and your text is writ large on screen. At that point you can amend the text by adding bold or italic formatting, for example, or selecting the text you want to appear as subheads. You can attach explanatory notes to each document, too, much as you would add notes to a cell in a spreadsheet; the only size limit is available memory.

Kerning (adjusting the spaces between letters for visual clarity) occurs automatically when you print. But if you're not satisfied with the kerning, you can edit *Byline*'s built-in kerning tables and view the changes before you print.

Byline allows you to crop graph files; however, you can't edit them. At the element menu, you can specify borders for graphics (or text). When you run across a graphics format that *Byline* doesn't support, the Camera utility enables you to make a screen capture of the graphic you need and then use it in *Byline*.



Byline's split screen is easy to understand and use. Page layout can be controlled from the menu area on the left.

Limits to Consider

Byline seeks to deliver ease of use, and for the most part it succeeds. It's only when you want to do something fancy that the program is recalcitrant. For example, *Byline* provides three levels of automatically formatted, adjustable subheads, but if you want to create a fourth you're out of luck, unless you define each additional heading as a separate element—a time-consuming chore. Moreover, there is no way to mix typefaces within a paragraph, a trivial operation in *Ventura* or *PageMaker*. Hyphenation and color are not available. And sizing an element can entail trial and error, because the text or graphic itself disappears from view while you're sizing it, leaving only a highlighted block.

Byline's zoom feature, which lets you examine a page close up, has its flaws, too. It magnifies only the top or bottom half of the page, and it cannot scroll. Worse yet, *Byline* reloads the elements each time you page up or down, which causes delays. On a 6-MHz AT, it took nearly 10 seconds to page to the upper part of the document (which contained both graphics and text elements) and about the same amount of time to return from zoom mode to regular page display.

Moreover, *Byline* doesn't provide much in the way of global formatting. If you create a page format that you like, you can

copy it over to subsequent pages. You can also use *Byline*'s macro facility to create macros for formatting and other tasks. Otherwise, when you're ready to create the second page of your document, you must define and position each element just as you did for the first page.

Clearly, *Byline* was designed for business users who want to set up short documents quickly and easily and use the same simple format over and over. If you need to produce long, intricately designed documents or toy with fancy typographic functions, turn to a high-end desktop publishing package.

Data Base Publishing

Byline's hooks into *dBASE* are certain to win it converts, especially among users who want output that surpasses what they can create with *dBASE*. To include information from data base records, you create a text element and insert variable-field codes—such as <.NAME>—from a special *Byline* menu that displays the codes from your .DBF file. You can print out as many records as you like on one page.

You can also use the data base as a mail merge file—for example, to send out a notice about a sale to all the customers in your data base. Simply create a form letter, load it into *Byline*, and enter the variable fields, such as name and address. For word processing–mail merge users, this process will seem very familiar.

Remember, any subsequent changes in a text file—say, an update to a price list—will automatically be reflected when you view or print your *Byline* document. Using the Archive utility, you can save the publication as it is, so that you maintain a record of every issue of a catalog or newsletter. This utility is also useful for gathering the publication and all its source files in one place or into one file, for telecommunicating or printing on another system.

Who Should Buy

Byline deserves a strong recommendation if you have simple formatting in mind and if you work primarily with *1-2-3* or *dBASE* files to create directories, catalogs, price lists, and so on. *Byline* protects users from trouble, and its ease of use, low price, and excellent merge printing make it worth a look.

On the other hand, *Byline* is not a full-featured desktop publishing program. Any trained artist, or anyone aspiring to that level of design, will eventually be frustrated by *Byline*'s limited capabilities. As products such as *WordPerfect 5.0* and *Samna Word IV* incorporate more and more desktop publishing features, potential *Byline* users should consider whether such word processors will meet their needs for polished output. ●

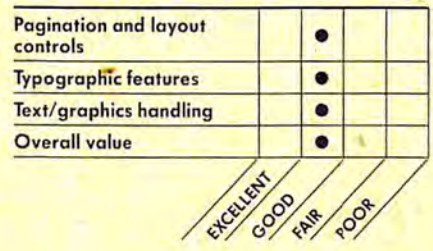
Lau Barnes is the author of dBASE Demystified *(McGraw-Hill, New York, 1987).*

EXECUTIVE SUMMARY

Byline

Desktop publishing software

Byline is a solid package for users with limited desktop publishing needs. It's easy to learn and offers a host of conveniences—an excellent text editor with a search-and-replace feature, a macro function, electronic Post-it notes, automatic or manual kerning, and handy utilities. But Byline isn't the tool for documents with fancy or changeable layouts.



WHERE TO BUY

Byline 1.0
Ashton-Tate
20101 Hamilton Ave.
Torrance, CA
90502-1319
213/329-8000

List price: $295
Requirements: 384K, two drives (512K and a hard disk required for the link to dBASE III Plus), DOS 2.00 or later version
Not copy protected

For more information, see Products Featured in This Issue.

NyTalk

NOW YOU'RE TALKING.

Get your PC and phone working together... without a modem.

INTRODUCTORY OFFER

ONLY **$89.95** *+ SHIPPING*

Introducing a totally new voice communication product that makes it easy for people to stay in touch. NyTalk integrates your telephone and IBM PC, XT, AT, compatibles or PS/2 **without** the use and **cost** of a modem.

It is ideal for use in telemarketing, sales, credit collections, corporate, professional and personal applications. Perfect, fast dialing at the touch of a key. No more costly wrong long distance numbers!

NyTalk consists of a half size card providing all dialing functions, as well as software which provides a powerful resident directory, extended dialing and telephone statistical functions. It's as easy to use as your telephone, and as simple to install.

And at **$89.95,** talk is cheap.

FEATURES

- pop-up the directory when the handset is lifted or the line is engaged.
- directory entry dialing, last number re-dial, speed dialing, dial by tag, keypad dialing, manual screen dialing.
- dial any number automatically from any form displayed on your screen. Ideal for use with mainframe data bases.
- automatically records the duration of calls for each directory entry.
- records the last time and date an entry was called.
- records the total number of calls, total time on phone, and the average time per call.
- maintains a detailed telephone log.
- directories are provided which contain area codes for the US, Canada and codes for international calls.
- print and file conversion utilities are provided so that directories may be utilized with a variety of applications such as dBase III and Lotus 1-2-3.
- design your own application which makes use of NyTalk's extended dialing functionality.
- works with standard telephone lines and most PBXs.

NyTalk

NOW YOU'RE TALKING.

FOR IMMEDIATE SHIPMENT

1-800-668-8620

Alaska, Hawaii: (416) 470-1203

HUMMINGBIRD COMMUNICATIONS LTD.

104–60 Queens Blvd.
Forest Hills, NY. NY 11375

NyTalk – Hummingbird Communications Ltd.; IBM, PC, XT, AT, PS/2 – International Business Machines; dBase III – Ashton Tate Inc.; Lotus 1-2-3 – Lotus Development Corporation.

MasterCard VISA

Circle 90 on reader service card

WHAT'S OPTIONAL ON THEIRS IS

STANDARD ON OURS!!

10MHz

Complete System with Single 360K Drive & Monographic Monitor Assembled & Tested IBM® XT Compatible

With MSDOS 3.3 Add $89.95

™ Swan XT10

$599

Standard Features

- 10/4.77 MHz 8088-1CPU
- 640K RAM
- 150W Power Supply
- 8 Expansion Slots
- (1) Serial Port
- Hercules Compatible Video Card (720 x 348)
- (1) Parallel Port
- (1) Game Port
- Clock Calendar w/Battery Backup
- 101 Enhanced "AT" Touch & Click Style Keyboard
- Quality Hi-Resolution Amber Monitor w/Tilt & Swivel

Mono System w/Dual Floppies	$669.00
Mono System w/20MB Seagate HD	$889.00*
Mono System w/30MB Hard Drive	$929.00*
Base Unit w/o Monitor or Video Card	$499.00*

Single 360K Floppy Drive

12MHz

CompleteSystem with 1.2MB Drive & Monographic Monitor Assembled & Tested IBM®AT Compatible

With MSDOS 3.3 Add $89.95

™ Swan AT12

$999

Standard Features

- 80286 12/6 MHz (Keyboard Switchable) 11.7 Norton S.I.Rating
- 640K of RAM on 1MB Motherboard
- 200W Power Supply
- Ports: (1) Serial , (1) Parallel, (1) Game
- Dual Floppy/Dual Hard Drive Controller
- (8) Expansion Slots
- 101 Enhanced "AT" Touch & Click Style Keyboard
- Clock Calendar w/Battery Backup
- Hercules Compatible Video Card (720 x 348) w/Parallel Port (2nd)
- Quality Hi-Resolution Amber Monitor w/Tilt & Swivel

Mono System w/40MB Miniscribe HD #3650	$1395.00
Mono System w/40MB Seagate HD #251	$1495.00
Base Unit w/o Monitor or Video Card	$899.00

Option Upgrades for XT10 & AT12:

Hercules to CGA with CGA Card and RGB Monitor Add $170.00

Hercules to EGA with EGA Card (operates in CGA, MDA, or HGA modes)and Packard Bell EGA Monitor Add $399.00

30 DAY SATISFACTION GUARANTEE Your complete satisfaction is our top priorty. Any Swan system may be returned within 30 days from the date of shipment for a full refund. *

FOR YOUR PROTECTION WE GO THE EXTRA YEAR A full 1 year warranty is included, with a 2nd year SEW (Swan Extended Warranty) available. Call or write for details.

FAST DELIVERY... We ship within 24 hours.†

TECHNICAL SUPPORT Our support staff is on call 9-5 Mon-Fri to answer all of your questions and make sure that you get the most from your systems.

YOUR COMPUTER INVESTMENT IS HASSLE FREE!!!

SWAN VIDEO & I/O CARDS

Monographics half card (720 x 348) Hercules Compatible w/parallel port	$69.95
Color half card (640 x 200) CGA Compatible	$69.95
Monographics, Hercules Compatible, 2 Floppy Controller, Parallel, Serial, Gameport, Clock & Calender w/Battery Backup	$119.95
Same board as above,except with CGA output instead	$109.95

* *Items returned must be as-new, without modification or damage. All warranty cards, manuals and packaging must be included. Return shipping must be prepaid and insured, bearing a RAC (Return Authorization Code) on the shipping label.*
† *On in stock items. Custom Systems May Take Longer.*

DON'T

ALDUS	
Pagemaker	$CALL
AMERICAN	
Design CAD 3.0	$189.00
ANSA	
Paradox (2.0)	$409.00
ASHTON-TATE	
dBase III+	$389.00
dBase IV	$CALL
FrameWork II	$399.00
Multimate Advantage II	$299.95
Rapidfile	$244.00

BORLAND

Quattro	$129.00
Eureka	$104.95
Reflex	$89.95
Reflex Workshop	$44.95
Sidekick(unprotected)	$54.95
Superkey	$59.95
Sprint	$CALL
Turbo Basic	$64.95
Turbo C	$75.95
Turbo Database T'box	$64.95
Turbo Developers Libry	$CALL
Turbo Gameworks	$44.95
Turbo Graphix Toolbox	$64.95
Turbo Lightning	$59.95
Turbo Pascal	$62.95
Turbo Pascal N. Mthds	$62.95
Turbo Prolog	$64.95
Turbo Prolog Toolbox	$64.95
Turbo Tutor	$27.95

PC LAPTOP

ZENITH

181 CLOSEOUT ..$1199

■ 4.77 MHZ ■ Limited Quantities

PRINTERS

CITIZEN

120D	$144.95
180D	$159.95
MSP-40	$294.95
MSP-45	$CALL
Premier 35	$459.00
Tribute 224	$629.95

Panasonic

1080ill	CALL
1091ill	FOR
1092i	PRICING
1592	$429.00
1524	$599.00
1595	$469.00
3131	$319.00
3151	$519.00
Laser Printer	$CALL

star

NX-1000	$169.95
NX-1000 Rainbow	$CALL
NX-15	$349.00
ND-10	$289.00
ND-15	$429.00
NB24-10	$499.00
NB24-15	$639.00

EPSON

CALL FOR PRICING ON EPSON PRODUCTS

OPEN: 8:00AM-9:00PM Mon-Fri; 10:00AM-6:00PM Sat, 12:00PM-8:00PM Sun EAST COAST TIME

tcp TUSSEY COMPUTER PRODUCTS P.O. BOX 1006 STATE COLLEGE, PA 16804

SETTLE FOR LESS...tcp SHIPS IT

SOFTWARE

BOEING
Boeing Calc $209.00
Boeing Graph $189.00

BRODERBUND
Graphics Library Disks $24.95
Print Shop $39.95
Print Shop Companion $32.00
Toy Shop $42.95

CENTRAL POINT
COPY II PC $27.00
Option Board $79.95
PC Tools Deluxe $44.00

DAC SOFTWARE
Dac Easy Accounting $62.95
Dac Easy Acct. Tutor ..... $CALL
Dac Easy Payroll. $39.95
Dac Easy Payroll Tutor ..... $CALL

FIFTH GENERATION
Fastback $79.00

FUNK
Sideways $37.95
Worksheet Utilities $59.00

GENERIC SOFTWARE
Gen. CADD 3.0 ..... $69.95
Gen. CADD 3-D Modeling $CALL
Gen. CADD w/Dot Plot $89.95
Call For Pricing on Libraries

LIVING VIDEOTEXT
Think Tank $109.00

LOTUS
123 ..... $307.00
Freelance Plus $369.00
HAL $119.00
Manuscript $337.00
Symphony $439.00

MECA
Managing Your Money $129.95

MERIDIAN TECHNOLOGY
Carbon Copy Plus $109.00

MICROPRO
Wordstar 2000+ ..... $CALL
Wordstar Prof Rel 4 ..... $229.00

MICRORIM
DB Graphics $189.00
R Base for DOS $439.00

Microsoft
PC Excel ..... $CALL
PC Works $129.00
Bookshelf w/CD ROM ... $CALL
C Compiler $295.00
Chart 3.0 ..... $249.00
Flight Simulator $34.95
Fortran $299.00
Macro Assembler $99.95
Learning DOS $34.95
MS-DOS & GW Basic ... $CALL
Mouse $109.00
Pascal $179.00
Project $349.00
Quick Basic $64.95
Quick C $64.95
Windows 2.03 ..... $69.00
Windows/386 ..... $129.00
Word Version 4.0 ..... $239.00

MICROSTUFF
Crosstalk XVI $94.00

MIGENT
Ability Plus ..... $CALL

NORTON PRODUCTS
Norton Commander $39.95
Norton Utilities $49.95
Norton Advanced Utilities . $84.00

OMNIS *from BLYTH*
Quartz ..... $CALL

PAPERBACK SOFTWARE
Executive Writer $39.95
VP Expert $64.95
VP Planner Plus $89.95

PERSONICS CORP
Smart Notes $47.95

QUARTERBACK
DESQView $79.95

SOFTWARE PUBLISHING
First Publisher $59.00
First Publishing Fonts ... $CALL
Harvard Total PM II $369.00
Harvard Graphics $279.00
PFS First Choice $85.00
Professional File $139.00
Professional Plan $79.00
Professional Write $115.00

SPRINGBOARD
Newsroom Pro $49.95
Clip Art I, II, or III ..... $CALL

SYMANTEC
Q & A $199.00
Q & A Write $115.00

TURNER HALL
Note It Plus $47.95
SQZ Plus $57.95

WORD PERFECT
Data Perfect ..... $CALL
Executive $115.00
Library $59.00
Plan Perfect ..... $CALL
Wordperfect (5.0) ..... $CALL

XEROX
Ventura Publisher $459.00

HARDWARE

PC HARD DRIVES

MiniScribe
30MB XT Drive w/cont.(65 ms) $339.00
40MB AT Drive (65 ms) $359.00
40MB AT Drive (25 ms) $579.00

Seagate
ST-225 20MB w/cont.(65 ms) $289.00
ST-238 30MB w/cont.(65 ms) $359.00
ST-251-0 40MB (42 ms) $439.00
ST-251-1 40MB (28 ms) $499.00

WESTERN DIGITAL
File Card 20... ..... $399.00
File Card 30 ..... $429.00
AT FD/HD Controller $159.00

Swan Technologies
TAPE DRIVE BACKUPS 1 YR WARRANTY
40MB XT Tape (Internal) $339.00
40MB XT Tape (External) $459.00
40MB AT Tape (Internal) $359.00
40MB AT Tape (External) $479.00

MAGNAVOX
7613 TTL (Green) $89.00
7623 TTL (Amber) $89.00
8762 RGB/CGA $249.00
8515 RGB/CGA $289.00
8053 EGA $349.00
8873 EGA Multimode $479.00

PC ADD ON BOARDS

AST
Advantage! (128K) ..... $CALL
Advantage Premium (512K) .FOR
Rampage 286 (512K) ... PRICING
SixPakPlus (64K) ..... ON
SixPakPremium (512K) ..... AST!

ATI
EGA Wonder $179.00
Graphic Solution $169.00
VIP VGA $299.00

BOCA RESEARCH
CALL FOR PRICING ON VIDEO AND BOCA RAM CARDS

EPIC
EPIC EGA $119.00
EPIC EGA 480 ..... $129.00

HERCULES
Graphics Plus $179.00
In-Color Card $299.00
Other Hercules boards in stock... Call for price

Swan RAM CARDS
Aboveboard Compatible Memory Cards - Include Software Utilities Disk
XT RAM CARD w/0K $99.95
AT RAM CARD w/0K $119.95
Call For Pricing on: 512K/1MB/2MB Upgrades

INTEL
AboveBoard PC $219.00
AboveBoard PS/XT $259.00
AboveBoard 286 ..... $309.00

PARADISE
Autoswitch 350 ..... $149.00
Autoswitch 480 ..... $169.00

VIDEO 7
VEGA Deluxe $199.00
VEGA VGA $299.00

ZUCKER
CGA $89.95
Monochrome Graphics $94.95
Memory Expansion ..... $CALL

MONITORS

TTL Monochrome
Amdek 410A Amber, Green,or White $149.00
Packard Bell Amber w/std. $97.00
Panasonic TR125 Green .. $89.00
Samsung TTL $89.00

RGB/CGA
Goldstar 4135 ..... $269.00
Thomson 4160 ..... $279.00

EGA
NEC Multisync II ..... $CALL
Packard Bell EGA/CGA/TTL Auto ... $419.00
Amdek 722 ..... $477.00
Mitsubishi Diamond Scan ..... $CALL

IMSI Optical Mouse w/Dr.Halo III $89.00

MICROSOFT Mouse $109.00

LOGITECH HiRez (320dpi) Mouse .. $99.00

WE CARRY A FULL LINE OF MACINTOSH PRODUCTS!

FEDERAL EXPRESS

Software orders over $100 and Accessories under 6 pounds will be shipped Federal Express
(Even at these prices) You only pay TCP's standard shipping charge of $4.00 per order. Orders arriving before 3:00 PM our time will be shipped out same day. If part of your order is back-ordered the remainder will be shipped UPS Ground FREE!

SECURITY
- Your Credit Card is not charged until your order is shipped.
- We insure your order at no extra cost to you.
- Tussey is a financially strong and well established company.

CUSTOMER SUPPORT
- After sales support.
- Knowledgeable staff, all graduates of Tussey's "Computer Boot Camp".
- Our advanced warehouse/materials handling system assures your order is shipped out accurately & on time.
- Our IBM 5360 allows instant order and inventory status.

To order by mail: We accept money order, certified check, personal check. Allow 2 weeks for personal & company checks to clear. **Shipping:** $4.00 for software. FOR ALL HARDWARE AND ANY ACCESSORY OVER 6lbs Call our Toll Free Number 1-800-468-9044 for shipping charges. Add $3.00 per box shipped COD. Additional shipping required on APO, FPO, AK, HI, and foreign orders. **Terms: PRICES REFLECT CASH DISCOUNT, ADD 1.9% FOR MASTERCARD OR VISA.** All products include factory warranty. **ALL SALES ARE FINAL** Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

VISA MasterCard

EDUCATIONAL & CORP ACCOUNTS
Purchase orders accepted from qualified corporations and institutions
CALL 1-800-533-1131
Inside PA 814-234-2236

MODEMS
Hayes Smart Modem
1200B Internal $259.00
2400B Internal ..... $CALL
Swan Technologies
Includes PC Talk III software
1200 baud Internal $69.95
2400 baud Internal $119.95
Packard Bell External
300/1200 baud $149.00
2400 baud External $279.00
Zucker
300/1200 Half Card Modem with software $87.00

MIGENT Pocket Modem ■ 300/1200 Bd $119.00

DISKS

per box of 10		3.5"	5.25"
BONUS	DS/DD	$16.95	$6.95
MAXELL	DS/DD	$17.95	$9.95
VERBATIM	DS/DD	$19.95	$9.95
SONY	DS/DD	$16.95	$8.95

intel CHIPS
Numeric Coprocessors
8087 ..... $104.00
8087-2 ..... $147.00
80287 ..... $179.00
80287-8 ..... $259.00

Call for Pricing on Memory Chips. Prices are too volatile to list!!!

PC1640 AMSTRAD PPC640

DESK TOP	PORTABLE
■ 8MHz Processor/640K	■ 8MHz Processor/640K
■ 3 Available Slots	■ Supertwist LCD Display
■ Parallel, Serial, & Game Port	■ Single or Dual 3.5" Drives
■ Microsoft Compatible Mouse	■ 2400 baud Internal Modem
■ MS-DOS 3.2	■ Parallel & Serial Ports
■ GEM Desktop, GEM Basic	■ 101 Key AT-Style Keyboard
■ Supports TTL/CGA/EGA	■ MS-DOS 3.3

*FULL PC Compatibility ** CALL FOR BEST PRICE***

CALL TOLL FREE 1-800-468-9044

For Information
Call 814-234-2236
Fax 814-237-4450

tcp

Circle 207 on reader service card

170 **Vectra ES/12**
Hewlett-Packard's high-speed AT compatible has everything going for it—but the price.

174 **Hot Shot/286**
AST aims high but falls short with this half-slot 80286-based accelerator board, intended to breathe new life into old XTs.

182 **MultiSync II**
Taller, more compatible, and with improved sync circuitry, NEC's second-generation multiscan monitor disproves the rule that you shouldn't mess with success.

184 **2Page Display**
Verticom's high-speed, high-resolution monitor and graphics board put desktop publishers in the fast lane.

190 **RuggedWriter 480**
Though it won't do everything, blistering speed, superior NLQ output, and a way with graphics give HP's wide-carriage dot matrix printer powerful appeal.

Hewlett-Packard Vectra ES/12

AT-compatible system

PROS: Fast CPU, special port for HP peripherals, disk caching software included

CONS: Expensive

If speed is the name of the game, Hewlett-Packard's high-velocity Vectra ES/12 holds four winning cards. For starters, this AT clone has a hot 12-MHz 80286 CPU. Fast dynamic RAM on the motherboard, a proprietary memory expansion board designed to keep pace with the CPU, and powerful disk caching software are equally important. But the fifth card in HP's hand—price—is not such a winner. The ES/12 is likely to please everyone in the office except the accounting department.

Three versions of the ES/12 are available. The low-end Model 10 comes out of the box with 640K of 100-nanosecond dynamic RAM on the motherboard, a 1.2MB floppy drive, a disk controller, a 101-key keyboard, MS-DOS 3.20, and a decent collection of utilities. This configuration will set you back a cool $2995 and does not include a video adapter, monitor, or hard drive. At the high end, a fully loaded Model 40, with a fast 40MB hard disk and HP's own EGA video board and enhanced color monitor, runs about $5500. At these prices the ES/12 is not exactly a smart bet, considering you can buy a high-speed 286 hard disk system (or a low-end 386) for $3000.

As high-speed CPUs become more commonplace, finding expansion memory that's fast enough to work with them is becoming as hard as filling an inside straight. HP's proprietary 12-MHz memory board does the job—but you'll have to pay a lot. Prices range from $1695 for the 2MB version to a whopping $4995 for the 8MB model. While there's nothing to stop

you from saving money by sliding a standard memory-expansion board into one of the ES/12's 8-MHz 8/16-bit slots, performance will slow down significantly.

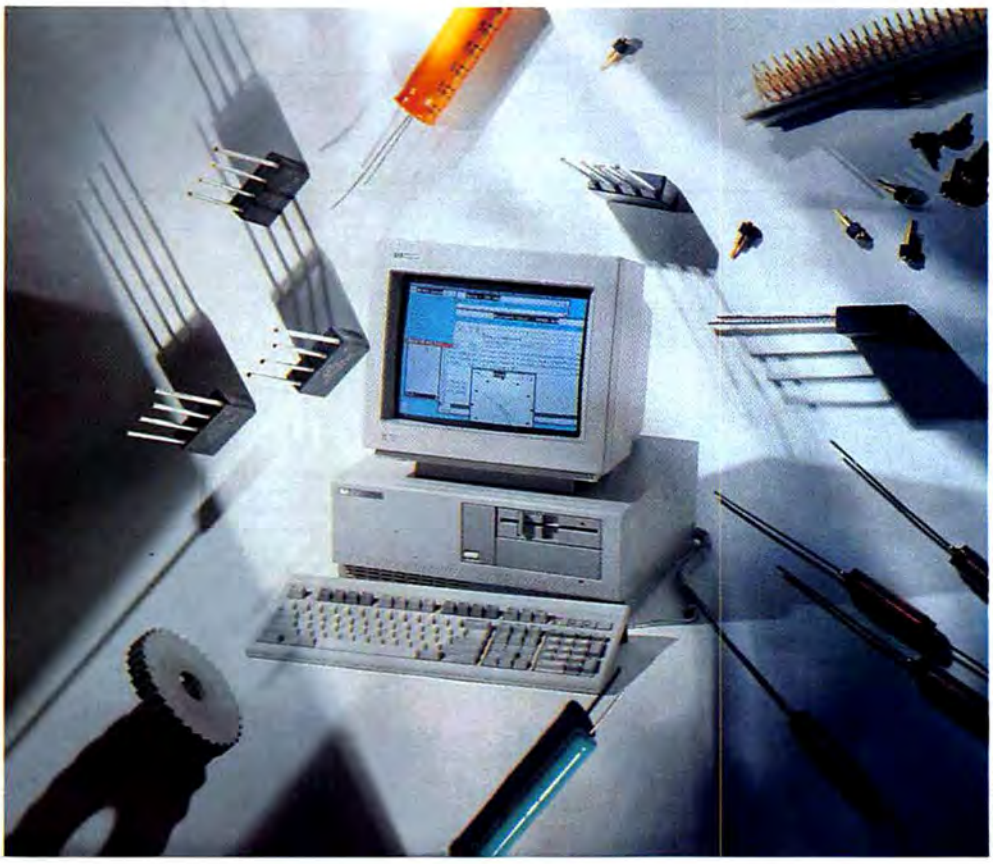
Fast disk access is one of the HP's strongest suits. The ES/12's 40MB Seagate hard drive has a sprightly average access speed of 28 milliseconds. HPCache, Hewlett-Packard's disk caching software, further quickens disk access. HPCache is easy to install and configure and seems to work without a hitch. It includes a neat on-screen readout that lets you know just how many disk accesses you've avoided. In informal tests using a wide variety of software, the CPU found the data it needed in cache memory about 60 percent of the time.

Thanks to its combination of speed-conscious features, the ES/12 performs on a par with the fastest 80286 systems. With a 128K disk cache installed, it outran (or held its own against) Compaq's 12-MHz Deskpro in three tests out of five. Without a cache its performance was less impressive, but still perfectly respectable.

If 12 MHz is too fast for your software, HP has provided not one but three ways to alter the Vectra's speed. You can toggle between 8 MHz and 12 MHz by entering a command at the DOS prompt or using a hot key; the latter beeps once to signal slow speed, twice to signal fast. Or you can preset the computer to power up at whichever clock speed you like.

The system unit is compact, but there's still space for three half-height drives. Along with the device bays, you'll find a 134-watt power supply, a lithium battery, and an 80287 coprocessor socket.

When it comes to expansion, the Vectra differs a bit from the standard AT. The



MARK JOHANN

Hewlett-Packard's ES/12 is a fast AT-compatible system that includes high-speed motherboard RAM, disk caching software, and a 12-MHz memory expansion board so add-on RAM can keep pace with the CPU.

HP's motherboard incorporates eight expansion slots, but only four of them will hold standard 8/16-bit boards—two less than the IBM AT. On the other hand, Hewlett-Packard has contrived to leave all four 8/16-bit slots available by installing the drive controller in an 8-bit slot. Of the remaining four slots, three are standard 8-bit slots and one is designed for the 12-MHz memory board.

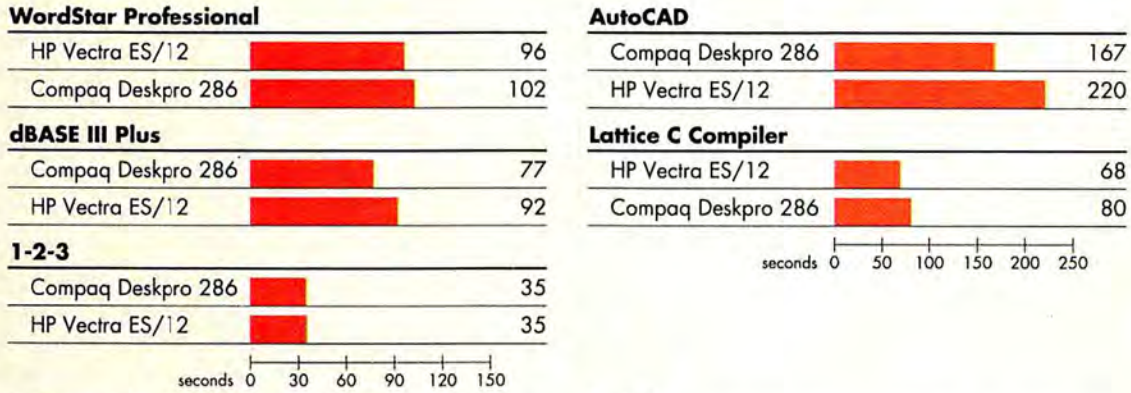
HP's drive controller can handle only three drives (as opposed to the industry norm of four)—two floppies and a hard drive, or two hard drives and a floppy. The controller serves as a multifunction board as well, providing an RS-232C serial port and a parallel port—both with clearly marked jumpers in case you need to add and configure additional ports. HP makes a mouse, a stylus, and a tablet especially for the Vectra series; the ES/12 supplies the special Human Interface Link port you'll need to hook them up.

All too often an AT compatible's keyboard has a soft, cheesy touch or is poorly laid out. In contrast, the Vectra's keyboard is a sheer delight. Laid out in the familiar 101-key style, with 12 function keys along the top and separate numeric and cursor control keypads, it boasts an unusually solid touch. The clicking volume can be controlled via <Ctrl>-<Alt>-

NSTL TEST REPORT

HP Vectra ES/12

The HP Vectra ES/12 shows its stuff by beating or tying the Compaq Deskpro 286 in three tests out of five.



The Compaq Deskpro 286 was tested with a disk cache using 192K of extended memory. The HP Vectra ES/12 was tested with a disk cache using 128K of conventional memory.

WordStar Professional
Although disk access plays a small part in this benchmark, processing and memory access speeds are the most significant factors. The test measures the time required to perform four operations on a 15,364-word document.

dBASE III Plus
Disk access speed is the most significant factor for this benchmark. The test measures the time required to produce a report based on a three-file join, select, and sort.

1-2-3
Because no disk access is required, this benchmark depends almost entirely on the processing and memory access speeds of the systems. In this test, a *1-2-3* macro executes a series of recalculations within a 50-by-50-cell matrix.

AutoCAD
Disk access, processing, and memory access speeds all contribute to a product's performance in this benchmark. However, the speed and type of math coprocessor used by the system are the most important factors. The test uses the sample office drawing provided with *AutoCAD* and measures the time required to retrieve and display the drawing, zoom in on a small detail within the drawing, zoom out to reveal the entire drawing, and print the entire drawing.

Lattice C Compiler
In this benchmark, the sequential disk access rate is the most important factor. Applications such as file managers commonly rely on this type of disk access. The test measures the time required to compile and link two 1000-line programs and is performed automatically using a DOS batch file.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

The AMSTRAD PC 1640.

The ability to compete with the big boys.

If you're a small business with plans to get a lot bigger, you're going to love the AMSTRAD PC 1640. It's the powerful computer that's got *all* the capabilities you'll need to compete with big corporations.

Naturally, the PC 1640 is PC compatible, so you can run virtually all the popular business software as well as communicate with the rest of the business world.

And to make your work *look* as good as the big boys', our computer also comes with the capability to run mouse-driven, windowing software for creating spectacular desktop publishing. It even comes with the mouse and software you'll need.

Plus, the PC 1640 ingeniously incorporates monochrome (Hercules), CGA and EGA capabilities into a single motherboard. So, to upgrade graphics, you merely pop on a new AMSTRAD high quality monitor.

The remarkably affordable PC 1640 is now at leading retailers nationwide. For the name of the one nearest you, call 214/518-0570. You'll see for yourself, it's not only a great computer, it's a great equalizer!

AMSTRAD

Strokes of Genius

The name and logo AMSTRAD are trademarks of AMSTRAD PLC and its subsidiaries.
Hercules is a registered trademark of Hercules Computer Co.

Circle 14 on reader service card

<Gray Minus> or <Ctrl>-<Alt>-<Gray Plus>. Little touches like these make the Vectra ES/12 a real pleasure to use. There's a front-mounted power switch, the cover is easy to remove, and the fan is barely audible. The front ventilation grill is recessed to avoid desktop clutter that might block air flow. Finally, the security lock (found on every AT since the dawn of time) is now a $50 option; you don't pay for it unless you want it.

The help screens in the ES/12's setup software are so well written you may never need to open the manual. The utility software is also extremely easy to install and master. If you do need the manual, you'll find it excellent—liberally sprinkled with diagrams, checklists, and clear step-by-step instructions.

Frequently, new machines are plagued with problems, but the ES/12 proved so bug free that only one relatively minor annoyance is worth mentioning: You have to remove the power switch assembly before you can install the coprocessor.

The ES/12's innovations add up to a winning hand, combining nice ergonomic touches like the solid keyboard and the front-mounted power switch with high-performance design features. Unfortunately, the steep price is likely to discourage players from recognizing the ES/12's virtues. That's a real shame because, price aside, this AT compatible's lightning performance has what it takes to win almost any game. —*Paul Meyers*

WHERE TO BUY

Vectra ES/12
Hewlett-Packard
Personal Computer Business Unit
974 E. Arques Ave.
P.O. Box 486
Sunnyvale, CA 94086
408/746-5000
List price: Model 10 (1.2MB floppy drive) $2995, Model 20 (1.2MB floppy drive, 20MB hard disk) $3195, Model 40 (1.2MB floppy drive, 40MB hard disk) $4195; EGA board $495; enhanced color monitor $845; monochrome video adapter $325; 12-inch monochrome display $325; touch-screen option for monochrome displays $505; 12-MHz memory expansion boards: 2MB $1695, 4MB $2795, 8MB $4995; security lock $50
For more information, see Products Featured in This Issue.

AST Hot Shot/286

80286-based accelerator board

PROS: Fast, speed switchable

CONS: Complicated installation, 80287 coprocessor requires an 8087 on the motherboard, expensive

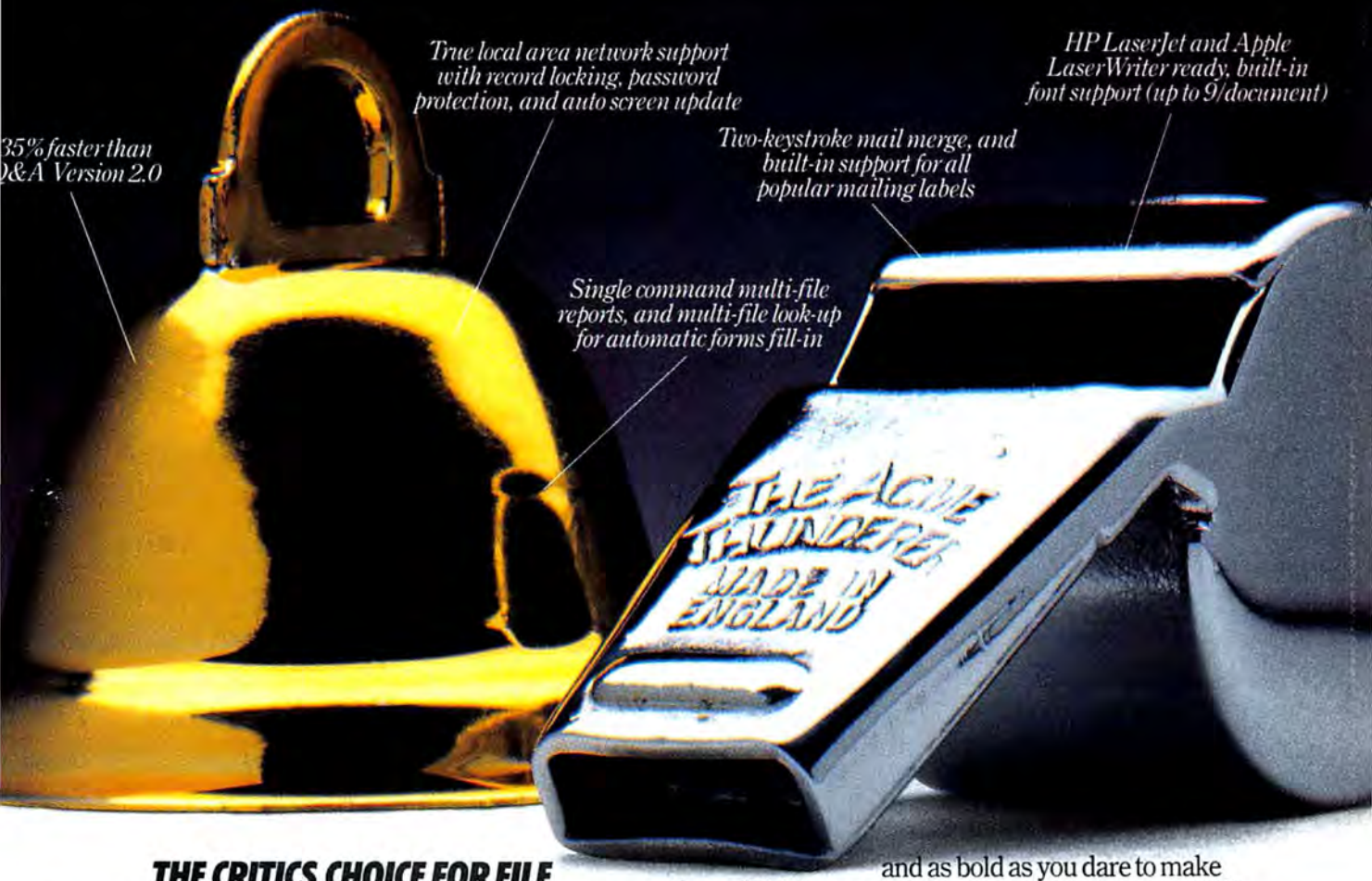
Plenty of PCs, XTs, and their 8088-based clones are still in service: dependable, time-tested, inexpensive—and very, very slow. You can grow cobwebs waiting for those workhorses to manipulate massive spreadsheets or format a long document. AST's Hot Shot/286 accelerator board—which packs a 10-MHz 80286 chip and a socket for an 80287 math coprocessor on an 8-bit half-card—provides your trusty XT with enough processing speed to blow those cobwebs away.

At $645, the Hot Shot can save you at least $1000 over the cost of a new 80286 computer. Sad to say, that's the extent of the good news. The Hot Shot (which costs twice as much as comparable units) isn't up to AST's usually high design standards.

For instance, to help speed data input and output, most turbo boards use on-board cache memory. The Hot Shot/286 has no on-board memory; instead, it sets aside a portion of system RAM to use as a memory cache. DIP switches control the size of the cache and allow you to install it in either base memory or high memory (above 640K).

While this caching technique knocks a few bucks off the price tag by eliminating the need for on-board memory chips, it introduces problems. For one thing, the cache is addressable only in slow 8-bit mode. For another, installing the cache in base memory eats up precious RAM. However, installing it in high memory can be tricky for inexperienced users because high memory is used for video and other

INTRODUCING Q&A 3.0: TO MAKE THE BEST EVEN BETTER, WE ADDED 136 MORE OF THESE.



THE CRITICS CHOICE FOR FILE MANAGEMENT AND WORD PROCESSING.*

Q&A 2.0 was rated #1 by *Software Digest* in 1986 and 1987.* It was *PC Magazine's* Editor's Choice. *InfoWorld* gave it their highest rating ever—9.6. And now, with 136 big new bells and whistles, Q&A 3.0 gives you even more.

Start with a real bell ringer: Q&A 3.0 is the first file manager in the world with true local area network support.** Next, multi-file capabilities that, for example, let Q&A 3.0 pull an address from one database and pricing from another. And automatically includes both in a separate invoice database or any report.

You'll find faster, two-keystroke mail merge, and built-in support for all the popular mailing labels. So you can personalize form letters and master any mailing in minutes. And with new font and laser printer support, headings or graphics can be as big and as bold as you dare to make them. Which means letters, memos, and reports will really stand out.

At $349, Q&A 3.0 is today's best software value. Use its power to easily manage mailing lists, invoicing, department databases, inventory, tax records, and expenses. Use its integration to do customer mailings, write letters and proposals, and to include 1-2-3 spreadsheets and graphs in your documents.

All without sacrificing ease of use.

Ring our bell today for a FREE Q&A 3.0 Demo Disk. And blow the whistle on file management and word processing problems for good.

(800) 888-0886 Ext. 176W

SYMANTEC™
Breakthrough Software Division

*Software Digest #1 File Manager 2/86 and 2/88, #1 Easy To Use Word Processor 1/87, #1 Integrated File Manager/ Word Processor 2/88; InfoWorld highest rating ever given (9.6) 3/87; PC Magazine Editor's Choice 1/87. ■ Q&A 2.0 owners call (415) 964-4440 for $69.95 upgrade instructions. ■ Q&A is a trademark of Symantec Corporation. Other brands and products are trademarks of their respective holders. © 1988 Symantec Corp., 10201 Torre Avenue, Cupertino, CA 95014. (408) 253-9600.

Circle 108 on reader service card

PC programs & pe

□ **3½" format available from us. Specify when ordering.**
▣ **package includes both 5¼" and 3½" disks.**
🅁 **3½" format available from manufacturer by request. Call us for details.**
CP—copy-protected; **NCP**—not copy-protected.

SOFTWARE

We only carry the latest versions of products. Version numbers in our ads are current at press time.

Alpha Software ... NCP
□Keyworks 3.0 *(macros)* ..... $59.
□Advanced Keyworks 1.0 ..... 175.
□Alpha/three 1.1 *(dB3 file compatible)* .... 219.
American Small Business Computers
□Design CAD 3.0 *(NCP)* ..... 169.
□Design CAD 3D 3.0 *(NCP)* ..... 169.
Application Techniques ... NCP
🅁Pizazz 2.0 ..... 45.
Ashton-Tate ... NCP
▣dBASE III Plus 1.1 ..... call
▣Rapidfile 1.2 ..... 229.
▣MultiMate Advantage II 1.0 ..... 299.
□Master Graphics Pack *(includes Sign Master, Chart Master, Diagram Master)* ..... 299.
Best Programs ... NCP
□Label Master 3.1 *(mailing label program)* .. 29.
□PC/TaxCut ..... 43.
Bible Research ... NCP
□THE WORD 4.0 *(specify KJV or NIV)* .... 159.
Bloc Development ... NCP
□FormTool 3.0 ..... special
Borland International ... NCP
□Sidekick 1.5 ..... 57.
□Turbo BASIC 1.1 ..... 67.
□Turbo C 1.5 ..... 67.
□Turbo Pascal 4.0 ..... 67.
□Superkey 1.1 ..... 67.
□Reflex 1.1 ..... 99.
□Eureka 1.0 ..... 109.
▣Quattro 1.0 w/SQZ!Plus 1.0 ..... call
▣Paradox 2.0 *(easy-to-use database)* ..... call
Broderbund ... CP
□Print Shop Companion *(tools for Print Shop)* 33.
□Memory Mate 1.0 *(NCP)* ..... 45.
Chipsoft ... NCP
🅁TurboTax Personal/1040 5.01 ..... 45.
🅁Tally Ho 1.01 *(financial calculator)* ..... 32.
Computer Associates ... NCP
▣SuperCalc 4 1.1 ..... 299.
Crosstalk Communications ... NCP
□Crosstalk XVI 3.61 ..... 95.
□Crosstalk MK.4 1.0 ..... 129.
Dac Software ... NCP
□Dac-Easy Payroll 2.0 ..... 45.
□Dac-Easy Light 1.0 ..... 45.
□Dac-Easy Accounting 2.0 ..... 59.
□Dac-Easy Bonus Pak 2.0 ..... 109.

PC Connection Software Special
through May 31, 1988

Bloc Development ... NCP
□**FormTool 3.0**

Keep in good form with FormTool. With the versatility and ease of use of FormTool you can create, edit, and easily print any and all forms.

- Menu-driven use makes for easy design and editing
- Create forms using international character sets, superscript, subscript, bold, under line, italic, ASCII symbols, math symbols, shades, borders and more
- Supports over 100 dot matrix printers and over 12 laser printers
- Merge functions puts data where you want it

For PC, XT, AT, XT286 & PS/2 ..... $59.

Digital Research ... NCP
□Gem Draw Plus 2.01 ..... 189.
□Gem Desktop Publisher 1.0 ..... 259.
Executive Systems ... NCP
□XTREE Pro 1.0 ..... 69.
5th Generation ... NCP
□Fastback Plus 1.01 ..... 99.
Funk Software ... NCP
□Sideways 3.21 ..... 42.
▣Noteworthy 1.0 ..... 49.
▣Inword 1.0 ..... 59.
▣Worksheet Utlities 1.0 ..... 59.
Generic Software ... NCP
□Generic CADD 3.0 ..... 69.
▣Generic CADD Level 3 ..... 109.
□Dot Plot ..... 35.
□Basic Home Design ..... 35.
□Drafting Enhancements ..... 35.
▣Editor's Choice Pack *(includes Generic CADD & four enhancement programs)* ..... 159.
Harvard Associates ... NCP
PC LOGO 2.0 ..... 89.
Hayes ... NCP
□Smartcom II 3.0 ..... 89.
Hilgraeve Software ... NCP
□HyperACCESS 3.2 ..... 89.
Individual Software ... NCP
▣Directory Assistance 1.0 ..... 33.
□Professor DOS *(with Smartguide)* ..... 33.
□Typing Instructor II ..... 26.
Intuit ... NCP
□Quicken 2.0 ..... 35.
Javelin Software ... NCP
□Javelin Plus 2.01 ..... 159.
Lifetree ... NCP
□Volkswriter Deluxe Plus 1.0 ..... 69.
▣Total Word 1.0 ..... 259.

MacroPac International ... NCP
101 Macros for:
1-2-3 dBASE III Plus WordPerfect
Excel ..... *each* $42.
MECA ... CP
□Managing Your Money 4.0 ..... 129.
MicroPro ... NCP
□WordStar Professional Release 4.0 ..... 259.
□WordStar 2000 Plus Rel. 3 *(Personal Ed.)* 199.
Microrim ... NCP
▣R:BASE for DOS (version 2.0) ..... 449.
Microsoft ... NCP
□Learning DOS *(for any version)* ..... 35.
□Windows 2.03 ..... 69.
▣Works 1.0 ..... 129.
Bookshelf 1.0 *(CD-ROM)* ..... 199.
Bookshelf 1.0 w/Amdek Laser Drive ..... 799.
▣Word 4.0 ..... 249.
▣Excel 2.0 *(requires 80286/80386 CPU)* ... 319.
LANGUAGES
□Quick BASIC 4.0 ..... 69.
□Quick C 1.0 ..... 69.
🅁Macro Assembler 5.0 ..... 99.
🅁C Compiler 5.0 ..... 299.
Migent ... NCP
▣Ability Plus 1.0 ..... 149.
Monogram ... NCP
□Dollars & Sense 3.1 ..... 105.
Nantucket Software ... NCP
▣Clipper *(Summer '87, dB3 Plus compiler)* . 399.
New England Software ... NCP
▣Graph-in-the-Box Release 2 ..... 75.
Nolo Press ... NCP
🅁WillMaker 1.0 ..... 35.
North Edge Software ... NCP
□Timeslips III 3.2 ..... 119.
Paperback Software ... NCP
□VP-Planner 1.37 *(1-2-3 vers. 1A compat.)* .. 54.
□VP-Planner Plus 2.0 ..... 95.
□VP-Info 1.4 ..... 65.
□VP-Expert 1.2 *(expert system)* ..... 65.
Paul Mace ... NCP
□Nvelope 1.01 ..... 29.
□H/Test-H/Format 2.0 *(hard-disk tools)* ..... 49.
□GRASP 3.02 ..... 55.
□Mace Utilities 4.1 *(DOS utilities)* ..... 59.
Personics ... NCP
🅁SmartNotes 2.0 *(Post-It-like notes)* ..... 49.
🅁SeeMORE 1.0 ..... 49.
🅁@BASE 1.0 ..... 119.
Peter Norton ... NCP
▣Norton Utilities 4.0 ..... 55.
▣Norton Guides *(C, Assembler, Basic, Pascal)* ..... *each* 55.
▣Advanced Utilities 1.0 ..... 85.
Quarterdeck ... NCP
□DESQView 2.01 *(operating environment)* ... 79.
□Expanded Memory Manager 4.0 ..... 39.
Revolution Software ... NCP
▣Cruise Control 3.02 ..... 39.
Simon & Schuster ... NCP
□Typing Tutor IV ..... 33.

For IBM Personal Computers exclusively.

PC CONNECTION®

PC Parachute.

No strings attached.
(Or, how we rise above the competition.)

Visitors to the jumping junction of Marlow, NH (pop. 552) often pause to admire the acrobatic feats (and toes) of our lofty mascots as they practice their very special delivery techniques. Call us airheads, but the sky's clearly the limit when it comes to landing our customers great deals in record time.

Avoiding crash landings, and other tricks of the trade.

In these turbulent times, there's no such thing as too much protection. Whether you're about to go down from 5,000 feet, or buy peripherals and software for your personal computer. Ever since we first leapt brazenly into the big blue mail order business, we've offered toll-free technical support and *at least* a 120-day warranty on every product. Plus, appearances to the contrary, we don't ride the float—your credit card isn't charged until we ship.

Worried that your word processor won't support your printer, or that you don't have enough power for that new turbo board? Fear not. Our crack squadron of sales specialists will help you hit the ground running with your new add-on or software program. By making sure that you choose products that are appropriate to your needs and fit your equipment. Look out below!

Open up!

Whether you need to protect your micro from poor performance or your person from persistent precipitation, we'd like to help. So, next time it's raining cats and dogs, you can protect yourself with an official PC Connection umbrella, featuring our very fair (and foul) weather friend. It's free to anyone who places an order of $750 or more between now and May 31st.

Just call 1-800/243-8088 or 1-603/446-3383, M-F 9:00 to 9:00; Saturday to 5:30. If you're planning to visit please call ahead.

Now you too can put on hairs (and keep them dry) with your very own very stylish PC Connection umbrella. Offer not available to net accounts. One per customer.

For IBM Personal Computers exclusively.

PC CONNECTION®

©COPYRIGHT PC CONNECTION, INC., 1988. PC CONNECTION AND THE RACCOON CHARACTER(S) ARE REGISTERED TRADEMARKS OF PC CONNECTION, INC., MARLOW, NH.

ripherals promptly p

Softlogic Solutions ... NCP
- ☐ Software Carousel 2.02 *(everything resident)* 45.
- ☐ Disk Optimizer 3.0 ... 45.

Software Publishing ... NCP
- ◧ PFS:First Publisher 1.0 ... 59.
- ◉ PFS:First Choice 2.0 ... 89.
- ◉ PFS:Professional Write 1.03 ... 119.
- ◉ PFS:Professional File 1.01 ... 149.
- ◉ Harvard Graphics 2.1 ... 299.

Springboard ... NCP
- Newsroom•Pro ... 45.

Surpass Software Systems ... NCP
- ◉ Surpass 1.0 ... 297.

Symantec/Turner Hall ... NCP
- ◧ Note-It Plus 2.0 ... 49.
- ◧ SQZ!Plus 1.01 ... 59.
- ◧ 4Word 2.0 ... 59.
- ◧ 4Views 1.0 ... 59.
- ◉ Q & A Write 1.01 ... 119.
- ◉ Grandview 1.0 ... 175.
- ☐ Q & A 3.0 *(database, word processor)* ... 209.
- ☐ *Breakthrough* Timeline 2.0 ... 289.

TOPS ... NCP
- *Flashcard (AppleTalk network card)* ... 169.
- NetPrint 1.08 *(share printers)* ... 125.
- TOPS 2.0 ... 125.

Traveling Software ... NCP
- ◉ LAP-LINK Plus 1.0 ... 85.

True BASIC, Inc. ... NCP
- ☐ True BASIC 2.01 ... 57.

Vericomp ... NCP
- ◉ SoftBytes 2.0 ... 35.

WordPerfect Corp. ... NCP
- ◉ WordPerfect Library 1.1 ... 59.
- ☐ WordPerfect 5.0 ... call
- ◉ WordPerfect Executive 1.0 ... 119.
- ◉ DataPerfect 2.0 ... 299.

WordTech Systems ... NCP
- ☐ dBXL 1.2 ... 89.

Xerox ... NCP
- Ventura Publisher 1.1 ... 539.

EDUCATIONAL

Barron's ... CP
- Computer SAT ... 35.

Stone & Assoc. ... NCP *(reqs. graph. brd.)*
- My Letters,Numbers,Words *(ages 2 to 6)* ... 27.
- Kids Stuff *(ages 2 to 6)* ... 27.

True BASIC, Inc. ... NCP
- ◧ Trigonometry ... 32.
- ◧ Algebra ... 32.

RECREATIONAL

Accolade ... CP *(reqs. graphics brd.)*
- ◧ Testdrive *(driving simulation)* ... 24.
- ◧ Hardball *(baseball simulation)* ... 24.
- ◧ Mean 18 *(great golf game, CGA or EGA)* ... 29.

Electronic Arts ... CP *(reqs. graphics brd.)*
- Chessmaster 2000 ... 32.
- ☐ Chuck Yeager's Flight Simulator ... 32.
- Grand Slam Bridge ... 45.

Hayden Software ... CP
- Sargon III *(requires CGA)* ... 15.

Infocom ... NCP
- Leather Goddesses of Phobos or Hitchhiker's Guide ... *each* 25.
- Zork Trilogy ... 49.

Microprose ... CP
- Gunship *(requires CGA or EGA)* ... 32.

Microsoft ... CP
- ☐ Flight Simulator 2.13 *(reqs. graphics brd.)* ... 35.

Mindscape ... CP *(reqs. graphics brd.)*
- ☐ Defender of the Crown ... 24.
- ☐ Balance of Power ... 30.

Parlor Software ... CP
- ☐ Bridge Parlor *(best Bridge simulation)* ... 49.

Sierra On-Line ... CP
- ◉ Leisure Suit Larry *(requires CGA or EGA)* ... 25.
- ◉ Space Quest *(requires CGA or EGA)* ... 33.
- ◉ King's Quest III *(requires CGA or EGA)* ... 33.

Sphere, Inc. ... NCP
- GATO *(submarine simulation, requires CGA)* 12.
- ◉ Falcon *(F-16 simulation, reqs. graphics brd.)* 32.

Sublogic ... NCP
- Jet 2.1 *(requires EGA or CGA)* ... 33.

XOR ... NCP
- ☐ NFL Challenge ... 69.

PC Connection Hardware Special
through May 31, 1988

Hercules ... 2 years
Network Card Plus

TOPS compatible connection to the Mac world with graphics and RamFont capabilities.

- Connect PCs to other PCs, to Macs and to UNIX based systems using AppleTalk protocol
- Combine Hercules graphics (resolution 720x348), RamFont technology and network capability all in one
- Allow any computer on the network to directly access files located on other computers—no need for a dedicated file server
- Share peripherals
- Save a slot

For PC, XT, AT, & PS/2 Model 30 .... $249.

HARDWARE

Manufacturer's standard limited warranty period for items shown is listed after each company name. Some products in their line may have different warranty periods.

AST Research ... 2 years
- I/O Mini 2 C/S/P ... $89.
- SixPakPlus 64k C/S/P *(now upgrades to 576k)* ... call
- SixPakPremium 256k C/S/P *(upgrades to 1 Meg or 2 Meg w/Piggyback)* call
- Advantage Premium 512k S/P *(upgrades to 1 Meg or 2 Meg w/Piggyback)* call
- Advantage 2 512k *(for PS/2)* ... call
- RAMpage! 286 512k *(upgrades to 2 Meg)* call
- Hot Shot 286 *(10 MHz)* ... 399.

Amdek ... 1 year
- 410A *(amber monochrome monitor)* ... 159.
- LaserDrive-1 *(CD-ROM Drive; 90-day wrty.)* 629.

Compucable ... 2 years
- 2-Position switch box ... 29.
- 3-Position switch box ... 39.

Cuesta ... 1 year
- Datasaver 400 Watt *(backup power unit)* 459.

Curtis ... lifetime
ACCESSORIES
- Disk Holder DB-1 *(holds 50 5¼" disks)* ... 8.
- Printer Stand PS-1 ... 18.
- Universal System Stand SS-3 ... 25.
- DS-1 Switch Box *(controls 2 printers)* ... 33.

CABLES
- Smartmodem-to-PC Cable *(9 feet)* ... 17.
- Printer-to-IBM cable *(9 feet)* ... 17.

SURGE SUPPRESSORS
- Safestrip SP-3 *(6 outlets; 1 year wrty.)* ... 21.
- Diamond SP-1 *(6 outlets)* ... 32.
- Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* ... 59.
- Ruby-Plus *(w/FAX & modem protection)* ... 69.

DCA ... 1 year
- Irma 2 *(3270 emulation board)* ... 729.

Epson ... 1 year
- FX-86e printer *(80 column, 240 cps)* ... call
- FX-286e *(136 column, 240 cps)* ... call
- LQ-500 *(80 column, 180 cps)* ... call
- LQ-850 printer *(80 column, 264 cps)* ... call
- LQ-1050 printer *(136 column, 264 cps)* ... call
- LQ-2500 printer*(136 column, 324 cps)* ... call
- LX-800 printer *(80 column, 180 cps)* ... call
- *Printer-to-IBM cable (6 feet)* ... 15.

Everex ... 1 year
- 1200 Baud Internal Modem ... 99.
- 2400 Baud Internal Modem ... 199.

5th Generation ... 6 months
- Logical Connection 256k ... 319.
- Logical Connection 512k ... 379.

Hayes ... 2 years
- Smartmodem 1200 ... 299.
- Smartmodem 1200B *(with Smartcom II)* ... 299.
- Smartmodem 1200B *(no software)* ... 265.
- Smartmodem 2400 ... 449.

1-800/243-8088

PC Connection
6 Mill Street
Marlow, NH 03456
603/446-3383

480W

For IBM Personal Computers exclusively.

PC CONNECTION®

ALL ITEMS SUBJECT TO AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ropelled to you.

Smartmodem 2400B *(with Smartcom II)* . . $449.
Hercules ... 2 years
Color Card *(CGA)* . . . . . 159.
Graphics Card Plus. . . . . 189.
Network Card Plus *(Graphics Card Plus and TOPS compatible card in one)* . . . . . special
Intel ... 5 years
Board 386/PC w/1 Meg . . . . . call
Board 386/AT *(req. installation kit)* . . . . . 949.
Board Installation Kit *(specify computer)* . . 139.
Inboveboard 286 512k. . . . . 319.
Inboveboard PS/286 512k S/P. . . . . 349.
InboveBoard 2 Ωk *(for MicroChannel)*. . . . . 279.
387 *(for IBM-PC & XT)* . . . . . 114.
387-2 *(for PS/2 Models 25 & 30)* . . . . . 159.
80287 *(for AT & XT286)* . . . . . 195.
80287-8 *(for 8 MHz 80286 machines)* . . . . . 249.
80287-10 *(for PS/2 Models 50 & 60)* . . . . . 319.
80387 *(for 16 MHz PS/2 Model 80)*. . . . . 499.
80387-20 *(for 20 MHz PS/2 Model 80)* . . . . 749.
Kensington Microware ... 1 year
Masterpiece . . . . . 94.
Masterpiece Plus. . . . . 109.
key tronic ... 3 years
101 Keyboard *(enhanced layout)* . . . . . 99.
Kraft ... 1 year
Three-button Joystick *(w/$5 rebate coupon)* . . 33.
Kye International ... 1 year
Genius Mouse Model GM-6 Plus . . . . . 69.
Microsoft ... lifetime
Mouse with Paintbrush. . . . . 109.
Mouse with Easy CAD . . . . . 129.
Mouse with Windows and Paintbrush . . . . 145.
Migent ... 1 year
Pocket Modem *(1200 baud, incl. software)* 119.
MSC Technologies ... lifetime
SPECIFY BUS OR SERIAL VERSION
MC Mouse w/PC Paint+ . . . . . 89.
MC Mouse w/Autosketch . . . . . 105.
MEC ... 2 years
Multisync II *(800 x 560 max. resolution)* . . . . call
Mitsi Logic ... 3 years
Mitsi 480 *(extended EGA)* . . . . . 129.
Mitsi EGA Plus *(supports 800x600 res.)* . . 169.
Mitsubishi Technologies ... 2 years
Mitsi Turbo 286 . . . . . 289.
Mitsi VGA . . . . . 299.
Mod Cooling Systems ... 1 year
REPLACEMENT POWER SUPPLIES
Mod Cool 150 *(run 25°-40° cooler)*. . . . . 129.
Mod Cool 200 *(run 30°-45° cooler)* . . . . . 169.
Silencer 200 *(69% noise reduction)* . . . . . 149.
Practical Peripherals ... 5 years
Microbuffer Mini *(parallel print buffer w/32k)* 75.
Microbuffer Inline *(par. print buffer w/32k)* 129.
1200 Baud Internal Modem *(w/ProComm)* . . 69.
1200 Baud External Modem . . . . . 109.
2400 Baud Internal Modem *(w/ProComm)* 159.
2400 Baud External Modem . . . . . 189.
Princeton Graphics ... 1 year
MAX-12E *(amber monochrome monitor)* . . . 139.
Ultrasync *(supports CGA, EGA, VGA)* . . . . 549.

Quadram ... 2 years
ProSync *(with mouse)* . . . . . $259.
Microfazer II Print Buffer 64k . . . . . 249.
Quad386XT . . . . . 749.
Toshiba ... 1 year
P321SL printer *(80 col., 216 cps, w/tractor)* 529.
P351SX printer *(136 column, 216 cps)* . . . . 999.
T1000 Laptop *(80C88, 6.4 lbs., 5 hr. battery)* call
T1200 Laptop *(80C86, 10 MHz, 20 Meg)* . . . call
T3100/20 Laptop *(80286, 8 MHz, 20 Meg)* . . call
T3200 Laptop *(80286, 12 MHz, 40 Meg)* . . . call
768k Ram Card for T1000. . . . . 299.
Video 7 ... 2 years
VEGA Deluxe *(supports 640x480)* . . . . . 229.
VEGA VGA *(supports full VGA specs)* . . . . . 287.

DRIVES

IOMEGA ... 1 year
Bernoulli II Single 20 Meg Internal *(5¼")* . . 949.
Bernoulli II Dual 20 Meg External *(5¼")*. . 1679.
20 Meg cartridge *(5¼")* . . . . . 65.
Bernoulli Box 40 Meg . . . . . 1679.
20 Meg cartridge *(8")* . . . . . 82.
PC3B Card *(bootable card for PC, XT, or AT)* 169.
PC4 Card *(for PS/2 Model 50/60/80)*. . . . . 299.
Mountain Computer ... 1 year
40 Meg Internal Tape Drive *(XT, AT or PS/2)* 379.
40 Meg External Tape Drive *(XT, AT or PS/2)* 479.
40 Meg External Tape Drive w/Power Supply *(XT, AT or PS/2)* . . . . . 569.
Plus Development ... 1 year
Hardcard 20 Meg *(49 ms)*. . . . . 579.
Hardcard 40 Meg *(39 ms)*. . . . . 729.
Seagate ... 1 year
FREE PCTV® Hard Drive Installation Tape with the purchase of 20 Meg Seagate drive for the IBM PC (not for AT). Specify Beta or VHS.
20 Meg Internal Hard Drive *(w/controller and cables, 65 ms)* . . . . . 309.
40 Meg Internal Hard Drive for AT *(40 ms)* 439.
40 Meg Internal Hard Drive for XT *(w/controller and cables, 40 ms)*. . . . . 499.
TEAC ... 1 year
PC, XT 360k Drive *(5¼" half-height)* . . . . . 99.
720k Drive *(3½" half-height, specify XT or AT)* 99.
Toshiba ... 1 year
AT 360k Drive *(5¼" half-height)* . . . . . 117.

MEMORY

256k Upgrade Set *(150 ns, set of 9)* . . . . . call
256k Upgrade Set *(120 ns, set of 9)* . . . . . call

1-800/243-8088

PC Connection
6 Mill Street
Marlow, NH 03456
603/446-3383

480W

DISKS

All disks have a lifetime warranty.
5¼" DS/DD Disks for PC & XT *(360k)*
Fuji MD2D *(10 disks per box)* . . . . . $12.
Sony *(10 disks per box)* . . . . . 12.
Maxell MD2-D *(10 disks per box)* . . . . . 13.
Verbatim Datalife *(10 disks per box)* . . . . . 13.
5¼" DS/High Density Disks for AT *(1.2 Meg)*
Fuji MD2HD *(10 disks per box)* . . . . . 22.
Sony *(10 disks per box)* . . . . . 23.
Maxell MD2-DD *(10 disks per box)* . . . . . 23.
Verbatim Datalife *(10 disks per box)* . . . . . 22.
3½" DS/DD Diskettes *(720k)*
Sony *(10 disks per box)* . . . . . 18.
Fuji *(10 disks per box)* . . . . . 19.
Maxell *(10 disks per box)* . . . . . 20.
3½" DS/High-Density Diskettes *(1.44 Meg)*
Fuji *(10 disks per box)* . . . . . 55.
Maxell *(10 disks per box)* . . . . . 59.

MISCELLANEOUS

CompuServe
CompuServe Information Service . . . . . 24.
Grolier's OnLine Encyclopedia . . . . . 32.
Cables ... lifetime
Smartmodem-to-AT cable *(9 feet)*. . . . . 15.
Parallel Printer cable *(15 feet)*. . . . . 19.
PC Connection Computer Toolkit . . . . . 22.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- COD max. $1000. Cash, cashier's check, or money order.
- 120 day limited warranty on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-3383 Monday through Friday 9:00 to 5:30.

SHIPPING

Note: Accounts on net terms pay actual shipping.
Continental US:
- For monitors, printers, Bernoulli Boxes, and computers, pay actual charges. Call for UPS 2nd Day & Next-Day-Air.
- For all other items, add $3 per order to cover UPS Shipping. For such items, we automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground.

Hawaii:
- For monitors, printers, Bernoulli Boxes, and computers, actual UPS Blue charge will be added. For all other items, add $3 per order.

Alaska and outside Continental US:
- Call 603/446-3383 for information.

For IBM Personal Computers exclusively.

PC CONNECTION®

*DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION.

system necessities, and the installation software doesn't help prevent conflicts.

In any case, installing the Hot Shot is tough—despite well-written documentation. Slipping the board into an empty slot is easy enough, but then you need to put together a complicated cable socket (which should have been done at the factory), pry the 8088 chip from the motherboard, and plug it into the top of a connector at the end of a ribbon cable attached to the Hot Shot. Finally, you slide the connector into the vacant 8088 slot on the motherboard.

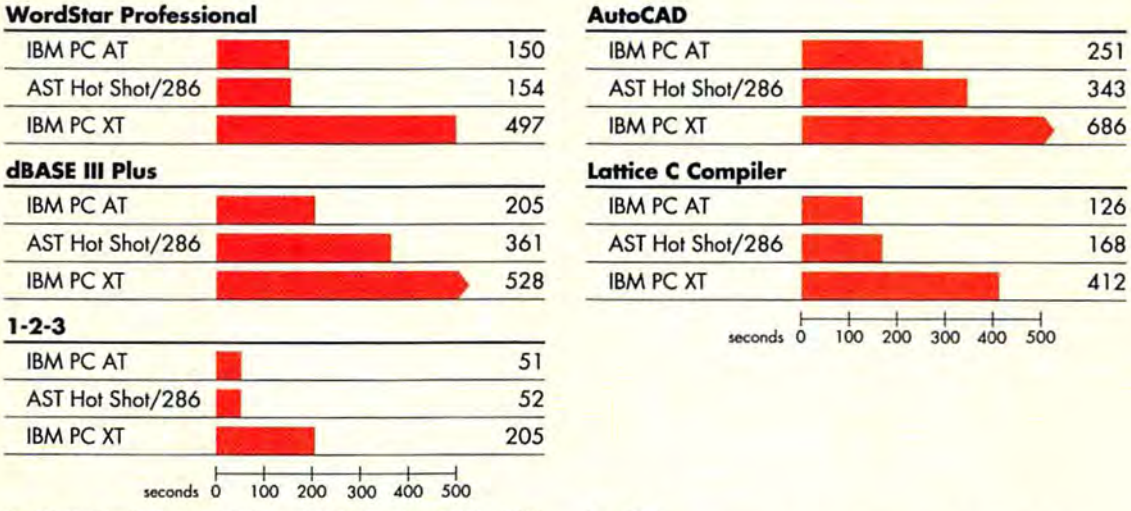
Still, some nice design touches compensate for the complex cable-socket construction. DIP switches are accessible from the rear, so settings can be changed without removing the board or lifting the system cover. A jumper setting determines whether the system starts up at 4.77 MHz (for the 8088) or 10 MHz (with the 80286). A hot-key toggle enables the PC to jump from one CPU to the other during operation.

Performance is not a problem. The Hot Shot zipped through National Software

NSTL TEST REPORT

AST Hot Shot/286

AST's Hot Shot/286 accelerator board pushes a poky IBM PC XT to near-AT velocity on WordStar, 1-2-3, and Lattice C Compiler benchmarks.



The AST Hot Shot/286 was installed in an IBM PC XT with a 10MB hard disk. The IBM PC AT tested was an 8-MHz Model 339 with a 30MB hard disk.

WordStar Professional
Although disk access plays a small part in this benchmark, processing and memory access speeds are the most significant factors. The test measures the time required to perform four operations on a 15,364-word document.

dBASE III Plus
Disk access speed is the most significant factor for this benchmark. The test measures the time required to produce a report based on a three-file join, select, and sort.

1-2-3
Because no disk access is required, this benchmark depends almost entirely on the processing and memory access speeds of the systems. In this test, a 1-2-3 macro executes a series of recalculations within a 50-by-50-cell matrix.

AutoCAD
Disk access, processing, and memory access speeds all contribute to a product's performance in this benchmark. However, the speed and type of math coprocessor used by the system are the most important factors. The test uses the sample office drawing provided with *AutoCAD* and measures the time required to retrieve and display the drawing, zoom in on a small detail within the drawing, zoom out to reveal the entire drawing, and print the entire drawing.

Lattice C Compiler
In this benchmark, the sequential disk access rate is the most important factor. Applications such as file managers commonly rely on this type of disk access. The test measures the time required to compile and link two 1000-line programs and is performed automatically using a DOS batch file.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

Save valuable time every day with the RANDOM information processor

TORNADO™

PROBLEM:

With all the software tools available, it is surprising that an important need has been overlooked—a way to deal with the countless bits of RANDOM information you spend hours with every day. As a result, you are losing valuable time and making decisions with incomplete information.

SOLUTION:

Tornado—the RANDOM information processor. The productivity software package for your PC that works wonders.

ONLY $99.95!

Just $149.95 with the valuable "Tornado Library"

30-DAY MONEY-BACK GUARANTEE

(When ordered direct)

■ New Concept

Tornado is a superfast new way to deal with an important type of information. Tornado will not only let you be more productive, it will help you make the decisions you need to reach your goals. Did you ever realize that over half the information you deal with is the RANDOM type? Not databases—not spreadsheets—not long documents—but the type scattered around your workplace and in your head. Yet amazingly, until now there was no great software to help you—the tools were either too structured or without organization. But now, at last, there is a quick and easy solution—Tornado—acclaimed by rave reviews and accepted by corporations nationwide. Whether you are a business executive, consultant, engineer, or in any other profession, you need Tornado—it will save you endless time and effort every day—guaranteed—or your money back. Here is how it works:

■ Information Windows

With Tornado, you process information in stacks of superfast "intelligent" windows—several on your screen at once. You type into the windows; interconnect and prioritize them; and scan through them in remarkable ways.

■ Free Form

Tornado is FREE-FORM. It works the way you think. To start a new window you just press N, and enter information. No file names. No extra keystrokes. To retrieve information you just press G (for Get), with any word or phrase—you'll watch Tornado zip through your windows like lightning linking and opening those requested. You can even flip through your windows with the arrow keys and watch them instantly pile up and lift away. These are just three of 18 easy but powerful features.

■ Space Station

Tornado is being used on the complex US Space Station project—but it does simple things too: When Harry calls you on the phone, in two seconds flat you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information. Tornado is so versatile you can: write and print a letter faster than ever; track things to do; edit electronic mail; and plan a project or event—quickly and easily. You can even build a sophisticated "knowledge" base—or an unstructured data base—without programming. And that's not all. Track phone conversations, numbers, sales leads, and all your other RANDOM information. With the new option you get a "Library" of windows containing: free-form calendar, project planner, grid maker, city/state/area code/time zone translator, and much more. On a portable, Tornado is your ideal moving office. Best of all, you tailor Tornado to your own needs—easily!

■ 25,000 Windows

Instead of one window or ten, imagine up to 25,000! It's like extra memory...for your brain! The uses are endless. If you can "type" it—you can "Tornado" it. And because it's memory resident (if you choose) you can quickly jump in from other programs—even move information between them. All this power, yet reviewers agree you can start "Tornado-ing" in 15 minutes—not 15 days. And that's a pretty good deal since Tornado can save you an hour every day!

"Excellent Excellent Excellent Excellent"
PC World, Patrick Marshall

"one of the niftiest ... programs I've ever seen."
BYTE, Jerry Pournelle

"Excellent value"
InfoWorld, Review Board

"a significant productivity tool"
PC Magazine, Chris Johnston

"simple ... superfast"
New York Times, Diment

■ Productivity Tool

To reach your goals, you need tools that maximize your productivity and help you make your best decisions. Tornado fits the bill perfectly. In fact corporate user surveys show you may well use Tornado more than any other software package! Order today risk-free.

To order call:

(800) 342-5930

Technical questions & NJ: (201) 342-6518
24 hr. modem: (201) 342-8101

☐ **YES,** send me ____ copies of Tornado at $99.95 each plus $3.50 shipping or ____ copies of Tornado with Library at $149.95 plus $3.50 shipping. ($10 shipping outside USA & Canada). NJ residents add 6% tax. No purchase orders. To order, mail coupon or call (800) 342-5930.

Payment: VISA MC Check
Credit Card Expiration _____
Card #_____
Not Copy Protected
30-Day Money-Back Guarantee

Name: _____

Address: _____

_____

City: _____

State: _____ **Zip:** _____

Telephone: _____

MICRO LOGIC CORP.
Dept.T93, 100 2nd St., POB 174
Hackensack, New Jersey 07602

Specifications: **FEATURES:** free-form & predefined windows, scrolling within window, import & export to files & screens, cut & paste, auto word wrap, time & date stamp, move & join & dup windows, mono or selectable color, definable Hot-key or non-resident, unloadable, LAN support, context help, extended ASCII, smart fully adjustable windows, parallel text processing, progressive resolution and "and-or-not" like searching without keywords, and more. **COMPATIBILITY:** IBM-PC/XT/AT/PS2 and compatibles; mono, CGA, 80 col EGA, and Hercules displays; 60K minimum RAM; 3.5" disk on request. **CAPACITY:** Up to 500 windows per pile - 50 piles. Not copy protected.

© 1987 Micro Logic. European marketing by Atlantex Inc. (203) 655-6980. Trademarks: IBM-PC/XT/AT/PS2 - IBM

Testing Laboratories (NSTL) tests at an admirable clip. An IBM PC XT took 205 seconds to recalculate the test *1-2-3* spreadsheet. With the Hot Shot installed, the same XT whizzed through the recalc in 52 seconds—only 1 second longer than a PC AT.

While the speed increase over a stock XT is impressive, the Hot Shot is no bargain. At $645, it costs about twice as much as other half-slot 80286 accelerator boards, such as Orchid's Tiny Turbo or the Turbo ChargeCard 286 from Compuadd, which offer similar performance for $295. What's worse, if you want to install an 80287 math coprocessor to speed up applications that require extensive number crunching, you'll need an 8087 math coprocessor on the motherboard.

Quality and support have given AST an enviable reputation as the IBM of expansion board companies, but the Hot Shot's design fails to justify a price that's much too steep. The lofty price, the hidden cost for an 8087 math coprocessor, and the intricate socket assembly make the Hot Shot a poor choice for speed-hungry but cost-conscious users. —*Lewis Perdue*

WHERE TO BUY

Hot Shot/286
AST Research
2121 Alton Ave.
Irvine, CA 92714-4992
714/863-1333
List price: $645, 80287 math coprocessor $195
Requirements: IBM PC, XT, or compatible
For more information, see Products Featured in This Issue.

NEC MultiSync II

Multiscan monitor

PROS: Compatible with all popular video modes, easily accessible controls

CONS: Excessive glare, muddy hues at low brightness, clouded VGA images

New and improved are promotional buzzwords used to hawk everything from diet soda to diapers. So when NEC replaces the world's best-selling color monitor—the MultiSync—with the "new and improved" MultiSync II, it makes you wonder how much is new and whether anything has really improved. The answers: plenty, and yes.

As you might expect, the MultiSync II has a new look. (As you might not expect, it costs no more than the original.) The monitor is housed in a sleek, modern cabinet; gone are the square corners and severe lines. The MultiSync II is a bit taller than the original, thanks to an apron located beneath the screen. A sturdier tilt-and-swivel stand is part of the package.

NEC has heeded customer complaints and placed frequently needed controls within easy reach. Vertical and horizontal controls have moved from the cramped, hard-to-reach compartment atop the machine and may now be found behind a small door on the front apron. Controls for contrast and brightness are located outside the door for even faster access. Best of all, the power switch has been moved up front, ending the infamous "gorilla reach" around the monitor formerly required to turn the machine on or off.

Unlike the old MultiSync, which did not work properly with the IBM Monochrome Display Adapter and refused to work at all with the Hercules Graphics Card, the redesigned MultiSync II accommodates these boards. Text generated by these adapters can now be displayed with near-monochrome sharpness.

Two new switches increase the display options for monochrome operation. The first simply toggles color off and on. The second sends monochrome characters to the screen in white, amber, or green; unfortunately, neither switch provides inverse video (black on white) in text mode.

The MultiSync II boasts improved switching electronics. Users with VGA boards no longer need to switch manually to analog mode; the MultiSync's circuitry tests the incoming signal from the video

75 Reasons To Use Samna Word IV.

1. The Preview feature gives you an on-screen display of how each page will actually look—including fonts, point sizes and graphics.

2. Samna Word IV has what it takes to satisfy the captains of government and industry.

3. The Fold feature lets you view widely separated columns side by side. Great for statistical documents and spreadsheets.

4. Context-sensitive help screens, intuitive commands and computer-based training make Samna Word IV a piece of cake to learn and use.

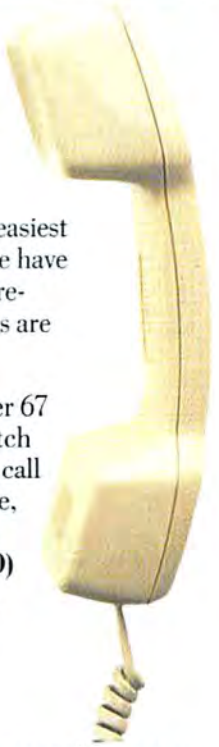
5. Forms Processing makes it a breeze to fill out and print any preprinted form.

6. Groping for a better word? The Thesaurus feature shows you synonyms, antonyms and definitions.

7. Samna appeals to all groups in a corporation. Including office workers, technical writers, executives and the legal department.

8. "Samna has one of the easiest command structures we have ever seen..." said Datapro's reviewer. That means new users are productive sooner.

9.-75. For the other 67 reasons, watch upcoming ads. Better yet, call for our free brochure, "75 Reasons to Use Samna." Phone **(800) 831-9679** or **(404) 851-0007.** Ask for Extension 17.



All in all, there's one big reason why many big organizations put Samna in charge of word processing. Quite simply, its combination of power, ease of use and productivity is unrivaled.

Samna Word IV. All the word processing power your company will ever need.

SAMNA

Samna Corp., Glenridge Centre, 5600 Glenridge Dr., Atlanta, GA 30342

Circle 166 on reader service card

adapter and automatically adjusts for digital or analog transmission, scanning frequency, resolution, and color requirements. Furthermore, unlike the original MultiSync, whose image tended to roll when you switched from VGA text to VGA graphics (see "Magical Multiscan Tour," *PCW*, September 1987), the MultiSync II shows no loss of stability during changeover.

The switching electronics' wider vertical capture range (50 to 80 Hz versus 56 to 62 Hz) makes the monitor compatible with a larger selection of graphics boards, including many proprietary CAD/CAM display adapters. For operation with non-IBM-compatible video modes, three rear-mounted slide switches allow manual control of many color-switching functions; frequency scanning and frequency lock remain automatic.

Unfortunately, the display electronics are neither new nor improved. The 13-inch screen looks just like the original monitor in virtually every respect. As always, color convergence is excellent; you won't find colors running together or characters tinged with an alien hue. However, vibrant colors fade to muddy if the brightness control is turned down, the contrast control still changes lime green to brown if set too low, and the 0.31mm-dot-pitch CRT retains the original maximum screen resolution of 800 by 560 pixels.

There are three problems—one old (VGA) and two new (glare and focus). NEC has thoughtfully included a 9-to-15-pin adapter for the VGA mode but failed to remedy the soft white veil that clouds VGA images and reduces contrast. Glare is much worse than before. In the old design, a deep bezel shaded the screen from incoming light; with bezel depth on the new version reduced to less than an inch, glare has increased noticeably. Focus on the MultiSync II seems slightly softer than on the original; presumably, this is due to factory misadjustment of the test unit and not a design flaw.

Overall, most of the changes in the new, improved MultiSync II really are improvements. Synchronization and circuit switching are now the best in the industry. The new monochrome text modes increase viewing options, and moving the controls up front is a great idea. While shortcomings in the VGA mode and the increase in glare are regrettable, the MultiSync II's improved, rock-solid sync circuitry (at the same old price) will continue to set the multiscan standard by which all other monitors are judged.
—TJ Byers

WHERE TO BUY

MultiSync II
NEC Home Electronics
1255 Michael Dr.
Wood Dale, IL 60191
312/860-9500
List price: $899
For more information, see Products Featured in This Issue.

Verticom 2Page Display

High-resolution monitor and graphics board

PROS: High performance, font caching

CONS: Supports only four applications, incompatible with some computers, poor documentation

Desktop publishers who are bored waiting for their large-screen monitors to slowly repaint over a million pixels every time the image changes will find Verticom's 2Page Display a godsend. The 2Page graphics board, one of the first to be designed around Intel's 82786 graphics coprocessor, provides the processing power required to drive the high-resolution, large-screen monitor at top speed.

The $2395 2Page system includes a 19-inch monitor (the same paper-white, high-resolution Phillips monochrome unit used with high-end Sun and Apollo workstations), a graphics board equipped with the coprocessor and 512K of RAM, and software drivers for *Ventura Publisher*,

To upgrade to the new Symphony 2.0, simply stop by any of these 600,000 convenient locations.

Symphony.® The software that does everything well, now does everything even better.

Announcing Symphony 2.0, a new release of the world's most popular integrated software. Symphony has been upgraded according to your requests. What results is an exciting new Symphony that feels and works like your present Symphony, yet offers significant enhancements, and no copy protection. So now you can have an even more efficient, versatile and powerful business tool.

An improved, more flexible word processor features an 80,000-word spelling checker, a text outliner to brainstorm, organize ideas and write more easily, plus other features that make editing faster and easier.

A more powerful database, now supporting 256 fields with menu-driven editing.

More communications options and easier use. Symphony 2.0 has VT100 terminal emulation and pre-configured communications files provide access to major on-line services like CompuServe®, ADP,® Dow Jones® and MCI Mail.®

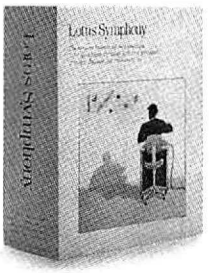
A faster, more readable spreadsheet, with minimal recalculation and new optional settings.

What's more, Symphony 2.0 offers DCA file translation to exchange data with other word processing programs, like Lotus® Manuscript® and DisplayWrite® III and IV. Also, expanded memory improvements leave more memory available for data.

To purchase your Upgrade, simply complete and return this coupon, enclose payment (see coupon for pricing),* enclose original Help & Tutorial Disk (5.25″ version) or Tutorial Lessons Disk (3.5″ version)** and mail to the address on the coupon.

Or, stop by a participating **Lotus Authorized Dealer.**

Clip this coupon right away. Because the sooner you get the new Symphony 2.0, the sooner you can put its great new features to work for you.



Lotus Symphony 2.0

Symphony Release 2.0 Upgrade Please return this coupon with payment (or proof of purchase), and your original Help & Tutorial Disk (5.25″ version) or Tutorial Lessons Disk (3.5″ version). Mail to: **Lotus Development Corporation, Upgrade Center S, P.O. Box 9129, Cambridge, MA 02139-9129.**

First Name_____ Last Name_____ MI____

Company_____

Street Address_____

City_____ State_____ Zip_____

Phone Number_____-_____-_____ Ext.____

Qty.	Version	Description	Price	Amount
_____	5.25″	2TO-9000 Rel-1.0 or 1.01 to 2.0 Upgrade	$150	_____
_____	5.25″	2TO-9010 Rel-1.1 or 1.2 to 2.0 Upgrade	$ 95	_____
_____	5.25″	2TO-9020 Rel-1.2 to 2.0 Upgrade with POP	0	_____
_____	3.5″	2TO-9005 Rel-1.0 or 1.01 to 2.0 Upgrade	$150	_____
_____	3.5″	2TO-9015 Rel-1.1 or 1.2 to 2.0 Upgrade	$ 95	_____
_____	3.5″	2TO-9025 Rel-1.2 to 2.0 Upgrade with POP	0	_____

Form of Payment (or Proof of Purchase):
☐ Check or Money Order ☐ Visa
☐ MasterCard ☐ American Express

Subtotal_____
Sales Tax*_____
Total $_____

Credit Card #_____ Expiration Date____-____

Signature_____

*Sales tax applies in the following states: California, Florida, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New York, Ohio, Virginia, Texas, Washington (State). Offer, terms and conditions are subject to change without notice.

If you purchased Symphony on or between January 25 and March 31, 1988 you're eligible for a free Upgrade package, but a store receipt is required. Lotus accepts payment by check, money order, MasterCard® Visa® or American Express® If paying by credit card, be sure to write in the credit card number and expiration date in the appropriate spaces and add your signature.

*** You may request as many Upgrade packages as you desire, however, you must enclose one original Help & Tutorial Disk (5.25" version) or Tutorial Lessons Disk (3.5" version) per Upgrade ordered.*

System Requirements: Symphony Release 2.0 reads all files from previous Symphony releases and runs on IBM PC, XT, AT, and Personal System/2 Computers, COMPAQ Computers, plus IBM Certified Compatibles.

© 1988 Lotus Development Corp. Lotus, Symphony and Lotus Manuscript are registered trademarks of Lotus Development Corp. DisplayWrite is a registered trademark of International Business Machines Corp. CompuServe is a registered trademark of CompuServe Inc. ADP is a registered trademark of Automatic Data Processing. Dow Jones is a registered trademark of Dow Jones Co., Inc. MCI Mail is a registered trademark of MCI Communications Corp.

We Can Handle Characters Like These.

Show most scanners anything but an image and they're at a loss for words.

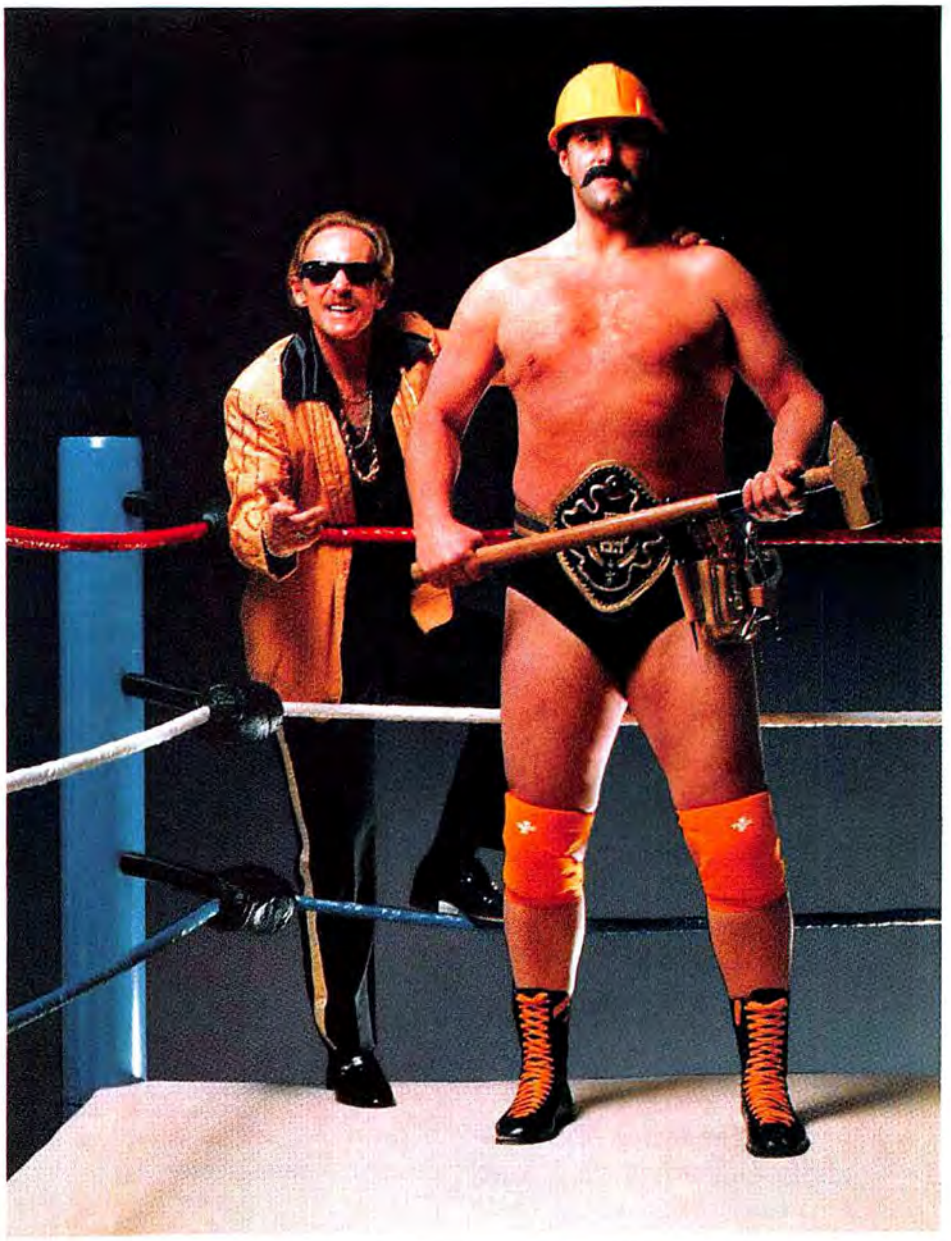
Which is why we'd like you to see things differently.

We've always recognized the importance of

being able to scan photographs and art as high-quality images, which we happen to do very well. But we also believe in the power of words. Which, not surprisingly, make up 80% of all desktop publishing.

To prove it, we've designed two new series of DEST scanners.

So now while scanning photographs, illustrations, logos, mastheads and graphics into your Macintosh™ Plus, Macintosh SE, Macintosh II, IBM,® compatible PC or PS/2,® you'll find it just as easy to get a word in, too.



In the time you'll save by not retyping documents you'll raise your office literacy rate. Our scanners read more business fonts faster and more accurately than any other scanner. Including first pass dot matrix, laser and daisy wheel print.

And everything on your screen will look like it did on the page. Making it easy for you to edit information.

GET A WORD IN EDGEWISE WITH OUR PC SCAN 2000 SERIES.

Our PC Scan 2000 Series scanners use an edgefeed design.

They scan up to 256 levels of grey-scale data, giving magazine-like quality results when printed on high resolution equipment like phototypesetters.

And they feature variable resolution scanning up to 300 dots per inch at speeds of up to nine seconds a page.

An optional automatic document feeder has a 35 sheet capacity.

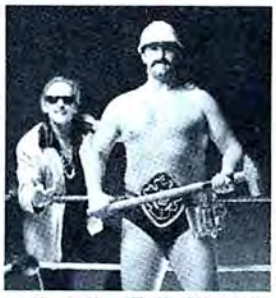
As Well As Characters Like These.

THE BIG EVENT

The Marketing Events Newsletter Of The Civic Arena Manager

Issue Number 36 — *Spring/Summer 1988*

Event Staff Pin Big Attendance Figures On Wrestling Matches



Manager Marty "The Mink" Mintz with "The Human SledgeHammer"

"Let me tell you one thing. Do you really think I care who I have to beat to a pulp to defend my belt? That is, if I can find anyone without a wide yeller streak down his back to take me on. My daddy always said, 'If you can't stand the heat, kick out a window.' And brother, I see a lot of broken glass!"

The rantings of a mad man? Perhaps. But "The Human Sledge-Hammer" and dozens of other wrestlers like him are just mad enough to bring wrestling fans by the thousands to civic arenas all across the country.

For many marketing managers wrestling matches have become the rock concert attractions of the '80s.

"Wrestling is a proven sports attraction," says Bernie Turk, events manager for the Los Angeles County Sports Dome.

"It seems everytime you flip through the channels on your television, you run across a wrestling match. They're on Saturday morning cartoons. You go in a toy store and you see their action dolls. People just can't seem to get enough of them."

Industry attendance figures seem to prove Turk's point.

In the first two months of the year, there were 37 wrestling matches held in the country. From a 57,000 seat arena in Denver to a 3,000 seat junior college gym in Raleigh. Total attendance for the matches has been estimated to be in excess of 500,000.

And it doesn't show any sign of slowing down.

More Facilities Benefiting From Hotel Tax

Seattle and Bismarck, North Dakota are just two cities that have passed legislation to enact an "entertainment tax." Hotel and motel rooms, along with restaurants, add a surcharge to each customer's bill to help finance improvements to public convention, meeting and entertainment facilities.

"It's worked wonders for us," says Linda Connell, the chairperson of the Bismarck Meetings Group. "The amount of the tax, which varies depending on the item taxed, hasn't affected us negatively in any way at all."

"We were a little leery at first of visitors complaining about the tax, but it's so little no one seems to really notice. But even though it seems small, it really adds up quickly."

How has the tax helped Bismarck?

"Very well," according to Connell. "This spring we'll be financing over 15,000 new square feet of exhibition space for our convention center. That's space that otherwise wouldn't have been available. Unless we passed a bond issue— which never seems to be a very popular idea."

For more information on how your city can benefit from similar legislation, please contact the public affairs office of *The Big Event*.

Deadline Approaching For Next Month's Articles

Remember, the deadline for all articles submitted to *The Big Event* is the 10th of each preceding month.

Send your pieces, double-spaced please, to Carol East, Events Coordinator, POB 8384, Seattle, WA 89382.

Dates To Remember

Executive Meeting
Planners Association
June 13-18
St. Louis, Missouri

National Events Association
August 18-22
Portland, Oregon

For full information, please contact the association.

PARK A FLATBED IN YOUR OFFICE WITH OUR PC SCAN 1000 SERIES.

Our PC Scan 1000 Series scanners use a flatbed design which lets you easily place open books, magazines and original artwork right on top of the scanner, like a copying machine.

The PC Scan 1000 Series can scan a page in 20 seconds, and with an optional automatic document feeder has a capacity of 20 pages.

Plus, it has 16 levels of grey-scaling and it has variable scanning resolution of up to 300 dots per inch.

Both series offer image sizing from 13% to 200% of the original size.

WE'LL RUN FOR ANY OFFICE.

The PC Scan 1000 and 2000 Series are supported by our Publish Pac™ and Text Pac™ software.

Publish Pac provides image sizing, scrolling and scanning capabilities as well as text entry for desktop publishing programs.

After scanning your images use SuperPaint™ or PC Paintbrush™ software (included with Publish Pac) to annotate and crop them before transferring them

into programs like PageMaker,™ ImageStudio™ or Ventura Publisher.™

Text Pac, our character recognition software, automatically formats text as it scans for today's most popular DOS-based word processing programs.

All with a single keystroke.

If you'd like more information on our desktop scanners, call 800-538-7582 outside California. Or 408-946-7100 inside California.

And we'll show you how to avoid buying a scanner with a character flaw.

DEST

© 1988. DEST Corporation. PC Scan is a trademark of DEST Corporation (not to be confused with PC Scanner, a trademark of Caere Corporation). Other names indicated by ™ or ® are trademarks and/or tradenames of their respective manufacturers.

Circle 113 on reader service card

MARK JOHANN

NEC's MultiSync II offers major improvements over its predecessor at no increase in cost. Important controls have been moved to the front for easy access, and the unit works with the Hercules Graphics Card.

AutoCAD, *PageMaker*, and *Windows*. The system produces 1280-by-960-pixel resolution.

The board offers two display modes: single page and facing page. When using *Ventura Publisher* in single-page mode, you can see 80 percent of the page (you lose 10 percent at the top and the bottom); in facing-page mode you can see 100 percent of both pages. Characters are reduced in size in this latter mode but are still large enough to read and edit easily.

The graphics board is the heart of the 2Page system. Since high-resolution, large-screen systems shuffle so many pixels around, they tend to be slower than conventional displays. The 2Page's Intel 82786 shoulders this screen-painting burden, speeding redraws and freeing the CPU for other work. The board's extra video memory speeds up the process by caching screen fonts for DTP programs and entire drawings for *AutoCAD*.

Unfortunately, the visual performance of the Phillips monitor is less than impeccable. While the image at center screen is true and has excellent contrast, images are slightly distorted and fuzzy along the top and sides of the screen, and straight lines take on a noticeable curve.

The manual is poorly written. Fortunately, you can ignore the documentation and go straight to the lucid READ.ME files on an accompanying system disk. In any case, the menu-driven installation programs are quite easy to use. Just answer a few questions about your hard disk and your mouse (if you have one), and the program automatically installs the Verticom driver.

This system's power has a price—and not just in dollars. Most desktop publishers need all the expanded memory they can get, but the 2Page driver conflicts with some expanded memory managers (EMMs). The Intel AboveBoard, AST Advantage, and Compaq 386 EMMs are all supported. Also, Verticom's technical support staff was helpful in suggesting ways to modify my CONFIG.SYS file so AST's EMM would coexist peaceably with the 2Page. Still, it might be smart to make sure your EMM will work *before* putting down $2395.

telemart

Your Hardware and Software Source

1-800-634-9270

Doing Business Since 1980 A Division of CW Marketing, Inc.

$435

FREE AIR EXPRESS

AIR EXPRESS SHIPPING
You Pay the Ground We Pay the Air

Turbo PC/XT
640K on Mother Board, 360K Brand Name Floppy Drive, 150 Watt Power Supply, Slide Case, AT Style Keyboard, 4-10 MH$_z$ Clock Speed, (Keyboard Selectable), 8 Expansion Slots.

FCC Approved Non-Infringing Bios All First Quality Materials
1 Year Limited Warranty IBM Compatible

Software

WORD PROCESSORS

Leading Edge W/P, W/SM Ver. 1.5	$ 55
Microsoft Word 4.0	185
Multimate Advantage II	249
PFS: Professional Write	102
Volkswriter 3	132
Volkswriter Deluxe Plus	57
Webster New World Writer	55
Webster Spell Checker	32
Webster Thesaurus	39
Word Perfect	Call
Word Perfect Executive	Call
Word Perfect Library	Call
Wordstar Pro Pack 4.0	205
Wordstar 2000 Plus 3.0	205

INTEGRATIVE SOFTWARE

Ability Plus	$105
Enable 2.0	352
Framework II	309
MS Works	111
PFS: 1st Choice	72
Smart Software System	Best Price
Symphony	439

DESKTOP PUBLISHING

Newsmaster	$ 48
Pagemaker	442
PFS: First Publisher	52
Ventura Publishing	Call

GRAPHICS/MICE

Chartmaster	$199
Diagram Master	185
Generic CAD w/Dot Plot 3.0	72
Harvard Graphics 2.1	239
IMSI Mouse w/Dr. Halo III	83
In-A-Vision	259
Logimouse	65
Logimouse w/paint	89
Microsoft Buss Mouse 1.0	92
Microsoft Chart 3.0	225
Microsoft Serial Mouse 1.0	92
News Room	30
News Room Professional	42
PC Buss Plus Mouse (New Ver.) w/paint	83
PC Mouse (New Ver.) w/paint	83
Printmaster	29
Print Shop	32
Signmaster	132
Turbo Graphix Tool Box	38
Windows Draw!! w/clip art	159

ACCESSORIES

Copy II Option Board	Call
Masterpiece	$ 79
Masterpiece Plus	92
MousePad by Mousetrac	9
Summasketch 12x12 Plus	369

LANGUAGES

C Compiler (Microsoft)	$256
Fortran Compiler (Microsoft)	256
Macro Assembler (Microsoft)	86
Ryan McFarlan Cobol	339
Ryan McFarlan Fortran Cobol	539
Pascal Compiler (Microsoft)	171
Quick C	57
Quick Basic 4.0	57
Turbo C	58
Turbo Jumbo Pack	159
Turbo Pascal 4.0	58

MONEY MANAGEMENT

Tobias Managing Your Money 4.0	$114
Dollars & Sense w/Forcast	92

SPREADSHEETS

Cambridge Analyst	$ 55
HAL	89
Lotus 1-2-3 Ver. 2.01	295
MS Excell	285
Multiplan 3.0	108
PFS Pro Plan	52
Quatro	Call
Supercalc 4	269
Twin Classic	32
VP Planner	47

DATA BASE MANAGEMENT

Clipper	$ 368
dBase III Plus	374
DB-XL	79
Eureka	88
Fox Base Plus 2.0	185
Genifer	188
Nutshell	75
Paradox 2.0	Call
PFS: Professional File	116
Q & A	189
Quickcode Plus	138
QuickReport	138
Revelation	459
R:Base For DOS	425
Reflex	78
VP Expert	55
VP Info	55

ACCOUNTING

Computer Associates	Call
DAC Easy Accounting	$ 52
One Write Plus 2.0	117
Time Slips	69

PROJECT MANAGEMENT

Harvard Total Project Manager II	$ 309
Microsoft Project 4.0	Call
Super Project Plus	269
Timeline 2.0	259

Hardware

PRINTERS

Alps	
All Models	Call
Citizen Printers	Call
120D	$ 145
180D	160
MSP-40	289
MSP-45	415
MSP-50	385
MSP-55	479
Other Models	Call
Diconics	
150	309
300P	480
Epson Printers	Call
Hewlett-Packard	
Laser Jet Series II	1775
Desk Jet	779
NEC	
Silent Writer	1539
Other Models	Call

MODEMS

Hayes	
All Model	Call
Prometheus	
1200B w/Software	$ 75
Other Models	Call
US Robotics	
Password 1200	149
Courier 2400	335
NEC	
P-6, P-7, P-9 Series	Call
Okidata	Call
Panasonic	
1080 Model II	169
1091 Model II	190
1524	579
1595	460
Other Models	Call
Star Micronics	Call
Toshiba	
321/SL	489
341/SL	665
351 SX	979

AST COMPUTERS

Model 80	$1509
Model 120	2130
140X	2335
Other Models	Call
NEC	
Multispeed	1375
Other Models	Call
Toshiba	
T-1000	785
T-1100 Supertwist	1370
T3120	3068
3200	3789
5100	4899
Zenith	Call

BOARDS

AST Six Pack Plus	$ 109
Other Models	Call
ATI EGA Wonder	175
VGA VIP	265
Hercules	
Color Card	145
Graphics Card Plus	175
Intel	
Above Board	Call
PC 1010	210
4020	309
Inboard 386 AT w/cable	855
Inboard 386 PC	719
Plus Hardcards	Call

KEYBOARDS

Keytronics	
KB5151	$ 119
KB5153	149
KB101	79
Amdek Monitors	Call
NEC	
Multisync II	$ 575
Multisync Plus	875
Other Models	Call
Princeton Graphics Monitors	Call
Princeton Ultrasync	495
Samsung	Call
Thompson C Ultrascan	519
Zenith 1490	615
Orchid	
EGA	565
Turbo EGA	449
Jet 386 Accelerator/AT	829
Tiny Turbo 286	399
Paradise	
Autoswitch 350	135
Autoswitch 480	150
VGA	279
VGA Plus	239
VGA Professional	355
Video-7	
Vega Deluxe	195

DISK DRIVES

Bernoulli Box	
10 Meg	$ 865
20 Meg	1260
40 Meg	1605
Beta Ext	1645
Beta Int	909
Everex Tape Back-Up	Call
Seagate	
20 MG w/WD Controller	339
251-1	469
Teac	
Floppy F-55BV	85
1.2 MEG AT	100
Toshiba	
3.5" XT 720K	99
3.5 1.4 MB	115

VISA · AMERICAN EXPRESS · MasterCard

- **No Charge for VISA and Mastercard**
- **We Do Not Charge Your Card Until Your Order is Shipped**
- You Pay the Ground Shipping - We Pay the Air
- Ground Shipping & Handling $6.00
- Free Air applies ONLY to orders up to 10 lbs. & Over $50
- All product carries a manufacturer's guarantee. All Guarantees, rebates, trial period priviledges & promotional programs are handled by the manufacturer only.

- No APO, FPO, or international orders, please.
- **Call before submitting P.O.'s Ask for National Accounts**
- Personal and Company Checks Will Delay Shipping 3 weeks
- Prices, Terms & Availability Subject to Change Without Notice
- Add 5% for C.O.D. Orders
- **We Do Not Guarantee Machine Compatibility**

Mailing Address:
8804 N. 23rd Avenue/Phoenix, Arizona 85021
To place an Order: 1-800-634-9270
To follow up on an Order: (602) 944-2552
Order Line Hours: Mon-Fri 7a.m.-6p.m.
Saturday 9a.m.-1p.m.
Order Processing Hours:(602) 944-1037
10a.m.-3p.m. Mon.-Fri.

You may also encounter hardware conflicts. The lack of a large-screen display standard means that compatibility problems can be expected. Although the 2Page runs happily on almost all PCs from major vendors, it doesn't work with the popular PC's Limited 80286 PC, and it may clash with other clones as well. Again, before you buy, ask Verticom to verify that the 2Page will work with your computer.

Furthermore, the applications you can run on the Verticom system in high-res 1280 by 960 mode are severely limited; it desperately needs more high-resolution drivers. On the other hand, the newly updated *Ventura* driver is particularly fine, providing faster operation and better screen fonts than the old version, while making *Ventura*'s sidebar and dialog boxes easier to read. Verticom promises eight new drivers in the near future.

The 2Page Display offers an adequate CGA emulation mode, but it does not include emulations for the more popular EGA and Hercules modes. Furthermore, while Verticom's CGA emulation works with most programs, it doesn't show you any more information than a regular display does. By contrast, Micro Display Systems' Genius CGA emulation supports 66 lines of text for most leading word processors, and the Wyse WY-700 offers special high-resolution text for its CGA mode. Enhancements like those would make the Verticom more versatile and practical.

Still, if a small display (or a slow, big one) is driving you crazy, the Verticom 2Page Display can provide a measure of relief. If you routinely design documents with facing pages, or if you frequently need to incorporate *AutoCAD* drawings into *Ventura* documents, the 2Page will probably increase your productivity enough to justify the high-end $2395 price tag. But unless your computer is dedicated primarily to desktop publishing, you may be happier with a large-screen display that supports a wider range of hardware and software. —*Jesse Berst*

WHERE TO BUY

2Page Display
Verticom
545 Weddell Dr.
Sunnyvale, CA 94089-2114
408/747-1222
List price: $2395
Requirements: 128K, DOS 2.10 or later version
For more information, see Products Featured in This Issue.

Hewlett-Packard RuggedWriter 480

Wide-carriage 24-pin dot matrix printer

PROS: Very fast, excellent NLQ and graphics output

CONS: Can't print envelopes, clumsy paper path, expensive

Hewlett-Packard plotters and laser printers have long been industry standards by which other print engines are judged. Now the company that brought you the LaserJet has released its first 24-pin dot matrix printer, the RuggedWriter 480. It should come as no surprise that the machine performs like a champ—delivering amazing speed, excellent print quality, and high-resolution graphics. Its single major failing is an inability to print envelopes.

The RuggedWriter is packed with features, including a wide carriage, forward and reverse formfeeds, and a built-in 2K print buffer. The top-mounted control keypad, complete with indicator lights, provides easy access to NLQ, draft, and compressed print modes; and formfeed, linefeed, and paper path selection. Two banks of DIP switches allow you to select either Hewlett-Packard's Printer Control Language (PCL) or Epson LQ-1000 emulation. An optional cartridge provides four additional fonts, plus 16K of RAM that can be used either as a print buffer or to store downloadable fonts. Unfortunately, these features do not come cheap; the

The new ergonomic design of the Microsoft® Mouse gives you a more comfortable way to seize control of your work. Or your company. Depending on your ambitions.

Smooth, subtle buttons can help you master today's newest programs like Aldus Pagemaker®, Microsoft Excel and Windows. They also make pleasing, productive sounds when pushed.

As a result of its makeover, you now control the mouse with your fingertips instead of the palm of your hand. Besides a more responsive, natural feel, this frees your palm to do something else.

Over 500,000 people are already living life hand in hand with a Microsoft Mouse.

Stylish plastic case is available in colors for every decor: white, white or white.

Microsoft Mouse is sold in three different packages. Get the mouse with EasyCAD™ or Windows 2.0 and PC Paintbrush® for Windows or Mouse menus and Microsoft Paintbrush. Available in serial-PS/2®, bus, and InPort™ versions.

The Microsoft® Mouse

For the name of your nearest Microsoft dealer call (800) 541-1261, Dept. E95.

Microsoft is a registered trademark and InPort is a trademark of Microsoft Corporation. PC Paintbrush is a registered trademark of ZSoft Corporation. Pagemaker is a registered trademark of Aldus Corporation. EasyCAD is a trademark of Evolution Computing. PS/2 is a registered trademark of International Business Machines Corporation.

RuggedWriter's $1695 base price approaches that of bottom-end laser printers.

If you don't require (or can't afford) laser-sharp print quality but still need to crank out good-looking spreadsheets, charts, and text, this printer is made for you. In NLQ mode, the RuggedWriter's 24-pin printhead produces near letter quality text (using a 36 by 24 matrix) that will pass for daisy wheel output to all but the most suspicious.

Best of all, even in NLQ mode the RuggedWriter is incredibly fast. A four-page, double-spaced, 800-word document, liberally sprinkled with boldface text and underlines, took only 11 seconds per page—significantly faster than many high-priced printers working in draft mode. Predictably, the RuggedWriter's draft speed was even hotter: 7.5 seconds per page.

When the RuggedWriter moves into graphics mode, it really struts its stuff. PCL mode is limited to two grades of graphics: normal resolution (90 dots per inch) and high resolution (180 dpi). Epson mode, however, offers no fewer than ten choices, ranging from 60 dpi to a classy-looking 360 by 180 dpi that produces dense black tones, subtle details, and crisp highlights. In any of its high-resolution modes, the RuggedWriter's graphics are in a different class from the muddy scrawl produced by most dot matrix printers.

The RuggedWriter offers three ways to handle paper: a built-in tractor for fanfold, a hand feed for single sheets, and an optional ($250) cut-sheet feeder. The hand feeder and the sheet feeder seem quite reliable, and you can use either without removing fanfold paper; the single sheets simply roll up in front of the fanfold.

On the other hand, HP made a mistake when it mounted the fanfold intake slot on the bottom front edge of the printer. Threading paper is tricky; unless you have room to stack it in front of the printer, you must elevate the RuggedWriter and feed the paper from underneath. Two thick books will do the elevation job, but HP would prefer to sell you an optional desk stand for $99 or a floor stand for $275. Considering its high price, the RuggedWriter ought to be capable of handling this problem out of the box, without expensive add-ons.

The RuggedWriter's most glaring flaw is its inability to print envelopes. Although the printer easily handles wide sheets, multipart forms, and mailing labels, it seems incapable of addressing envelopes without mangling or smearing them, or both.

If you've got the bucks, the RuggedWriter has a lot of bang. Its print quality is outstanding, and it may well be the fastest nonlaser printer ever made. In spite of its curious bottom-loading paper feed, it's a well-designed machine whose only Achilles' heel is its inability to print envelopes. If you can live without envelope capability, it's a tempting buy. Otherwise, you may be happier with a slower, more versatile printer. —*Paul Meyers*

WHERE TO BUY

RuggedWriter 480
Hewlett-Packard
1820 Embarcadero Rd.
Palo Alto, CA 94303
800/752-0900
List price: with parallel and serial ports $1695, with HP-IB port and serial port $1895; sheet feeder $250; font cartridge $150; desktop printer stand $99, floor printer stand $275; cable $50
For more information, see Products Featured in This Issue.

Paul Meyers is a San Francisco-based video producer and freelance writer specializing in science and technology. Lewis Perdue is the author of Supercharging Your PC *(Osborne/McGraw-Hill, Berkeley, California, 1987). TJ Byers is a contributing editor for* PC World. *Jesse Berst is coauthor of the best-selling* Inside Xerox Ventura Publisher *(1987) and* Publishing Power with Ventura *(New Riders, Westlake Village, California, 1988).*

Who Says FoxBASE+ is Better than dBASE®?

The Experts!

Nicholas Petreley, *InfoWorld Review Board:*
"FoxBASE+ has outdone itself. Once again, FoxBASE+ earns an "excellent" in performance, with kudos for responding to user suggestions. For sheer productivity, there is no other choice."

P.L. Olympia, *Founder & President, International Dbase Users Group / Government Computer News:*
"FoxBASE+ is a supercharged dBASE, with all the features Ashton-Tate forgot. If you're into serious dBASE development and have not tried FoxBASE+, you are living in the dark ages and wasting your company's money."

George F. Goley IV, *Contributing Editor, Data Based Advisor:*
"The product is fast, very compatible, fast, easy to use, fast, relatively inexpensive, and very fast. In every test, FoxBASE+ outperformed the other products. And people who answer the phone at Fox know what they are talking about."

David Irwin, *Former President/CEO, Data Based Advisor:*
"From the dBASE compatibility standpoint, FoxBASE+ is flawless. From the speed standpoint, FoxBASE+ is unbelievable. From the "lazy factor" standpoint, FoxBASE+ is perfect."

Glenn Hart, *Contributing Editor, PC Magazine:*
"Initial tests of FoxBASE+ were simply stunning. In many ways, FoxBASE+ gives you the best of both worlds: all the benefits of interactive development and debugging, plus the speed and code protection of a compiler."

Pat Adams, *Founder, International Dbase Users Group/NYPC Consultants SIG:*
"Imagine a dBASE without bugs! Imagine a dBASE that is at least six times faster and comes with its own runtime 'compiler.' Imagine a company whose tech support department is reachable on the first telephone call, and whose staff knows what it is talking about. Imagine all that—and more—and you have FoxBASE+."

Adam Green, *Contributing Editor, Data Based Advisor, dBASE Author:*
"For the PC, FoxBASE+ has consistently set the performance standard for dBASE compatible languages. For the Macintosh, FoxBASE+/Mac will set standards for innovation and leadership in a new dBASE implementation."

Don Crabb, *Contributing Editor, InfoWorld:*
"You can expect blazing speed on the Mac. FoxBASE+/Mac breezes past tests that have proven stumbling blocks for Macintosh databases in the past. FoxBASE+/Mac combines complete dBASE compatibility with a genuine Macintosh user interface."

Why not join the experts—get your copy of FoxBASE+ now! Visit your nearest quality software dealer, or order directly from us by calling (419) 874-0162.

Because when it comes to speed, compatibility and value, nothing runs like a FOX!

Fox Software

Nothing Runs Like a Fox.

Fox Software, Inc.
118 W. South Boundary
Perrysburg, OH 43551

(419) 874-0162
FAX: (419) 874-8678
Telex: 6503040827

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

Circle 68 on reader service card

194 **The Office Publisher 1.0**
Pros will appreciate the new typesetting talents and sharp-looking output, but desktop publishing neophytes might get lost.

198 **VP-Planner Plus 2.0**
1-2-3's best-known clone adds some handy features and lets you slice and dice data in five dimensions.

204 **Boyan D3**
A shareware heritage is no bar to this full-featured communication package's ambitions.

208 **Zoomracks II**
Is it hypertext? Even if it isn't, *Zoomracks*' index-card metaphor offers a handy way to move and link bits of text and information.

210 **Q-DOS II 2.0**
Yet another hard disk manager? Q-DOS II is fast, easy to use, and costs what *Xtree Pro* ought to.

The Office Publisher 1.0

Desktop publishing program

PROS: Offers style sheets and templates, extensive typographic controls and automatic forms generation, context-sensitive help

CONS: Hard to learn and use, poor compatibility with object-oriented graphics programs, expensive

PageMaker and *Ventura Publisher* rule the PC desktop publishing landscape the way the twin towers of New York's World Trade Center dominate the lower Manhattan skyline. Though other page layout programs keep springing up, few match the ease with which this pair integrates text and graphics to produce a full range of business publications. The latest challenger is Laser Friendly's *The Office Publisher.* It boasts extensive typesetting controls and style sheets, but its $995 price and steep learning curve may restrict its appeal to professional publishers.

Originally designed as a PC interface to Compugraphic typesetting equipment, *Office Publisher* resembles another modified high-end typesetting system, *Harvard Professional Publisher* (see "Ivy League Publishing," *PCW*, July 1987). It's an ambitious, feature-packed program that includes batch pagination (up to 32,000 pages per document), style sheets, automatic text flow, templates for common business documents, automatic forms generation, password protection, user-definable zoom settings, global search and search and replace, pixel editing of imported bit-mapped graphics, and excellent typographic controls.

Office Publisher also lets you select options from pulldown menus with a mouse or keyboard commands, compose pages on screen with text and graphics files im-

ported from other programs, and print finished documents on laser and dot matrix printers and PostScript-based typesetters.

The program produces sharp-looking output, especially office forms: appraisals, invoices, ledgers, inventories, deeds, registration cards, and other records. Unfortunately, *Office Publisher* takes a circuitous approach to page layout. Where *Ventura* puts everything you need on a single screen, for example, *Office Publisher* uses one screen for a main menu and another for page layout. From the main menu you manage files, open documents, configure system options, and—sigh!—convert files into *Office Publisher*'s proprietary format. In fact, it's essential at this stage to convert all the text and graphics files you plan on using, because you can't import them later during page layout.

Nor do you get much in the way of file compatibility. *Office Publisher* imports files from most popular word processing and bit-mapped graphics formats but reads only object-oriented graphics files generated by *1-2-3* and *Symphony*, which seriously limits its appeal to CAD/CAM, engineering, and scientific groups.

One of *Office Publisher*'s most annoying features is an interface that is both complicated and inconsistent. The opening screen consists of a large work area bounded by scroll bars, pulldown menus, and a control panel that gives you access to the four main page layout modes: Layout (for designing pages), Text (for editing text), Style (for applying typographic specifications), and Retouch (for editing bit-mapped graphics). The problem is that *Office Publisher*'s commands and nomenclature are confusing, and many of its dialog boxes poorly designed and crammed with options. Even with its tutorials and context-sensitive on-line help, *Office Publisher* will stymie would-be PC publishers who have limited typesetting experience.

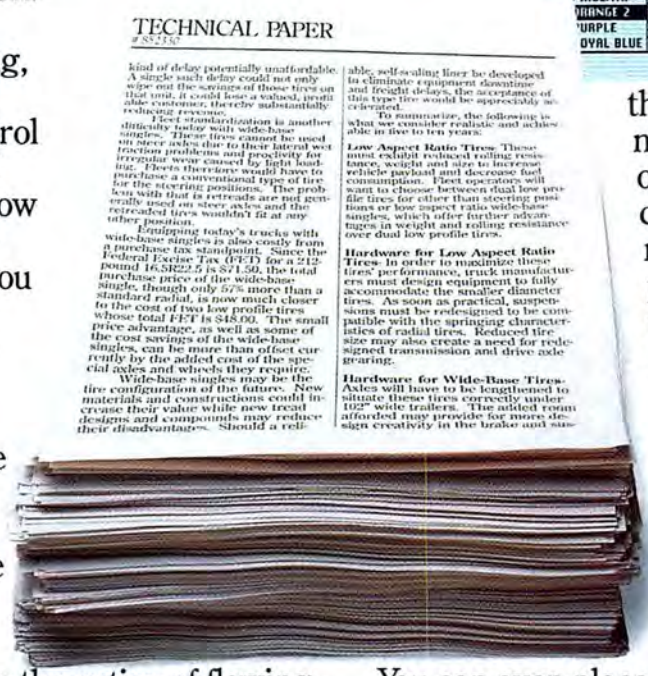
Installing *Office Publisher*'s nine disks (five disks for PS/2 systems) takes an easy 15 minutes and requires at least 2MB of hard disk space (depending on the hard-

PageMaker

Three years after inventing desktop publishing, the people at Aldus have just re-invented it. With a new version of PageMaker® dedicated to one simple proposition: freedom of choice.

From the beginning, PageMaker has given people unequalled control over all the elements of their publications. But now we've added many new features that also give you the ability to assemble even the longest documents with a couple clicks of your mouse. With PageMaker 3.0 the choice is always yours.

Here are a few of the new ways you'll have to exercise it.


TECHNICAL PAPER

kind of delay potentially unaffordable. A single such delay could not only wipe out the savings of those tires on that trip, it could lose a valued, profitable customer, thereby substantially reducing revenue.

Fleet standardization is another difficulty today with wide-base singles. These tires cannot be used on steer axles due to their lateral wet traction problems and proclivity for irregular wear caused by light loading. Fleets therefore would have to purchase a conventional type of tire for the steering positions. The problem with that is retreads are not generally used on steer axles and the retreaded tires wouldn't fit at any other position.

Equipping today's trucks with wide-base singles is also costly from a purchase tax standpoint. Since the Federal Excise Tax (FET) for a 242-pound 16.5R22.5 is $71.50, the total purchase price of the wide-base single, though only 57% more than a standard radial, is now much closer to the cost of two low profile tires whose total FET is $48.00. The small price advantage, as well as some of the cost savings of the wide-base singles, can be more than offset currently by the added cost of the special axles and wheels they require.

Wide-base singles may be the tire configuration of the future. New materials and constructions could increase their value while new tread designs and compounds may reduce their disadvantages. Should a reliable, self-sealing liner be developed to eliminate equipment downtime and freight delays, the acceptance of this type tire would be appreciably accelerated.

To summarize, the following is what we consider realistic and achievable in five to ten years:

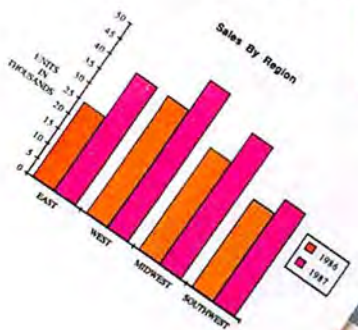
Low Aspect Ratio Tires- These must exhibit reduced rolling resistance, weight and size to increase vehicle payload and decrease fuel consumption. Fleet operators will want to choose between dual low profile tires for other than steering positions or low aspect ratio wide-base singles, which offer further advantages in weight and rolling resistance over dual low profile tires.

Hardware for Low Aspect Ratio Tires- In order to maximize these tires' performance, truck manufacturers must design equipment to fully accommodate the smaller diameter tires. As soon as practical, suspensions must be redesigned to be compatible with the springing characteristics of radial tires. Reduced tire size may also create a need for redesigned transmission and drive axle gearing.

Hardware for Wide-Base Tires- Axles will have to be lengthened to situate these tires correctly under 102" wide trailers. The added room afforded may provide for more design creativity in the brake and sus-

Autoflow

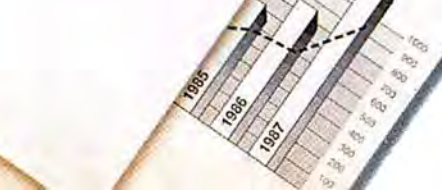
Now you have the option of flowing text automatically to speed up long-document creation or placing it column by column for shorter, more design-intensive pieces.



Text Wrap

Our new text wrap function gives you the choice of flowing text through an object, jumping over it or wrapping around it, like you see here.

And when you move a graphic, your text will automatically reflow around it. You can also control the margin between text and image and, with a custom wrap feature, fit text to even the oddest shape.



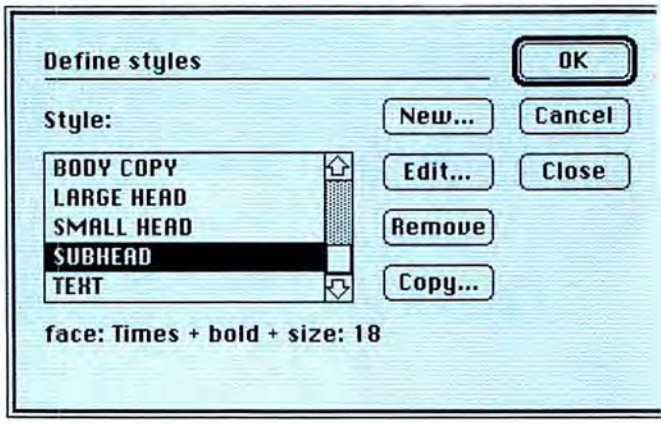
Spot Color

Mix a virtually unlimited palette of colors based on any one of three standard color models: RGB, CMYK or HLS. Then you can tag any element in the publication with a color by just clicking your pointer on it.

And, when you print your document, PageMaker 3.0 gives you the choice of a single composite image or separate sheets for each color used. You can even place registration marks in the corners of your separated output for accurate assembly by a professional printer.

Style Sheets

PageMaker's style sheets give you the ability to create and apply style formats, including color, for all your text. And that allows you to reformat an entire story or document in a single operation.



Is Turning 3.0

You can also tag text in your word processor, database or spreadsheet for instant formatting in PageMaker. And any style commands from Microsoft® Word files are read directly.

Templates

Since professionally designed templates are now included with PageMaker, it's easy to give every document you create a designer's touch.

You use the templates like blueprints, placing your own headlines, text and graphics according to the designated styles and sizes.

Image Control

You can now adjust the lightness or contrast of any scanned image or bit-map graphic you place in PageMaker. And if you want to further customize a graphic, you can use one of our built-in special effects, or even create one of your own.

High Quality Fonts

In addition to supporting a wide range of PostScript® fonts, PageMaker for the PC now expands the capabilities of the HP LaserJet Series II and other PCL output devices.

That's because we're including four Bitstream® fonts and Fontware,™ a special font generator, at no extra cost.

So you'll be able to create bit-map and screen fonts from 6 to 72 points in many versatile type faces. PageMaker 3.0 comes complete with Bold, Roman, Italic and Bold Italic variations of Dutch and Swiss (Bitstream's versions of Times and Helvetica) along with the Courier and Symbol typefaces. Which will give many people the ability to do even more with PageMaker.

EEEEEEEEEEEE

If all this has whetted your appetite to find out more, visit your authorized Aldus dealer today.

And ask for the program that did a number on PageMaker.

ALDUS PageMaker®

411 First Avenue South, Seattle, WA 98104 (206) 622-5500

©1988 Aldus Corporation. The following are registered and unregistered trademarks of the companies listed: PageMaker, Aldus, Aldus Corporation; Microsoft, Microsoft Corporation; PostScript, Adobe Systems, Inc.; Hewlett-Packard, LaserJet Series II, Hewlett-Packard Company; Bitstream, Fontware, Bitstream Inc.; Times, Helvetica, Linotype AG.

SERIAL NUMBER: 12247

WACKO INTERNATIONAL

Customer Registration Card

Congratulations!
Your new WackoMeter will prove to be a wise investment. To assure eligibility for service and support please complete and return this card to Wacko International today.
Thank you!

PLEASE TYPE OR PRINT CLEARLY:

Model Number: _____ Date: ___/___/___

Name (Last) (First) (MI)
Title
Company
Address
City State
Zip Code Country
Phone - - Ext.

The Office Publisher is excellent for generating forms. For this order form you create a "comb" (a blank line with vertical boxes for each character) simply by drawing a rectangle and answering some dialog box prompts.

ware configuration), but a whopping 4MB is recommended to ensure sufficient room for your documents and graphics. Unlike *Ventura*, which efficiently leaves all imported text and *GEM*-based graphics in their original source files, *Office Publisher*'s required conversion of text and graphics files eats up even more space.

At press time Laser Friendly was preparing to release *Office Publisher* version 1.1. The company says that enhancements will include extra word processor and printer support, function-key character formatting, and much faster screen redraws and text entry.

Seasoned desktop publishers who don't mind paying top dollar for the privilege of wrestling with dialog boxes may find *Office Publisher*'s extensive features worthwhile. But unless the program's interface is radically modified, *Office Publisher* won't ever emerge from the long shadows cast by the Big Two. —*Richard Jantz*

WHERE TO BUY

The Office Publisher 1.0
Laser Friendly
930 Benicia Ave.
Sunnyvale, CA 94086
408/730-1921
List price: $995
Requirements: 640K, hard disk, DOS 2.10 or later version, graphics card and display; mouse recommended
Not copy protected
For more information, see Products Featured in This Issue.

VP-Planner Plus 2.0

Multidimensional spreadsheet

BEST BUY

PROS: Easier access to multidimensional data base, improved report generator, no longer copy protected

CONS: Limited text editor, macros not fully compatible with 1-2-3

The appearance of *VP-Planner Plus* is persuasive evidence that litigation doesn't stop innovation. In the face of a heavy-handed lawsuit from Lotus, Paperback Software has released a major upgrade of the program that moved the phrase *look and feel* from the classroom to the courts.

Garden-variety spreadsheet users won't notice much difference; *VP-Planner Plus* looks like a solid *1-2-3* release 2.0 clone that costs a third as much as the real McCoy. But those who manage multiple departments, perform complicated financial consolidations, or work with massive amounts of spreadsheet data will prize the program's much-improved access to its multidimensional data base.

Paperback has scrapped *VP-Planner*'s opening menu and added a set of tiled pulldown menus to its *1-2-3*-like command line. The program is now compatible with *1-2-3* release 2.*x* worksheets and has gained a text editor and improved its report generator. *VP-Planner Plus* is no speed demon, though: It trails *Excel*, *Surpass*, and *1-2-3* in NSTL tests—and it can't access expanded memory.

Working more easily with the multidimensional data base, however, is what the *Plus* is all about. Suppose your com-

(continues)

Shouldn't all this be in your computer instead of on it?

Remember the early allure of PCs? How they were going to make your office work easier and your life more organized? Well, Lotus® Metro™ 1.1 delivers on that promise.

Metro is a memory resident desktop manager which runs behind application programs such as 1-2-3® and Symphony.® It's a two-for-one product combining 12 valuable accessories with a powerful macro generator.

The accessories all use the familiar Lotus interface, and include an appointment book, phone book, calculator, DOS file manager, list manager, basic word processing, notepad, clipboard, watch, among other features. The macro generator helps you simplify difficult or repetitive tasks.

If available RAM is an issue, Metro now includes "The Swapper" allowing you to run its accessories using as little as 64K of RAM. Or if need be, you can unload the whole program with a single keystroke.

Because Metro is designed to the highest standards of 1-2-3, it's highly reliable in protecting data. And it does everything listed here, and more, for only $85.*

All of this makes Metro sound pretty impressive—and it is. So impressive that PC Magazine selected Metro as Editor's Choice in 1987 in the categories of Desktop Organizer and Keyboard Macros Programs.

Metro 1.1 has both 5.25″ and 3.5″ disk versions packaged in the same box. So visit your Lotus Authorized Dealer today, or call Lotus directly at 1-800-345-1043 and ask for product ACE-1690 to order Metro.

It's never too late for your PC to make you more organized.

Introducing Lotus Metro 1.1

Lotus Metro 1.1

System Requirements: Lotus Metro runs on IBM,® COMPAQ,® Toshiba® and other computers. For specific system compatibilities consult your Lotus Authorized Dealer. Metro requires two 5.25" double sided disk drives or one 3.5" disk drive. Hard disk not required but strongly recommended.
Minimum of 64K required with Swapper, 125K without. DOS 2.1 or higher. Swapper requires a hard disk, extended RAM with VDISK, or Intel AboveBoard with Intel RAM Disk. Metro is unprotected and runs with a wide variety of software programs, including 1-2-3 and Symphony. When you purchase Lotus Metro directly from Lotus, take your first 30 days to try it. If after 30 days, Lotus Metro does not perform as described and you've purchased it directly from Lotus, we'll gladly give you a full refund.

© 1988 Lotus Development Corp. Lotus, 1-2-3, and Symphony are registered trademarks, and Lotus Metro is a trademark of Lotus Development Corp. IBM is a registered trademark of International Business Machines Corp. COMPAQ is a registered trademark of COMPAQ Computer Corp. Toshiba is a registered trademark of Toshiba Corp.

*Suggested Retail Price

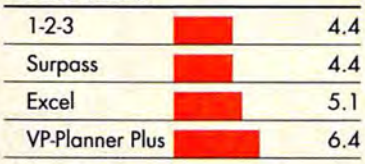
NSTL TEST REPORT

VP-Planner Plus

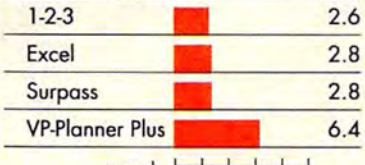
Jostled by an aggressive gang of new spreadsheet programs, VP-Planner Plus generally trails the pack, with less than competitive calculation speed.

Addition

75 x 75 cells

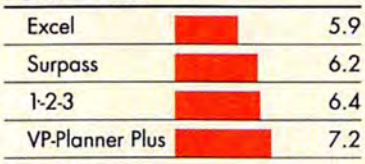


25 x 75 cells

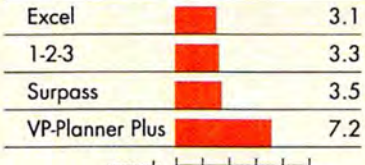


Division

75 x 75 cells

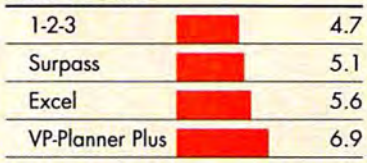


25 x 75 cells

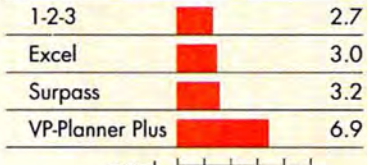


Multiplication

75 x 75 cells

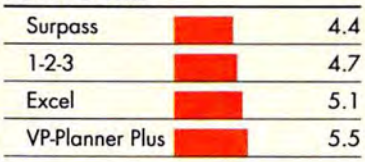


25 x 75 cells

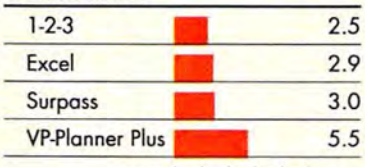


Multiplication with coprocessor

75 x 75 cells

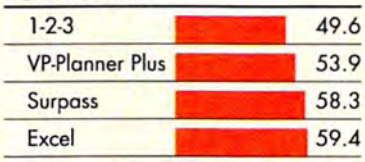


25 x 75 cells

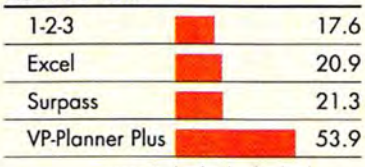


Exponentiation

75 x 75 cells

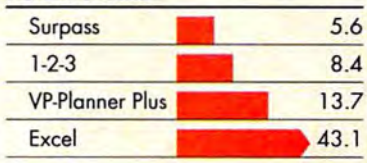


25 x 75 cells

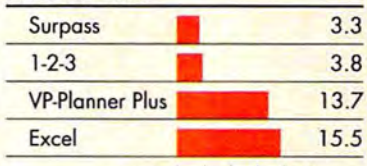


Exponentiation with coprocessor

75 x 75 cells



25 x 75 cells



Benchmarks were performed on an IBM AT Model 339 running at 8 MHz, equipped with a 30MB hard disk and a 2MB AST RAMpage 286 memory expansion board providing expanded memory. Tests were performed on *1-2-3* with *Speedup*. All cells were given a starting value of 0 and formatted to display fixed numerics with 2 decimal places. Column width was set globally at 5. For all tests, all cells except A1 contained similar formulas. For example, in the multiplication test, B1 contained the formula, *A1 * 1.01*, C1 contained *B1 * 1.01*, and so on.

Complete recalculation (75-by-75-cell matrix)
For the complete recalculation tests, the value in cell A1 was changed to 1, except for the exponentiation benchmarks, where it was changed to 2.

Partial recalculation (25-by-75-cell matrix)
After the full recalculation benchmarks were completed, the cursor was moved to cell A51. The formula in that cell was replaced with 0. Next, the numeral 1 was entered into cell A51, except for exponentiation tests, where 2 was entered.

[1] VP-Planner Plus locked when the exponentiation test was performed with the coprocessor installed. The program did not lock up every time the recalculation was executed but would generally lock up after one or more recalculations were performed.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

WHOLLY KAO.

Shutter. Door slamming test of 500,000 opens and closes typifies the extent to which Kao goes to test every component.

Shell. Precision shells molded at Kao's fully-automated 3.5 inch microdiskette production facility are available in 124 different colors.

Liner. Kao's non-woven liners provide lint-free cleaning of error-causing microscopic debris and dispersion of error-causing static electricity.

Metal Hub. Kao's specification for center hub wobble is less than half that allowed by others (20um vs. 50um). This stabilizes the disk under the disk drive heads, critical in 2MB and greater densities.

Lifter. (under liner). Heavy gauge (Kao's 5mil vs. others' 3mil) precision-formed mylar lifter sustains its cleaning pressure for millions of revolutions, while maintaining the low torque required for laptop computers.

Magnetic Coating. Proprietary surface treatment of magnetic powders is the key to Kao's superior performance; better dispersion and patented binder for durability and higher output.

Base Film. Isotropic (center cut) base film enhances performance even under extreme temperature and humidity conditions by equalizing expansion and contraction to maintain track concentricity.

The diskette. The whole diskette. And nothing but the diskette. That's what we make at Kao Corporation's Infosystems Division.

Kao is committed to total vertical manufacturing integration because a single flaw at any step in the diskette manufacturing process can result in data loss.

From raw materials to final packaging, 100 years of Kao leadership in surface science technology goes into every Kao diskette.

So whatever size, density, or color Kao diskettes you purchase, you're assured that they will exceed every industry standard worldwide.

Ask your office products or computer specialty dealer for Kao brand professional diskettes. Or call Kao at 1-800-443-0100 Ext. 947 for the name of your nearest dealer.

And make sure every diskette you buy is wholly Kao.

Sponsor of
National
Apple User Group
Conference '88
April 8-10
Ann Arbor, Michigan

©1988 Kao Corporation

KAO
Media from the Surface Scientists

World Headquarters: **Kao Corporation** 14-10 Nihonbashi Kayabacho 1-chome, Chuo-ku, Tokyo 103 Japan, 813-660-7690 Fax 813-660-7789 Telex KAOTYO J24816
In USA contact: **Kao Corporation of America** Infosystems Division, 2065 Landings Drive, Mountain View, CA 94043 (415) 965-4188 Fax (415) 965-0469
In Canada contact: **Kao-Didak Ltd.** P.O. Box 41, 10 Didak Drive, Arnprior, Ont. K7S 3H2 (613) 623-7901 Fax (613) 623-2885 Telex 0533548
In Europe contact: **Kao Corporation GmbH** Infosystems Division, Wanheimer Str. 57, 4000 Düsseldorf 30, F.R. Germany, 0211-4176-0 Fax 0211-413559 Telex 8587565 kaoe d

Circle 236 on reader service card

pany distributes ice cream through a group of retail stores. To compute income and expenses for a given store, a conventional spreadsheet would do just fine. But what if you wanted to answer a question like, How much raspberry did the Seattle store actually sell in May?

If you juggle this kind of sales data with *1-2-3*, you probably have to stuff each store's data into separate worksheets and link them with an elaborate maze of macros. *VP-Planner Plus*, on the other hand, imports and stores such information on disk in its relational data base. So getting the ice cream sales information involves slicing out the appropriate cross section of data and displaying it in a worksheet for analysis and editing. (As with conventional spreadsheets, this data cross section must fit into available RAM in order to be displayed in the worksheet, but *VP-*

FEATURES EVALUATION

VP-Planner Plus Compared to 1-2-3

VP-Planner Plus has more graph, print, and macro features than 1-2-3 and manages multidimensional data bases to boot.

	VP-Planner Plus	1-2-3 release 2.01
Data entry and editing		
Reads/writes ASCII	●	●
Reads/writes .WKS and .WK1	●	●
Reads/writes .DBF	●	●
Undo command	●	◒ [1]
Goto feature	●	●
Global search and replace	●	○
Searches using wild cards	●	●
Underlining/boldface in cells	●	○
Invisible/hide feature	●	●
Background recalculation	●	○
Minimal recalculation	●	◒ [2]
Password protection	●	●
Supports mouse	●	○
Capacity		
Maximum number of rows	9999	8192
Maximum number of columns	256	256
Maximum number of windows per screen	6	2
Maximum number of keys sorted concurrently	4	2
Supports expanded memory	○	●
Supports multidimensional data bases	● [3]	○
Supports dynamically linked files	○	◒ [1]
Supports math coprocessor	●	●

	VP-Planner Plus	1-2-3 release 2.01
Reporting and graphs		
Maximum report width (in characters per line)	255	240
Automatic page numbering	●	●
Number of graph types	6	6
Number of colors supported	16	7
Free text on graphs	○	○
Prints sideways	●	○
Spooler	●	○
Macro/Programming		
Macro libraries	●	○
Macro learn mode	●	◒ [1]
Creates macro transcript files	●	○
Input statements	●	●
Step mode	●	●
Trace cells option	●	●
DOS access from macro procedure	●	○
Reads/writes 1-2-3 macros	●	●

● Yes ○ No ◒ Deficient

[1] With Lotus's HAL.
[2] With Lotus's Speedup.
[3] Five dimensions.

ClickArt®

The No. 1 Source for Desktop Publishing Art and Graphic Accessories

NEW

ClickArt EPS Illustrations

Professional PostScript® Art for Macintosh® or PC

Picture this. Computer art crisp and clear enough for even the most discriminating designers. Introducing ClickArt EPS Illustrations, the new standard for high-quality computer art.

ClickArt EPS Illustrations is a portfolio of *PostScript* art created by professional artists. PostScript allows EPS Illustrations to be resized to any dimension *without* loss of detail or sharpness. And, the resolution of the images is limited only to the resolution of your PostScript printer. That means that EPS images print at 300 dots per inch on your LaserWriter or Personal PagePrinter, and at 2,540 dpi on your Linotronic™ 300!

EPS Illustrations are ideal for use in publications demanding only the highest quality art. Images include business-oriented art, maps, food & drink, travel & transportation, maps, sports, musical instruments, seasons, states, people & lifestyles, and more.

Macintosh and IBM PC versions: $129.95. Must be used with applications that read Encapsulated PostScript and printers that output PostScript.

NEW

ClickArt Business Images

Serious Business Art

Guaranteed to give your business reports that professionally designed look. Includes presentation art, office equipment, industrial & communication images, people, states, map symbols, flags, food, arrows, logos, and more.

Macintosh $49.95
PC $69.95

ClickArt

Personal Graphics

Add that personal touch to your printed materials. Includes cars, famous people, cartoons, animals, sports, statues, billboards, Americana, dingbats, borders, arrows, political figures, skylines, and more.
Macintosh $49.95 **PC $69.95**

Publications

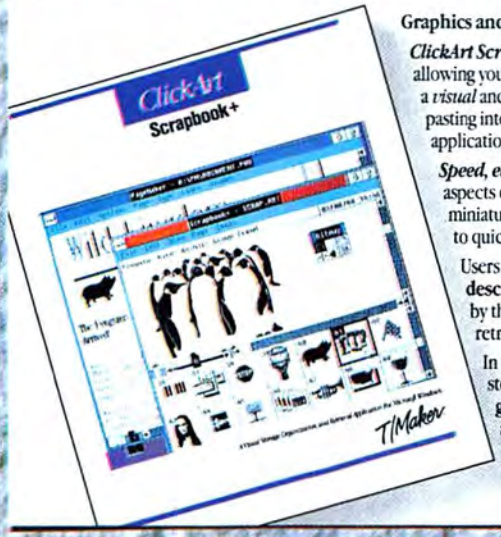
Give your publications a professional flair. Includes borders, cartoons, maps, illustrated headlines, presentation displays, abodes, dingbats, desk items, seasons, marquees, literary figures, street signs, sports, MC and Visa symbols, decorative alphabets, and more.
Macintosh $49.95 **PC $69.95**

Christian Images

Enlighten your Christian-oriented publications. Includes crosses, Christian lifestyles, services & ceremonies, images of Jesus, churches, old testament, stations, religious holidays, and more. For the wide range of Christian denominations.
Macintosh $59.95 **PC $69.95**

NEW

ClickArt ClickArt Scrapbook+



Graphics and Text at your fingertips!

ClickArt Scrapbook+ is an intelligent graphics and text manager, allowing you to store and organize graphic images and text in both a *visual* and *labelled* way. Retrieving art, text, or Excel graphics for pasting into PC PageMaker,® Windows™ Write, or any other Windows application is both immediate and convenient.

Speed, ease-of-use, and ***visibility*** are the most important design aspects of ClickArt Scrapbook+. By automatically creating miniature copies of images in a file, Scrapbook+ allows a user to quickly scan a visual index of the entire file.

Users can also attach a series of keywords to an image. The **description line** is the basis for keyword searches performed by the **Find** function, allowing for a lightning fast way of retrieving images by name.

In addition to art, ClickArt Scrapbook+ also lets you store and organize **Text files, Excel data (SYLK), Excel graphics, Encapsulated PostScript files, MetaFiles,** and more!

PC $129.95

To receive your Free ClickArt Catalog, filled with image portfolios, font collections, and graphic accessories for your personal computer, contact:

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

© 1988 T/Maker Company. All rights reserved. T/Maker and ClickArt are registered trademarks of T/Maker Company. All other products are trademarks of their respective holders.

T/Maker. **Send for FREE Catalog!**

Circle 123 on reader service card

Planner Plus's data base is limited only by free disk space.) The process obviously isn't for amateurs, but it beats the *1-2-3* approach.

VP-Planner gave users a window into this array of multiple worksheets, but structuring—and getting data out of—the multidimensional data base was a chore. With *VP-Planner Plus*, nearly all operations are done via the worksheet. To define the data base's structure, for example, you load a special worksheet called DIM.WKS, define the dimensions (time, amounts, etc.) and their categories (months, gallons), enter the appropriate field types, and finally, interconnect the dimensions and categories with formula-like logic statements.

Best of all, you can adapt a multidimensional data base to new uses; in the old *VP-Planner*, you always had to start from scratch. *VP Planner Plus* also lets you test the physical integrity of the data base (much the way DOS checks a file's integrity), tighten the structure of the data base if too many files have been deleted, and password-protect worksheets and data bases.

Although more pedestrian, *VP-Planner Plus*'s other enhancements are welcome. The report generator enables you to print text, .PIC files, and raw worksheet data contained in one document. A Tools Draw option lets you draw boxes and lines. The program's new text editor is adequate but suffers from slow cursor movement and paragraph formatting and lacks page format functions.

If you're an experienced *1-2-3* user, you will find that *VP-Planner Plus* has a number of minor eccentricities. For example, the program uses the *1-2-3* release 1A .WKS file extension instead of release 2.*x*'s .WK1. And many *1-2-3 2.0* macros must be edited before they will work in *VP-Planner Plus*. If you're lonely for the old look and feel, you can suppress *VP-Planner Plus*'s pop-up menus and use a *1-2-3*–like command line—and promptly become an accessory after the fact in the Lotus lawsuit.

With *VP-Planner Plus*, Paperback has upgraded a solid piece of software at a price that still looks like a bargain. The real beneficiaries will be the number crunchers who need to cross-tabulate data and whose worksheet recalcs are measured not in minutes but hours. For them, *VP-Planner Plus* is a must buy—regardless of what Lotus has in mind. —*Alan Southerton*

WHERE TO BUY

VP-Planner Plus 2.0
Paperback Software Int'l
2830 9th St.
Berkeley, CA 94710
415/644-2116
List price: $179.95
Requirements: 384K (448K for multidimensional data base), DOS 2.00 or later version
Not copy protected
For more information, see Products Featured in This Issue.

Boyan D3

Telecommunications program

PROS: Adaptable, easy to use; has modular transfer protocols, scroll-back buffer, and redial queue; inexpensive

CONS: ANSI-only terminal emulation, lacks host and learn modes as well as script and text editors

If *ProComm* and *Qmodem* are the Goliaths of shareware communications programs, *Boyan* must be the new David. A comprehensive general communications package, *Boyan* combines enough convenient features to endear it to on-line junkies everywhere. Although it's difficult to learn, *Boyan* makes up in power what it sometimes lacks in polish.

Like *ProComm* and *PC-Talk*, *Boyan* lacks menus but offers a pop-up summary screen of its mnemonic <Alt>-*key* commands; <Alt>-D, for example, brings up the dialing directory—the base of operations for communications sessions.

Besides providing such basics as file transfer protocols, macros, and a script language, *Boyan* offers a number of un-

Advanced Revelation:™
Building PC Applications dBase III And The Others Simply Cannot Handle.

Discover The Advanced Revelation™ Difference

Building a comprehensive personnel/payroll system to manage 15,000 employees on a 24-user 386 PC network is not the kind of application you would want to tackle with an ordinary DBMS product best suited for building phone lists.

Nor would you want to rely on a traditional DBMS, to take on the challenge of building a materials handling and order shipping control system to be accessed in 120 manufacturing locations worldwide.

That's because it takes more than just a DBMS to build a solid PC application.

It takes a complete application building environment that includes not only a superior database, but also professional programmers tools and an easy-to-use Application Processor™.

And that's the Advanced Revelation difference.

Since 1982 Advanced Revelation has been the only complete application development environment for IBM PCs and compatibles that offers these three critical application building blocks:

Multiple windowing environment makes it easy to control data and establish relationships between files.

1 Advanced Revelation's Application Processor puts the end user in control

Most applications must be ultimately maintained by the users; able to write reports without any programming expertise. Customize their application by adding new fields of information, define new edit patterns, add entirely new windows.

Advanced Revelation's Application Processor offers a complete set of menu and window-driven tools for producing any application without coding or programming.

Pop-up windows offer options and HELP throughout the entire process.

Whenever a user builds screens, menus or windows, Advanced Revelation automatically builds and updates the central data dictionary and produces documentation.

2 Advanced Revelation's Programmer Tools for the professional application builder

Professional programmers require an advanced set of tools that permit efficient design of a complete application from database implementation to data entry and inquiry screens.

Advanced Revelation's Professional Programmer Tool Kit provides the tools you need to create even the most challenging applications. Like MRP and payroll/personnel systems. A task no traditional PC DBMS can perform.

Tools like a powerful programming language with complete dictionary integration, with dozens of database, string and three-dimensional dynamic array handling functions. A language so powerful that users have written such comprehensive utilities as word processors and spread sheets — applications normally written in the C language.

3 Advanced Revelation's Dictionary Driven Database centralizes intelligence

A solid PC application must be built around a superior database. One where all the information is centralized for ease of update and ease of maintenance.

Advanced Revelation's dictionary builder allows you to specify the names, output formats, edit patterns, data conversions, formulas for your fields.

Windows can be created and customized with Advanced Revelation's easy-to-use painter.

Advanced Revelation's relational DBMS truly centralizes the intelligence of your application through an active data dictionary. One that manages every element of the application information including field lengths, edit patterns, field descriptions and formulas, assuring that application maintenance is easily performed.

Advanced Revelation's unique variable length record architecture (providing maximum record length of 65,500 characters; up to 32,000 fields per record) delivers efficiency in storage as well as substantial improvements in database flexibility.

With Advanced Revelation's exclusive linear hashing retrieval technique, your application building and database design capabilities are unsurpassed. Even if your application contains 100,000 records, and has 24 users on a LAN, your retrieval time still can be one-half second.

Experience the Advanced Revelation difference yourself. Send for your demonstration system today

In less than two hours, your fully functional Advanced Revelation demonstration system will guide you through development of a complete customer, invoice and product tracking system.

If you have never built an application before — fear not. And if you consider yourself a programming "connoisseur" — you are in for a development session you will never forget.

Simply call toll free

800-327-0216

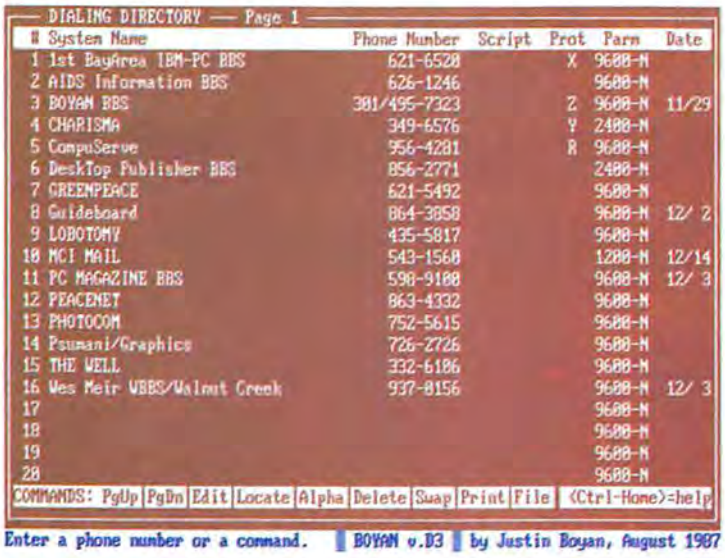
In WA: 206-643-9898

RevelationTechnologies INC.

3633 136th Place, SE Bellevue, WA 98006
Two Park Ave., N.Y., NY 10016
Offices: New York. Boston. Philadelphia. Atlanta. Chicago. Los Angeles. San Francisco.

NOTE: Advanced Revelation is compatible with the IBM PC-AT IBM PS/2, Compaq and other 100 percent IBM Compatibles.
Advanced Revelation and Application Processor are trademarks of Cosmos, Inc., a subsidiary of Revelation Technologies, Inc. dBase III is a registered trademark.

Circle 224 on reader service card



Boyan's dialing directory is home base for telecommunications sessions. Along with listing phone numbers, parameters, and transfer protocols, it can run complex log-on scripts that automate remote system connections.

usual touches: context-sensitive help screens, redial, and limited background processing reminiscent of Lotus's *Express*. A scroll-back buffer lets you peruse extensive on-line sessions for needed data without having to save volumes of unwanted information to disk. Justin Boyan, the program's 17-year-old author, reportedly wrote this remarkable package to help pay his way through college. Considering the program's quality, Boyan's college days shouldn't be darkened by economic blight.

The program is easy to install and a model of convenience once it's up and running. The dialing directory lists phone numbers, communications parameters, default file transfer protocols, and log-on scripts for up to 200 entries. You can search the directory, sort it, or mark a range of entries to delete, save to disk, or print out. If at first you don't connect, *Boyan* automatically plunks each dialed number into a 20-entry redial queue. Jump into the redial area, tap a key, and *Boyan* cycles through all listed numbers until a connection is made—convenient for BBS habitués. The dialing directory also reports the last date each service or system was accessed.

The convenience continues on line, as *Boyan* lets you control everything from communications parameters and screen colors to reconfiguring the default directory for file transfers. It also provides a split-screen mode, translation and filter tables, screen dump, disk and printer log files, and complete status-line information. On-line file and directory management is also exemplary. *Boyan* not only permits you to delete, rename, copy, and view files, it also sorts directories automatically. Given enough system memory, *Boyan* can even download data in the background while you run other applications up front.

Those who must frequently purge their disks of superfluous downloaded BBS effluvia will appreciate *Boyan*'s scroll-back buffer. The program automatically saves all incoming text into RAM for perusal during or after a session. You can search the buffer for text strings and mark passages for routing to disk or printer.

Boyan's list of built-in file transfer protocols is ample for most users: ASCII, XMODEM, YMODEM, and YMODEM G. If you need more, however, the program is designed to accept additional protocol modules. *Boyan* comes with several: Kermit, ZMODEM, Sealink, and Megalink. Others are available from most BBS systems.

Along with 10 macros earmarked for special functions, such as session start-up and conclusion, *Boyan* supports up to 60 user-definable macros. Combined with the sophisticated script language, these macros let you direct the program to automatically log on to any number of services, download mail unattended, and so on. Using the script language, however, isn't for novices. The manual doesn't adequately explain *Boyan*'s unusual macro-and-script combinations and is short on substantive examples. The program also lacks a learn mode and log-on scripts for commercial on-line services. Moreover, *Boyan*'s ANSI-only terminal emulation limits its ability to connect to mainframes. Missing altogether are a host mode and a script editor; you must write or edit scripts with a text editor and copy the resulting file to the directory containing *Boyan*. If these shortcomings prove

THE BEST EXECUTIVE WORD PROCESSOR IN THE WORLD.*

$29.95

ANNOUNCING A STEAL FOR PFS: WRITE AND PROFESSIONAL WRITE OWNERS, AND A BARGAIN FOR EVERYONE ELSE.

*"*A lot of factors make Q&A Write ($199) the best in this group." Executive Word Processor Comparisons, John Lombardi, InfoWorld Magazine, 10/12/87, Pg. 59.* Surprised? Unfortunately, some people are. Because even though Q&A Write was rated the best executive (easy-to-use, yet powerful) word processor by both *InfoWorld* and *PC Magazine*, PFS: Professional Write continues to sell. So we've cooked up an upgrade and promotion to get the word out. And hopefully when it's finished, thoughts of PFS: Write will be too.

The first 5000 PFS: Write or PFS: Professional Write owners to rip the title page out of their manual and send it along with the coupon from this ad and a check for $29.95 get a complete Q&A Write package.

Feature:	Q&A Write	PFS: Professional
Number of fonts per document	9	1
Supports HP LaserJet cartridge and soft fonts	Yes	No
Prints Lotus graphs in documents	Yes	No
Hot-links documents to Lotus spreadsheets	Yes	No
Imports Lotus spreadsheets into documents for editing with fonts and enhancements	Yes	No
Number of columns per document	8	1
Runs Lotus and up to 7 programs or macros from its main menu	Yes	No
Supports Postscript	Yes	No
Date/time-stamp documents	Yes	No

The same, complete package *InfoWorld* rated #1 and *PC Magazine* named Editor's Choice. That's our PFS upgrade. And if you don't own PFS, 5000 of you can get a fully functional trial-size Q&A Write package (normally $9.95) absolutely free just by calling the toll-free number below. Upgrade or call today. But hurry. When the word gets out, 5000 will go fast. Q&A Write instead of PFS. For easy yet powerful word processing, it's the best in the *World*.

For your $29.95 upgrade or FREE trial-size call:
(800) 888-0886 Ex. 175W

"Superpowerful, superfast, Q&A Write is superessential if you need a professional word processor that doesn't require hiring a personal trainer."

Carol Olsen Day, PC Magazine, Editor's Choice February 29, 1988

LIST PRICE $199

SYMANTEC™
Breakthrough Software Division

☐ Please send my PFS upgrade. I enclose the title page from PFS: Write or PFS: Professional Write and $29.95.

WOR 588

☐ I don't own PFS, but I'd like to check out the best executive word processor with your FREE Q&A Write trial-size diskette.

Total Enclosed/Authorized $ _____ ☐ Check ☐ VISA ☐ MC ☐ AMEX

Card # _____ Exp. Date _____

Name _____

Company _____

Address _____

City/State/Zip _____

Day Phone _____

Send to: Q&A Write Offer, Symantec, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600.

Send PFS title page and $29.95 check or money-order to Q&A Write Upgrade Offer, 10201 Torre Ave., Cupertino, CA 95014. (408) 253-9600. Q&A Write even includes power features like: ■ Card-File for customized mailings using addresses entered into the Card-File, or imported from dBase, 1-2-3, or other programs. ■ HP LaserJet and Apple LaserWriter ready so it uses large type and fonts (including Soft Fonts and Postscript) as easily as underlining. ■ Optional DCA conversion utility available ($29.95). Upgrade offer may not be used in conjunction with any other Q&A Write or Symantec offer. Offer void where prohibited. Q&A Write is a trademark of Symantec Corporation. Other brands and products are trademarks of their respective holders. © 1988 Symantec

Circle 93 on reader service card

overwhelming, Boyan Communications offers customer support by way of a 24-hour BBS board—the only method, by the way, of contacting the company.

Although any single *Boyan* feature can be found in other packages, the program is so easy to use it will appeal both to hard-core BBS trollers and to corporate communicators. Justin Boyan claims he will rectify the current version's omissions, but you needn't wait. This program is already a match for shareware and commercial Goliaths alike. —*Art Wilcox*

WHERE TO BUY

Boyan D3
Boyan Communications
9458 Two Hills Ct.
Columbia, MD 21045
919/682-4225 (BBS)
List price: $45
Requirements: 192K, DOS 2.00 or later version
Not copy protected
For more information, see Products Featured in This Issue.

Zoomracks II

Memory-resident personal data manager

PROS: Useful for a variety of applications, has macros to automate data manipulation and report generation

CONS: Sluggish on 8088- and 8086-based systems, data bases limited by available RAM, can't use expanded memory

Successful software designs are often based on real-life tools—consider the spreadsheet metaphor used by *1-2-3*. The creators of *Zoomracks* have taken a similar path, building a memory-resident data management program that uses racks of file cards as its visual and conceptual metaphor. Some have hailed *Zoomracks* as a precursor to hypertext; it's actually a clever free-form data base for people whose filing needs fall somewhere between cocktail napkins and *dBASE III Plus*. The program handles daily schedules, memos, phone logs, and client contacts and can even perform mail merges.

Zoomracks' options are grouped into <Alt>-*key*–invoked submenus—listed on an opening menu—that let you edit and search records, print reports, and change system defaults. Although this design isn't as intuitive as pulldown menus, it's friendly enough and promotes exploration. For any command you enter, another can undo it, and if you get lost, you can retrace your steps by pressing <Esc> without losing data. A help file (not context sensitive, unfortunately) is always available via <F1>.

Racks, the equivalent of data base files, hold "index cards" that can contain up to 27 fields; fields can hold an amazing 250 80-character lines. Nine racks can reside in memory at any time (an on-screen "fuel gauge" measures RAM consumption), and you can display all of them at once. Just bear in mind that the program can't use expanded memory, so work space is limited to about 400K. You can scroll back and forth through a rack of cards using function keys or search the first line of each card in the rack for matching text strings. Moving from rack to rack is a two-keystroke maneuver.

Creating a rack is easy: First press <Insert>, then Z; *Zoomracks* will prompt you to name the rack and its fields. You can add fields to the current line or start them on a new line. When all the fields are placed, <Shift>-<F3> saves the layout for use by every card in the rack. Changing a rack's field structure is also easy—you can cut, copy, and paste lines and fields and specify fields' display lengths.

To enter data in a card, press <Insert>, then Q; the cursor will jump to the first field. <Tab> moves you to subsequent fields, and <Enter> saves the card. Each rack's format is mirrored on screen and in print, but you can modify the appearance of output by funneling data through custom memo, report, or other forms stored on cards in separate racks.

Unlike many flat-file data managers, *Zoomracks* lets you pull data from a num-

Software

Word Processing/ Desktop Publishing

Byline	$ 199
Microsoft Word	$ 229
Multimate Advantage-II	$ 259
Lotus Manuscript	$ 339
Office Writer/Speller	$ 249
Pagemaker 3.0	$ 569
PFS: Prof Write	$ 119
Q&A Write	$ 119
Ventura Publisher	$ 499
Word Perfect 4.2	$ 195
Wordstar Pro 4.0	$ 199
Wordstar 2000 + 3.0	$ 209
Xywrite III +	$ 239

Database Systems

Clipper	$ 389
DBase III Plus	$ 389
Data Perfect	$ 269
DBase IV	$ Call
Foxbase +	$ 199
Paradox 2	$ 319
PFS: Prof File	$ 149
Q&A	$ 209
R Base for DOS	$ 479
RapidFile	$ 199
Reflex	$ 89
Omnis Quartz	$ 449

Spreadsheets/ Integrated Packages

Javelin +	$ 169
Lotus 1-2-3	$ 309
Lotus Hal	$ 99
Microsoft Excell	$ 319
Microsoft Works	$ 139
Plan Perfect	$ 179
Quattro	$ 109
Smart System	$ 449
SuperCalc 4	$ 279
Symphony	$ 449

Communications

Carbon Copy +	$ 119
Crosstalk XVI	$ 99
Crosstalk MK 4	$ 125
Relay Gold	$ 149
Smarterm (Persoft)	$ Call
Smartcom III	$ 149

Statistics

SPSS/PC +	$ 699
Statgraphics 2.6	$ 479
Systat	$ 439

Desktop Environments

MS Windows	$ 69
Sidekick	$ 59

Graphics

Boeing Graph	$ 209
Chartmaster	$ 209
Design CAD	$ 159
Diagraph	$ 259
Diagram Master	$ 189
Freelance Plus	$ 329
Harvard Graphics	$ 279
MS Chart	$ 269
PC Paintbrush Plus	$ 89
Picture Perfect	$ 199
Presentation Pak	$ 349
Publishers Paintbrush	$ 159
Signmaster	$ 139

Project Management

Harvard Total Project Manager II	$ 369
Microsoft Project 4.0	$ 319
Superproject Plus	$ 239
Timeline 2.0	$ 279

Languages/Utilities

Fastback +	$ 99
Lattice C	$ 229
Norton Advanced	$ 79
Microsoft C	$ 299
Mace Utilities	$ 65
MS Fortran 4.0	$ 299
Quick Basic	$ 69
Quick C	$ 69
Turbo Basic	$ 65
Turbo C	$ 65
Turbo Pascal	$ 65

Accounting

AccPac BPI	$ 279
Great Plains	$ 499
Peachtree Comp II	$ 159

Hardware*

Computers

AST Premium 286	$ Call
NEC Multispeed	$ Call
Samsung	$ Call
Toshiba 3100/20 +	$ Call

Multifunction Boards

AST Advantage Premium	$ 309
AST 6 Pak Plus (64K)	$ 169
AST Premium (256K)	$ 209
AST Rampage 286	$ 339
Everex RAM 4000	$ 299
Inboard 386AT	$1050
Inboard 386 PC	$ 795
Intel AboveBoard	$ Call
Tiny Turbo 286	$ 289

Display Boards

ATI EGA Wonder +	$ 199
Hercules Graphics Card Plus	$ 189
Hercules Color Card	$ 159
Paradise Auto Switch EGA 480	$ 169
Quad VGA	$ 259

Modems

Hayes 1200/1200B	$ 299
Hayes 2400/2400B	$ 449
US Robotics 1200B	$ 109
US Robotics 2400B	$ 189
Ventel 2400/2400B	$ 389
Ventel 2400/2-PS2	$ 299

Networking

Arcnet Board	$ 149
Novell Advanced Netware 286	$1499
Novell ELS	$ 399

Emulation Boards

AST 5251-11 +	$ 629
Irma/2 PCA/MCA	$ 725

Monitors

Amdek 410A	$ 159
NEC MultiSync II	$ 649
Princeton HX-12 +	$ 439
Princeton MAX-12E	$ 149
Samsung Amber	$ 99

Printers/Plotters

Epson FX-286E	$ 499
Epson LQ1050	$ 779
HP 7475A	$1499
HP Laserjet II	$1750
LQ-500	$ Call
NEC 3550	$ 789
NEC P2200	$ 369
Okidata 192 +	$ 339
Okidata 193 +	$ 479
Okidata 393	$1050
Okidata 293E	$ 675
Panasonic	$ Call
Toshiba P321SL	$ 549
Toshiba P341SL	$ 749
Toshiba P351M2	$ 999

Mass Storage/Backup

Bernoulli II Dual	$1799
External 5¼ Floppy	$ 259
Irwin Tape Drives	$ Call
Miniscribe 3650AT 40MB	$ 339
Mountain 40MB Int Tape	$ 389
Plus HardCard 20MB	$ 579
Plus HardCard 40MB	$ 749
Seagate ST251	$ 439
Seagate ST 225 W/int	$ 299
Seagate ST238 W/int	$ 349
Tecmar QT60 Int	$ 899

Input Devices

Keytronics KB 101	$ 109
Logitech C7 Mouse	$ 89
Logitech Hi-res Mouse	$ 99
Microsoft Mouse	$ 109
PC Mouse w/Paint	$ 109

Accessories

Curtis Ruby	$ 59
DataShield S-100	$ 69
Logical Connection	$ 329
Masterpiece Plus	$ 125
256K Ram Set	$ Call
8087 Math Chip	$ 119
80287-8/80287-10	$289/$339
80387-16/80387-20	$529/$775

***CALL FOR SHIPPING COST**

ATTENTION CORPORATE BUYERS!!

Join over 1000 major corporations and institutions who have selected **SOFTLINE** as their primary vendor. Here's why:

- **Wide Selection**—We carry over 1000 "corporate" titles. We will assist you to source those difficult requests.
- **Low Price** Our motto has always been "Sample our Service. Price shall never be an issue."
- **Fast Delivery** For those last minute rush orders, we offer convenient overnight delivery.
- **P.O.'s, of Course!!** We accept purchase orders from qualified organizations. Ask about our customized purchasing programs for volume buyers.
- **Worldwide**—We process export orders to thousands of companies worldwide. Convenient TELEX and FAX facilities available.

24 Hours A Day, 7 Days A Week

1-800-221-1260

Customer Service Hours: 9 AM—5 PM, Mon.—Fri.

In New York State call (718) 438-6057

FREE SHIPPING

on all orders over $1,000.00, credit card orders and prepaid orders.

MasterCard VISA

Softline

1333 60th Street
Brooklyn, NY 11230-0010
TELEX: 627-30170 or 910-240-3918
FAX: 718-972-8346

Our Policy: • All returns require prior authorization • 20% Restocking fee on returns • POs accepted from qualified organizations • Visa or Mastercharge—add 3% • COD, Cash M.O. or bank check only—add $5.00 per order • Prepaid personal or company check—allow two weeks to clear • Shipping via UPS surface—add $3.00 per item, UPS Blue—add $8.00 per item • Prices subject to change; call for latest prices.

Zoomracks displays the first line of each card—the equivalent of a data base record—in its file rack. You zoom cards to view or edit their contents and can print data in forms, letters, and reports that you design.

ber of racks, but the process can be laboriously keystroke intensive. Even simple operations, such as copying a field from one rack to another, can mean typing your way into one submenu to select the copy command, backing out, then wading back in for the next command, and so on. Luckily, *Zoomracks* has a macro processor that can record keystrokes (and text) and play them back.

A *Zoomracks* macro, for example, could load a client address listing, search by ZIP code for East Coast addresses, copy contact names and telephone numbers to a differently formatted rack, and display the result for your morning dialing campaign. Alternatively, names and addresses could be merged with a form letter from another rack, then printed out for mailing. Individual macros are saved as cards in a special macro rack that's limited to 27 cards; you can create an unlimited number of macro racks, but only one can be loaded at any time.

Zoomracks is slow on a PC or XT but zips along on an AT, even when juggling multiple racks. It's not intended as a heavy-hitting data base—just as a fast and flexible way to manage bits and pieces of essential data. If you can live without pulldown menus and blockbuster data bases, *Zoomracks* may be the metaphor you've been looking for. —*Michael Ham*

WHERE TO BUY

Zoomracks II
Quickview Systems
146 Main St.
Los Altos, CA 94022
415/965-0327
List price: $119.95
Requirements: 384K, DOS 2.00 or later version
Not copy protected
For more information, see Products Featured in This Issue.

Q-DOS II 2.0

Hard disk file manager

PROS: Loads quickly, easy to use, good text editor

CONS: No tree-structured display, directory listings can temporarily be out of date

At first glance, hard disk managers are like toaster ovens, differing only in minor features. They all list the files on your disk; let you tag files and copy, move, rename, and delete them en masse; and display a tree diagram of the disk's directory structure. Yet their individual feel inspires the kind of loyalty that makes some people swear by Westinghouse instead of General Electric.

Into this crowded field leaps Gazelle Systems' *Q-DOS II*, a speedy alternative to *Xtree Pro* that offers almost as much power at half the price. Unlike *Xtree Pro*, which scans the entire disk before displaying its trademark directory tree, *Q-DOS II* loads instantly after reading a small file that stores the disk's directory structure. This means changes to directories aren't reflected until *Q-DOS II* rescans the disk; however, you can reconfigure the program to read the disk anew every time *Q-DOS II* is loaded.

You can perform the equivalent of DOS's COPY, RENAME, ERASE, and ATTRIB commands as well as find, tag, move, and print files and view their con-

UNLEASH YOUR 80386!

Your 80386-based PC should run two to three times as fast as your old AT. This speed-up is primarily due to the doubling of the clock speed from 8 to 16 MHz. The new MicroWay products discussed below take advantage of the real power of your 80386, which is actually 4 to 16 times that of the old AT! These new products take advantage of the 32 bit registers and data bus of the 80386 and the Weitek 1167 numeric coprocessor chip set. They include a family of MicroWay 80386 compilers that run in protected mode and numeric coprocessor cards that utilize the Weitek technology.

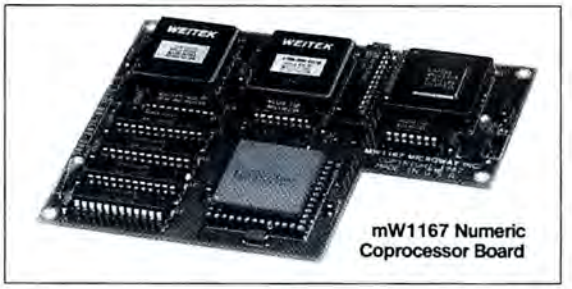
The benefits of our new technologies include:

- An increase in addressable memory from 640K to 4 gigabytes using MS-DOS or Unix.
- A 12 fold increase in the speed of 32 bit integer arithmetic.
- A 4 to 16 fold increase in floating point speed over the 80387/80287 numeric coprocessors.

Equally important, whichever MicroWay product you choose, you can be assured of the same excellent pre- and post-sales support that has made MicroWay the world leader in PC numerics and high performance PC upgrades. For more information, please call the Technical Support Department at

617-746-7341

After July 1988 call 508-746-7341



mW1167 Numeric Coprocessor Board

MicroWay® 80386 Support

MicroWay 80386 Compilers

NDP Fortran-386 and **NDP C-386** are globally optimizing 80386 native code compilers that support a number of Numeric Data Processors, including the 80287, 80387 and mW1167. They generate mainframe quality optimized code and are syntactically and operationally compatible to the Berkeley 4.2 Unix f77 and PCC compilers. MS-DOS specific extensions have been added where necessary to make it easy to port programs written with Microsoft C or Fortran and R/M Fortran.

The compilers are presently available in two formats: Microport Unix 5.3 or MS-DOS as extended by the Phar Lap Tools. MicroWay will port them to other 80386 operating systems such as OS/2 as the need arises and as 80386 versions become available.

The key to addressing more than 640 kbytes is the use of 32-bit integers to address arrays. NDP Fortran-386 generates 32-bit code which executes 3 to 8 times faster than the current generation of 16-bit compilers. There are three elements each of which contributes a factor of 2 to this speed increase: very efficient use of 80386 registers to store 32-bit entities, the use of inline 32-bit arithmetic instead of library calls, and a doubling in the effective utilization of the system data bus.

An example of the benefit of excellent code is a 32-bit matrix multiply. In this benchmark an NDP Fortran-386 program is run against the same program compiled with a 16-bit Fortran. Both programs were run on the same 80386 system. However, the 32-bit code ran 7.5 times faster than the 16-bit code, and 58.5 times faster than the 16-bit code executing on an IBM PC.

NDP FORTRAN-386™ $595
NDP C-386™ $595

MicroWay Numerics

The **mW1167™** is a MicroWay designed high speed numeric coprocessor that works with the 80386. It plugs into a 121 pin "Weitek" socket that is actually a super set of the 80387. This socket is available on a number of motherboards and accelerators including the AT&T 6386, Tandy 4000, Compaq 386/20, Hewlett Packard RS/20 and MicroWay Number Smasher 386. It combines the 64-bit Weitek 1163/64 floating point multiplier/adder with a Weitek/Intel designed "glue chip". The mW1167™ runs at 3.6 MegaWhetstones (compiled with NDP Fortran-386) which is a factor of 16 faster than an AT and 2 to 4 times faster than an 80387.

mW1167 16 MHz $1495
mW1167 20 MHz $1995

Monoputer™ - The INMOS T800-20 Transputer is a 32-bit computer on a chip that features a built-in floating point coprocessor. The T800 can be used to build arbitrarily large parallel processing machines. The Monoputer comes with either the 20 MHz T800 or the T414 (a T800 without the NDP) and includes 2 megabytes of processor memory. Transputer language support from MicroWay includes Occam, C, Fortran, Pascal and Prolog.

Monoputer T414-20 with 2 meg[1] ...$1495
Monoputer T800-20 with 2 meg[1] ...$1995

Quadputer™ can be purchased with 2, 3 or 4 transputers each of which has 1 or 4 megabytes of memory. Quadputers can be cabled together to build arbitrarily fast parallel processing systems that are as fast or faster than today's mainframes. A single T800 is as fast as an 80386/mW1167 combination!

Biputer™ T800/T414 with 2 meg[1] $3495
Quadputer 4 T414-20 with 4 meg[1] ...$6000

[1]Includes Occam

80386 Multi-User Solutions

AT8™ - This intelligent serial controller series is designed to handle 4 to 16 users in a Xenix or Unix environment with as little as 3% degradation in speed. It has been tested and approved by Compaq, Intel, NCR, Zenith, and the Department of Defense for use in high performance 80286 and 80386 Xenix or Unix based multi-user systems.

AT4 - 4 users $795
AT8 - 8 users $995
AT16 - 16 users $1295

Phar Lap™ created the first tools that make it possible to develop 80386 applications which run under MS-DOS yet take advantage of the full power of the 80386. These include an 80386 monitor/loader that runs the 80386 in protected linear address mode, an assembler, linker and debugger. These tools are required for the MS-DOS version of the MicroWay NDP Compilers.

Phar Lap Tools $495

PC/AT ACCELERATORS

287Turbo-10 10 MHz $450
287Turbo-12 12 MHz $550
287TurboPlus-12 12 MHz $629
FASTCACHE-286 9 MHz $299
FASTCACHE-286 12 MHz $399
SUPERCACHE-286 .....$499

MATH COPROCESSORS

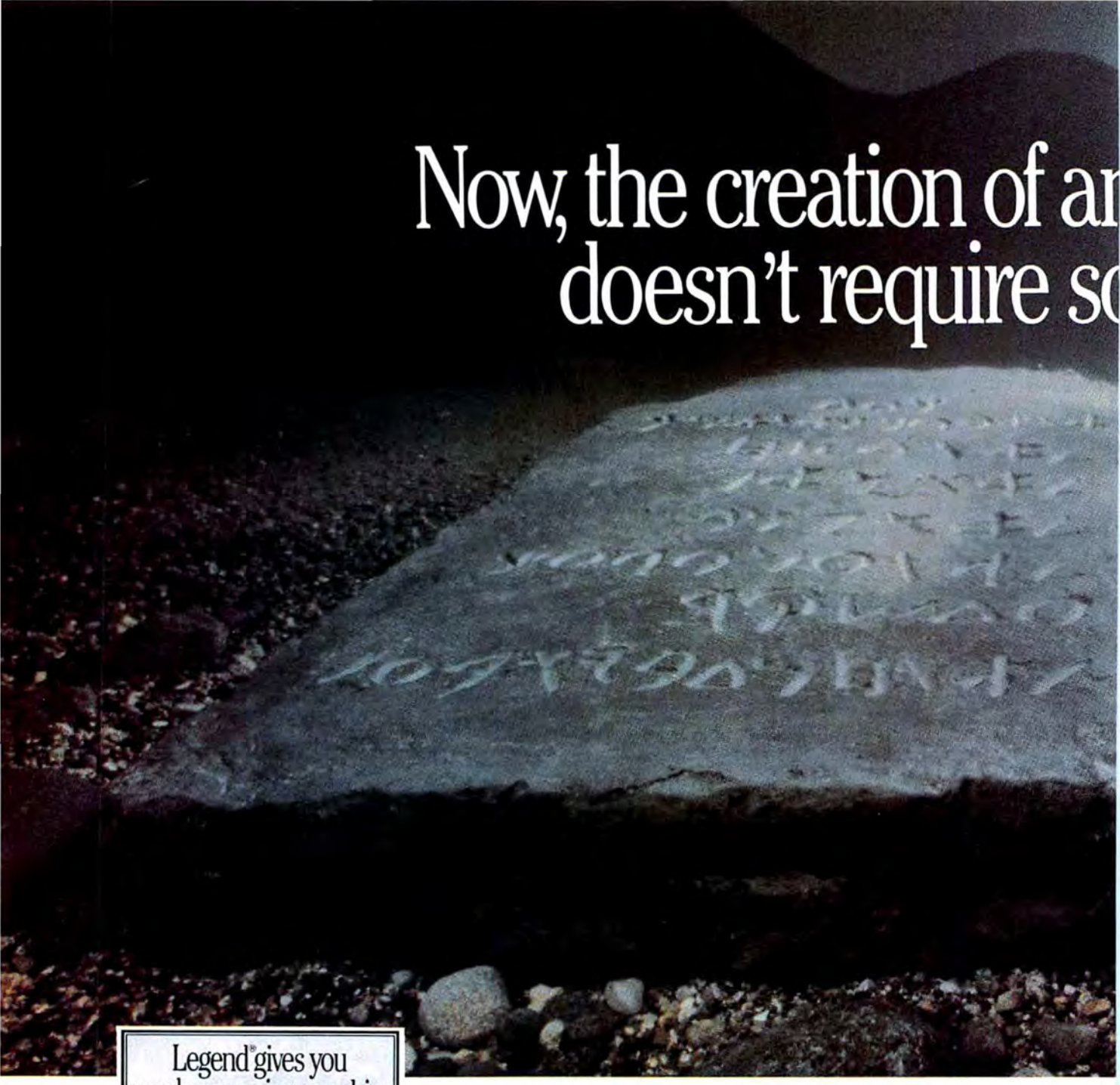
80387-20 20 MHz $895
80387-16 16 MHz $495
80287-10 10 MHz $349
80287-8 8 MHz $259
80287-6 6 MHz $179
8087-2 8 MHz $154
8087 5 MHz $99

MicroWay

The World Leader in PC Numerics

P.O. Box 79, Kingston, Mass. 02364 USA (617) 746-7341
32 High St., Kingston-Upon-Thames, U.K., 01-541-5466
St. Leonards, NSW, Australia 02-439-8400

Circle 73 on reader service card



Now, the creation of an
doesn't require so

Legend® gives you word processing, graphics and desktop publishing in one comprehensive program.

It used to take a miracle to get valuable documents produced. Moving in and out of different programs for different functions was no small feat.

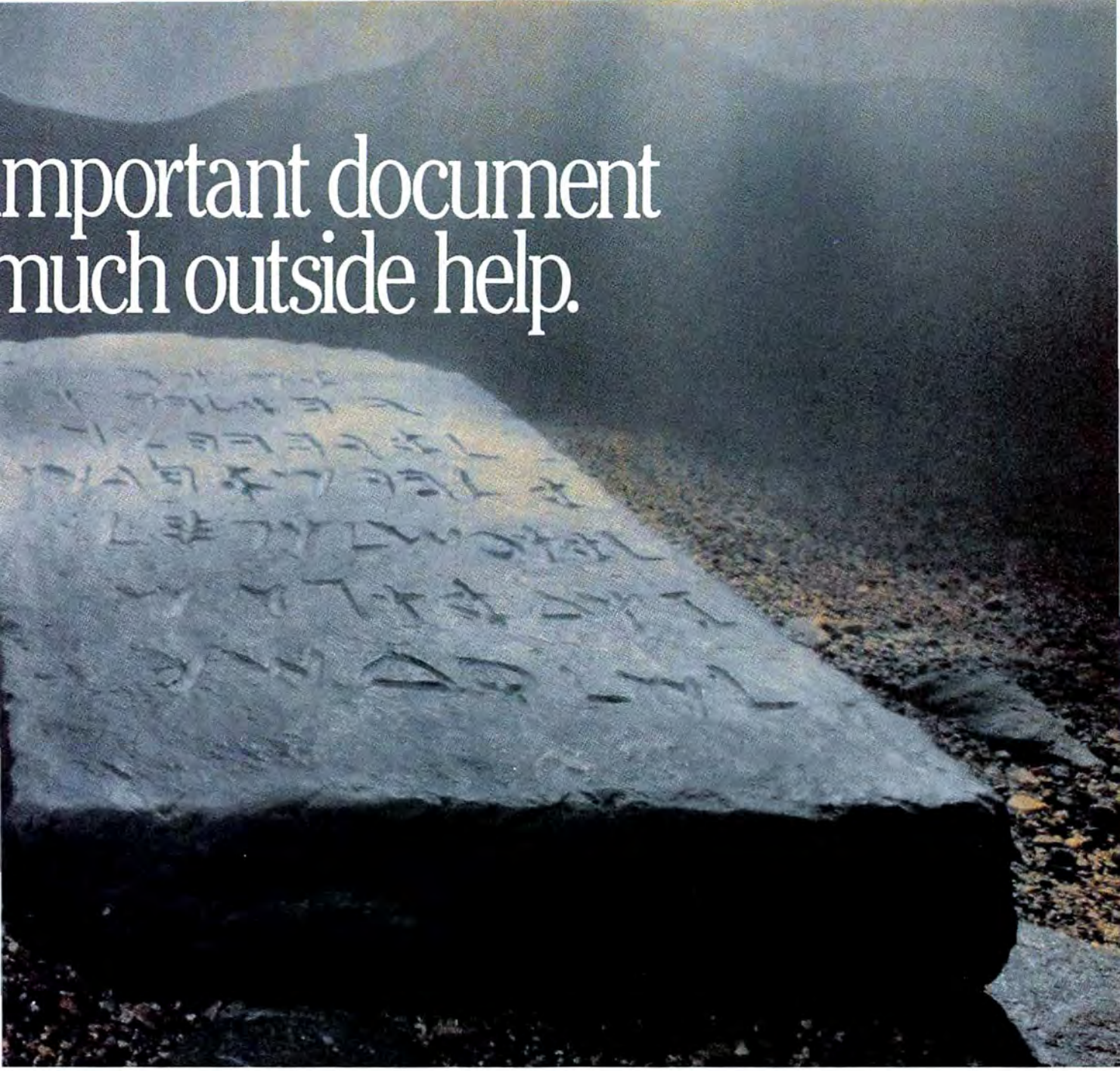
But now there's NBI Legend. The answer to all your prayers for a simpler way to produce a multitude of documents.

Simply slip Legend into your IBM® 286/386 Personal Computer or compatible equipped with Microsoft® Windows and you can process words, create graphics and lay out pages. All without leaving the comforts of one extremely comprehensive software program. And all for nothing more than you would expect to pay for a desktop publishing package.

The competition covets us.

Unlike conventional word processing programs, Legend gives you the power to command more attention. You can blend text, graphics and tables into your document to get your points across with impact. And if you ever need to make a revision, every component will adjust to the change. That's versatility and flexibility you can worship.

Even desktop publishing systems pale in comparison. Because they're always at a loss for words. In fact, you usually have to import most of your text into your document. And heaven help you if you need to make revisions. Because you'll be



mportant document much outside help.

forced into an unfair game of software leapfrog.

Words and pictures. All in good form.

With Legend, you can bring it all together. Write a paragraph, create a graphic to illustrate your point, then make it look good on the page. It's the perfect combination of functions for people who function best with efficiency.

Yet as self sufficient as Legend is, it's not too proud to ask for help. Legend will graciously import practically anything you'll ever need. Like scanned images, files from Micrografx, paint packages, spreadsheets and many others. Even your current word processing files.

Make your documents legendary.

If you're looking for the single best way to make a lasting impression with your documents, don't ask for divine intervention. Call 1-800-922-8828, ext. 503, for more information or a $9.95 evaluation disk.

Legend from NBI. Because the creation of an important document shouldn't bring you to your knees.

LEGEND
From NBI™

Legend is a registered trademark licensed in the U.S. to NBI, Inc., by Cal Circuit Abco, Inc. IBM is a registered trademark of International Business Machines Corporation. Microsoft is a registered trademark of Microsoft Corporation. The NBI stylized logo is a trademark of NBI, Inc.

Circle 113 on reader service card

It's easy to overlook files on a hard disk crowded with subdirectories and cryptic file names. Q-DOS II's Find command locates them in seconds and lets you use wild-card characters in your search.

tents. You can tag highlighted files by pressing the <Space> bar and sort a directory by file name, extension, date, or size. *Q-DOS II* initially displays the current path, a DOS-like directory listing, a command line, and a separate function key menu.

However, *Q-DOS II* doesn't lock you into its way of doing things. Press <F6>, and the program yields to a DOS prompt, where you can issue commands at will. Press <F6> again to enter the file name that was last highlighted in *Q-DOS II*'s directory listing. Pressing <F2> brings up the file name minus its extension, which makes it easy to run an executable file quickly. Type EXIT to return to *Q-DOS*.

Q-DOS II makes changing directories a breeze. Highlight the directory you want to log on to, press <F5>, and the program displays that directory's files. Type a period, and it instantly moves you back to the parent directory.

For amnesiacs in a hurry, *Q-DOS*'s Find command will rip through megabytes of files in just a few seconds, listing every occurrence of a named file (wild cards accepted) directory by directory. You can have *Q-DOS II* list its finds on the screen all at once or ask it to pause after each one.

One of *Q-DOS II*'s nicest features is QED, a snappy text editor that lets you create text; search and replace; do block deletes, copies, and moves; and view text in hexadecimal mode. QED is great for minor programming fixes and quick-and-dirty editing, and you can run it independently of *Q-DOS II*. If you don't like QED, you can configure the main program to default to your favorite text editor or word processor. *Q-DOS II*'s context-sensitive help makes the excellent documentation practically unnecessary.

Although it can temporarily lose track of frequently modified directories, *Q-DOS II*'s loading speed and text editor give it an edge over the classic file manager, *Xtree* (see "The Forest Through the Xtrees," *PCW*, July 1987). Further, though *Xtree Pro* comes with a text editor and refreshes the directory listing each time it's loaded, it costs a steep $128. For basic hard disk file management at a reasonable price, *Q-DOS II* is hard to beat—even though it can't make toast. —*David Weinberger*

WHERE TO BUY

Q-DOS II 2.0
Gazelle Systems
42 N. University Ave. #10
Provo, UT 84601
801/377-1288
List price: $69.95
Requirements: 256K, DOS 2.00 or later version
Not copy protected
For more information, see Products Featured in This Issue.

Richard Jantz is a desktop publishing consultant in Berkeley, California, and the author of Ventura Publisher for the IBM PC: Mastering Desktop Publishing *(John Wiley & Sons, New York, 1987). Alan Southerton is a technical writer at Imaging Technology in Woburn, Massachusetts. Art Wilcox is a contributing editor for* PC World. *Michael Ham is the data processing product manager for CTB/McGraw-Hill in Monterey, California. David Weinberger is a staff writer for an electronic publishing software company.* ●

Take Charge! T.M.

LIKE NOTHING IN RECENT MEMORY

$99.99
Excluding Shipping & Handling

- 23K Resident Memory
- Easy-To-Learn/Use
- Point and Shoot
- No Blown Systems
- No Program Conflicts
- No Confusion
- Powerful File/Systems Services*
- Powerful Utilities/Disk Services*
- No Technical Skills Required
- Menu-Driven

SYSTEM REQUIREMENTS: IBM™ PC, XT, AT, PS/2, or compatible. Two disk drives, or hard disk. MS/DOS 2.0 or greater. 256K minimum.

See Us At Comdex, Atlanta Apparel Mart–Booth 6545

Circle 46 on reader service card

One Disk Does What All These Do. And More*.

TAKE CHARGE™! One of the last DOS utilities you'll ever need. A complete, integrated DOS environment and utility program -- with enhancements for the beginner and the experienced user -- in one PC, MS/DOS-based software package. A powerful workhorse anyone can use immediately. Once you use it, you'll never want to be without it. Write Departmental Technologies, Inc. 131 Washington St., Suite 200, Lodi, NJ 07644; 201-473-2400. Or call:

1-800-628-2828 ext. 784

CREDIT CARDS ACCEPTED. DEALER INQUIRIES WELCOME.

* File manager (Copy Delete, Rename, Menu Print, Etc.), appointment book/calender, fully-automatic Rolodex® card file system (with autodialer and label-maker), virtual memory text editor/word processor (edit up to 10 files at once), ASCII table, alarm package and clock, five calculators, printer redirect, speed key, cut and paste, clipboard, notepad, screensaver, security keyboard lock, system reset, DOS command line editor, hex editor, directory editor, disk optimizer, graphic directory display, directory sort, tree directory, file locator, undelete, format recovery, and more.

All product names are trademarks of their manufacturers. Copyright 1987. Departmental Technologies, Inc. All rights reserved.

For those with better things to do

If yours is like most small businesses, much of your day is spent attending to customers, filling orders and answering messages. The business of doing business.

Accounting for the day's activities is either done at the expense of something else, or late at night when everyone has gone home.

A 48 hour day would be helpful.

A comfortable, well documented system, developed for the needs of a company your size would be even better.

Our Integrated Accounting System has been designed specifically for the needs of small business.

Bedford delivers on the promise of simplicity and responsiveness, without the struggles of sophisticated extras you don't really need.

You can save yourself some time tomorrow by giving us a call today. Or drop by your nearest Bedford dealer to see for yourself just how comfortable we can be.

$249 complete

General Ledger
- entire fiscal year available for reports
- user definable chart of accounts
- produces full audit trail

Payables/Receivables
- uses open invoice method
- prints checks, invoices and statements
- user defined aging periods

Payroll
- automatic federal and state deductions
- accumulates QTD, YTD, W-2, 940 and 941 information

Inventory
- fully integrated with payables and receivables
- uses average weighted cost method
- handles adjustments and transfers

Jobcost
- distributes revenue or expense to projects or profit centers
- paycheck distribution includes the company's portion of FICA, SUTA and Disability Insurance

Overall
- Six modules fully integrated on one disk
- Reports can be displayed, printed or exported
- Requires 256K RAM, two drives, MS-DOS 2.0 or higher
- Not copy protected

bedford®

making software comfortable

☎(206) 883-0074

EDITOR'S PC MAGAZINE CHOICE

Bedford Software Corporation
15311 N.E. 90th Street
Redmond, WA 98052
Fax# (206) 885-0859

Circle 52 on reader service card

OUR SILENTWRITER IS CREATING HEADLINES ON SEVERAL FRONTS.

Our Silentwriter™ LC890 is the first desktop publishing printer that gives you both popular standards for creating graphics and type: true Adobe PostScript® and LaserJet Plus emulation.

That alone would be enough to cause headlines. But we also added many more features to simplify desktop publishing. Like both Apple and IBM compatibility. *PC Week* stated, "the LC890 is actually better than having both an Apple LaserWriter Plus and an HP LaserJet Plus on your desk." Equally impressed, *PC Magazine* awarded it an "Editor's Choice." And cited it in their "Best of 1987" issue.

And because the Silentwriter has a simple, trouble-free printing mechanism, it will be creating headlines for years to come. In fact, it's twice as reliable as ordinary lasers, with an average life of 600,000 pages.

If you don't require the power of our LC890, consider the rest of the family. The LC850 for text applications and the LC860 Plus for text and less complex graphics.

To start producing your own headlines, call 1-800-343-4418 (in MA 617-264-8635). We'll send you reprints of all the great reviews and the name of the NECIS dealer nearest you.

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

NEC

C&C Computers and Communications

NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

Reprinted from PC Magazine Jan. 12, 1988. © 1987 Ziff Communications Company.

Circle 253 on reader service card

Is desktop publishing worth the effort?

Desktop publishing is a learning experience, users say, but the benefits are real.

Bring desktop publishing into an office, and publications managers can immediately toss their XActo knives, rubber cement, and typesetting bills into the nearest circular file. So goes the myth, but is do-it-yourself publishing really that simple?

Marina Hirsch

Not exactly, publication managers say; first you have to put in the hours to learn your system. But once you know what you're doing, desktop publishing lives up to its billing.

"It amazed me," says Ted Hugger, marketing manager of Gougeon Brothers, a manufacturer of epoxy for boat building and maintenance in Bay City, Michigan. "I probably spent only a day or two indoctrinating myself in the program, and then I went right into our first publication."

Hugger produces catalogs and price lists, along with technical manuals and a quarterly newsletter. His company purchased Xerox's *Ventura Publisher* last spring on the recommendation of a consultant brought in to analyze Gougeon's computer needs. "We compiled spending histories on typesetting and printing," says Hugger. "Convincing the company that desktop publishing was where we needed to go was simply a matter of looking at the numbers."

The company wanted compatibility with *Microsoft Word*, the ability to handle large documents, and a reasonable learning curve. *Ventura* met all the requirements.

GWENDOLEN CATES

Ted Hugger, Marketing Director, Gougeon Brothers

While Hugger has some graphics background, he feels that *Ventura*'s style sheets let almost anyone create presentable documents. He accelerated his own training by taking a two-day, $325 documentation seminar from Xerox, which offers a range of *Ventura* courses nationwide. "I picked up techniques and shortcuts that might otherwise have taken me months to learn," he remarks.

Hugger upgraded his XT clone with a hard disk and faster processor, but rather than buying a laser printer, he turned to a local graphics consultant. "I use *Ventura*'s Copy All feature to save all my files to a disk, and then modem the disk's contents to the consultant, who loads it into his system and outputs it to either an Apple LaserWriter or, for a glossier look, a Linotronic 300 typesetting system," he explains.

While Gougeon can now make changes down to the last minute, Hugger calls such freedom a double-edged sword. "Traditional typesetting required greater lead time, and the expense was much greater, so we didn't edit as much as we would have liked. Now, it's a different story. Because there's never an end to people's changes, you have to impose deadlines."

He also cautions against too-widespread use of desktop publishing within a company: "Do you want an engineer you're paying $50,000 to $60,000 a year formatting a document?

"We haven't used the system as a money-saving tool," Hugger notes. "The money we saved we plowed right back into our publications, adding spot color and increasing the number of pages or the pressrun, or both."

Presentation Management

Lord, Geller, Federico, Einstein, Inc., is the Madison Avenue advertising agency that concocted the "M*A*S*H" ads for IBM's PS/2. The firm decided to move into desktop publishing more than a year ago, says graphics coordinator Joel Landy. "We were going into a meeting with IBM with a washed-out photocopied pie

chart," recalls Landy. "The powers that be took a look at it and decided, 'Let's not mess around—we've got to get with it.' "

Landy now supervises a small desktop publishing center, built around *PageMaker* on an AT. This system churns out time sheets and other administrative forms, flow charts, policy manuals, an internal newsletter, the office Christmas party invitations, and scripts used in storyboard frames for commercials.

Desktop publishing also turns out props for client presentations. "We can take anything we produce in *PageMaker*, put it on the laser printer, blow it up to 2½ feet by 1½ feet, and mount it on foam-core board. Then we can have the same material in standard 8½-by-11-inch format in the *leavebehind* [materials 'left behind' for a client]." Landy can create overhead transparencies as well.

Landy became familiar with *PageMaker* in two weeks and felt adept after two months. However, he would have welcomed a tutorial that explained graphics and publishing terms.

"We do a lot of writing in *PageMaker* itself," Landy says. "It's more immediate; you eliminate one step. When you use IBM's *Writing Assistant*, you save your files in ASCII and lose all the formatting. If you do everything in *PageMaker* from the get-go, you're formatting, laying down the type, and getting the typefaces you want—all in one shot."

"I find myself creating marketing campaigns more often. I can do a couple of letters and send them to the printer, and it's not going to cost me $1000."

There's one caveat, though. "If you do a lot of text editing in *PageMaker*, the program crashes quite often, so you've got to constantly save," Landy says. (Aldus expects this problem—particularly likely to strike during editing of tabbed text—to be resolved in version 3.0.)

Landy feels strongly about the need for a mouse: "Using *PageMaker* without a mouse is like trying to put salt in a shaker through the holes one grain at a time," he says. "Don't try it."

His wish list starts with the capacity to rotate text and objects. He'd also like an easy way to merge pages from one document to another. (Currently, you can merge pages by cutting and pasting with the *Windows* clipboard, which may impose size limits, Aldus says.) Furthermore, Landy would appreciate a selection of predrawn arrows and the ability to select objects, group them together, and keep them that way until he's finished.

A Solid Investment

Investment counselor Eric Kobren runs Mutual Fund Investors Associates, a four-person company in Needham, Massachusetts, that produces a monthly newsletter and a yearly guide to Fidelity mutual funds. Until last year, Kobren would hand hard copy to a typesetter who would then rekey it. That process drastically limited the newsletter's tables and charts. "The numbers may change at the last minute, but you can't redo a complicated graph at the last minute," he says. "I'd stay at the typesetters' until four o'clock in the morning, making changes."

After last October's market crash, his business became even more time-sensitive, and that hastened its switch to desktop publishing. Kobren soon discovered that "the big investment is in the learning; the cost of the software is irrelevant." A beta site tester for *PageMaker*, he says it takes a good 50 to 100 hours to really learn the package, but he doesn't complain. "It's natural when you're getting into a very new program."

After playing with *PageMaker* for weeks on his Wyse 386, Kobren rolled up his sleeves to crank out a 160-page guide. "I'm reporting on over 90 funds in my book, and each fund gets a bar graph and a line graph," he says. "It would have taken an artist hundreds of hours to do these graphs; *PageMaker* whizzed right through in two days. I imported Lotus worksheets into *Windows Graph*, created my graphs, wrote the text in *Word*, and then merged the graphs and text into *PageMaker*."

Kobren now hungers for faster, higher-resolution printers. "One problem with desktop publishing is the time it takes to print; it just took me about 3½ minutes to print out a page." Additionally, he declares, "300 dpi isn't enough for me. There are some 600-dpi printers out there, but you're talking about a $12,000 investment."

Another drawback, says Kobren, is that he now does more menial tasks. "People pay me hundreds of thousands of dollars for investment advice, and here I am figuring out font sizes. But on the other hand, it takes less time to do it myself than to tell a typesetter what I really want."

What suggestions does the adviser have for new publishers? "Find a person using a desktop publishing system who has the same needs that you do, and then buy exactly the same system, down to the mouse. Expect to overbuy—you buy what you need, and then you outgrow it and want something faster. Make the investment, and don't worry that prices are going to come down next week, because whatever you've bought will pay for itself. The time, the control, and the additional things you'll be able to do with this luxury are phenomenal."

For Kobren, those extras include more direct-mail campaigns. "I find myself creating marketing campaigns more often. I can do a couple of letters and send them to the printer, and it's not going to cost me $1000 to send them to a typesetter."

In the future, Kobren hopes that industry standards will simplify desktop publishing system configurations. "Because I happen to have an HP printer with HP soft fonts and a WYSE 700 monitor, I have to configure my

program differently than someone working with a PostScript printer and an EGA monitor—and that's very frustrating."

The Collegiate Publisher

Judy Brown, a PC technical/instructional coordinator at Fox Valley Technical College in Appleton, Wisconsin, quickly picked up *Ventura* when it appeared last year. "Our first project was a book more than 200 pages long addressing quality in education," says Brown. "Laser quality wasn't high enough for printing a book, so we generated text on our IBM 4381 mainframe, downloaded ASCII files to a PC XT, did layout in *Ventura*, and then sent the data by modem to a Linotronic 100, which produced typesetting film for the final book. It worked really well."

Brown oversees the publication of a monthly newsletter for district PC users and a bimonthly district-staff newsletter, as well as agendas, program announcements, forms, documents, brochures, and a catalog of shareware and public domain software. Next on the list for desktop conversion is the student newspaper. "There hasn't been anything we wanted to do that we couldn't do," she proclaims.

Before *Ventura*, Brown says, newsletter text would come off an IBM mainframe printer in a long column, and a pasteup artist would spend 8 hours cutting and pasting the column into the camera-ready copy. Today, she reports, camera-ready copy is produced right on the PC, and layout takes all of 2 hours.

Brown uses *WordPerfect* with a Princeton monitor, which lets her see full pages at a readable size, and produces output via an HP LaserJet. As she sees it, the system's main problem is that it's too easy for users to keep fiddling with the design. "You've just got to say no," says Brown. "When you've got all these options—moving a margin, adding a line—you tend to use all the different capabilities."

Her feature wish list is extensive. Like Gougeon Brothers' Hugger, she wants an undo command. She would also like shadowed boxes; the capability to break a box around text or titles (so text can overflow a box, for example); a more precise line-snap capability; better instructions and easier methods for cropping; an enhanced cross-hair cursor option (for alignment of text and graphics); and global search and replace.

A programmer with a graphics background, Brown taught herself *Ventura*. "I had to learn a new vocabulary, terms like *kerning* and *leading*, *em* and *en*. [Kerning adjusts the spacing between letters so they'll look better, and leading is the space between lines; *em* and *en* refer to dashes or spaces of particular lengths.] But once you get into desktop publishing, you're addicted," she says. "It's one, two o'clock in the morning, and you're trying something new." ●

Marina Hirsch is a freelance writer living in Berkeley, California.

BOB WAGNER

Joel Landy; Graphics Coordinator; Lord, Geller, Federico, Einstein, Inc.

HENRY HOLMES

Eric Kobren, Investment Counselor, Mutual Fund Investors Associates

Ventura Publisher and PageMaker Tools

Even the masters of the rasters need assistance now and then. With a little homework, you can find the right tools to make the most of your desktop publishing system.

Scott Spanbauer

Ventura Publisher and *PageMaker* don't dominate desktop publishing simply because they beat competing products to market. Like *1-2-3* and a precious few other software classics, they're tremendously powerful yet relatively easy to use.

But even these capable programs can use some help—as can most desktop publishers. Luckily, profit-minded developers have rushed to the scene with collections of tools for both neophyte and professional *Ventura* and *PageMaker* users. The lists that follow cover a broad spectrum of user needs: There are fill-in-the-blank templates for those who must quickly crank out professional-looking newsletters; font and file housekeeping utilities for full-time *Ventura* publishers; graphics tools for capturing and manipulating screen images; plus the raw materials of page design—downloadable fonts and clip art.

Keep in mind that this guide doesn't encompass the universe of graphics and publishing tools—such as *PC Paintbrush* and *GEM Draw*. Though many of the products listed work with other applications, all of them are especially useful with *Ventura* or *PageMaker*. Before you part with any cash, however, consider what to look for in each category.

Style Sheets, Templates, and Related Tools

PageMaker templates and *Ventura* style sheets guarantee professional-looking documents, even for beginners. Just make sure you like the look of the templates provided. Other utilities help you manage files, format printed output, and import spreadsheet and data base tables. Compare products that perform similar tasks and avoid those with features you don't plan to use.

Clip Art

The same rules apply when selecting clip art. A variety of ready-to-use image libraries can help you dress up your documents. Some clip art libraries include borders, icons, and pasteup fonts (decorative fonts you place on the page like a graphic image)—but buy only what you think you'll need. The quality of clip art varies too, so ask the vendor for a catalog of images and sample laser-printed output.

Graphics Tools

These utilities will help you manipulate graphics. Some capture screen images and save them as graphics files, some let you convert images in one graphics file format to another, while others let you create custom headlines and logos. When selecting graphics utilities for your publishing toolbox, make doubly sure they support the file formats recognized by your page layout and graphic design programs and your printer.

Font Utilities

These products let you alter or add characters to existing downloadable bit-mapped fonts or PostScript fonts—they even convert fonts from one format to the other. Just remember that typeface design isn't for amateurs.

Fonts

The fonts listed in the Buyers' Guide table fall into three categories: downloadable bit-mapped fonts in fixed sizes for the HP LaserJet and compatible printers, font generation programs that produce LaserJet-compatible bit-mapped fonts in a range of point sizes from a single master outline, and scalable fonts for PostScript printers such as the Apple LaserWriter and Texas Instruments' Omnilaser (see "PostScript Printers' Progress" in this issue). Fonts vary in quality and in the number of special characters they include. As always, ask the vendor to print out a complete sample of what's available before buying.

With a little research, you can assemble a desktop publishing toolbox that'll squeeze the maximum return out of your already substantial hardware and software investment. For detailed evaluations of these and other publishing tools, stay tuned to *PC World*.

Style Sheets, Templates, and Related Tools

Hyphenation Dictionary for Ventura Publisher

A user-expandable 130,000-entry upgrade to *Ventura*'s own English and Spanish hyphenation algorithms. Can run in expanded memory for instant execution. List price: $200; $625 with 2MB memory board and expanded memory manager. Edco Services, 12410 N. Dale Mabry Hwy., Tampa, FL 33618; 813/962-7800 (**VP**).

PageMaker Portfolios: Designs for Newsletters; Designs for Business Communications

Ready-to-load, predesigned page layout templates into which you insert text, graphics, and headlines. The newsletter portfolio offers 21 prefab multiple-page styles, while the business portfolio provides 12 templates for memos, reports, handbooks, and presentations. Both include a tutorial and helpful workbook. List price: *Designs for Newsletters* $79, *Designs for Business Communications* $99. Aldus Corp., 411 First Ave. #200, Seattle, WA 98104; 206/622-5500 (**PM**).

Style Sheet Secrets

Each of two volumes contains approximately 25 predesigned *Ventura* style sheets for instant forms, directories, reports, and other business publications—just add text and graphics. List price: $39.95 per volume. New Riders, P.O. Box 4846-V, Thousand Oaks, CA 91360; 818/991-5392 (**VP**).

Tabin

Formats any ASCII file holding tabular data (such as *1-2-3* .PRN files) for use in a *Ventura* document. The utility replaces spaces with tabs, maintaining vertical column alignment when tables are printed with *Ventura*'s proportional fonts. The program can also tag nontabular text, such as titles or captions, for regular formatting within *Ventura*. List price: $99. Corel Systems, 1600 Carling Ave., Ottawa, Ontario K1Z 7M4 Canada; 613/728-8200 (**VP**).

Table Manners

Like *Tabin*, this no-frills program converts *1-2-3* .PRN files or any tabular ASCII file for use in *Ventura*, but it also works with *PageMaker*. List price: $140. The Desktop Publishing Group, 978 Douglas Ave., Altamonte Springs, FL 32714; 800/257-8087, 305/862-7755 (**PM, VP**).

Ventura Designer Stylesheets

A collection of 30 prefab style sheets for newsletters, brochures, books, manuals, and reports. The company will also customize style sheets to your specifications. List price: $29.95 per style sheet. BCA/Desktop Designs, P.O. Box 2191, Walnut Creek, CA 94595; 415/946-1716 (**VP**).

Ventura Utilities

A cornucopia of tools that print out style sheet and tab settings; remap the keyboard for special characters; and copy, delete, and list chapter files and their attendant image and table files without loading *Ventura*. PostScript printer utilities let you print large files without time-out disasters and toggle a printer between PostScript and text mode. List price: $99. Corel Systems (**VP**).

VP/Saddle

Converts *Ventura* document print files to half-size, saddle-stitched documents that you can print out, fold in half, and staple into booklets. It can also print two copies of the same page on a single piece of paper to cut reproduction costs. *VP/Saddle* works only with PostScript printers. List price: $79. The Laser Edge, 360 17th St. #203, Oakland, CA 94612; 415/835-1581 (**VP**).

VP/Tabs

Converts *1-2-3* .PRN files and tags them for *Ventura*. List price: $89. The Laser Edge (**VP**).

VPToolbox

Displays and prints out style sheet settings, and copies or deletes chapter files in one operation without loading *Ventura*. List price: $99. SNA Inc., P.O. Box 3662, Princeton, NJ 08543; 609/683-1237 (**VP**).

Clip Art

ClickArt

Five volumes of images in *PC Paintbrush* (.PCX) format appropriate for informal newsletters and flyers. The number of images varies per volume; the business-oriented collection, which contains 1000, is the biggest. List price: $69.95 per volume. T/Maker, 1973 Landings Dr., Mountain View, CA 94043; 415/962-0195 (**PM, VP**).

ClickArt EPS Illustrations

For more professional-looking desktop publishing applications: 175 images relating to business, people, geography, and transportation in scalable Encapsulated PostScript Format (EPSF). List price: $129.95. T/Maker (**PM, VP**).

Desktop Art

Four volumes of clip art, each containing 200 business and general interest images in .PCX format. List price: $74.95 per volume. Dynamic Graphics, 6000 N. Forest Park Dr., Peoria, IL 61614; 800/255-8800, 309/688-8800 (**PM, VP**).

Digit Art

Over 1000 EPSF images divided into eight volumes offering business, industry, map, and transportation images as well as cartoon drawings, pasteup fonts, and decorative borders. List price: $99 to $149 per volume. Image Club Graphics, 2915 19th St. NE #206, Calgary, Alberta T2E 7A2 Canada; 800/661-9410, 403/250-1969 (**PM, VP**).

HotType

More than 100 exotic-looking pasteup fonts in EPSF in regular and boldface styles. List price: $150 per eight-font set. (A CD ROM disk containing the *HotType* fonts and all eight *Digit Art* volumes costs $999.) Image Club Graphics (**PM, VP**).

PC Quick-Art

Over a dozen volumes of business-oriented images, each containing 200 .PCX-format pictures. The series is frequently updated. List price: $59.95 per volume. PC Quick-Art, 394 S. Milledge Ave. #200, Athens, GA 30606; 404/543-1779 (**PM, VP**).

Publisher's PicturePacks

Three 200-image volumes in .PCX, PCC, and scalable CGM vector file formats are divided into Executive Management, Finance and Administration, and Sales and Marketing categories. The CGM file format is compatible only with *Ventura* version 1.1 and *PageMaker* version 3.0. List price: $99.95 per volume. MGI, 401 E. Main St., Richmond, VA 23219; 804/788-8844 (**PM, VP**).

Spellbinder Art Library

Fifty comic .PCX illustrations depicting cavemen, wizards, dancing bears, dinosaurs, and other people and animals. List price: $79. Lexisoft, P.O. Box 1950, Davis, CA 95617; 916/758-3630 (**PM, VP**).

Windows Clipart

Each of sixteen image libraries contains between 50 and 400 color and black-and-white images in a *Windows*-compatible file format. General-purpose maps, flags, signs, and office and computer images are prevalent; some volumes offer highly detailed engineering, architectural, and industrial images. List price: $49.95 per volume. Micrografx, 1820 N. Greenville, Richardson, TX 75081; 800/272-3729, 214/234-1769 (**PM**).

Downloadable Fonts for PageMaker and Ventura Publisher

The numbers in the table represent the range of point sizes available in a given typeface. Most typefaces, though not all, offer commonly used point sizes: 6, 7, 8, 9, 10, 12, 14, 18, 24, 30, 36, 48, and 72. Most typefaces (but again, not all) include bold, italic, and bold italic, along with a standard, or roman, style. Screen fonts are included for all font sizes shown in color. For manufacturer information, see Where to Buy.

		Downloadable fonts						
	Typeface sample and name	*Office Series, Professional Series* Alcatel Qume	*Magic Font* Computer Editype Systems	*Conofonts* Conographic	*Font Factory Library* The Font Factory	*Hewlett-Packard SoftFonts* Hewlett-Packard	*Balifonts* Janus Associates	*SDP Font Library* Lexisoft
PC World	American Typewriter							
PC World	Antique Olive	6-36			6-36			
PC World	Avant Garde	6-36			6-36			
PC World	Baskerville	6-36			6-36			
PC World	Bauhaus							
PC World	Benguiat			10-30				10-30
PC World	Bodoni					14-30		
PC World	Bookman							
PC World	Broadway					14-30		
PC World	Charter							
PC World	Cooper Black					14-30		
PC World	Dom Casual			10-30				10-30
PC World	Franklin Gothic							
PC World	Friz Quadrata							
PC World	Futura	6-36			6-36			
PC World	Galliard							
PC World	Garamond	6-36			6-36	7-30		
PC World	Gill Sans	6-36			6-36			
PC World	Goudy Old Style							
PC World	Helvetica (Swiss)	6-18			6-18	6-30		
PC World	Korinna							
PC World	Lubalin Graph							
PC World	Melior							
PC World	New Century Schoolbook	6-36			6-36	6-30		
PC World	Old English			10-30				10-30
PC World	Optima		8-72			6-30	6-30	
PC World	Palatino							
PC World	Rockwell	6-36			6-36			
PC World	Souvenir	6-36		6-30	6-36			6-30
PC World	Times Roman (Dutch)	6-36	8-72	6-30	6-36	6-30	8-24	6-30
PC World	Univers	6-36			6-36			
PC World	University Roman					14-30		
PC World	Zapf Chancery			10-30				10-30
	Approximate price per typeface	$100-$200	$100	$30-$125	$100-$200	$100-$200	$75	$125

* Used with Ventura Publisher: 1-254 points; with PageMaker: 4-127 points.

				Font generators					PostScript fonts	
Standard Series SoftCraft	*ZFonts* Straight-forward	*VS Library* VS Software	*LJ Fonts* Weaver Graphics	*Fontware* Bitstream	*Font Pac* Metro Software	*Typefoundry Series* SoftCraft	*Glyphix* SWFTE International	*Alphabets* Wilkes Publishing	*Adobe Font Library* Adobe Systems	*Adobe PostScript Typefaces* Alcatel Qume
			6-30				6-60		•	
	6-24	6-30					6-60			
		6-30	6-30	6-72	4-48	3-120	6-60		•	
	6-24	6-30	6-30				6-60		•	
		8-30						3-72		
			6-30						•	8-24
	6-24								•	8-24
		6-30	6-30		4-48				•	
		8-30		6-72		3-120	6-60			
				6-72		3-120				
				6-72		3-120			•	
	12, 24									
									•	8-24
			6-30						•	
	6-24	6-30		6-72		3-120			•	
				6-72		3-120			•	
	6-24	6-30	6-30	6-72		3-120	6-60		•	8-24
	6-24	6-30					6-60			
			6-30						•	8-24
	6-72	4-10	6-30	6-72	4-48	3-120	6-60	3-72	•	8-24
	6-24		6-30	6-72		3-120			•	8-24
			6-30						•	
			6-30						•	
	6-72	6-30	6-30	6-72		3-120	6-60	3-72	•	
10-40	14	8-30			4-48	3-120		3-72		
	6-24		6-30	6-72		3-120	6-60	3-72	•	8-24
	10-14		6-30	6-72		3-120	6-60		•	
		6-30					6-60			
	6-24	6-30	6-30	6-72		3-120			•	8-24
6-72	6-72	6-30	6-30	6-72	4-48	3-120	6-60	3-72		
		6-30					6-60		•	
				6-72		3-120			•	
			6-30				6-60		•	
$60	$100-$400	$170	$120	Program: $95 Outlines: $195	Program: $150 Outlines: $60-$80	Program: $95 Outlines: $195	Outlines: $25 (program included)	Program: $100 Outlines: $95	$185	$185

Downloadable Fonts for PageMaker and Ventura Publisher

WHERE TO BUY

Adobe Systems
1585 Charleston Rd.
P.O. Box 7900
Mountain View, CA 94039
415/961-4400

Alcatel Qume
500 Yosemite Dr.
Milpitas, CA 95035
408/920-2500

Bitstream Athenaeum House
215 First St.
Cambridge, MA 02142
617/497-6222

Computer Editype Systems
509 Cathedral Parkway #10A
New York, NY 10025
800/251-2223

Conographic
16802 Aston St.
Irvine, CA 92714
714/474-1188

The Font Factory
P.O. Box 5429
Kingwood, TX 77339
713/358-6954

Hewlett-Packard
P.O. Box 3640
Sunnyvale, CA 94088-3640
800/538-8787

Janus Associates
46 Chestnut St.
Boston, MA 02108
617/720-5085

Lexisoft
P.O. Box 1950
Davis, CA 95617
916/758-3630

Metro Software
2509 N. Campbell Ave. #214
Tucson, AZ 85719
800/621-1137

SoftCraft
16 N. Carroll St. #500
Madison, WI 53703
800/351-0500, 608/257-3300

Straightforward
3901 Via Oro Ave.
Long Beach, CA 90810
213/830-8773

SWFTE International
P.O. Box 5773
Wilmington, DE 19808
800/237-9383, 302/733-0956

VS Software
209 W. Second St.
Little Rock, AR 72216
501/376-2083

Weaver Graphics
Fox Pavilion Box 1132
Jenkintown, PA 19046
215/884-9286

Wilkes Publishing
25251 Paseo de Alicia #229
Laguna Hills, CA 92653
714/855-0730

For more information, see Products Featured in This Issue.

Graphics Tools

The Graphic Link

Converts images to and from many formats, such as .PCX, Tagged Image File Format (TIFF), *GEM*'s .IMG format—even *MacPaint*'s. The program also converts color images to gray-scale images or line drawings. List price: $99.95. PC Quick-Art **(PM, VP)**.

Headline

A utility that outlines, shadows, rotates, scales, and fills PostScript text and graphics to create a nearly endless variety of graphic effects suitable for producing headlines, logos, or display type. The program supplies some simple geometric forms (but no typefaces) and saves files in EPSF. List price: $185. Corel Systems **(PM, VP)**.

HiJaak

Captures CGA, EGA, MCGA, VGA, and Hercules screen images and saves them in a number of formats, including EPSF, TIFF, .PCX, *GEM*'s .IMG, and ASCII. It can also convert graphics files in batches from one supported format to another. List price: $89. Inset Systems, 12 Mill Plain Rd., Danbury, CT 06811; 203/794-0396 **(PM, VP)**.

Hotshot Grab

Captures MDA, CGA, EGA, MCGA, VGA, and Hercules screen images and converts them to *GEM*'s .IMG, .PCX, or TIFF. List price: $99.95. Symsoft, 444 First St., Los Altos, CA 94022; 415/941-1552 **(PM, VP)**.

Laser FX, Laser FX-Pak

Thirty special effects for modifying PostScript fonts; the utility saves modified text as an EPSF image. Six *Laser FX-Pak* volumes provide ten additional effects and five fill patterns each. List price: *Laser FX* $195, *Laser FX-Pak* $49 per volume. Postcraft Int'l, 3 King St., P.O. Box 938 #127, St. Catharines, Ontario L2R 6Z4 Canada; U.S. sales office: 805/257-1797 **(PM, VP)**.

LePrint Headliner

A headline utility that sets its own collection of scalable type in any size from 4 to 720 points, then saves it as a .PCX-format graphic. Standard and Extended editions come with 5 and 16 type styles, respectively; typefaces do not include bold or italic. List price: Standard $100,

Extended $250. LeBaugh Software, 10824 Old Mill Rd. #6, Omaha, NE 68154; 800/532-2844, 402/334-4820 **(PM, VP).**

Pizazz

A program that snags MDA, CGA, EGA, and Hercules screens and saves them in .PCX file format. You can manipulate the color and size of captured images and print them out. List price: $59.95. Application Techniques, 10 Lomar Park Dr., Pepperell, MA 01463; 617/433-5201 **(PM, VP).**

PS Portfolio

A collection of 25 programs that shade, outline, and create 3-D and other effects with PostScript typefaces and graphic images. The resulting images are saved in EPSF. Includes simple geometric shapes—stars, circles, and so on—but no fonts. List price: $59. Lexisoft **(PM, VP).**

Font Utilities

Font Effects

Adds special effects like shadowing, outlining, contouring, and shading to downloadable bit-mapped fonts; suitable for creating headlines or display type. List price: $95. SoftCraft, 16 N. Carroll St. #500, Madison, WI 53703; 800/351-0500, 608/257-3300 **(PM, VP).**

FontGen IV+

Allows you to edit downloadable bit-mapped fonts or create new ones from scratch for *Ventura* and *PageMaker*. Generates matching screen fonts for *Ventura* only. List price: $250. VS Software, 209 W. Second St., Little Rock, AR 72216; 501/376-2083 **(PM, VP).**

Newfont

Creates hollow, shadowed, shaded, stretched, skewed, and angled variations of PostScript fonts and installs them on *Ventura*'s font menu. List price: $185. Corel Systems **(VP).**

Publisher's Type Foundry

This font editing tool allows you to manipulate bit-mapped fonts or effect sweeping changes to the master outline from which bit-mapped fonts are derived. Font format translators can create either PostScript or LaserJet downloadable fonts, and you can convert a PostScript font to LaserJet format and vice versa. List price: $495. ZSoft, 1950 Spectrum Circle #A-495, Marietta, GA 30067; 404/428-0008 **(PM, VP).**

SoftCraft Font Editor

Edits existing downloadable bit-mapped fonts or creates entirely new ones, but lacks an outline editor and can't create PostScript fonts. List price: $290. SoftCraft **(PM, VP).**

Supplemental Font Pak

While *Ventura* supplies a smattering of sizes and weights of Swiss and Dutch fonts (similar to Helvetica and Times Roman), *Font Pak* fills in the gaps, offering medium, italic, bold, and bold italic versions of the fonts in sizes from 6 to 30 points. List price: $169.95. VS Software **(VP).**

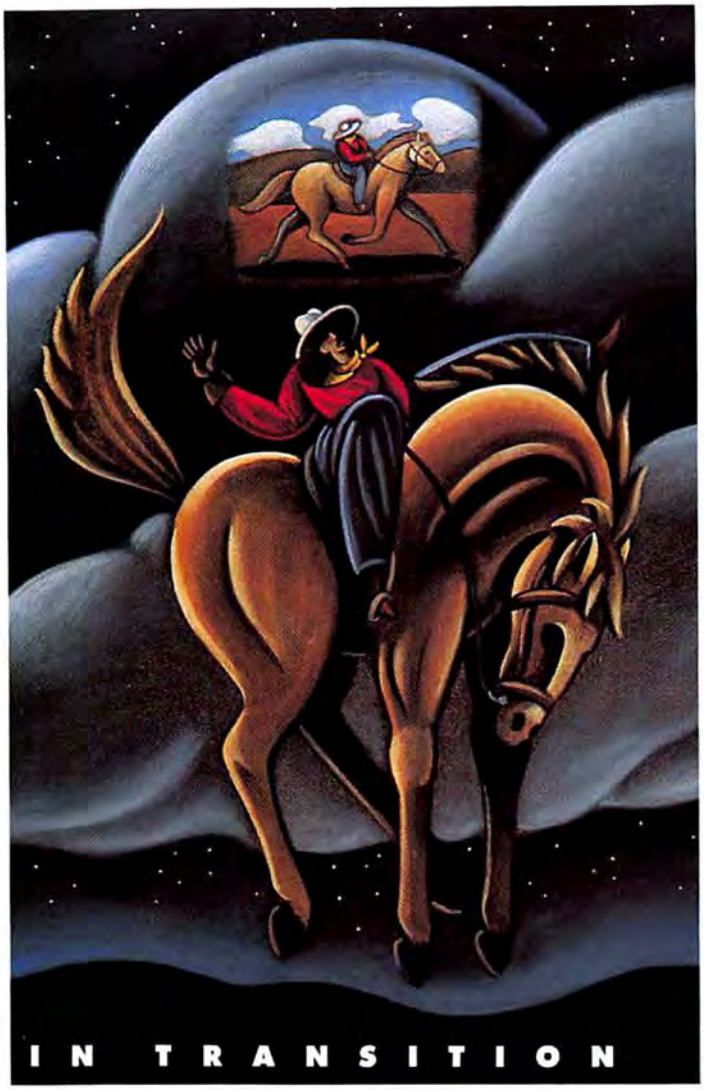
VP/Fonts

Installs downloadable bit-mapped fonts in a simple two-step process, bypassing *Ventura*'s own tedious and error-prone conversion utilities. List price: $79. The Laser Edge **(VP).**

WYSIfonts

Installs downloadable fonts and constructs a matching screen font and kerning table. List price: $95. SoftCraft **(PM, VP).** ●

Scott Spanbauer is an assistant editor for PC World.



OS/2

After years of promises from pundits, programmers, and PR people, OS/2 is a reality. Many industry analysts expect an OS/2 software explosion in 1989. Microsoft and IBM predict (somewhat optimistically) that as many as 1000 OS/2 applications will ship by the end of 1988.

At first most OS/2 applications will look and behave much like their DOS equivalents. Only a few programs will offer capabilities that DOS applications lack—the most compelling reason for switching to OS/2. And because you need an 80286 or an 80386 machine with a hard disk and at least 2MB of memory—not to mention the appetite for learning a new operating system—the first patrons of OS/2 will be power users.

However, thanks to the Presentation Manager—OS/2's *Windows*-like front end—entry-level users will be the ultimate beneficiaries of OS/2. The Presentation Manager's stan-

Michael Goodwin
and
Eric Knorr

The first OS/2 applications are here. PC World tells you what to expect just around the bend—and further up the road.

dardized user interface will enable users to master more programs with less effort; even the most complex OS/2 application will offer one-button installation and a familiar menu structure. OS/2's full flowering will be marked not only by more powerful programs but by easy, consistent access to that power.

In the Shadow of DOS

The transition to an ideal OS/2 environment won't happen overnight. The first OS/2 programs will generally be simple "ports" from DOS—the same code, rewritten, relinked, and recompiled, featuring the same user interface.

Microrim's OS/2 version of *R:base System V* is typical of the first round of OS/2 applications. "The features and functionality are the same as our latest *R:base* release for DOS," says Microrim president and CEO Dave Hall. "We did that intentionally to provide a painless migration path for users. The size of the memory we can access under OS/2 isn't significant in terms of the size of the data base. Any time you're converting 200,000 lines of code from one operating system to another, you're happy if it just runs."

Applications that are effectively clones of their DOS counterparts won't send users rushing to OS/2. Many analysts believe that OS/2's biggest initial attraction will be its support of powerful local area network (LAN) applications.

OS/2 is well suited to networks partly because it can access 16MB of memory directly. However, equally important is another, more fundamental OS/2 advantage: *multithreading*. A *thread* is a sequence of instructions that the computer executes (every DOS application is a single-threaded program). Under OS/2, not only can many different applications run at the same time, but a single application can run multiple threads simultaneously. Thus, OS/2 network software can assign a separate thread to each workstation, concurrently handling requests from multiple workstations rather than polling each node and handling requests consecutively.

A powerful OS/2 network operating system has already been developed jointly by Microsoft (which calls it *LAN Manager*) and 3Com (which will market it as *3Share Open*). In another joint venture, Ashton-Tate and Microsoft have teamed up to produce *SQL Server*, a souped-up data base engine written in Structured Query Language (SQL).

Thanks to large memory and multithreading, both these products enable OS/2 network applications to perform on the server, processing tasks that normally occur on workstations. With a powerful server, this increases performance and smooths arbitration of conflicting workstation requests for the same data.

SQL Server's support for a mixed operating system environment is an added advantage. Workstations will run DOS-based data management front ends that speak SQL, sending commands to *SQL Server*, which will handle the heavy-duty processing. Even if you want to exploit the powerful network data base features that OS/2 will deliver, you won't have to convert your whole shop, or even most of it, to the new operating system.

Applications in Transition

In the second round of OS/2 software releases—probably beginning early next year—not only network programs but workstation applications will begin to reap the benefits of mul-

tithreading and large memory. A growing number of programs will also use the Presentation Manager as their front end. In this transitional phase, the first fully optimized OS/2 applications will begin to emerge, but programs with either multithreading or the Presentation Manager—though not both—will be the rule.

Some software vendors are already close to releasing single-user applications that deftly exploit OS/2's advantages. *WordStar 2000*, which under DOS was forced to implement its powerful features via a series of memory-saving (but time-consuming) overlays, is a prime example of the kind of second-generation application that will benefit tremendously from OS/2.

According to Dave Cannon, MicroPro's director of product development, "From the user's point of view, the word processor itself will be just like the DOS version. But it does take advantage of multithreading and extra memory. For example, we're spinning off concurrent printing as a full background task. When you print something, the program comes back immediately to the editing menu."

David Intersimone, Borland's director of language and tools, notes that *SideKick Plus* for OS/2 will not be a RAM-resident program at all, but "a tightly integrated, multitasking program. OS/2 versions of Borland applications will use familiar keystrokes, so no retraining will be needed, but the rewritten versions will use bigger memory and take advantage of multithreading."

Lotus's vice president of research and development, David Reed, explains that both *1-2-3* release 3 and *Agenda* for OS/2 will take only partial advantage of OS/2's advanced features. "They use multithreading to do what they need to do, and do it faster," he says, "but they don't do anything new. There are a number of activities that go on in the background while you do other things, like printing and so on. Those work much faster using multithreaded code. Multitasking will allow you to run multi-

THE PARADOX OF PERFORMANCE

Is OS/2 faster than DOS? Slower? Benchmarks comparing the speed of a DIR under DOS and OS/2 are missing a critical point: Performance needs to be redefined in a multiprocessing environment.

Because OS/2 can run many applications at the same time and uses only one CPU to handle all the processing tasks, a DIR or COPY (or a complex application, for that matter) will run at different speeds depending on what other operations are running concurrently. The real question is, Can you get your work done faster under OS/2 than under DOS?

To arrive at that answer you must understand how OS/2 distributes CPU power among applications. If five applications all use the CPU all the time and you run them simultaneously, each will run at one-fifth speed compared to solo execution. However, this situation will rarely, if ever, happen. Most applications spend 90 percent of their time waiting for the user to strike a key, or updating the screen, or twiddling their binary thumbs while the hard disk looks for data.

OS/2 is designed to use every tick of CPU time; if one application isn't using the CPU, another program is moved into action. "If there's a thread that's waiting for disk I/O, for instance, we don't even schedule processor time for it," says Mark Mackaman, Microsoft's OS/2 product manager. "The system is smart enough to block the thread while the disk I/O executes, so it finds something else to go work on. When the thread becomes runnable again, the system resets priorities." The result is not easily summarized in old-fashioned performance tables.

Microsoft claims that if you compare the time it takes to perform an operation five times in a row with the time it takes to run it in five simultaneous OS/2 sessions (on a PC with plenty of memory to spare), the concurrent scenario finishes about 40 percent faster. As more OS/2 applications become available, *PC World* and National Software Testing Laboratories will provide hard figures. —*M. G.*

ple *1-2-3*s, and the external data base access mechanism will be able to access a data base running in another session."

A Mac-Like Future?

The future of OS/2—and the future of computing on the PC, if Microsoft and IBM have their way—looks suspiciously like the Macintosh environment. The ease of use of today's PC invariably suffers when compared with that of the Macintosh. The reason is obvious: Mac programs are so similar that if you know how to use one, it's easy to get up and running with another; when you learn a new PC program, you generally need to learn a new user interface from scratch. The Presentation Manager promises to change all that.

OS/2's designer, Gordon Letwin, puts it this way: "There will be a lot more consistency in program commands. It's like when you pick up a portable cassette player. Even though every manufacturer has different sets of buttons, you can usually figure out how to make it work without reading the manual."

According to Philippe Kahn, president of Borland, "The Presentation Manager is going to make a PC look like a Mac. It will be very similar to running a Mac with MultiFinder—except MultiFinder isn't really a multitasking environment."

Thanks to multitasking and multithreading, OS/2 applications promise to be much more powerful than their Mac counterparts. While it's impossible to predict precisely what kinds of features and capabilities will spring from programmers' brains, fully optimized OS/2 software will probably achieve an oft-stated goal of both vendor and user communities: Data will have to be keyed in only once. OS/2 applications will be able to import and export data in fully usable form, from word processor to spreadsheet to data base to another data base to on-screen calculator, and so on.

"Programs will no longer be monolithic entities," says Richard Schwartz, Ansa's vice president of research and development. "Programs are going to be able to tap other programs, use other programs, start them up, and exchange information. You can consider each application as a module that's capable of using other modules in the environment."

Future OS/2 applications will be able to share not just data but program capabilities. Gordon Letwin predicts that new standards—similar to the SQL standard—will emerge to enable diverse applications to take advantage of the same software en-

AN OS/2 GLOSSARY

Background task. A process that continues executing even though it is not currently displayed.

DOS compatibility environment (or DOS box). An OS/2 simulation of the DOS environment.

Multitasking. Two or more programs executing simultaneously.

Multithreading. Two or more threads of code, in the same program, executing simultaneously.

Piping. A system of data storage buffers used by OS/2 to enable applications to exchange data.

Presentation Manager. The graphics user interface, much like *Microsoft Windows*, for OS/2.

Protected mode. The operating mode of the 80286 chip that allows an operating system to use features that protect one application from another.

Session. A collection of threads executing together as a group under OS/2.

Session manager. An OS/2 system utility that switches between sessions; soon to be replaced by the Presentation Manager.

Thread. An instruction sequence (line of code) that the CPU executes.

Time slice. That portion of CPU time given to a thread before another thread gets access to the microprocessor. —*M. G.*

"Programs will no longer be monolithic entities. Programs are going to be able to tap other programs, use other programs, start them up, and exchange information."

gine. "If you have a spreadsheet program, it will have facilities to use a standard data base interface running under OS/2. Or if you need a 600MB data base, you can buy that and plug it in, and your old applications will automatically use the new facility."

This resource sharing will extend to what Robert Frankston, Lotus's chief scientist, calls trinkets—OS/2's equivalent of the Macintosh's desk accessories. "Under OS/2, these will be full-blown applications," asserts Frankston. "And with standards for cross-application sharing, you can have your phone book take full advantage of a SQL data base. To the user these trinkets will seem lightweight, but they'll have full functionality."

Ultimately, however, OS/2's greatest benefits may well be in communications. To Brett Walter, Symantec's vice president of research and development, the evolution of the new OS/2 environment is inseparable from the trend toward greater connectivity. "When you ask yourself what kinds of background tasks lend themselves to multitasking, the answer is communications," says Walter. "You may be working away on your spreadsheet or your word processor while sending a stack of mail back and forth. E-mail is comparable to the telephone in the effect it's going to have on business, and E-mail will benefit tremendously from OS/2."

Is This Trip Necessary?

While die-hard power users may want to install OS/2 just to check out the lay of the land, for most of us there's no rush.

A poster on the office wall at Microsoft shows The OS/2 logo stamped with a *Ghostbusters*-like encircled slash, which reads: "OS/2: Just Say No!" The poster is a joke, but Microsoft's OS/2 product manager, Mark Mackaman, is not kidding when he says, "Nobody but software developers should buy OS/2 until they're holding an application they've *got* to have, and it says 'Requires OS/2' on the box."

On the other hand, if you're the type who must boldly go where no one has gone before, take the controls and get going. One of the most intriguing things about the multitasking, multithreading, big-memory system is that nobody yet knows how far it can be pushed. And there's only one way to find out.

Michael Goodwin is an associate editor and Eric Knorr a senior editor for PC World.

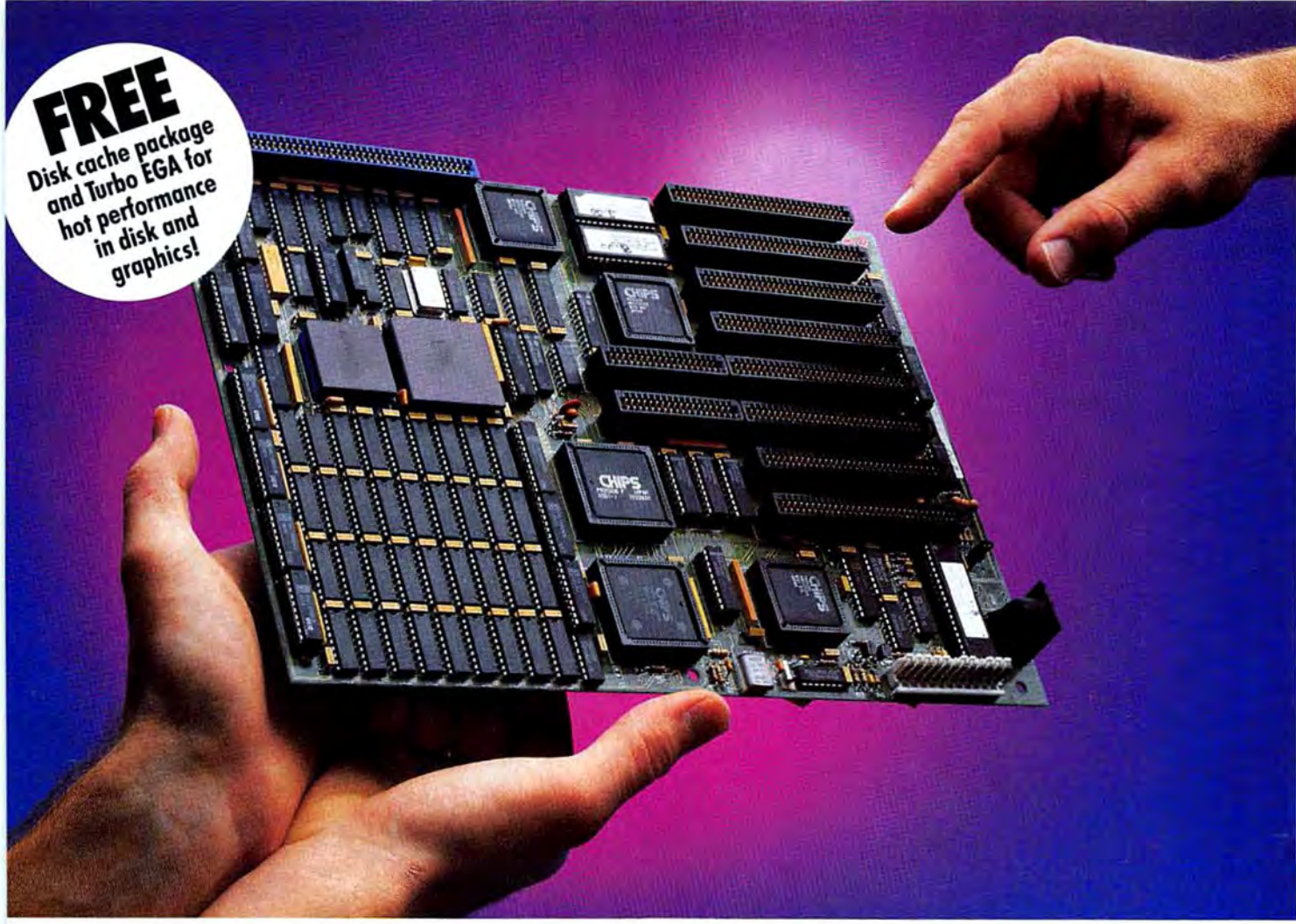
WHAT'S IN THE BOX?

Early OS/2 users will have only one or two OS/2 applications and lots of DOS applications. Microsoft has gone to great trouble to ensure backward compatibility; *most* DOS applications will run perfectly in OS/2's *DOS compatibility environment*, also known as the DOS box.

Nonetheless, users are likely to discover that the DOS box has its difficulties. Aside from offering only about 500K of user RAM rather than DOS's 640K, the DOS box refuses to run *any* telecommunications packages. When National Software Testing Laboratories tested ten of the most common PC applications—*Microsoft Word, 1-2-3, dBASE III Plus, WordStar Professional, Symphony, Paradox, SideKick, Freelance Plus, Framework II,* and *Microsoft Windows*—the sole major compatibility problem encountered was that (predictably) *Symphony*'s communications module would not run. (The only other problem was that *Windows*' 'Format a disk' option in the MS-DOS Executive would not execute.)

If you need an application that won't fit in the DOS box, you *must* be able to boot DOS itself—and that's easier said than done once OS/2 has been installed. Microsoft's OS/2 Development Kit provides a handy dual-boot option that asks the user whether to boot OS/2 or DOS when the system starts. Microsoft's OEM version of OS/2 retains this feature; unfortunately, IBM's version does not yet provide it.

Those who want to run DOS in standalone mode are faced with two alternatives, neither of which is ideal. You can buy Microsoft's version of OS/2 (with the dual-boot option) via an OEM like Zenith; it may run perfectly on your PC, but it may not. Or you can buy IBM's version and boot DOS from a floppy disk. —*M. G.*



CONVERT YOUR PC, XT OR AT INTO A HIGHER FORM OF LIFE!

386 MOTHERBOARDS FOR 386 SPEED

Don't let your PC give up the ghost—Hauppauge has just arrived with a new spark of life: the 386 MotherBoard.™ Far more advanced than an accelerator card, our line of MotherBoards grace your PC, PC/XT, PC/AT or compatible with speeds equal to the IBM PS2 Model 80. And faster. Because we've built in 1 Megabyte of high speed RAM and a 387 math coprocessor socket for speeds that make users humble with awe.

OS/2 Compatible. To ensure a long, fruitful life, our 386 MotherBoard is compatible with the PC/AT (BIOS and I/O)—so you can run the new generation of DOS, OS/2. Our Board also runs Windows/386, UNIX V and PC-MOS/386. For more power, you'll find 16-bit expansion slots that accommodate the latest I/O expansion cards. No 386 accelerator card gives you so much versatility. **Only our 386 MotherBoard gives your PC a future with unlimited possibilities!**

The Critics Applaude! *PC Magazine* awarded our Board "The Editor's Choice" for 386 Replacement Boards. *PC World* called it "the Upgrade Product of the Year."

Technical Features ▪ 16 MHZ 80386 ▪ 1 Megabyte of 100 nsec 4-way interleaved RAM ▪ PC/AT compatible I/O and BIOS for support of OS/2 ▪ Six 8-bit expansion slots ▪ two 16-bit expansion slots (four on 386 MotherBoard/AT) ▪ One 32-bit expansion slot for up to 12 Megabytes of high speed memory ▪ Battery-powered clock calendar

386 MotherBoard/PC or MotherBoard/XT	$1495
386 MotherBoard/AT	$1595
32-bit RAM Board (2 Mbytes installed; up to 4 Mbytes)	$795
16 MHz 80387 math coprocessor	$695
16-bit combination hard disk/ floppy disk controller	$245

For more information on our easy-to-install MotherBoard, call: **1 (800) 443-6284**. In New York, call **(516) 434-1600**.

Hauppauge Computer Works, Inc.
175 Commerce Drive,
Hauppauge, New York 11788

Hauppauge!

Circle 35 on reader service card

The new NEC desktop publishing monitors. For those getting started. And for those who can't stop.

MultiSync GS

The ideal way to break into desktop publishing. For system from PC/XT/AT to PS/2.

MonoGraph System

1024 x 1024 resolution and 1:1 aspect ratio for the dedicated desktop publisher.

NEC has the perfect monitor for any desktop. For starters, there's our MultiSync® GS. It offers a maximum resolution of 720 x 480 for crisp text and graphics, a flat 14″ screen for minimal glare, and compatibility with just about any system you may be using, including PC/XT/AT and PS/2.

Then there's our MonoGraph System, for the ultimate in desktop publishing. Along with brilliant 1024 x 1024 resolution, its square 16″ screen gives you the best of both portrait and landscape-style displays. There's room for an entire page of material, with a large area alongside for menus, icons and scrap. The system also includes a graphics board that works with any PC/XT/AT (or 100% compatibles) and lets you run software like Ventura Publisher and PageMaker.

Best of all, with either monitor you get a feature no one else can give you at any price: NEC. For literature or a dealer call 1-800-447-4700. For technical details call NEC Home Electronics (USA) Inc. 1-800-NEC-SOFT.

PC/XT/AT and PS/2 are registered trademarks of the International Business Machines Corporation
Ventura Publisher is a trademark of Ventura Software
Pagemaker is a registered trademark of Aldus Corporation
NEC is a registered trademark of NEC Corporation

C&C
Computers and Communications

NEC®

15 Ventura Publisher Speed Tips

Drum your fingers no more!

Here at last are 15 techniques—some free, some pricey—that kick Ventura into high gear.

Publishing

Ted Nace

Just as you can never be too thin or too rich, your desktop publishing program can never be too fast. Although *Ventura Publisher*'s reputation as a speed demon is well deserved, serious users agree that even this roadrunner could use a little help.

Depending on your whim and budget, kicking *Ventura* into overdrive can be as simple as choosing the right hyphenation routine or as expensive as buying an expanded memory board. But before you lay down the bucks, carefully consider the nature of your work with *Ventura*. If you typically generate stacks of multiple-page documents stuffed with graphics and digitized images, a high-speed printer controller like the JLaser board is probably in order. On the other hand, if you merely hate waiting for *Ventura* to load, consolidating all the fragmented files on your hard disk with a disk optimizing utility can be a cost-effective solution.

Working smarter makes a difference, too. Keyboard commands can eliminate excessive mouse mileage; inserting format codes in a text file before *Ventura* ingests it can speed formatting. Use any or all of the following 15 tips, and you can stop drumming your fingers—and get on with the business of desktop publishing.

1. USE A DISK CACHING UTILITY

Try this experiment. Load *Ventura* with a blank chapter by typing **VP** at the DOS prompt. Switch to the paragraph tagging mode by clicking the appropriate

TABLE 1

16 Top Keyboard Shortcuts

<Ctrl>-X	Displays the most recently accessed dialog box.
<Esc>	A high-speed backspace key. Clears the text off a line in a dialog box.
<Enter>	An alternative to selecting 'OK' with the mouse in a dialog box.
<Ctrl>-S	Saves a chapter.
<Delete>	Deletes the currently selected text or graphic.
<Insert>	Pastes the most recently deleted text or graphic onto the page.
<Shift>-<Insert>	Copies the currently selected graphic.
<Ctrl>-F	Applies the current default fill attributes to the selected graphic.
<Ctrl>-L	Applies the current default line attributes to the selected graphic.
<Ctrl>-E	Switches to enlarged view.
<Ctrl>-N	Switches to normal view.
<Ctrl>-R	Switches to reduced view.
<Ctrl>-U	Activates frame setting mode.
<Ctrl>-I	Activates paragraph tagging mode.
<Ctrl>-O	Activates text editing mode.
<Ctrl>-P	Activates graphics drawing mode.

icon; you'll notice that the system's hard disk light flashes. Select an option from a menu and the light blinks again. As you might surmise, *Ventura* keeps most of its code on disk. When you request a function, the program finds the appropriate overlay file and loads it into memory—a rather sluggish process.

You could take the shotgun approach and copy all of *Ventura*'s overlays into a RAM disk, but a simpler and more efficient solution is to create a disk cache. A disk caching program identifies the blocks of data that are frequently read from or written to disk and automatically stores them in a reserved section of RAM for quick access. Of course a cache won't improve performance at the beginning of a session, but once the utility observes the goings-on for a bit, performance jumps noticeably.

Because *Ventura* needs all 640K of a system's conventional memory to function effectively, you should pair the cache program with an expanded memory board containing about 1MB of RAM. (If you shop around, you can easily find an unpopulated board for under $400 and upgrade with RAM chips for as little as $100.) Note, too, that cache programs are a quirky breed; not every utility is suited to *Ventura* (see "Cache on Demand?" *PCW*, September 1987). One program that has proven effective is *Flash*, a versatile, feature-laden utility that can create a cache in either extended or expanded memory.

Configuring *Flash* is relatively straightforward. Just run its installation program, identify the drive to be cached (such as C:), and copy the appropriate files to the hard disk. To set up a 500K extended memory cache, you would simply type **FLASH 500/m=a** at the DOS prompt (or place the commands in a batch file) to indicate the amount and type of RAM being used. Run *Ventura*, repeat any operation a few times, and behold—the hard disk light stops flashing.

A cache won't speed up every facet of *Ventura*'s operation, but you'll find that loading documents or moving bit-mapped graphics around can take half

the time. Even better, other disk-intensive applications such as *dBASE* can take advantage of the cache, too.

2. CONSOLIDATE HARD DISK FILES

DOS is something of a digital squirrel. If it can't store that latest program or document in one neat contiguous block, it breaks the file up and stuffs pieces into any free space on the disk. Unfortunately, when you need the file—be it a *Ventura* overlay or a frequently used chapter—the hard disk's read/write heads can't suck it up in one sweep, but must poke around the disk. Disk optimizers, which reunite scattered file fragments, can cut the delays and minimize hard disk wear and tear.

One indication that disk optimizing is needed is if the hard disk light flashes rapidly when you load a program: Every blink means another portion of the disk is being searched. Diagnostic routines typically found in disk optimizers can provide more detailed information in the form of disk maps and statistical reports showing the degree of file fragmentation.

As with disk caching utilities, there's a universe of disk optimizers to choose from. Programs such as *DS Optimize*, Condense from the *Mace Utilities*, and Speed Disk from the *Norton Utilities Advanced Edition* can consolidate disk files in a matter of minutes without disturbing copy-protected or hidden system files. Before running an optimizer, however, make sure you back up the entire disk.

Running a disk optimizer like Speed Disk is simplicity itself. At the DOS prompt type **SD** *n:*, where *n:* is the drive you want tidied up. Speed Disk takes about 20 minutes to rearrange the files on a nearly full 20MB disk, graphically illustrating its progress along the way.

To wrest the most from this speed tip, look for disk optimizers like *DS Optimize* that allow you to specify the order in which coalesced files should appear on the disk. For maximum performance, install DOS first, then *Ventura*.

3. AVOID SWAPPING FILES TO DISK

If a chapter contains graphics or text files that are too large to fit in available memory, *Ventura* swaps out the excess to a temporary "spill" file on the hard disk. Not surprisingly, this is like strapping lead sneakers onto *Ventura*, since the program must continually access the disk for information.

The simplest way to minimize swapping is to free up RAM. The first step is to eliminate any memory-resident utilities. Next, break large chapters into smaller ones by exiting *Ventura* and divvying up the source text files. If *Ventura* is still cramped for space, you might even resort to an earlier version of DOS. DOS 3.10, for example, takes up approximately 37K of RAM; DOS 2.00, only 24K.

But these techniques liberate only a tincture of memory. A more effective solution involves redirecting *Ventura* spill files into a RAM disk created in expanded or extended memory. Any RAM disk program that supports expanded or extended memory will do, but budget-conscious desktop publishers may prefer DOS's own VDISK.SYS. To set up a 300K RAM disk in extended memory, simply place the statement DEVICE = VDISK.SYS 300/E in the system's CONFIG.SYS file. Assuming the RAM disk is drive D:, add /O = D: to the end of the last line in VP.BAT, and *Ventura* will know what to do.

4. GREEK THAT TEXT!

When you're laying out a document in Reduced or Facing Pages view, you're concerned mostly with the overall look of the pages—not with picking out fine details. For that reason, *Ventura* provides a "greeking" option, which represents text below a specified size as horizontal lines in these two views. This reduces the time *Ventura* takes to display a page, thereby speeding up your work.

Ventura's default setting is 6 screen pixels. To change the default, open the Options menu, select *Set Preferences*, and choose *Text to Greek: All* from the dialog box to greek all text.

5. SUPPRESS ON-SCREEN KERNING

Ventura's on-screen kerning function is the program's bid for what-you-see fame, since it attempts to show how printed text will appear when automatic kerning is in effect. But when on-screen kerning is active, page display is sluggish. Perhaps more important, on-screen kerning is imprecise. Unless you have a high-resolution full-page monitor, you must check printed

pages against what *Ventura* displays and adjust accordingly.

Keep in mind, too, that the LaserJet's internal, cartridge, and downloadable disk fonts can't be kerned automatically anyway, because they don't include a set of prekerned letter pairs. In short, automatic kerning is exclusively for those with PostScript printers. So if your system is not on the cutting edge, flip open the Options menu, click the *Set Preferences* option, and select *On-Screen Kerning: None.* If your publishing system can take advantage of automatic kerning but you still want to save time, limit kerning to the larger point sizes.

6. HIDE THOSE PICTURES!

Whenever you scroll a document or move a frame, *Ventura* must redraw any pictures on the page. To eliminate this performance bottleneck, select *Hide Pictures* from the Options menu. Images are represented as gray blocks, which are swiftly redrawn by the program.

7. SWITCH HYPHENATION ROUTINES

Ventura automatically hyphenates a chapter when it is first loaded and whenever a picture or a text file is imported. Depending on the hyphenation algorithm being used, the process may take a few seconds or long enough for you to grab a cup of java.

Ventura's default hyphenation routine (USENGLSH.HY1) is fast but prone to skipping hyphenation opportunities or simply breaking lines incorrectly. The slower routine (USENGLS2.HY2, found on the Utilities disk) is far more accurate but something of a RAM hog. In the best of all possible *Ventura* worlds, hyphenation would be both quick and unerring.

SLOW.BAT

```
CD\VENTURA
RENAME FAST.HY1 FAST.BAK
RENAME SLOW.BAK SLOW.HY1
CD\
VP.BAT
```

FAST.BAT

```
CD\VENTURA
RENAME SLOW.HY1 SLOW.BAK
RENAME FAST.BAK FAST.HY1
CD\
VP.BAT
```

LISTING 1: Here are two batch files that switch Ventura's hyphenation routines.

You can have your cake and keep *Ventura* running trim by using the fast algorithm during initial layout of a document and the slower algorithm toward the end of the process, when the correct line breaks really matter. Switching quickly between the two and reloading *Ventura* is simply a matter of writing a pair of batch files—and remembering that *Ventura* uses the hyphenation algorithm only when it has the .HY1 or .HY2 file extension.

Copy the USENGLS2.HY2 file to the \VENTURA subdirectory and rename it SLOW.BAK. Rename USENGLSH.HY1 as FAST.HY1, and create the batch files SLOW.BAT and FAST.BAT shown in **LISTING 1.** When you reach the point where accurate hyphenation is called for, exit to DOS and run SLOW.BAT; FAST.HY1 will be uninstalled, and SLOW.HY1 will take its place. When speed's the thing, run FAST.BAT, and *Ventura* will hyphenate documents in a flash.

8. INSTALL A HIGH-SPEED PRINTER INTERFACE

When a laser printer outputs mostly text, it's a page-per-minute device. When bit-mapped graphics are involved, it becomes an inscrutable oracle—you may have to wait 3 minutes or 10 minutes or even 30 minutes for enlightenment. The problem is particularly acute with PostScript printers, most of which rely on a serial interface to transport the megabytes of graphics data from PC to printer.

Install a JLaser Plus or LaserMaster CapCard board in your PC, however, and you can eliminate two bottlenecks at once. The boards come with

2MB and 1.5MB of RAM, respectively, both of which give *Ventura* enough room to assemble an entire page instead of sending it piecemeal to the printer. More important, both boards bypass the printer's serial or parallel port and connect directly to its high-speed video interface. The performance difference can be startling. For example, a three-column single-page document with seven fonts takes 150 seconds to emerge from an Apple LaserWriter, 69 seconds from a LaserJet Series II, and only 30 seconds from a LaserJet Plus equipped with a LaserMaster. Of course, there's no gain without pain: The boards sell for about $1000 each. But if your time and sanity are at a premium, the investment is worthwhile.

9. DOWNLOAD FONTS BEFORE RUNNING VENTURA

If you're like most *Ventura* users, you probably print out part or all of a document several times during a work session. Unfortunately, every time the print command is issued, *Ventura* laboriously copies (or downloads) the same fonts to the laser printer's memory. You can short-circuit this redundancy with the aid of Hewlett-Packard's *Pclpak* utility by permanently downloading the desired fonts before running *Ventura*. The process involves identifying the fonts in question, saving them in special disk files with *Pclpak*, and then copying the files to the printer.

Ventura's mouse-driven menu system is fast but hardly perfect. Save your strength by using keyboard commands.

Let's say you want to use *Ventura*'s 18-point and 24-point Swiss bold fonts for an advertising brochure you are creating with the LaserJet Plus. Slip the *Pclpak* disk into drive A: and copy PCLPAK.EXE and USENG.CAT to the hard disk's \VENTURA subdirectory. Type **PCLPAK** at the DOS prompt, and press **<Enter>**. At the first menu type **2** to select the LaserJet Plus, **M** to trigger the Managefiles function, and **D** to indicate the destination. (In this example, you would supply a file name, SW18B.) Type **Q** to escape the current menu, **F** for fonts, **D** for download, and **F** again for the 18-point font's file name. Type **HLVB3018.SFP** and press **<Enter>**. Display the Download Font menu by pressing **I**, **1**, and **<Enter>**, and make sure that under 'Current Settings' the temp/perm status is 'permanent'. Select *Go*, and *Pclpak* saves the font to disk. Repeat the procedure for the 24-point Swiss font, creating the font file SW24B, then exit *Pclpak*.

At this point you could manually copy the fonts to the device the LaserJet is attached to (COM1, LPT1, and so on). But you can automate this step with a batch file that contains the lines

```
COPY/B SW18B LPT1:
COPY/B SW24B LPT1:
```

Load *Ventura* and go to work; the fonts will be permanently installed until the printer is turned off or reset.

10. LOAD THE POSTSCRIPT PROLOGUE BEFORE VENTURA

Redundancy, it seems, is *Ventura*'s watchword. Before *Ventura* sends a file to a PostScript printer, it transmits the PS2-.PRE "prologue" file that contains PostScript definitions. You can shave 10 seconds off document print time by removing PS2.PRE from the \VENTURA subdirectory and instead copying a permanent version of the prologue, PERMVP.PS, to the printer before running *Ventura*. The file, found in the \POSTSCPT directory on the Utilities disk, can be downloaded to the printer by typing **COPY/B PERMVP-.PS LPT1:**. Remember to restore PS2.PRE to the \VENTURA directory before you create print files for outputting on other printers and typesetters.

11. USE KEYBOARD SHORTCUTS

Ventura's unique pop-down, mouse-driven menu system is fast but hardly perfect. When you're modifying a style sheet or

fiddling with a graphic, you may have to return to the same menu option repeatedly—and that means racking up hundreds of mouse miles. Save your strength by using keyboard commands. The most useful is probably <Ctrl>-X, which displays the last dialog box. For a compendium of speedy shortcuts, see **TABLE 1.**

12. DOUBLE-CLICK FILE NAMES

To quickly load a file listed in a dialog box, double-click the name. This is the equivalent of highlighting a name and then selecting *OK*.

13. USE EFFICIENT TAGGING TECHNIQUES

You can quickly format elements in a *Ventura* document without a mouse by assigning tags to the PC's function keys. Select the *Assign Func. Keys* option from the Paragraph menu (or press <Ctrl>-K) and match the tag names with the function keys listed in the on-screen form. An extra speed bonus: You can now tag text while in the Text Editing mode.

You can also quickly format documents by inserting the appropriate style-sheet codes in the source text with a word processor. Open the file, locate an element (such as a headline), and at the beginning of the line type the @ symbol, the name of the tag (in capital letters), a space, an equal sign, and another space (for example, @SUBHEAD =). You can further accelerate the process by assigning formatting codes to key combinations with a macro processor such as *SuperKey* or *Keyworks*.

14. USE THE SHIFT KEY

If you expect to use the same graphics tool several times in a row, hold down the <Shift> key so you don't have to reselect the tool every time you release the mouse button. Hold down the <Shift> key while selecting paragraphs in the Paragraph Tagging mode, and you can tag several paragraphs at once.

15. STORE GRAPHIC DEFAULTS

Instead of tediously selecting line and fill attributes every time you create a graphic with *Ventura*'s drawing tools, save the current attributes as default settings. Select a graphic you're working on, then *Line Attributes* or *Fill Attributes* from the Graphic menu. Pick the desired attributes, and then select *Save To* from the dialog box. *Ventura* will automatically apply these new attributes to any picture you subsequently create. If you want to apply the defaults to existing graphics, select the graphic, then *Line Attributes* or *Fill Attributes* from the Graphic menu, and *Load From* from the dialog box. The image will be transformed in a flash. And that, after all, is what this article is all about. ●

Ted Nace is a contributing editor for PC World. *This article was adapted from his book* Ventura Tips and Tricks *(Peachpit Press, Berkeley, California, 1987).*

WHERE TO BUY

DS Optimize version 1.00a
Design Software
1275 W. Roosevelt Rd.
West Chicago, IL 60185
312/231-4540
List price: $69.95
Requirements: 256K, hard disk, DOS 2.00 or later version
Not copy protected

Flash version 5.0
Software Masters
6352 N. Guilford Ave.
Indianapolis, IN 46220
317/253-8088
List price: $69.95
Requirements: 256K, DOS 2.00 or later version
Not copy protected

JLaser Plus
Tall Tree Systems
2585 E. Bayshore Rd.
Palo Alto, CA 94303
415/493-1980
List price: PC version $1000, AT version $1200
Requirements: PC, XT, or AT compatible; laser printer with Canon CX or SX engine

LaserMaster CapCard
LaserMaster Corp.
7156 Shady Oak Rd.
Eden Prairie, MN 55344
List price: $995; cables $95, cables for LaserJet and LaserJet Plus $195
Requirements: PC, XT, or AT compatible; laser printer with Canon CX engine

Mace Utilities
Paul Mace Software, Inc.
400 Williamson Way
Ashland, OR 97520
800/523-0258
List price: $99
Requirements: 256K, DOS 2.00 or later version
Not copy protected

The Norton Utilities, Advanced Edition
Peter Norton Computing, Inc.
2210 Wilshire Blvd.
Santa Monica, CA 90403
213/453-2361
List price: $150
Requirements: 64K, DOS 2.00 or later version
Not copy protected

Pclpak
Hewlett-Packard
P.O. Box 6008
Sunnyvale, CA 94088
800/538-8787, 408/738-4133
List price: $79
Requirements: 256K, DOS 2.00 or later version
Not copy protected

For more information, see Products Featured in This Issue.

Macintosh Today

has what you want. Timeliness. Side-by-side product comparisons. Trends and new technologies. Profiles of Macintosh users. Useful tips. Industry news and inside information.

When you read *Macintosh Today*, you know what's going on in the Mac marketplace. We have the most experienced editors ever assembled to produce a Macintosh publication. We know what we're writing about.

Macintosh Today was created *on* the Macintosh *for* the Macintosh. Its clear design and high quality make it easy to read for busy Macintosh users.

Best of all *Macintosh Today* is FREE to qualified volume Macintosh business and technical users. To qualify, fill out the qualification card and return it promptly.

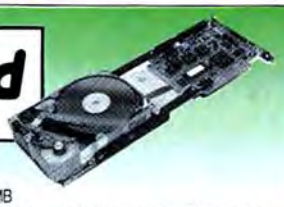
If you wish to receive extra reader qualification cards, call 800. 351. 1700.

Best then.

Best now.

Send in your qualification card today!

Leprecard



FAST 28-65 ms. access. **BIG** Up to 49MB
LOW POWER Less than 10 watts of power means less strain on the power supply, lower operating tremperatures, and longer component life.
QUALITY Leprecards feature components utilizing the latest technology from Seagate & Western Digital. 1 year warranty. 35 page illustrated User's Guide.
FREE SOFTWARE including **TakeTwo,** the backup utility named PC MAGAZINE Editor's Choice in 1986 & 1987. Call for details on the right card for your system!

30MB 65ms	30MB 40ms	49MB 28ms
$349	**$389**	**$579**

Now includes PC-QUIK Disk Cache

TANDY 1000/A/SX/TX Leprecards add $20

3.5" Floppy Kits

Instant Laptop & PS/2 compatibility. All kits include bracket to mount in 5¼" drive bay.

Now included: **TakeTwo,** the backup utility PC MAGAZINE named as their Editor's Choice.

$119
720K Internal for PC/XT/AT Requires DOS 3.2 or optional $19 driver software.

$149
1.44 MB Internal for AT only. Includes driver software.

$249
1.44MB Internal for PC/XT. Includes high speed floppy Controller & cables. Supports two drives.

PC/XT Disk Kits

- Drive & controller pretested & formatted
- Genuine Western Digital short slot controller
- 30 page installation guide & reference manual
- Cables, mounting screws, full & half-height face plates
- **TakeTwo** backup software, PC MAGAZINE "Editor's Choice"
- 1 year Warranty, 30 day Money Back Guarantee
- Optional: 150 watt, UL/FCC approved power supply, **$69**

TANDY 1000 kits add $20

20MB kit **$289**
Seagate ST225 21.4MB/65ms/Half-Height/14.8 watts

30MB kit **$329**
Seagate ST238 32.7MB/65ms/Half-Height/14.8 watts

40MB kit **$487**
Seagate ST251 42.8MB/Half-Height/11 watts
pre-formatted into a pair of 21MB/28ms partitions

65MB kit **$549**
Seagate ST277R 65.5MB/Half-Height/11 watts
pre-formatted into a pair of 32MB/28ms partitions

286[10] Computer

Is your PC running out of slots, or maybe not capable of keeping up with today's applications? Buy our system with stunning AT class performance, top quality components, at a little more than the cost of a speedup card.

$895

80286 processor running at 6/10Mhz with 0 wait states provides a Norton SI rating of 11.5. 8 slots - Room for 1 full-height and 3 half-height drives - 200 watt power supply - Clock calendar - Choice of 1.2 or 1.44MB floppy drive - Combination Hard Disk/Floppy drive controller - Maxiswitch 84 or 101 key Keyboard - 512 RAM standard expandable to 1MB - Award BIOS - 1 year warranty - 30 day money back guarantee.

OPTIONS:

Increase system memory to 640K or 1 megabyte of RAM **CALL**

Monochrome graphics adaptor and tilt/swivel amber monitor **$139**

Orchid Designer VGA (color) graphics adaptor & NEC Multisync II monitor **$878**

I-O Board wih serial, parallel, and game ports(2nd Serial option) **$59**

1.5 MB Laser Printer

"One of the Laserjet's strongest competitors."
INFOWORLD October 5, 1987

$1595

- 100% HP Laserjet, Epson & IBM compatible
- 1.5MB RAM Gives Full Page 300dpi graphics
- Vector graphics capability improves speed on programs like Autocad & Ventura up to 93%
- 9 resident & 5 soft fonts standard
- Printer utility software
- Serial & Parallel Interfaces
- 120 day TRW on site maintenance
- 1 year Warranty
- Options: All HP style font cartridges
  Toner Cartridge **$29**

AT Hard Disks

- Includes IBM AT rails & cables
- **SpeedStor** or **OnTrack** large drive software
- Formatted, Partitioned & Tested

Size	Model	Speed	Capacity	Price
HH	Seagate ST251	40ms	42.8MB	**$439**
HH	Seagate ST251-1	30ms	42.8MB	**$489**
FH	Seagate ST4096	28ms	80.2MB	**$749**
FH	Micropolis 1333	30ms	44MB	**$555**
FH	Micropolis 1335	28ms	71MB	**$749**
FH	Maxtor 1140	27ms	117MB	**$1669**

Orchid

Designer VGA
1024x768 **$279**
Tiny Turbo 286 **$289**
Twin Turbo **$409**

Shamrock

Toll Free **800-722-AT-XT**
California **805-373-7847**
FAX **805-379-9345**

2524B Townsgate Road, Dept. W
Westlake Village, CA 91361

- No extra for Visa/Mastercard (AMEX add 3%).
- Prices include UPS surface shipping.
- Federal Express shipping just $1.50 per pound.
- 30 Day Money Back Guarantee.
- Corporate & Institutional PO's accepted.

2400 MNP Modems

$239/$229

- Hayes Compatible, 300/1200/2400
- MNP level 4 error correction
- **FREE** MIRROR II Software, a $69 value
- Internal model $229, fits in short slot

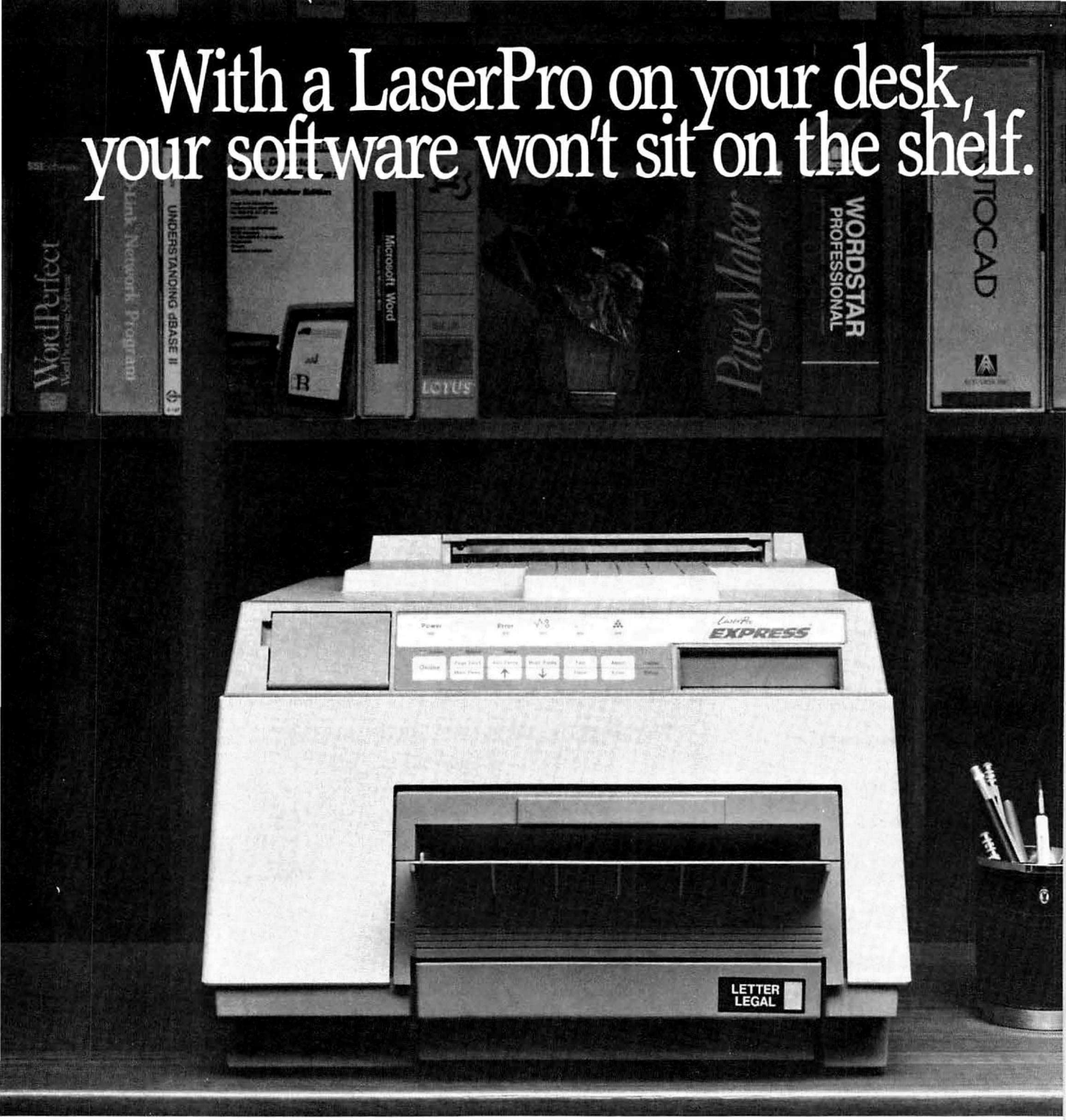
2400 without MNP $189 Ext $169 Int

Western Digital

FileCard 30 Disk Card	**$419**
Hard/Floppy Controller for AT's 1003-WA2	**$139**
above w/ RLL Encoding for AT's 1003-RA2	**$149**
Hard only/12Mhz up AT's, 1.1 Interleave 1006-WAH	**$179**

Circle 283 on reader service card

With a LaserPro on your desk, your software won't sit on the shelf.



Instead, your software will stay on the job. Working better than ever. Because now it's linked to LaserPro™—the laser printer line with a range of emulations unmatched in the industry.

The emulation advantage.

Put your software to work with LaserPro's wide selection of emulations. Our laser printers are compatible with all software programs that support the HP LaserJet Plus,™ Diablo® 630, Epson® FX-80,™ Qume Sprint® 11, and NEC Spinwriter® printers. Which means that the money you've already invested in software is still well-spent. Even today's newest software packages will leap into action with LaserPro. Printing everything from business presentations to bar codes, graphics to CAD/CAM drawings.

No hidden costs.

With LaserPro the compatibility is built right in. Our entire selection of emulations is standard. No extra cartridges. No optional cards. No extra costs. Just push-button access and hassle-free operation.

And there's more.

Prices for our full line of printers are amazingly low. Each model brings you versatile performance that over-powers the competition, but not your budget. So hang on to your software—and hook up with LaserPro. The full-featured printer line that's truly "top shelf."

For more information, contact **Office Automation Systems, Inc.** 8352 Clairemont Mesa Blvd., San Diego, CA 92111. (619) 576-9500.

See Us At Comdex, Atlanta—Booth 1362

Circle 17 on reader service card

LaserPro

CONSUMER WATCH

Advice and information for the computer consumer

This month: Tips on protecting your PC from disaster, an overview of insurance coverage, plus a cautionary tale in Shop Talk

Anita Amirrezvani

Checkpoints for Complete Coverage

After using a PC at work, you may find that you can't live without one at home—for personal use as well as for unfinished business.

But if you part with $1000 or more for a system, don't ignore the issue of security. After all, a computer might be your most expensive purchase, after your home and car. With a little care, you can protect your investment—and your valuable data—from theft or damage. The following five tips will help you safeguard your system.

1. Buy a lock. Many office supply companies sell locks that make it virtually impossible for a thief to walk off with your equipment. One lock sold by Inmac, an office supply firm, consists of two large steel pads, a thick cable, and a lock. Both pads have a strong adhesive backing; you stick one to your computer and the other to your desk. That done, you attach the cable from one pad to the other and lock it. The Lock Kit is available for $39.95.

Another company—Anchor Pad, of Ventura, California—sells a full line of security products. Anchor Pad's $250 maximum-security system consists of a large adhesive pad locked to a swiveling shelfing system. The CPU sits on the pad on the bottom shelf; the monitor is held in place on the top shelf with steel posts. Both components can be unlocked and moved if necessary. "If someone steals your equipment when you use this system, we'll replace it up to $5000," says Anchor Pad marketing director Jeff Kennedy. The guarantee holds for three years and can be extended with an inspection. Anchor Pad also sells less expensive security systems that begin at about $70.

2. Check your insurance policy. Even if you have homeowner's or renter's insurance, your computer may not be fully covered if disaster strikes. State Farm, for example, limits computer coverage to $3000 under its homeowner's and renter's policies. Although some companies have higher limits—Farmer's and Allstate insure home computers up to $5000—most systems and their accompanying software are worth far more.

Worse yet, if you use your home computer primarily for business, you may not be covered at all. Aetna homeowner's policies, for example, exclude computers used mainly for business. "There's no cut-and-dried percentage for business use," says Aetna spokesperson Micaela Woodbridge. "But people who take a business tax deduction on their equipment should probably get business insurance coverage."

(continues)

Order Status,
Technical & Other
Info. (602) 246-2222
FAX # (602) 246-7805
Call for programs not listed

WAREHOUSE DATA PRODUCTS

SPECIAL
MICROSOFT WORD 4.0
$195

MasterCard VISA No Charge for MasterCard or Visa

TOLL-FREE ORDER LINE 1-800-421-3135

FREE SOFTWARE!

Purchase over $100 and receive one of these disks absolutely FREE! Purchases over $250 get two free disks, over $400 get three, or get all four disks when your purchase is over $500! **1) MIXED BAG**—A great assortment of utilities and games all packed on one disk. **2) PC-WRITE**—Try this famous feature packed word processor. It's a winner! **3) FONT-SET**—Lets you set popular fonts like bold, underline, etc. on most late model printers from Citizen, Epson, NEC, Okidata, Panasonic, Star, Toshiba, etc. You can even use your printer like a typewriter! **4) ABC-LIST**—Great mailing list program! Sort on any field, do qualified searches, print reports and mailing labels, and more!

— SOFTWARE —

Accounting

Cyma	Low Price
Dac Easy Acct.	$54
Dac Easy Payroll	39
Dollars & Sense	94
In House Acct.	112
Managing Your Money 3.0	117

Communication Programs

Carbon Copy Plus	$108
Crosstalk XVI	89
Crosstalk MK4	110
Remote	89
Smartcom II	79

Data Base Managers

Clipper	$375
Condor 3	325
DBase III Plus	Low Price
DB-XL	80
Fox Base Plus	195
Genifer	189
Paradox 2.0 Premium	435
PFS: Pro File	Low Price
Powerbase	169
Q&A	189
Quicksilver Diamond	329
Revelation	464
R Base System V	Low Price
Reflex	81
Relate & Report	112
VP Info	65

Desktop Publishing

Pagemaker	$479
PFS: First Publisher	59
Ventura Publisher	493

Graphics

Chartmaster	$199
Design Cad 2	148
Diagram Master	Low Price
Easy Cad	109
Energraphics 2.01	294
Generic Cad	49
In-A-Vision	270
Microsoft Chart 3.0	Low Price
Newsroom Pro	65
Printshop	33

Integrated

Ability	$56
Ability Plus	Low Price
Enable	Low Price
Framework II	Low Price
Smart System	429
Symphony	Low Price

Languages

Lattice C Compiler	$220
Microsoft C Compiler	275
Microsoft Fortran	Low Price
Microsoft Macro Assembler	92

Languages

Microsoft Pascal	Low Price
Microsoft Quick Basic	59
Microsoft Quick C	59
Ryan McFarlan Fortran	342
Ryan McFarlan Cobol	549
Turbo Basic	59
Turbo C	59
Turbo Pascal	59
Turbo Prolog	59

Multi-User Software

Fox Base	$299
Word Perfect	310
Word Perfect Modules	ea 75
Microsoft Word	Low Price

Project Manager

Microsoft Project	Low Price
Super Project Plus	Low Price
Timeline 2.0	$270
Total Havard Man. 2	Low Price

Spreadsheet

Lotus 1-2-3	Low Price
Microsoft PC Excel	$302
Spreadsheet Auditor	82
Supercalc 4	Low Price
Surpass	329
VP Planner Plus	88

Utilities

Copy II PC	$19
Copywrite	39
Cubit	39
Deskview 2.0	72
Direct Access	49
Eureka	95
Fastback Plus	92
Formtools	56
Graph in the Box 2	55
Mace	55
Microsoft Windows	59
Norton Advanced	75
Norton Utilities	48
PC Tools Deluxe	37
Prokey 4.0	70
Q DOS II	49
Righwriter	75
Sidekick	55
Sideways	39
Sqz	Low Price
Superkey	55
Turbo Lightning	55
XTree	35

Word Processing

Microsoft Word 4.0	$195
Multimate Advantage II	Low Price
Q and A Write	Low Price
Webster Spellcheck	37
Word Perfect	195
Word Perfect Executive	106
Word Perfect Library	59
Wordstar Pro	233
Wordstar 2000+	194

— HARDWARE —

Accessories

Brooklyn Bridge	$72
Copy II PC Bd.	75
Curtis Ruby	59
Mach III Joystick	36
Masterpiece	88
Masterpiece+	99
150 Watt Power Supply	69

Boards

AST	
Advantage Premium	$285
Sixpac Premium	Low Price
Sixpac Plus	129
HERCULES	
Color Card	145
In Color Card	302
Graphics Plus	182
INTEL	
Above PC 64K	225
Above 286	319
Orchid Tiny Turbo	289
TALLTREE	
J Ram 3 ATP	Low Price

COMPUTERS

AZ 386
80386-16 Micro Processor, 1 MB of Ram, Teac 1.2 MB disk drive, 220 watt power supply, 6 layer mother board, RT keyboard **$2595**

AZ Turbo AT
512K, 6 & 10 MHZ, keyboard, 200 watt power supply, one 1.2 teac drive, Phoenix Bios **$975**

AZ Turbo XT
135 watt power supply, One 360K drive, 640K, keyboard **$519**

AZ 10
150 watt power supply, dual 360K drive, 10 MHZ mother board, 640K, keyboard **$515**

AST 286
Premium Computer
512K, expandable to 2MB on the system board, RT enhanced style keyboard, parallel, serial and clock, 1.2 MB floppy disk drive, 7 expansion slots, two 32 bit fastram slots, DOS 3.1 & Basic 1 year warranty **Low Price**

EGA Boards

ATI Ega Wonders	$195
NEC GBI	Low Price
Paradise Auto 480	155
Quad EGA Plus	165
Vega VGA	299

EGA Monitors

AMDEK 722	$455
Casper	410
Mitsubishi Diamond Scan	486
NEC	
Multisync Plus	Low Price

Hard Cards

Plus 20 MB	Low Price
Plus 40 MB	Low Price

Hard Drives

Seagate 20 MB	$269
Seagate 30 MB	299
Seagate 30 MB AT	Low Price
Seagate ST-125 w/cont	329
Seagate ST-138 w/cont	399

Modems

AZ 300/1200	$75
Everex 300/1200	89
Hayes 1200	Low Price
Hayes 1200B	Low Price
Hayes 2400	Low Price
U.S. Robotics 2400	335

Mice

Genius	$59
Logitech	Low Price
Microsoft Bus w/Paintbrush	92
Microsoft Serial	92
Optimouse w/Dr Halo	89
Optimouse w/DPE	185

Monitors

AMDEK	
410 Amber	$145
MAGNAVOX RGB	Low Price
PRINCETON	
Max 12	138
HX 12E	460
SAMSUNG	
TTL Amber w/tilt	76
Color w/tilt	249

Printers

CITIZEN	
MSP 10	$249
MSP 15	315
MSP 20	285
120 D	142
Premiere 35	471
Tribute 224	639
EPSON—Call on all models	
NEC	
P5XLP	815
P7 Parallel	595
8850	1059
P6 Parallel	419
P960XL	1005
P2200	335
OKIDATA—Call on all models	
PANASONIC—Call on all models	
STAR MICRONICS	
NB24-10	456
NB24-15	610
ND10	275
NX1000	179
TOSHIBA—Call on all models	

TERMS: Shipping on most software is $5.00. AZ orders +6.7% sales tax. Personal check/company check—allow fourteen (14) days to clear. We accept purchase orders from authorized institutions for 3.5% more than cash price. All returns are subject to our approval. There will be a 20% restock fee. Minimum phone order $50. All prices are subject to change. Due to copyright laws we cannot take back any open software.

TOLL-FREE ORDER LINE 1-800-421-3135

WAREHOUSE DATA PRODUCTS
2701 West Glendale Ave. • Phoenix, AZ 85051
We do not guarantee compatibility

Servicing our PC buyers with low pricing and technical experience since 1979.

Phone Hours: Monday, Wednesday & Thursday 7 am-90am; Tuesday & Friday 7am-5 pm; Satruday 9am-5pm MST.

Most homeowner's and renter's insurance policies specifically cover damage due to fire, lightning, windstorms, hail, theft, and vandalism. Off-the-shelf software is usually covered along with the hardware; however, coverage of blank media, media, custom programs, and damage from power surges not caused by lightning varies considerably from policy to policy.

Beyond that, consumers should check into the amount of their deductible. Of course, the higher the deductible, the cheaper the policy. But a deductible of, say, $500 means you'll be out a substantial sum if your PC is stolen or extensively damaged.

Then there's the issue of the type of coverage. Less expensive insurance policies cover the depreciated value of property—not its replacement value. And like cars, most computers depreciate rapidly once they roll out of the showroom.

3. Beef up your policy if needed. If your policy isn't sufficient, call your insurance agent for an overview of additional coverage. For current policyholders, extra insurance is usually cheap. Aetna, for example, charges its customers in New York City $8 for $1000 of added computer coverage, $38 for $5000, and $75 for $10,000—and there's no deductible. Similarly, State Farm offers $5000 extra coverage for about $20 yearly; the standard deductible on a State Farm renter's or homeowner's policy applies. On Allstate's deluxe homeowner's policy (good only on homes less than 25 years old), customers can increase the $5000 limitation on computer equipment to $10,000 for a $10 annual fee. Similarly, Farmer's offers $10,000 extra coverage for a variable amount.

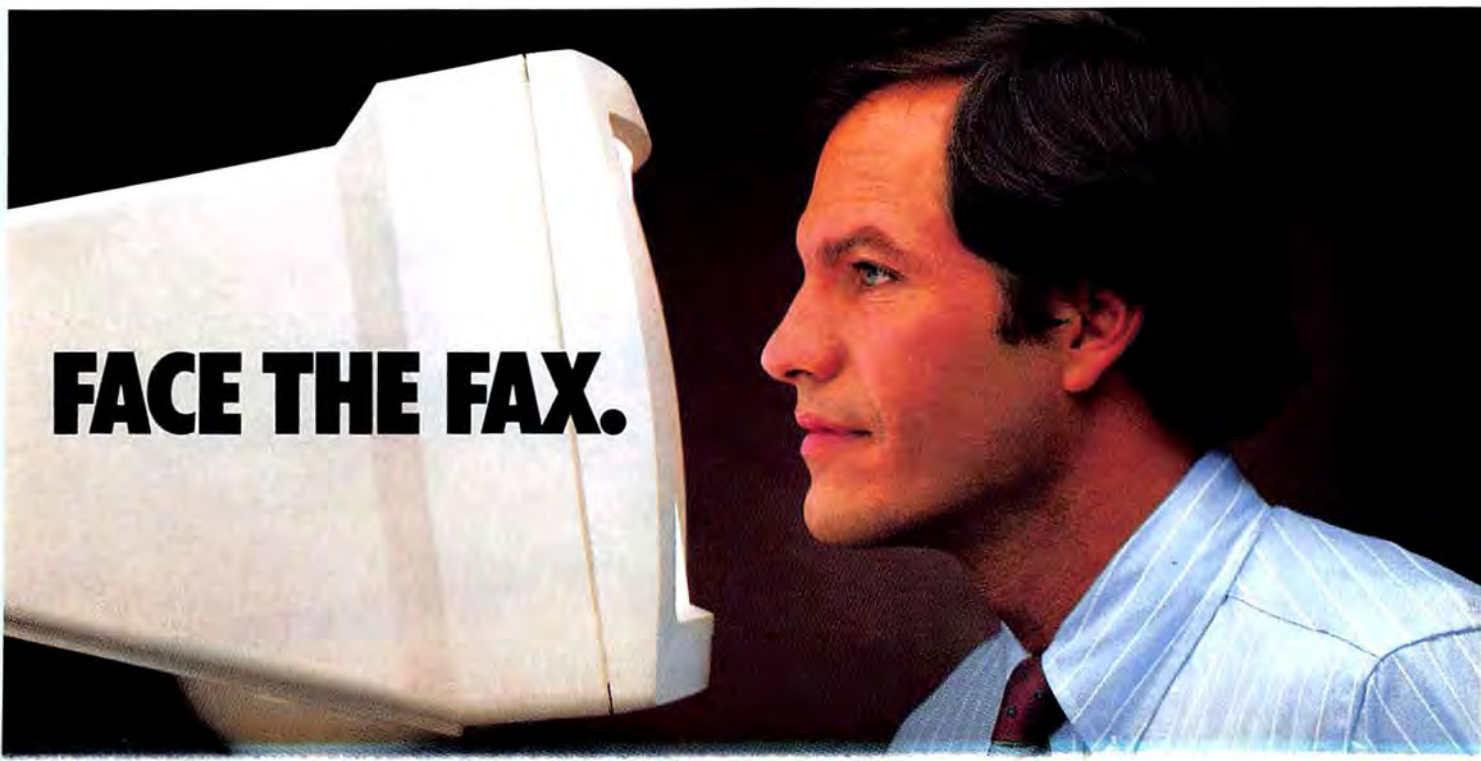
Policies may also be available for those whose homes or apartments are not currently insured, although that's less common. According to State Farm spokesman David Hurst, authors who work at home can apply for insurance policies that specifically cover their computer equipment. And of course, commercial insurance policies are widely available.

4. Consider other sources of insurance. Two companies offer insurance policies specifically for computer owners. Safeware, a firm in Columbus, Ohio, insures computer hardware and software against the usual perils, and kicks in coverage for damage due to accidents and power surges. According to Safeware CEO Dave Johnston, power surges "are the number one cause of loss." Most major insurance companies exclude damage from power surges, except when caused by lightning.

Safeware also offers full replacement coverage for computer equipment with a standard $50 deductible. Annual fees begin at $39 for equipment valued at $2000 or less and range up to $149 for systems in the $14,000 to $17,000 range.

Similarly, Data Security Insurance in Boulder, Colorado, is an independent computer insurer. Unlike most others, the company includes custom programs on its list of covered equipment.

(continues)



However, coverage is not blanket; when you apply for insurance, Data Security requires an itemized list of your equipment. The annual cost of an insurance policy with a $100 deductible is $35 for equipment worth $2000 or less, $75 for systems worth $5000 or less, and $25 for each additional $5000 up to $50,000. Policies are underwritten by Casualty Underwriters and the St. Paul Life Insurance Company.

5. Keep good records. If you buy insurance, make sure your records reflect the equipment you own. In case of theft or damage, you'll need a detailed inventory of your hardware and software, complete with purchase receipts. Store this information away from your home—for example, in a safe deposit box at your bank.

Raul Arias, Allstate's territorial underwriting manager in Cupertino, California, says that videotaping the contents of your home "is extremely helpful for claims adjusters, because then it's clear exactly what needs to be replaced." Most insurance companies will pay even if you don't have receipts, but it will take longer for you to prove your claim.

WHERE TO BUY

Anchor Pad
4483 McGrath St.
Ventura, CA 93003
800/426-2467, 800/626-2467
California

Data Security Insurance
P.O. Box 9003
4800 Riverbed Rd.
Boulder, CO 80301
800/822-0901, 303/442-0900

Inmac
2465 Augustine Dr.
Santa Clara, CA 95054
408/737-7777

Safeware
P.O. Box 02211
2929 N. High St.
Columbus, OH 43202
800/848-3469, 614/262-0559
Ohio
Type GO SAF on CompuServe

For more information, see Products Featured in This Issue.

Shop Talk

All Work and No Pay

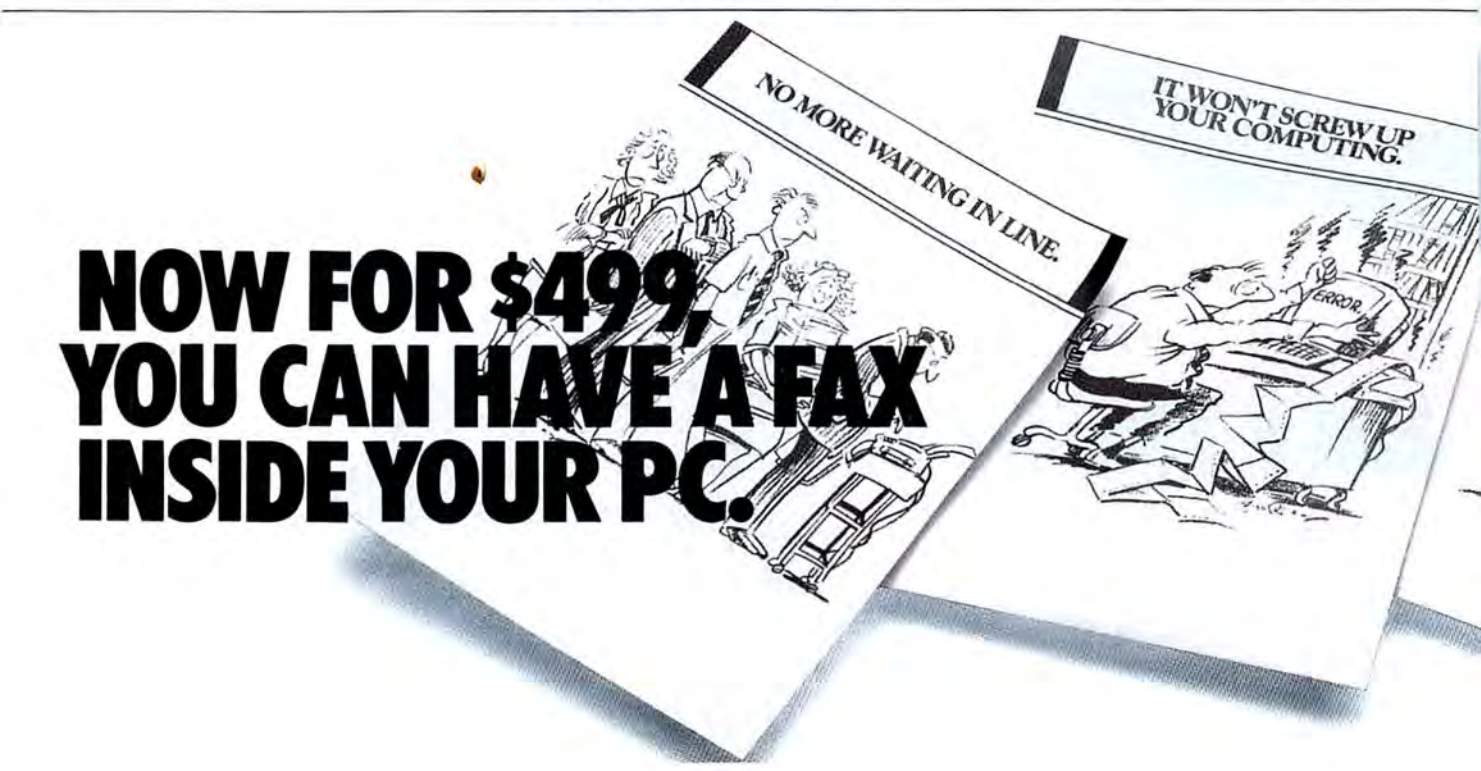
In March 1987 I answered an ad placed in *MIS Weekly* soliciting software reviewers for the Professional Software Programmers Association (PSPA). Subsequently, I was informed that I had been accepted as a reviewer but that writing for the organization required an initiation fee of $25 and annual dues of $78. On April 7, I forwarded a check for $103, which was cashed.

In May PSPA sent me *Software Carousel*, which I reviewed in time for a June 10 deadline. Payment for the article was supposed to occur once PSPA had placed the article in a newspaper or magazine.

Although I've written three letters to PSPA and called to track down my article, no one has answered. And I haven't heard another word about the services promised in the brochure: a monthly newsletter, free subscriptions to trade publications, technical and editorial assistance, and low-cost insurance.

Dave Phillips
Budd Lake, New Jersey

Editor's note: PC World *attempted to contact PSPA and*



discovered that the association's phone number had been disconnected. A letter sent via Federal Express to PSPA's Bay Avenue address in Capitola, California, was returned to sender. Another letter sent to an address in Cupertino, which was obtained from a court statement, went unanswered.

PC World *has learned of two suits filed in California small-claims court against Forrest C. Huff, president of PSPA. In a written statement to the court filed on April 20, 1987, plaintiff Chris Russell said she reviewed two software packages for PSPA in 1985. "Time after time I would call [about payment] and Mr. Huff would put me off." Eventually, Russell received $100. In 1986, according to her statement, she wrote another review for PSPA, but her attempts to get paid were futile.*

Plaintiff Mark Colen says he was hired by Huff in February 1986 at $8 per hour to edit reviews for PSPA. According to Colen's May 17, 1987, court statement: "The excuses Mr. Huff used to avoid paying me were of the 'I don't have the checkbook in the office' and 'I'll pay you next week' variety."

In separate decisions by the court, Russell was awarded $150 plus costs, and Colen was awarded $1393.35 plus costs. Huff appealed both cases to the California Superior Court, but because Huff did not appear at either hearing, both awards remain in effect. At press time neither plaintiff had been paid by Huff.

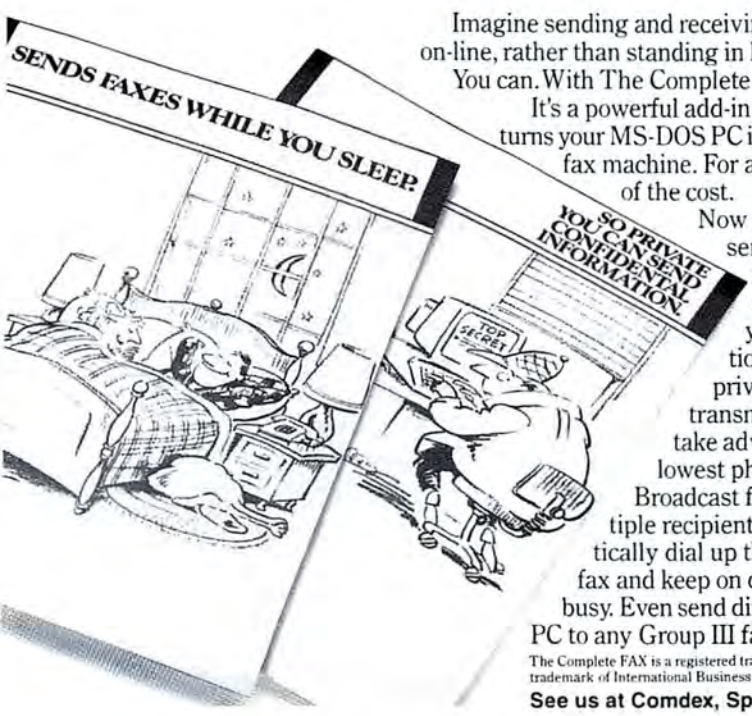
Others who filed statements before the court on behalf of the plaintiffs included Jean Lockwood, a PSPA reviewer who said that she had never been compensated for her work, and Carolyn Stallard, a former PSPA staff editor. According to Stallard in her statement: "I was seldom paid on time, and never the full amount owed... Mr. Huff's repeated failure to keep promises . . . led me to believe that my own reputation . . . might be damaged by my continued involvement with the organization." Stallard resigned in September 1986, but her name continued to be used without her permission on letters sent to prospective reviewers.

By Any Other Name

Consumer Watch blasted a mail-order firm from Beverly Hills called CompuSystems in December 1987. I was shocked at first because I've done business with a firm called CompuSystems in Columbia, South Carolina, and have nothing but praise for them.

I first contacted the company when I decided to buy an adapter board to mate my Tandy 1000 to a Cipher tape backup unit. Before ordering I wrote the company expressing my concerns about compatibility. Upon receiving my letter, the president of the company called me and admitted that to his knowledge the board had never been tested with the Tandy. He agreed to ship the board and software for a 30-day trial period; if it worked I would pay the agreed-upon amount.

(continues)



Imagine sending and receiving your faxes on-line, rather than standing in line.

You can. With The Complete FAX.

It's a powerful add-in board that turns your MS-DOS PC into a Group III fax machine. For a fraction of the cost.

Now you can send messages from your desktop to your destination in complete privacy. Schedule transmissions to take advantage of the lowest phone rates. Broadcast faxes to multiple recipients. Automatically dial up the receiving fax and keep on dialing if it's busy. Even send direct from your PC to any Group III fax.

And because it's all done in the background, you have all the power of your PC to boot.

All you need is an IBM PC or compatible with a hard disk and graphics board.

And a willingness to face the fax.

For more information and the dealer nearest you, call (800) 634-5558.

THECOMPLETEPC

521 Cottonwood Drive, Milpitas, CA 95035 (408) 434-0145 FAX: (408) 434-1048

The Complete FAX is a registered trademark of The Complete PC, Inc. MS-DOS is a registered trademark of Microsoft Corp. IBM is a registered trademark of International Business Machines, Inc. © 1988 The Complete PC, Inc.

See us at Comdex, Spring. Booth 4920

Circle 44 on reader service card

To make a long story short, the board didn't work, but in the meantime CompuSystems engineers helped me solve another problem. All this was at no cost to me but involved considerable effort and expense on the part of CompuSystems.

W. C. Ellis
San Diego, California

Editor's note: CompuSystems president Nick Johnson says his company has been in business since 1976 and is the largest supplier of medical computer systems in South Carolina. CompuSystems sells two products nationally: a 20-MHz 386 motherboard for $1995, with trade-in of your AT motherboard; and a 25MB Cipher 5210 tape backup for $395. CompuSystems' phone number is 800/845-2712; 803/922-5528 South Carolina.

Meanwhile, according to Postal Inspector Gary Austin, the investigation of CompuSystems of Beverly Hills had slowed at press time due to a manpower shortage. As before, Austin advises consumers to mail complaints about CompuSystems to his attention at P.O. Box 4140, Burbank, CA 91503. "Eventually, if we can make restitution, we'll do that," says Austin. However, the main suspect in the case is still at large.

Orphans Not Wanted

I spent more than $700 for a Panasonic FX-600 computer in June 1987. Imagine my surprise when I tried to get two drive rails from my dealer and found I couldn't get the parts because Panasonic had recalled the com-

(continues)

dBASE USERS!

STOP CODING with QUICKCODE PLUS™

NEW — NOW 100% CLIPPER 100% FOXBASE+ COMPATIBLE

Let's face it. Coding is a waste of time. Why should *you* have to work hard just to get dBASE to do what you want? Let QUICKCODE PLUS automatically write all your dBASE programs for you. Its built-in Form Editor and 1-2-3 style commands are a breeze to use. And it can write programs like an *expert* to read and update *dozens* of databases; 11 pages and 500 fields per form; Protected Fields; and *hundreds* of other state-of-the-art features!

WHAT THE CRITICS SAY:

"Remarkably easy to use" — Infoworld
"Impressive." — PC Magazine
"Outstanding in terms of form, structure, style, and internal documentation... offering unique user interfacing and multi-page and multi-file capability" — Data Based Advisor

GO NEW with QUICKREPORT™

NOW 100% CLIPPER 100% FOXBASE+ COMPATIBLE

Not getting enough mileage out of your dBASE reports? Is REPORT FORM too weak and programming too slow? Then it's time to switch to something a lot stronger...QUICKREPORT, the dBASE Report Writer you've always wanted. Design reports in seconds simply by drawing them on the screen. Put text and data anywhere, define computed fields, totals, averages, etc. You can even link together 6 databases and use powerful features like file chaining and transaction processing. Sort, group, and total on up to 16 fields. Use fancy printer features like BOLD, italics, etc. This is the Report Writer that PC Magazine called "elegant."

FOX & GELLER

Fox & Geller
604 Market Street • Elmwood Park, NJ 07407
(201) 794-8883 Telex: 311256

QUICKCODE PLUS and QUICKREPORT are trademarks of Fox & Geller. dBASE III PLUS is a trademark of Ashton Tate. 1-2-3 is a registered trademark of Lotus Development

Circle 67 on reader service card

Portrait of the Great American Investor

It's his job to know good advertising—and he also knows a good investment. Terry Wilson puts his money in U.S. Savings Bonds.

Bonds now pay competitive rates, like money market accounts.

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

U.S. SAVINGS BONDS
THE GREAT AMERICAN INVESTMENT

Bonds held less than five years earn a lower rate.

The *Signal Research Report*®

SIGNAL RESEARCH INC.

You've seen how the technologies of computing and state-of-the-art audio, video, and other consumer electronics are rapidly converging. And you probably wish you had more time for reading about new PC products, for contemplating new technologies, for thinking ahead.

The *Signal Research Report* will help. In a modern, sophisticated format, we're bringing together consumer electronics and personal computing in a newsletter for busy computer users. In one truly useful, fact-filled publication, we'll keep you current on everything from time-saving extensions to WordPerfect and 1-2-3 to the impact of compact discs on your future PC productivity. And we'll do it in an intelligent, nontechnical writing style you can relate to.

We've formed Signal Research, Inc., to launch a newsletter unlike any you've ever seen. We're Robert Lock, Founder, and former Editor In Chief of COMPUTE! Publications; Jim Casella, past President & Publisher of *Modern Photography* and *High Fidelity* magazines; Richard Mansfield, former Editorial Director of COMPUTE! Publications, and author of the widely acclaimed *Machine Language for Beginners*; and Tom Halfhill, former Editor of COMPUTE! and *COMPUTE!'s PC Magazine*.

Every two weeks you'll receive a sixteen-page issue, covering the latest in personal computer industry news, products, and events from all over the world. You'll find insightful analyses of consumer electronics trends—wherever they're happening. When IBM and Bertelsmann Ag (the German media giant that owns Bantam Books and Doubleday) form a joint venture in Germany to develop CD software, we'll tell you about it now and how it might have a very important impact on the US market in the future.

When digital audio tape takes off in Europe, months before it's even available here, we'll tell you why. And we'll tell you what Japanese consumers think of Sony's decision to add VHS format to its VCR line.

But the *Signal Research Report* is more than just intriguing world-wide personal computing and consumer electronics news. Much more. Every timely issue brings you prompt information about new software and hardware you can immediately use.

You'll find fascinating material we've screened from thousands of pages of domestic and international wire services. Our business digest will bring up-to-date earnings reports on personal computing companies you thought no one else had ever heard of.

You'll never find us wasting valuable space to pad features. But when a new start-up introduces a product of startling significance, or Microsoft announces a fundamental shift in the scope of OS/2, we'll be there. And when a shirt-pocket computer as powerful as a PC comes along, we want you to know about it months before you decide to buy an earlier model.

For a limited time, we're offering PC users a very special Charter Subscription price of $24.95. You'll save $5.00 off our regular price of $29.95. If for any reason you're not completely satisfied with your first issue, simply mark cancel across your invoice and return it. There'll be no further obligation.

To reserve your information-packed premiere issue, return this card immediately, or call toll free: 1-800-777-1222

Since 1979, Millions Of Personal Computer Users Have Relied On Us For Advice, Guidance, Insight & Expertise

COMPUTE!, COMPUTE!'s PC Magazine, Modern Photography, and High Fidelity are publications, and tradenames, of ABC Publishing, a subsidiary of Capital Cities Broadcasting. Neither Signal Research, Inc., any of its employees, nor the Signal Research Report, are affiliated in any way with Capital Cities or ABC Publishing, other than as former employees. Signal Research Report is a trademark of Signal Research, Inc. Copyright 1988. All rights reserved.

J120

To: HP LaserJet II users and dealers

Subject: GUIS LaserFax 401, more than just a plain paper fax

Data: 1. GUIS LaserFax 401 can be linked between your IBM PC and your HP LaserJet II to make the system into a plain paper fax.
2. Retail price under US$3,000
3. Transmission speed of 9600bps, Group III and Group II, with 16 levels of halftone
4. Can also be a second plain paper copier

Suggested Action: HP users--Call your HP dealers.
HP dealers--Call your HP users.

To: All persons interested in the future of the telecommunications market.

Subject: GUIS products already available

Data: 1. Scanner model 321
--specially designed for FAX USE
--easy to write software for
--also suitable for DTP (high cost-eff'ness at under US$900)
2. Fax Card
--to use w/Scanner 321 or alone (under US$800)

P.S.: All potential distributors, dealers, and OEM welcome.

GUIS

A Little Giant in Telecommunications

Glorious Union Information Systems Inc.
14th Floor, 207 Tun-Hwa North Rd., Taipei, Taiwan, R.O.C.
TLX: 22651 GUIS FAX:2-7134572 TEL: 2-7153356 2-7168035

GUIS America Inc.
1420 Kensington, Suite 207, Oakbrook, IL 60521, U.S.A.
TEL (312)574-7703 FAX: (312)571-2185

Agent in Switzerland:
INTER BIERI COPIERS SA
TEL: 045-513322 TLX: 869349 FAX: 045-513409

HP is a registered trademark of Hewlett Packard Co.

Circle 118 on reader service card

puters and dropped the line! What happens a year from now when the floppy disk controller or the power supply breaks? If I had bought a cheap clone, at least I'd be able to repair and update it myself with off-the-shelf parts.

Gregory Zagursky
Columbia, South Carolina

Panasonic responds: In April 1987 the U.S. government imposed a tariff on some types of microcomputers, including the Panasonic Business Partner FX-600. To abide by that tariff, Panasonic suspended dealer sales and shipments.

Still, we continued to service and support the FX-600 because our policy is to back all our machines for a minimum of seven years. But now the tariff policy has changed, and Panasonic plans to resume sales of the FX-600 this year.

Joel Port
Computer Products Manager

Got a gripe? Want to set the record straight? Write Consumer Watch, PC World, *501 Second St., San Francisco, CA 94107, or use MCI Mail PCWORLD/ 179-3813, CompuServe 74055,412, or The Source STE908. Include your name, city, state, and daytime telephone number with all correspondence. Letters may be edited for length and style. Due to the volume of mail we cannot acknowledge every letter.* ●

THE UPGRADE PATH

Hands-on advice for upgrading PCs, compatibles, and peripherals

A cautionary tale for Model 50 users, double-time processing for the Leading Edge Model D, and a new mouse in the house

Edited by Robert Luhn

A Tough DoublePlay for the Model 50

For all its high-tech charm, the PS/2 Model 50 is not much faster than the AT, a predicament that can be traced in part to the system's 80-millisecond (ms) 20MB hard disk drive. IBM's disk caching software compensates for some of the drive's sluggishness, but upgrading the system with a faster hard disk drive should yield real speed gains. Those who plan on using OS/2 will want to consider faster and bigger drives, too.

Enter Rodime. This venerable hard disk manufacturer recently released the DoublePlay, a 28ms 45MB hard disk for the Model 50 that sells for $1495. The drive even includes a kit for installing the evicted 20MB drive in a Model 25 or 30 or (with a bit of tinkering) a PC, an XT, or an AT.

Unfortunately, this is one upgrade that calls for a pro. The drive is poorly documented and difficult to install and configure. Chances are you won't notice much performance improvement once the DoublePlay is in place, anyway; the drive's data transfer rate isn't much higher than IBM's 20MB drive.

Although the Model 50's BIOS ROM supports 32 drive types, the DoublePlay isn't one of them. This leaves you with two choices. If you want to use OS/2, DOS 3.30, and later versions of these operating systems, you must format the DoublePlay as an IBM-compatible 37MB drive and say good-bye to 8MB of storage. If you need all 45MB, patch DOS 3.30 with Rodime's utilities, format the disk with this modified version of DOS, and install Rodime's special device driver. If you take the latter path, you can create nonbootable disk partitions exceeding 32MB—but the patches lock you into using DOS 3.30. Patches for OS/2, Xenix, and other operating systems aren't available.

Physical installation is easy and requires only a number 2 Phillips screwdriver. Before you start, back up the Model 50's original hard disk. If you plan on formatting the drive for 45MB, create a bootable 3½-inch floppy disk and copy the files from Rodime's installation disk onto it.

Boot the system with the Reference Disk (the Model 50's equivalent of Advanced Diagnostics) in drive A:, and park the hard disk drive's heads ('Prepare for relocation'). Unplug all external cables and then remove the Model 50's cover by loosening the two large thumbscrews at the back; you'll see the drive resting on a plastic shelf. Ground yourself, depress the two large tabs to the right of the drive, and slide the unit to the right until it separates from the Model 50's

(continues)

The Graphics Gallery difference has to be experienced to be believed. So we've arranged for you to experience our business graphics software for yourself. Just call now to get your **free** demonstration copy.

Find out for yourself how easy Graphics Gallery is to use. Take a look at the high quality output. Discover how quickly it turns ordinary worksheet files from Lotus® 1-2-3® into extraordinary charts and graphs. And see how effortlessly it works with all the most popular desktop publishing programs to enhance your results.

Because until you've actually slipped Graphics Gallery into your own disc drive, you simply won't know what a difference Graphics Gallery can make in your day—every day.

That's why we simply can't offer anything less than a real demonstration copy of the actual program. Use it just as you would a purchase copy (except for printing and saving files) and prove everything we say for yourself.

Graphics Gallery software is everything you'd expect from the industry leader in graphics devices like plotters and laser printers—and from the people who never stop asking "What if..."

Take Graphics Gallery for a desk drive.

But don't take our word for it. To order your **free** demonstration copy—or for more product or purchase information—just call **1-800-752-0900,** Dept. **710S**. Or write to Hewlett-Packard, Dept. **710S**, 1000 N.E. Circle Blvd., Corvallis, OR 97330.

HEWLETT PACKARD

The Graphics Gallery demonstration copy runs on IBM PC/ATs and XTs, Vectra PCs, and most compatibles with an EGA or monochrome monitor with Hercules™ graphics card. Lotus® 1-2-3® is a registered U.S. trademark of Lotus Development Corp. Hercules™ is a trademark of Hercules Computers.

© Hewlett-Packard Company 1988 IS02816

Circle 117 on reader service card

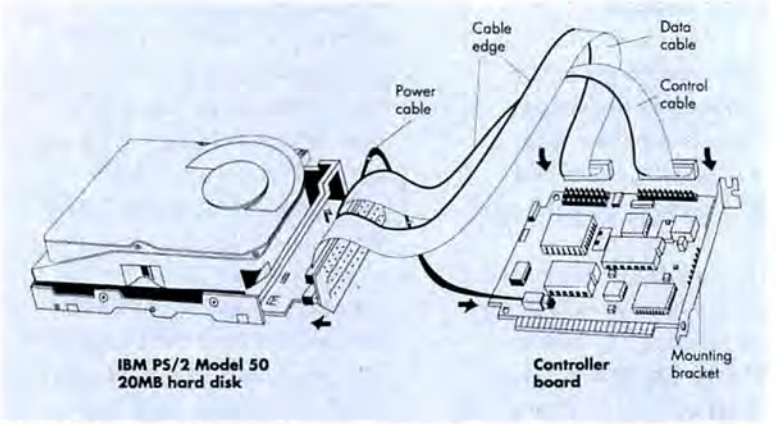


FIGURE 1: Installing the PS/2 Model 50's 20MB hard disk in another system is simple—until you have to connect the ribbon cables. Attach the cables to the drive as shown here. When you connect the cables to the controller board, make sure the same cable edges that pointed toward the power cable on the drive are pointing away from the controller's mounting bracket.

edge connector. Remove the drive and lay it upside down on a solid, flat surface.

On the bottom of the extracted drive are two plastic slides that fit into slots in the Model 50's chassis. Remove the slides, attach them to the DoublePlay, and pop the drive into the waiting bay. Reassemble the system.

Now the fun begins. If you're formatting the drive for 45MB, boot the system with the 3½-inch disk that you prepared earlier; a menu listing six options will appear. Run each item in sequence, following the instructions in Rodime's manual to the letter. Don't second-guess them or you'll end up in trouble. The machine will reboot several times as the installation program modifies DOS, adds a device driver, and creates a CONFIG.SYS file (make sure you don't overwrite the last when restoring your own files).

If you're treating the DoublePlay like a standard 37MB IBM drive, boot the system with the Reference Disk and select 'Change configuration' from the first menu that appears. Scroll to the bottom of the screen and specify that the hard disk is type 11, with arbitration set to 'Level _3'. Press <F10> to save these setup values in the system's battery-backed clock/calendar chip.

The system then reboots, and a menu appears automatically. Press <Ctrl>-A (an option not listed) to run DOS's diagnostics routines. Choose 'Format fixed disk' and go through the low-level format procedure. Along the way several urgent messages will flash on screen warning you that configuration data on the disk is not readable; ignore these messages and press on. The disk will be low-level formatted in about 20 minutes. Finally, boot the Model 50 with a DOS disk in drive A:, use FDISK and FORMAT to create partitions, and high-level format the hard disk in the usual manner.

And what of the Model 50's original 20MB drive? You can pop it into the Model 25's unused drive bay or replace one of the 3½-inch floppy disk drives in the Model 30. Rodime supplies a kit with all the fixin's—a PC-style hard disk controller, a TTL-to-CMOS adapter that plugs into the back of the drive, two ribbon cables, and a power cable. The company notes that some cables were incorrectly color coded; users should contact Rodime or authorized dealers for installation instructions.

Rodime claims its controller and the IBM drive will work in an IBM PC, XT, AT, or clone. Since the drive was designed for the Model 50's smaller bays, however, you'll need mounting brackets designed to hold a 3½-inch floppy disk drive in a 5¼-inch bay.

On balance, the DoublePlay is probably more trouble than it's worth. If you desperately need 45MB, never plan on running anything other than DOS 3.30, and can fathom maddeningly vague instructions, the DoublePlay may fit your needs. Otherwise, hold out until a speedy, adequately documented, and truly IBM-compatible drive hits the market. —*Michael Covington*

WHERE TO BUY

DoublePlay
Rodime
901 Broken Sound Pkwy. NW
Boca Raton, FL 33487
305/994-6200
List price: $1495
Requirements: DOS 3.30 or later version
For more information, see Products Featured in This Issue.

Twice the Leading Edge

Leading Edge's Model D is one of the most popular PC compatibles ever made. But older versions of the machine built around the 4.77-MHz 8088 are a little poky. If you don't feel like spending $500 on a turbo board, one cheap (but not so simple) fix is the D-Z Option Speed Up Kit from Innovation Computer Cor-

(continues)

poration. Once the kit—a 2-inch-square circuit board and external switch—is installed, the Model D can skip along at 7.8 MHz.

Installing the D-Z kit is the sticky part. Like the AT Turbo-Switch II (see "Poor Man's Turbo Board," *The Upgrade Path*, *PCW*, October 1987), the D-Z kit works its magic by essentially replacing the crystal on the Model D's motherboard that controls the microprocessor's clock speed. With most machines, this would involve simply popping the old crystal off the board, replacing it, and attaching a couple of wires. Because of the Model D's design, however, you must first remove the system's motherboard and solder a chip socket into place for the D-Z circuit board. Unless you're a very experienced upgrader—and you're in a mood to decipher Innovation's terse instructions—take the company's advice and pay a competent computer technician to do the job.

Before you take this leap, be advised that altering the Model D in this fashion invalidates Leading Edge's 20-month warranty. (This point is obviously moot if you bought your system before September 1986.) More important, Innovation notes that some machines may "malfunction or operate marginally" at 7.8 MHz. So don't make this upgrade lightly. Better still, save your money for that turbo board. —*R. L.*

WHERE TO BUY

D-Z Option Speed Up Kit
Innovation Computer Corp.
1325 Juniper St.
Cleveland, WI 53015
414/693-3416
List price: $149
For more information, see Products Featured in This Issue.

A Better Mouse

Most users scoffed when they heard Microsoft had developed a new mouse. A mouse, after all, is the simplest peripheral around. You roll it, click it, and that's it.

But Microsoft's mouse makeover has produced a surprisingly superior product. The new design relocates the ball from under your fingertips. As a result, the now all-white rodent is a dream to hold; it rolls like ice on Teflon; and best of all, it's easier to click. Keyboard aficionados might consider such huzzahs to be a tempest in a teacup. But if you use a mouse all day with your word processor or a click-intensive program like *PageMaker*, Microsoft's upgrade is just the thing.

Financially and physically, making the move is relatively painless. The serial-PS/2 and bus versions of the mouse cost from $150 to $200, depending on the software bundle you select: *Mouse Menus* and *Microsoft Paintbrush*, *EasyCAD*, or *Microsoft Windows 2.0* and *PC Paintbrush for Windows*. Installing the bus mouse examined here involves popping the supplied InPort bus-interface board into a free slot, attaching the mouse, and copying a file or two to your system. (If you buy the serial-PS/2 version, you'll have to choose from 9-pin and 25-pin serial cables, or a PS/2 mouse port adapter and cable. If your system already has an older bus mouse adapter card with the proper connector, you can just plug the mouse in and copy the new mouse drivers over.) The tools of the upgrade: small Phillips and flat-blade screwdrivers.

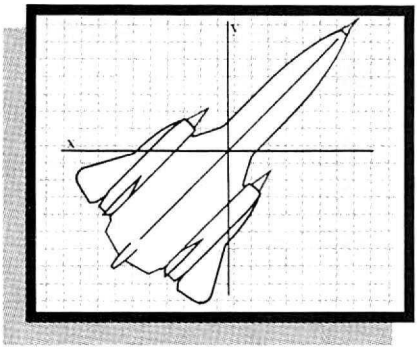
If you're upgrading a machine with a hard disk, park the drive; otherwise, just turn off the system, unplug all external cables, and remove the cover. Ground yourself, remove the InPort board, and lay it on top of its antistatic wrapper. You'll notice red

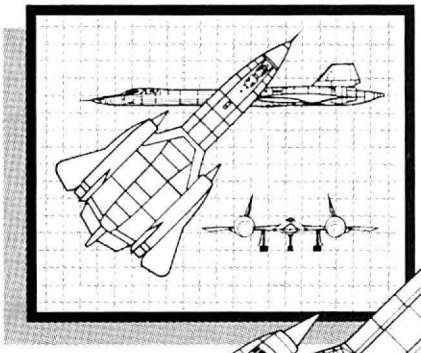
(continues)

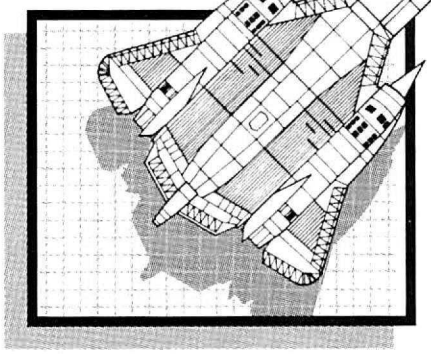
MARK FARBIN

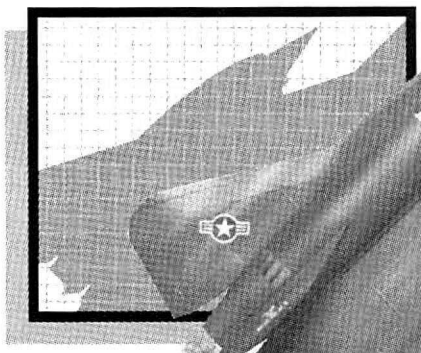
It's sleek, swift, and a joy to hold. Microsoft's new cream-colored mouse is easy to install, too. Stick a card in your PC, copy a file, and start rolling.

At only $299, DesignCAD is the simplest way to get some very sophisticated results.









You can spend thousands of dollars for a CAD software package without getting the kind of power and performance that DesignCAD delivers for only $299...complete! With the DesignCAD's easy-to-use, easy-to-learn single keystroke commands, you'll be producing ultra-sophisticated results in no time at all.

The Features You're Looking For

The options you normally have to purchase separately with other CAD programs, aren't options with DesignCAD. They're built in.

- Expanded Memory Support
- Selection of Character Fonts
- Symbol library with over 500 symbols
- Bill of Materials utility
- Finest curve fitting in the industry
- Extensive snap features
- True Auto Dimensioning with several formats
- Extensive layering features
- Full zoom, pan and rotate capabilities
- And many other features

In addition, DesignCAD's extensive file transfer utilities allow you to read and write different formats. DesignCAD allows you to: transfer documents to and from IGES, DXF, HPGL, transfer to GEM and Postscript, and to read ASCII text files and X,Y Coordinate files.

DesignCAD re-defines Compatibility

Virtually any printer, plotter or graphics adapter compatible with IBM PC is compatible with DesignCAD. DesignCAD is also compatible with most other CAD systems, large and small.

For all of the capability, compatibility and ease-of-use you need in a CAD system, get DesignCAD – only $299! See your local computer dealer, or contact:

American
Small Business Computers, Inc.
327 S. Mill St., Pryor, OK 74361
(918) 825-4844 FAX 918-825-6359
Telex 9102400302

Call or write for a detailed brochure and a free demo disk.

Circle 306 on reader service card

There I was, sitting at my when the rang. My boss was to the next day, and needed some visuals for his . Fortunately, all I had to do was turn on my and Diagraph software. With dozens of typefaces and thousands of pre-drawn symbols, I was able to create attention-getting and illustrations.

The boss said I'd pulled a out of a . I give Diagraph .

Use Diagraph to turn your ideas, concepts, plans and data into diagrams, maps, flow charts, signs, forms and organization charts.

Diagraph comes complete with over 2,200 high-quality symbols and 13 typefaces. Thousands of optional symbols and 20 typefaces can be ordered from our catalogue.

Diagraph is available from the IBM PC/XT/AT, IBM 3270, PC/AT, PS/2, IBM compatibles and HP desktop computers. The IBM Enhanced Graphics Adapter (EGA), Video Graphics Adapter (VGA) and a wide variety of plotters, printers and film recorders are supported.

For additional information, including a free 20-page color brochure, call or write:

Computer Support Corporation
15926 Midway Road
Dallas, Texas 75244
(214) 661-8960

Suggested retail: $395

Diagraph is a registered trademark licensed to Computer Support Corporation.
IBM is a registered trademark of International Business Machines Corporation.

Circle 58 on reader service card

plastic jumpers at three locations on the board. The top two blocks allow you to configure the InPort to work in the XT's short slot and with a second InPort board. The J4 block at the bottom of the board is where most of the action takes place.

Configuring the interface board is a process of elimination. The AT compatible used in this upgrade included a serial board and an EGA adapter; according to a table in the user manual, that meant pins 2 and 4 should *not* be covered. Slip the jumper over either pin 3 or 5 and you can put the board in a slot, connect the mouse, reassemble the system, and install the mouse driver. But don't put the hood back on just yet. If there's an expansion board that for some reason conflicts with the InPort, you'll need to remove the InPort and experiment with the jumper settings. However, chances are you won't have to—the upgraded system also included a parallel port, a game port, an AboveBoard, and a Ditron MegaPrint buffer board. The InPort worked uncomplainingly with all of them.

With the hood off, boot up the system and delete any old mouse drivers, such as MOUSE.COM and MOUSE.SYS, and remove any references to the latter in CONFIG.SYS. Then place the supplied Setup disk in drive A: and type MSETUP. Follow the prompts as the mouse driver and control panel program (a pop-up utility that adjusts the mouse's sensitivity to movement) are copied to the system disk. The setup program will also modify AUTOEXEC.BAT so that the mouse driver (and the control panel, if desired) is loaded automatically whenever the system is rebooted. Once software installation is complete, reboot the system, and the mouse is ready to roll. Note: If your applications were previously installed for a bus mouse, your work is done. But if you used a serial mouse, programs such as *Windows* and *Ventura Publisher* will have to be reinstalled. —*R. L.*

WHERE TO BUY

Microsoft Mouse
Microsoft Corp.
16011 N.E. 36th Way
Box 97107
Redmond, WA 98073-9717
800/426-9400, 206/882-8080
List price: with Mouse Menus and Microsoft Paintbrush $150, with EasyCAD $175, with Windows 2.0 and PC Paintbrush for Windows $200
Requirements: DOS 2.00 or later version, one disk drive, one free slot (bus mouse) or serial port (serial mouse)
For more information, see Products Featured in This Issue.

Michael Covington does artificial intelligence research at the University of Georgia. He has written more than 100 magazine articles on the PC and PC programming.

Please forward submissions and queries to The Upgrade Path, PC World, *501 Second St., San Francisco, CA 94107 or electronically to MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. Articles submitted by mail should be accompanied by a self-addressed, stamped envelope and an ASCII file of the item.* ●

XEROX
DIABLO 630
LETTER QUALITY
PRINTER
LIQUIDATION
FACTORY NEW! FACTORY PERFECT!

Enjoy the ease and speed of printing with this letter quality Xerox/ Diablo 630 ECS/API Daisy Wheel Printer. Prints both graphics and letter quality text without changing Daisy Wheel! Perfect for home or office use!

- API (All Purpose Interface) works with most personal or business computers on the market including:
  - Serial: RS232-C, 110-300-1200-2400 baud.
  - Parallel: Centronics, 8-bit.
- Includes: IBM Interface cable, Ribbon, Manual, & Plastic print wheel.
- ECS (Extended Character Set) supports 96 & up to 192 extended character set print wheels.
- 40 cps with plastic print wheels.
- Paper width: 16.53" max. if using friction feed; 15.25" max. if using forms tractor (not included).
- Graphics, HyPlot Vector Plotting, Word Processing.

FREE!!
IBM Compatible Interface Cable, & ECS (Extended Character Set)
$200.00 VALUE

90-Day Warranty!

Manufacturer's Suggested Retail
$1995.00

PUBLIC NOTICE
Diablo, a divison of world renowned Xerox, decided to liquidate this model. As a result, we obtained the remaining stock and can now offer them to you at FAR BELOW DEALER COST!

DAMARK PRICE:
$398
Order No. B-681-102103
Insured Ship/Hand.: $26.00

FOR FASTEST SERVICE
CALL TOLL FREE
1-800-533-3379

MasterCard or send check, money order or credit card info. to: VISA

DAMARK INTERNATIONAL, INC.
7714 Brooklyn Blvd. Minneapolis, MN 55443
Corporate Offices • 612/560-5415

Please send me ____ Xerox Diablo Printer(s) @ $398 each, plus $26.00 shipping/handling each.
MN res. add 6% sales tax.

Name _____
Address _____
City, State, Zip _____
☐ Check/MO ☐ VISA ☐ Master Card
Card No. _____
Exp. Date ____/____ Ph. # ( ) _____
Order No. B-681-102103

DELIVERY TO 48 U.S. STATES ONLY

Compuclassics

1 800 328-4473 US 1 818 705-1895
1 800 231-6603 CA

SOFTWARE

ALDUS
Pagemaker 499.00
AMERICAN SMALL BUSINESS
Design Cad 165.00
Design Cad 3D 165.00
ASHTON TATE
Multimate II 289.00
Dbase III Plus 409.00
Rapidfile 219.00
Framework II 429.00
Chartmaster 239.00
Master Graphics 379.00
AUTODESK
Autosketch Enhanced 65.00
BANNER BLUE
Org Plus 65.00
BLOC DEVELOPMENT
Formtool W/Greatest Hits 65.00
BOEING COMPUTER SERVICES
Boeing Graphics (3D Color) 229.00
BORLAND
Turbo Database Toolbox 65.00
Turbo Graphix 65.00
The Developer's Library 235.00
Turbo Lightning 65.00
Reflex 90.00
Superkey 65.00
Turbo Prolog 65.00
Turbo Basic 65.00
Turbo C 65.00
Sidekick 59.00
Eureka 99.00
Quattro 115.00
Paradox V 2.0 405.00
Turbo Pascal 4.0 65.00
Turbo Tutor 4.0 45.00
BOURBAKI
1 Dir PLUS 55.00
BREAKTHROUGH
Timeline 295.00
Timeline Graphics 119.00
BRODERBUND
Print Shop 39.00
Memory Mate 45.00
BUTTONWARE
PC File + 45.00
CENTRAL POINT
Copy II PC 29.00
Copy II PC Option Board 79.00
PC Tools Deluxe 45.00
CHIPSOFT
Turbo Tax 49.00
Turbo Tax Professional 169.00
Turbo Tax State Module 29.00
Turbo Tax Prof State Module 115.00
COMPUTER ASSOCIATES
Supercalc IV 299.00
Superproject Expert 459.00
ACCPAC Easy 69.00
ACCPAC BPI 295.00
ACCPAC Plus CALL
CONCENTRIC DATA SYSTEMS
R & R Relational Report 115.00
CORE INTERNATIONAL
Corefast 99.00
DAC
Easy Accounting 2.0 59.00
Easy Payroll 2.0 40.00
Bonus Pack 99.00
DELTA TECHNOLOGY
Direct Access 59.00
DIGITAL MARKETING
Grammatik II 59.00
DIGITAL RESEARCH
Gem Desktop 32.00
Gem Draw Plus 179.00
Gem Collection 69.00
Gem Word Chart 89.00
Presentation Team 285.00
Desktop Publisher 235.00
DIGITALK
Smalltalk V 79.00
Smalltalk V 286 149.00
EXECUTIVE SYSTEMS
X Tree 39.00
X Tree Pro 69.00
FIFTH GENERATION
Fastback 82.00
Fastback Plus 105.00
FOX SOFTWARE
Foxbase Plus 215.00
Foxbase Multi-user 299.00
Foxbase Runtime Unlimited 279.00
FUNK SOFTWARE
Sideways 40.00
GENERIC SOFTWARE
Generic Cad 59.00
Dot Plot 29.00
Auto Convert 29.00
Auto Dimension 29.00
3D Solid Modeling 109.00
3D Solid Modeling 79.00
HAYES
Smartcom III 165.00
IBM
Displaywrite IV 299.00
DOS 3.3 95.00
LATTICE
Lattice C Compiler 245.00
LEADING EDGE
Word Processor W/Spell/Merge 65.00
Word Processor V1.5 125.00
LIFETREE
Volkswriter III 169.00
LIVING VIDBOTEXT
Thinktank 119.00
LOTUS DEVELOPMENT
Symphony 469.00
Manuscript 369.00
Lotus 1-2-3 329.00
Hal 110.00
Freelance Plus 369.00
Graphwriter 369.00
Metro 75.00
MATHSOFT
Mathcad 2.0 239.00
MAXTHINK
Max Think 49.00
MECA
Managing Your Money 4.0 125.00
MERIDIAN TECHNOLOGY
Carbon Copy Plus 109.00
MICROLOGIC
Tornado Notes W/Library 79.00
MICROPRO
Wordstar Professional 4.0 239.00
Wordstar 2000 Plus 245.00
MICRORIM
Rbase for Dos 509.00
MICROSOFT
Quick C 69.00
Word 239.00
Quickbasic 69.00
C Compiler 309.00
Fortran Compiler 309.00
Cobol Compiler 469.00
Macro Assembler 105.00
Learning DOS 39.00
Flight Simulator 39.00
Excel 395.00
Windows 386 145.00
PC Works 145.00
MICROSTUF
Crosstalk XVI 99.00
Crosstalk Mark 4 129.00
MIGENT
Ability Plus 115.00
NANTUCKET
Clipper 399.00
NASHOBA
Nutshell Plus 169.00
NEW ENGLAND SOFTWARE
Graph-In-The-Box 55.00
NORTH EDGE SOFTWARE
Timeslips III 119.00
PAPERBACK SOFTWARE
VP Info 69.00
VP Planner 59.00
VP Planner Plus 99.00
PATTON & PATTON
Flowcharting II Plus 155.00
PAUL MACE
Mace Utilities 59.00
PC SUPPORT GROUP
Lightning 59.00
Lucid 3D 59.00
PEACHTREE
Complete Accounting II 169.00
PERSOFT
Smarterm 240 219.00
Referee 49.00
PETER NORTON COMPUTING
Norton Utilities 55.00
Norton Utilities Advanced 79.00
Norton Commander 39.00
POLYTRON
Polywindows Desk Plus 49.00
Polyboost II 45.00
PRIME SOLUTIONS
Disk Technician 65.00
Disk Technician Plus 95.00
QUAID SOFTWARE
Copywrite/Zeredisk CALL
QUARTERDECK
Desqview 2.01 75.00
RIGHTSOFT
Rightwriter 59.00
SCITOR
Project Scheduler Network 379.00
SEASIDE SOFTWARE
Ask Sam 255.00
SIMON & SCHUSTER
New World Writer 79.00
Typing Tutor IV 32.00
SOFTCLONE
Mirror II 39.00
SOFTLOGIC SOLUTIONS
Disk Optimizer 42.00
Cubit 42.00
Double DOS 42.00
@ Liberty 119.00
Magic Mirror 60.00
SOFTWARE MASTER
Flash 5.0 49.00
SOFTWARE PUBLISHING
PFS Professional Write 119.00
PFS Professional File 140.00
PFS Professional Plan 89.00
PFS First Choice 79.00
Harvard Total Project II 375.00
Harvard Graphics 339.00
SOFTWARE TOOLS
Viewgen 95.00
SYMANTEC
Q & A 235.00
TRAVELLING SOFTWARE
Laplink 85.00
TURNER HALL
Note-It-Plus 59.00
SQZ Plus 69.00
Cambridge Spreadsheet Analyst 69.00
UNISON WORLD
Printmaster Plus 32.00
Art Gallery I & II (Each) 22.00
Newsmaster 55.00
WALLSOFT
The Documentor 189.00
dFlow 89.00
WISEWARE
Prime Time 65.00
WORD PERFECT CORPORATION
Word Perfect 209.00
Word Perfect Network Server 305.00
Word Perfect Network Add-On 75.00
Plan Perfect 175.00
Data Perfect 275.00
Word Perfect Executive 119.00
Word Perfect Library 59.00
WORD TECH
DBXL 89.00
Quicksilver Diamond 345.00
XEROX
Ventura Publisher 1.1 519.00

HARDWARE

ARRAY TECHNOLOGIES (ATI)
Ega Wonder 209.00
AST RESEARCH
Premium 286 Model 140 Computer 2749.00
Premium 286 Model 80 Computer 1645.00
Advantage Premium 512K 335.00
Six Pack Plus 384K 195.00
Six Pack Premium 256K 219.00
Rampage AT 512K 365.00
AST 5251/11 Enhanced 579.00
Hot Shot 395.00
ATD ZUCKER
Monographics Short Card 79.00
Memory Expansion 384K 120.00
Modular I/O Bare P/S/Clock 75.00
Clock Board Standalone 35.00
1200 Baud Internal Modem 85.00
CITIZEN
120D 189.00
MSP 10 299.00
MSP 15 375.00
MSP 20 329.00
COMPUTER ACCESSORIES
P15 Power Director 99.00
DIGITAL COMMUNICATIONS
IRMA 3278 809.00
EVEREX
EV 1800-8MHZ AT System 929.00
EV 1800 10MHZ AT System 1049.00
Evercom II 1200 Modem 129.00
Evercom III 2400 Int Modem 225.00
Magic I/O For AT 59.00
RAM 3000 EMS Expansion 119.00
FIFTH GENERATION
Logical Connection 256K 309.00
HAYES
Smartmodem 1200 325.00
Smartmodem 1200B W/Software 325.00
Smartmodem 2400 489.00
Smartmodem 2400B W/Software 489.00
HERCULES
Hercules Monochrome Plus 199.00
HEWLETT PACKARD
Laserjet II 1799.00
Fonts for Laserjet II CALL
INTEL
Above Board PC 64K 269.00
Above Board 286 W/512K 369.00
8087-3 (5MHZ) 119.00
8087-2 (8 MHZ) 175.00
80287 (6 MHZ) 199.00
80827 (8 MHZ) 299.00
80287 (10 MHZ) 349.00
INTERNATIONAL BATTERY
AT Replacement Battery 27.50
AST Six Pack Battery 3.50
IRWIN MAGNETICS
120 XT 20MB Internal 479.00
125 AT 20 MB Internal 479.00
KENSINGTON
Masterpiece 89.00
Masterpiece Plus 109.00
Masterpiece Remote 115.00
LOGITECH
Logimouse C7 95.00
Logimouse C7 + Paintbrush 135.00
Logimouse W/Cadd/Paint 145.00
Publisher Mouse 155.00
MICROSOFT
BUS Mouse W/Paintbrush 125.00
BUS Mouse W/Windows 165.00
Serial Mouse W/Paintbrush 125.00
Serial Mouse W/Windows 165.00
MICROSPEED
Fast 88 79.00
MIGENT
Pocket Modem 159.00
MOUSE SYSTEMS
PC Mouse BUS Plus 115.00
PC Mouse Serial Plus 105.00
NEC HOME ELECTRONICS
GB-1 Multisync Card 105.00
Multisync II 529.00
Multisync Plus 1055.00
NEC INFORMATION SYSTEMS
P 760 Printer 689.00
P 660 499.00
P 2200 80 COL 389.00
OKIDATA
Microline 182 269.00
Microline 192 Plus 375.00
Microline 193 Plus 549.00
Microline 292 W/Interface 549.00
Microline 293 W/Interface 749.00
Laserline 6 1539.00
PARADISE
Autoswitch 480 169.00
Modular Graphics Card 129.00
VGA Plus 259.00
PLUS DEVELOPMENT
Hardcard 20MB 659.00
Hardcard 40 MB 815.00
POLAROID
Polaroid Palette 1499.00
Polaroid Palette Plus 2399.00
PRACTICAL PERIPHERALS
Practical Modem 1200 Internal 99.00
Practical Modem 1200 SA 119.00
Practical Modem 2400 INT 165.00
Practical Modem 2400 SA 199.00
SAMSUNG
Amber Monitor 79.00
ST 251 40MB No Controller 439.00
SEAGATE TECHNOLOGY
ST 225 20MB W/Controller 299.00
ST 238 30MB W/Controller 349.00
ST 4038 30MB For AT 529.00
SUMMAGRAPHICS
Summasketch 1201 Plus 419.00
TOSHIBA
T 1000 Laptop 959.00
T 3100-20 Laptop 3499.00
P321 Printer 549.00
P341 E SL 759.00
P351 Model 2 1109.00

ADVANTAGES

- Orders placed before 3 p.m. (PST) shipped same day.
- We welcome corporate accounts.
- Free technical support.
- Immediate replacement of defective goods.
- Bulk discounts.
- One million dollar inventory.
- Immediate shipment on purchase orders from qualified institutions (schools and universities included).
- No hidden charges.

TERMS:

All prices subject to change without notice. We do not guarantee compatibility. No surcharge for VISA or MasterCard. 2% surcharge American Express. No returns without RA#. Short shipments must be notified within 48 hours. 15% restocking fee on non-defective goods: $3.00 C.O.D. charge. Shipping $4.50 per item, less on bulk orders. ($8.50 Blue Label.) (Higher for some hardware items.)

Call for prices for any item not included in this price list.

Order desk & technical support open:
8 a.m. to 6 p.m. Monday–Friday
10 a.m. to 2 p.m. Saturday (PST)

P.O. BOX 1588
6934 Canby St. Suite #109-110
Reseda, CA 91335

We welcome International Orders and Corporate Accounts.
Telex 299415KET UR Fax 818-705-4885

1 818 705-1895 US 1 800 231-6603 CA 1 800 328-4473 US

Circle 4 on reader service card

THE HELP SCREEN

PC World offers answers and advice at every level

Translate the jargon in computer ads, unearth the elusive hidden file, and learn more about the utility FILL.

Karl Koessel

Beginner's Bewilderment

Q. *I am interested in buying an IBM-compatible clone and, while researching various advertisements, have come across terms and phrases I don't fully understand. Can you tell me: (1) What's the difference between an 8-, a 16-, and a 32-bit CPU? (2) Of what significance is* MHz*? (3) What is* turbo mode*? (4) What does* wait state *mean (as in* zero-wait-state design*)? (5) What is the Norton SI rating? (6) What is a BIOS? What is the difference between a* legal *BIOS and a* Phoenix *BIOS?*

Fred A. Flook
Long Beach, California

A. Good questions, all. Those of us who work with PCs take a lot for granted; it's easy to forget that the terms we use daily can be as baffling as a foreign language to a new PC user.

1. The CPU (central processing unit), or processor, is the part of a PC that actually does the computing. The computing, or processing, is performed by manipulating sequences of electronic 1s and 0s, or *bits*. An 8-bit CPU can process 8 bits at once internally; a 16-bit CPU, 16; and a 32-bit CPU, 32. The greater the processor's bit width, the more powerful it is.

Each new member of a given product family—such as the Intel processors that drive IBM's microcomputers—has been designed with new or improved capabilities, such as faster operation. The IBM PC and XT use a 16-bit Intel 8088 processor. The PS/2 Models 25 and 30 house a 16-bit 8086; the AT and the PS/2 Models 50 and 60, a 16-bit 80286; and the PS/2 Model 80, a 32-bit 80386.

Bit width is also used to describe the number of bits a processor can pass between itself and memory at one time. The wider a processor's data path, the faster it can move data in and out. For example, the 8088 and 8086 are nearly identical, but although the 8088 processes 16 bits internally, its data path is only 8 bits wide, in contrast with the 16-bit data path of the 8086. The 8088's slower 8-bit data path was all that was required to connect to the 8-bit peripherals available in the early 1980s. A few years later, however, IBM introduced the AT, equipped with an expansion bus that enabled 16-bit devices to be connected to the AT's 80286 processor via a 16-bit data path. (The connectors, or slots, on the AT's expansion bus also accept most 8-bit, PC/XT-style expansion boards. When relevant, manufacturers distinguish between 8-bit, PC/XT-style and 16-bit, AT-only boards.) A year ago, IBM introduced the Personal System/2 family, whose top-of-the-line PS/2 Model 80 features a 32-bit data path.

(continues)

2. *MHz* is the abbreviation for *megahertz*, or 1 million cycles per second, and denotes the speed of computer system components. Generally, you will see *MHz* used in reference to processor speed. For example, the 8088 in the original PC runs at 4.77 MHz. Because processing a computer instruction requires a number of cycles (timing pulses), the faster a given type of processor is, the faster it can process an instruction: A 12-MHz 80286 executes a given instruction in half the time it takes a 6-MHz 80286. When you see *MHz* used to describe a system, you should understand that it applies only to the processor's speed. A system that used a 12-MHz 80286, for example, would run your application programs twice as fast as a system equipped with a 6-MHz 80286 only if every other system activity (such as reading or writing disk data or manipulating the video display) were also twice as fast.

You're also likely to see *MHz* used in connection with a computer system's expansion bus and expansion boards. Because so many expansion boards have been designed to work with processors running at up to 8 MHz, most manufacturers continue to use an 8-MHz, AT-compatible bus in systems that have faster processors.

Some manufacturers are producing *dual-bus* systems: One bus is dedicated to memory, and the other is for all other system enhancements. Those systems remain compatible with 8-MHz expansion cards but provide a faster (for example, 20-MHz) memory bus.

It's not unusual to find 10-MHz, zero-wait-state machines that outperform 12-MHz, one-wait-state machines.

3. *Turbo mode* originally referred to the faster speed available on a system that has been upgraded with an accelerator, or turbo, board. Such boards substitute a faster CPU for the system's original CPU. Because some software copy protection schemes are time dependent, turbo boards are designed to allow the PC they're installed in to run at a speed that permits such software to load, and then switch into turbo mode, speeding program execution. Fortunately, such copy protection schemes are rare nowadays.

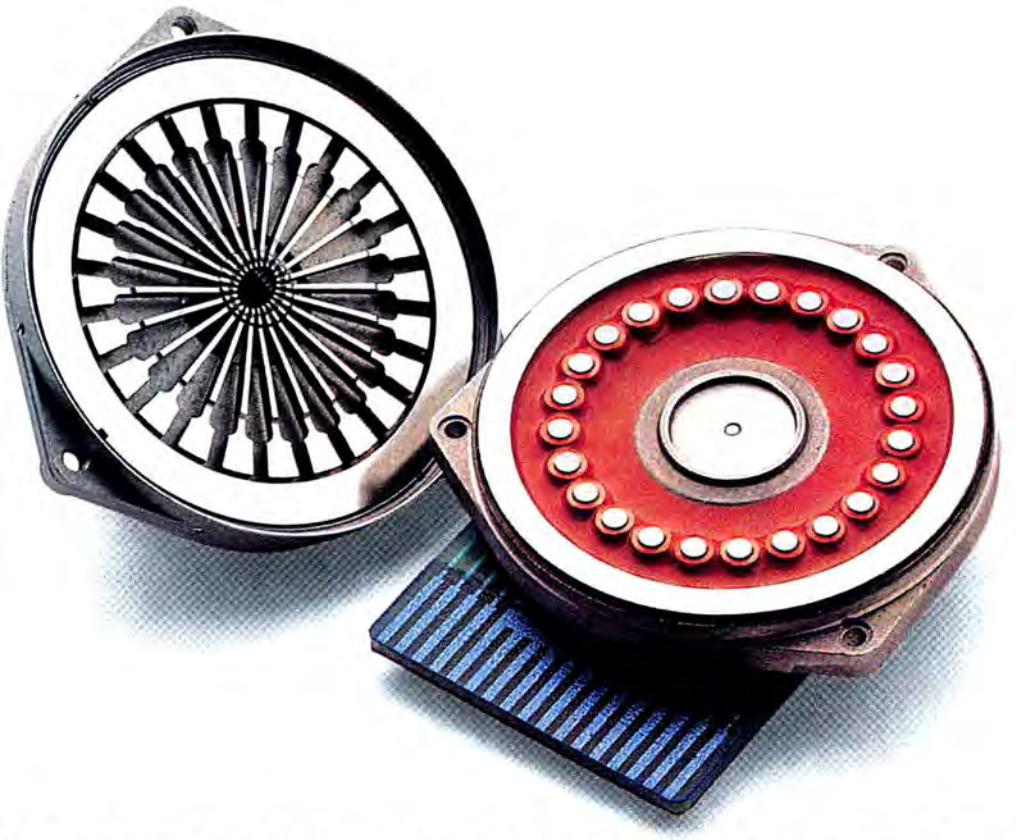
In recent years, Intel has developed CPUs that can be driven at increasingly faster speeds, and the turbo marketing hype has found its way into system advertisements. You will sometimes see an ad that touts a system's faster turbo mode. From a marketing standpoint, this approach is better than pitching a fast machine that includes a "slow-down" feature.

4. *Wait states* are processor delays that some systems introduce after the processor executes an instruction that accesses system memory or performs other system I/O (input/output). To minimize costs, a system may use memory and I/O subsystems that cannot respond as fast as its high-speed processor would like. Wait states are used to ensure that those subsystems have concluded their function before the processor executes the next instruction. It's not unusual to find 10-MHz, zero-wait-state machines that outperform 12-MHz, one-wait-state machines.

5. Peter Norton is the author of the popular *Norton Utilities*, a collection of small programs, the best known of which enables you to "unerase" a file after you mistakenly delete it. The *SI (system index) rating* is generated by a program Peter wrote to compute a system's performance relative to that of the original IBM PC. An SI of 6.0, for example, means that on average, the system functions at six times the speed of the original PC. Version 4.0 of the *Utilities* also measures disk performance.

6. *BIOS* stands for *basic input/output system*. The BIOS is a collection of service routines that perform basic hardware functions, such as reading from or writing to the disk or putting characters on the screen. These routines isolate the operating system and application program from specific hardware devices. Because BIOS routines are in ROM (read-only memory), programs can ask the BIOS (or ask the operating system to ask the BIOS) to perform a service. Thus, the programmer does not

(continues)



HEADS UP, JAPAN.

Above you see the most ingenious printhead developed in years.

It's a new stored-energy head that uses less energy and delivers more speed than traditional ballistic printheads.

And according to *Infoworld*,* delivers constantly superior print quality, with letter quality comparable to a laser.

You'll find this printhead, with its seven patents on design, materials, and production process, only on Mannesmann Tally's newest family of printers. Including the 24-needle MT330 word processing printer, a 10,000 page-per-month, 300 cps printer. And the 18-needle MT340 data processing and industrial graphics printer, a 13,000 page-per-month, 400 cps machine.

We invite you to compare either of these heavy-duty printers to their Japanese counterparts.

Because head to head, we win.

And body to body? Again from *Infoworld:* "...most plastic and metal components appear quite a bit sturdier than their Japanese equivalents."

Again, bad news for Japan. But very good news for you.

To take advantage of this news at a pleasantly surprising price, call the number below for the name of your nearest dealer.

MT340

MT330 with optional dual bin sheet feeder

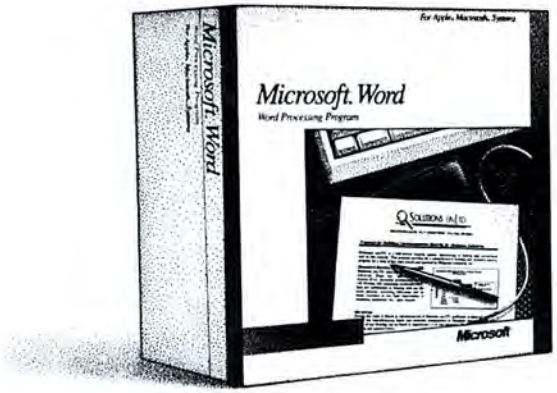
MANNESMANN TALLY

800-843-1347 Ext. 72

In Washington state, call:
206-251-5524 Ext. 72

Circle 112 on reader service card

Word travels fast.



Get same-day shipment of Microsoft® Word. Just $229. There's no better way to look good on paper than to combine your Apple® Macintosh™ personal computer with Microsoft Word. And there's no better way to buy Microsoft Word than from Software Spectrum.

You see, from same-day shipping of your order to our knowledgeable, professional salespeople, you can count on Software Spectrum for the most reliable, responsive service in the industry.

You'll find the latest version of Word includes many features to help you work smarter. Like a built-in outlining feature to help you organize your thoughts. Easy-to-use style sheets to help you present your text in any format you desire. And a WYSIWYG (What You See Is What You Get) display to let you preview a page, integrate graphics and polish your output for printing.

So don't wait any longer. Just call Software Spectrum at 1-800-367-0687* to find out more about Microsoft Word or to open a corporate account.

Software Spectrum

12255 Greenville Avenue, Dallas, Texas 75243 *In Illinois, Indiana, Michigan or Wisconsin call 1-800-445-6454.

Microsoft is a registered trademark of Microsoft Corporation. Apple is a registered trademark and Macintosh is a trademark of Apple Computer, Inc.

Z-NIX

Super Mouse

BORN TO BE YOUR CHOICE AND THE RIGHT ONE!

Z-Nix Co., Inc., the well-known OEM Mouse Manufacturer, is introducing the new Z-Nix Super Mouse which is one of the most reliable and long-lasting mice manufactured.

The Z-Nix Super Mouse is fully compatible with all popular programs and comes in both Serial and Bus versions. Being cost-effectively priced, it is the only mouse you CANNOT AFFORD to be WITHOUT.

Some of it's most distinctive features include:

- Two long, feather touch buttons and one short button for easier operations.
- Bundled with a versatile mouse driver, pre-written pop-up menus, tester program, and a powerful graphics paint program. (PC Paint Brush or DR HALO III)

Z-Nix Super Mouse comes with a Lifetime warranty and is built around our high-quality. reputation, and Support/Service.

Because we know it is more than just a tiny input device - it carries a lot of YOUR SELECTIONS.

Please call us at 213-493-2516 for more information or the dealer near you.

Circle 126 on reader service card

Z-NIX

Z-NIX COMPANY, INC.

10527 Humbolt Street
Los Alamitos, CA 90720
Fax: (213) 493-2790
Tel: (213) 493-2516

Hurry, just fill out and mail this special-offer coupon, we will pay Shipping for you.

I'd like to order my **Z-Nix Super Mouse**
Enclosed is my ☐ Money Order **$95**
☐Cashier's Check
☐ Visa/Master Card Authorization
for $95.00. please rush me the Right Choice.

Print Name

Company

Address

City State Zip Code

Telephone

Credit Card Number

Expiration

Signature

Z-Nix Company, Inc.,
National Sales Dept.,
10527 Humbolt Street, Los Alamitos
CA 90720, **213-493-2516**

need to write code to perform basic functions and can concentrate on designing applications that are easy to use and do what you want. Easier programming also shortens the development cycle, resulting in quicker and less expensive updates.

In order for a clone to run IBM PC applications, its BIOS must perform exactly the same tasks as IBM's BIOS. However, simply copying IBM's BIOS would be a violation of copyright law. Because in the early days of the PC almost every would-be clone manufacturer lacked the funds to fight a legal battle if IBM challenged its BIOS, clone makers looked for a company that could document "independent development" of its BIOS, ensuring that it had been engineered legally. Phoenix Technologies was the first company to do this and is still the best known. Thus, a Phoenix BIOS is a legal BIOS; however, it's not the only legal one. Since Phoenix developed its BIOS, Award Software and American Megatrends International have developed BIOS's that are just as fast and compatible, if not more so.

Hunting the Hidden File

Q. *I have a hidden file called ~CAROSEL.TMP in the root directory of my hard disk. I know it's there because when I try to back up the root directory, the file name* \~CAROSEL.TMP *appears as the computer fills more than two 720K disks. (I don't know the exact number—I've never been patient enough to wait and see how many disks the file takes up before I terminate the backup with <Ctrl>-<Break>.) Also, CHKDSK/F tells me I have close to 2MB in hidden files.*

How can I delete this large and pesky beast? I've tried several ways, but to no avail. Here's a clue: I had been using Software Carousel. *When I decided to discontinue using this program, I simply deleted it.*

R. H. Newman-Evans
Somerville, New Jersey

A. The simplest solution is to use a utility program that can delete hidden files (some DOS shell and file-management programs include this capability). In lieu of such a one-step utility, you can use a utility, such as Peter Norton's FA (File Attribute) program, that can change a file's attribute so that the file is no longer hidden, and then delete the file using DOS. Although it's a tedious process, you can also use DEBUG (from the DOS Supplemental Programs disk) to "unhide" a file. But first, do a complete backup. The DEBUG procedure rewrites disk sectors, and any mistake may destroy the disk's data.

Load DEBUG. The hyphen prompt will appear. Type **L 0 2 0 80** and press **<Enter>**. The L command loads—beginning at memory offset 0 of the CS register—disk data into memory from drive 2's (drive C:'s) first sector (0), and it continues to load data until 1280 (80 hex) sectors have been loaded. Now type **S 0 FFFF "~CAROSEL"** and press **<Enter>**. That command searches (S) from offset 0 through offset FFFF (hex) for the string ~CAROSEL. If the hyphen prompt reappears without DEBUG first displaying an address (in the form of *xxxx:yyyy*), type **L 0 2 80 80** and press **<Enter>** to load the second 80 hex sectors of data, and issue the search command again. When the address value is displayed, type **D** followed by the *yyyy* portion of the displayed address and press **<Enter>**.

Several lines of hex code will be displayed along with some ASCII characters on the right side of the display, beginning with ~CAROSEL. Type **E** followed by the first 3 digits of the *yyyy* portion and then a **B**. That command tells DEBUG that you want to edit the *yyy*Bth byte, ~CAROSEL.TMP's attribute byte. Press **<Enter>**. Type **0** and press **<Enter>** again. That changes the attribute byte to 0. Now, very carefully, retype the last L (load) command that you used, but substitute a W for the L. Press **<Enter>**. That command writes (W) the sector data, along with the changed attribute byte, back to the sectors from which the data came. Finally, press **Q** and **<Enter>** to quit DEBUG. The file is now unhidden and can be deleted.

Finding FILL

Q. *Where can I buy Jean Lalonde's public-domain utility, FILL.EXE, which facilitates copying large groups of files from a hard disk directory to floppies? It was recommended by a reader in "Full FILLing*

(continues)

Utility" [The Help Screen, *February 1988] because its organizational savvy minimizes the required number of floppy disks.*

Al George
Canton, Ohio

A. FILL.EXE and its companion documentation file, FILL-.DOC, are not for sale—they are available free and can be found on CompuServe or on BIX (*Byte* magazine's Info Exchange). You can freely use and redistribute the program as long as the documentation file and the program's copyright remain intact and you do not charge other users (except for the floppy disk). The author welcomes comments and can be reached on line on CompuServe (ID: 76606,671) or on BIX (BIX name: jlalonde). Mail can be sent to Jean Lalonde, P.O. Box 721, Station "R," Montreal, Quebec, H2S-3M4 Canada. FILL is written in Logitech's Modula-2/86 release 2.0 (A), and the source files are available for $25 from the author.

Do you have any questions concerning the IBM PC or compatibles? Send them to The Help Screen, PC World, *501 Second St., San Francisco, CA 94107 or electronically to MCI Mail PC-WORLD/179-3813, CompuServe 74055,412, or The Source STE908.* ●

A HYUNDAI FOR THE FAST LANE.

Looking for a computer that won't slow you down? Test drive Hyundai's new Super-286C. An affordable AT-compatible with all the speed (8/10Mhz) you need to zip through big applications, like database management and desktop publishing, with ease.

The Super-286C also features six expansion slots, an EGA card, optional 30/40MB hard disk drives, and an 18-month warranty. Plus, it has a small footprint to take up less parking space on your desk. And an equally small sticker price. Just $1499*.

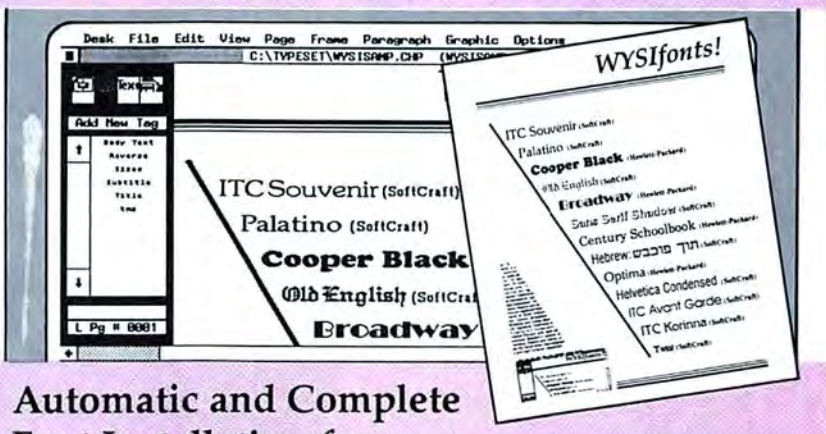
Take the Super-286C, or one of our other compatibles, for a spin today. For the Hyundai dealer nearest you, call 1-800-544-7808 ext. 322.

HYUNDAI

*Suggested retail price for single floppy drive model. AT is a trademark of International Business Machines Corporation.

Circle 78 on reader service card

What You See Is FONTS!



Automatic and Complete Font Installation for Ventura Publisher and Aldus PageMaker.

WYSIfonts! effortlessly installs HP soft fonts and makes matching screen fonts. Our font library contains hundreds of styles in many sizes.

- Menu-driven, automatic installation of soft fonts for Aldus PageMaker, Microsoft Windows and Ventura Publisher.
- Choose from SoftCraft's library of low-cost ($15/disk) Standard Series fonts; SoftCraft's Typefoundry Series of typefoundry-quality fonts licensed from Bitstream; Hewlett-Packard soft fonts or any other vendor's soft fonts.
- Automatically makes matching screen fonts for any soft fonts you have, using the proper resolution for your display.
- Automatic kern pair tables or install your own customized kern tables.

Only $95. Call TOLL FREE to order.
1-800-351-0500 • (608) 257-3300 • Telex 756332

We make it easy for you to look good.
SoftCraft, Inc.
16 N. Carroll Street, Suite 500, Madison, WI 53703

Circle 101 on reader service card

"There's No Reason To Look Beyond PC TOOLS"

–PC Magazine, Editor's Choice Award, Two-Time Winner

*Data Recovery · **Fast** Hard Disk Backup · Disk Management*

Now we've given you even more reason–PC Tools™ Deluxe.

PC Tools Deluxe gives you all the best features of **Fastback,™ Norton,™ XTREE,™ Mace,™ Sidekick,® Lightning**™ and **Disk Optimizer**–a $700 value–for just $79.

Other utilities may claim they "do it all," but only PC Tools Deluxe delivers:

• A **DOS shell** so complete 80 Micro called it their **"overwhelming choice based on versatility, ease of use, and cost."** • The best **UNDELETE** available–instead of merely "guessing," it recovers all data even on fragmented files. • **HARD DISK BACKUP** as fast and every bit as reliable as Fastback. • The leading **UNFORMAT** for hard disks and floppy disks, enabling you to recover from many disk disasters. • **PCFORMAT** for safe formatting of floppy and hard disks. • A quick, reliable **DISK CACHING** utility for speeding up disk access. • A ***fast*** **COMPRESS** feature that like Disk Optimizer dramatically improves hard disk performance. • And a better resident mini **WORD PROCESSOR** than Sidekick, including word wrap, search/replace, formatted page printing and more.

Before you buy any of these other utilities, take a look at PC Tools Deluxe. Like PC Magazine, you'll find there's no reason to look any further. **For the dealer nearest you, or to order direct, call (503) 244-6036,** M–F, 8 a.m.–5 p.m. (West Coast time). Questions? Call us at (503) 244-5782.

Central Point Software
INCORPORATED
9700 S.W. Capitol Hwy.
Portland, OR 97219

PC Tools is a trademark of Central Point Software. All other product names are trademarks of their manufacturers.

Circle 155 on reader service card

STAR-DOT-STAR

.

A global exchange of personal computer discoveries

Write batch files that know the day of the week, program WordStar data entry screens, and improve a dBASE application documenter.

Edited by Tom Swan

Batch of the Day

It's impossible to write batch files that perform differently based on the day of the week, or so I thought until I wrote DATECHEK.COM. This 8-byte utility allows a single batch file to run a disk optimizer on Mondays, download electronic mail on Tuesdays, perform backups on Fridays, and bring up your favorite computer game on Saturdays.

To create DATECHEK.COM, execute DEBUG.COM (from the DOS Supplemental Programs disk) and type the bold characters in **FIGURE 1,** pressing <Enter> at the end of each line as indicated. The program calls DOS function 2A, which returns the weekday as a number from 0 to 6. Examine this value with an IF ERRORLEVEL batch command. Sunday is 0, Monday 1, Tuesday 2, Wednesday 3, Thursday 4, Friday 5, and Saturday 6.

In an example of DATECHEK at work, DAYCHECK.BAT **[LISTING 1]** displays the day of the week. The REM statements indicate where to insert commands to run various utilities on different days. In your own batch files, be sure to check higher ERRORLEVEL values first because values greater than or equal to ERRORLEVEL evaluate as true, executing the GOTO statements.

Rusty Brown
Irving, Texas

Editor's note: Talk about short but sweet! At 8 bytes, DATECHEK.COM has to be the shortest useful .COM file around. On my system, I added the commands in **LISTING 2** *to AUTOEXEC.BAT so that CHKDSK would execute every Monday morning. (The DOS manual recommends running CHKDSK periodically "to ensure the integrity of the [disk's] file structures.")* **LISTING 2** *also shows how to test for a specific day without using the seven GOTOs in* **LISTING 1.** *The IF ERRORLEVEL command eliminates days with higher numbers than the one you want. The IF NOT ERRORLEVEL command eliminates days with lower numbers.*

Programming WordStar Data Entry Screens

WordStar's repeat-printing and ask-for-variable dot commands (.dv and .av) let me program mail-merge data-entry screens that operate like data base forms. I've found this to be a real time-saver when creating name and address lists for merge printing with *WordStar 4.0* master documents.

ASKADDR **[FIGURE 2]** creates a name-and-address nondocument data file, prompting individually for items. The dot commands separate items with commas, add quotes around items containing commas, and print the results to a nondocument file,

(continues)

ready for merge printing. Change the 100 in the .rp command to the number of records you have to enter.

After saving ASKADDR to disk, type **M** from *WordStar*'s opening menu. Specify **ASKADDR** as the file name to print. Press **<Enter>** repeatedly until you see 'Name of Printer?' Then type **XTRACT > ADDR.LST** to send output to the disk file ADDR.LST. Specify a different file name after the greater-than symbol if you prefer not to overwrite an existing file.

In a few seconds, you'll see a 'Print Wait' message at the top right of your screen. Press **P** to display the data entry form. Type your data, pressing <Enter> to move to subsequent fields and also for blank fields. Take care to correct each line before pressing <Enter>—you can't return to previous fields to fix typos. Don't worry too much about minor goofs, though; you can always edit mistakes later.

After you've finished entering records, *WordStar* returns to the opening menu. Type **N** and **ADDR.LST** to edit your data file. Correct any mistakes and save. You can now mail merge the names and addresses in ADDR.LST with any master document.

Virginia Shovlin
Mentor, Ohio

Editor's note: To stop entering records before you reach the maximum number specified by .rp, press <Ctrl>-U. The non-document data file will be saved. The first .dm (display message) in ASKADDR displays an optional prompt above the entry form created by the .av commands. You can edit these commands to display other messages and create custom forms. Begin each field with .av, followed by a prompt string in quotes, a comma, and a unique field name. Finally, as shown in ASKADDR after the clear-screen command (.cs), list each field name within the "& and &" delimiters, separating each field name with commas, in the order you want data written to disk. If you have many fields to enter, remove the empty .dm commands, which display blank lines between prompts.

Improved dBASE Documenter

George Salguero's data base documenter ["dBASE Documenter," *.*, *PCW*, November 1987] inspired me to offer several improvements. My version, DOC2.PRG [shown in **LISTING 3**], doesn't require you to manually create a temporary data base file. It also does some error checking that George left out.

Giles A. Birch
Boston, Massachusetts

Editor's note: With DOC2.PRG on disk, type **DO DOC2** at the dBASE *dot prompt to run the program. Enter any .DBF file name (do not type the .DBF file-*

(continues)

```
ECHO OFF
DATECHEK
IF ERRORLEVEL 6 GOTO SAT
IF ERRORLEVEL 5 GOTO FRI
IF ERRORLEVEL 4 GOTO THU
IF ERRORLEVEL 3 GOTO WED
IF ERRORLEVEL 2 GOTO TUE
IF ERRORLEVEL 1 GOTO MON
IF ERRORLEVEL 0 GOTO SUN
:SUN
ECHO Today is Sunday
REM  Insert Sunday commands
GOTO EXIT
:MON
ECHO Today is Monday
REM  Insert Monday commands
GOTO EXIT
:TUE
ECHO Today is Tuesday
REM  Insert Tuesday commands
GOTO EXIT
:WED
ECHO Today is Wednesday
REM  Insert Wednesday commands
GOTO EXIT
:THU
ECHO Today is Thursday
REM  Insert Thursday commands
GOTO EXIT
:FRI
ECHO Today is Friday
REM  Insert Friday commands
GOTO EXIT
:SAT
ECHO Today is Saturday
REM  Insert Saturday commands
:EXIT
```

LISTING 1: DAYCHECK.BAT demonstrates one way to test for the errorlevel returned by DATECHEK.COM.

```
ECHO OFF
DATECHEK
REM The following IF commands test for errorlevel=1 and 1 only
IF ERRORLEVEL 2 GOTO NOCHECK
IF NOT ERRORLEVEL 1 GOTO NOCHECK
ECHO ************************************************************
ECHO Welcome to the I-Hate-Mondays CHKDSK maintenance program
ECHO ************************************************************
CHKDSK /F
ECHO Maintenance complete.  See you next Monday.
PAUSE
:NOCHECK
ECHO ON
```

LISTING 2: Use these commands in your AUTOEXEC.BAT file to run CHKDSK every Monday, courtesy of DATECHEK.COM. Note how IF and IF NOT are used to exclude errorlevels not equal to 1.

SALES GENERATORS

Are you a Sales Generator?

Introducing Sales Generator Plus. An easy to use, comprehensive program designed to fully organize your sales and marketing management activities and help you increase your personal and business productivity.

FEATURES

- Customer information database
- Customer action tracking
- Sales reports
- Full mailmerge
- Notepad
- Auto dialer
- Full search capabilities
- Sales tracking

- Leads tracking
- Promotional tracking
- Individual letters
- Mass mailing
- Communication history reports
- Telemarketing
- Runs on any IBM or compatible desktop, laptop or portable personal computer.

SG+

SALES GENERATOR PLUS

FOR IMMEDIATE SHIPMENT CALL:

1-800-268-8588

In Hawaii & Alaska: 1-416-862-0017

$345 plus shipping and handling

Supersell Software Inc.
25 Adelaide St., Suite #702
Toronto, Ontario M5C 1Y2

MasterCard VISA American Express

*Trademarks: IBM-International Business Machines:

Circle 48 on reader service card

```
-N DATECHEK.COM                    <Enter>
-A                                 <Enter>
xxxx:0100 MOV AH,2A                <Enter>
xxxx:0102 INT 21                   <Enter>
xxxx:0104 MOV AH,4C                <Enter>
xxxx:0106 INT 21                   <Enter>
xxxx:0108                          <Enter>
-RCX                               <Enter>
CX 0000
:8                                 <Enter>
-W                                 <Enter>
Writing 0008 bytes
-Q                                 <Enter>
```

FIGURE 1: Run DEBUG and type the text shown in bold to create DATECHEK.COM.

name extension) to create a .DEF text file containing the data file's structure. This text is automatically loaded into the dBASE *editor for viewing or modification. Press* **<Esc>** *to return to the file prompt. Type another name or press <Esc> again to quit the program. DOC2 creates the temporary file Q$$$.DBF, deleting an old file of the same name if one exists. You could name the temporary file anything else, but it's best to use an obscure name like Q$$$ that other programs are unlikely to need.*

*Join the *.* global exchange. We'll pay $25 to $200 for each item published. Send your personal computer discoveries to* Star-Dot-Star, PC World, *501 Second St., San Francisco, CA 94107, or electronically to MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. All published submissions become the property of* PC World *and are subject to editing for length and style. Due to the volume of mail, we cannot acknowledge any submitted materials. Accepted contributions will be acknowledged by payment.* ●

(Turn page for Softstrips)

```
..        WordStar Nondocument Data File Maker
.rp 100
.mt 0
.mb 0
.pl 1
.po 0
.pf off
.op
.dm Type name and address. Press Enter for blank lines.
.dm
.av "Name ........... : ",Name
.dm
.av "Address ........ : ",Address
.dm
.av "City, State, ZIP : ",CityStZip
.cs
"&Name&","&Address&","&CityStZip&"
```

FIGURE 2: ASKADDR displays an entry form for entering records into a WordStar nondocument data file.

A Positive Point About Breast Cancer.

Now we can see it before you can feel it. When it's no bigger than the dot on this page.

And when it's 90% curable. With the best chance of saving the breast.

The trick is catching it early. And that's exactly what a mammogram can do.

A mammogram is a simple x-ray that's simply the best news yet for detecting breast cancer. And saving lives.

If you're over 35, ask your doctor about mammography.

Give yourself the chance of a lifetime.™

AMERICAN CANCER SOCIETY®

```
** DOC2.PRG
** BUILDS AN ASCII DEF FILE CONTAINING A .DBF FILE'S STRUCTURE

CLEAR
SET CONFIRM ON
SET TALK OFF
DO WHILE .T.
   STORE SPACE(8) TO dbfile
   @ 10,10 SAY "ENTER DBF FILE NAME: " GET dbfile PICTURE "!!!!!!!!"
   READ
   STORE TRIM(dbfile) TO dbfile
* if no file name was given, quit
   IF LEN(dbfile) = 0
      EXIT
   ENDIF
* if the file can't be found, say so and try again
   IF .NOT. FILE(dbfile+".DBF")
      @ 12,10 SAY dbfile+".DBF NOT FOUND."
      LOOP
   ENDIF
* define the name of text file where the structure will be written
   STORE dbfile+".DEF" TO altfile
   USE &dbfile
* copy the structure
   DELETE FILE Q$$$.DBF
   COPY STRUCTURE EXTENDED TO Q$$$
   USE Q$$$
* set up the text file to receive output
   SET ALTERNATE TO &altfile
   SET ALTERNATE ON
   ?
   ? "FIELD NAME   TYPE      LENG   DEC"
   ?
* output a line for each record in the test database
* tailoring the output for every possible kind of field
   DO WHILE .NOT. EOF()
      ? FIELD_NAME+"   "
      DO CASE
         CASE FIELD_TYPE = "N"
            ?? "NUMERIC    "+STR(FIELD_LEN,3)+"  "+STR(FIELD_DEC,3)
         CASE FIELD_TYPE = "C"
            ?? "CHARACTER  "+STR(FIELD_LEN,3)
         CASE FIELD_TYPE = "D"
            ?? "DATE         8"
         CASE FIELD_TYPE = "L"
            ?? "LOGICAL      1"
         CASE FIELD_TYPE = "M"
            ?? "MEMO"
      ENDCASE
      SKIP
   ENDDO
* last carriage return flushes the buffer
* (without this you lose the last line of output)
   ?
   SET ALTERNATE OFF
   SET ALTERNATE TO
   USE
* look at and modify the text file
   MODIFY COMMAND &altfile
ENDDO
SET CONFIRM OFF
SET TALK ON
RETURN
```

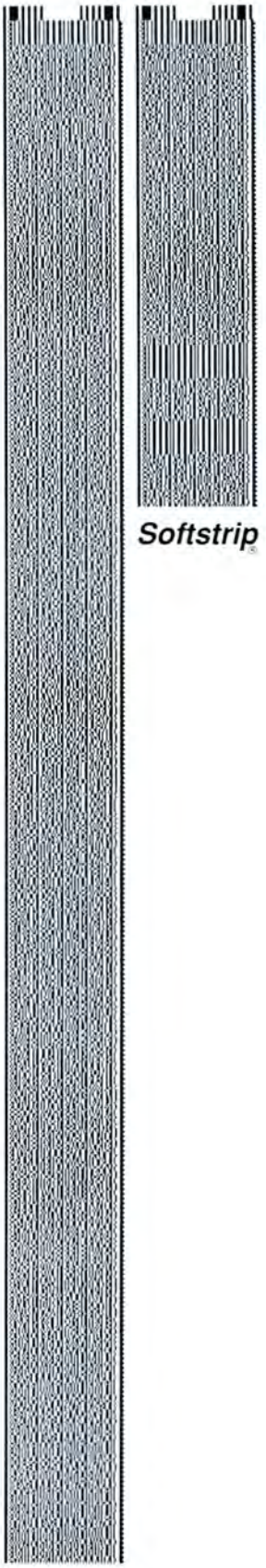
LISTING 3: DOC2.PRG is an improved dBASE data file documenter.

Some People Commit Child Abuse Before Their Child Is Even Born.

According to the surgeon general, smoking by a pregnant woman may result in a child's premature birth, low birth weight and fetal injury. If that's not child abuse, then what is?

AMERICAN CANCER SOCIETY

These Softstrips contain *.*'s program listings for May. They can be read by Cauzin's Softstrip System Reader.



Softstrip®

1 | 2 |

You'll Find it Faster and Buy it Easier in *The PC World Catalog!*

You know what you want and you need it now. *The PC World Catalog* puts the buying information you need right at your fingertips. Each month we bring you a diverse selection of hardware, software, peripherals and services along with the pricing, specs and delivery information you need to make the best possible choice for your company.

Don't Miss This Month's Collection!

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

HARDWARE

- Accessory Boards — page 279
- Communications/Modems — page 279
- Computers/Systems — page 279
- Expansion Units — page 279
- Insurance — page 279
- Peripherals — page 280
- Speed Devices — page 280

MISCELLANEOUS

- Accessories — page 280
- Bar Coding — page 280
- Catalogs — page 281
- Computer Insurance — page 281
- Contracts — page 282
- Data/Disk Conversion — page 282
- Disk Copy Service — page 282
- Disks — page 282
- Mailing Lists — page 283
- Publications — page 283
- Supplies — page 283
- Typesetting — page 283

SOFTWARE

- Accounting — page 284
- Business Applications — page 284
- Church Applications — page 285
- Communications — page 285
- Construction — page 286
- Data Base — page 286
- Data Entry — page 286
- Development Tools — page 286
- Educational — page 286
- Engineering — page 287
- Entertainment/Games — page 287
- Financial — page 287
- Flow Charting — page 288
- Graphics — page 288
- Health — page 288
- Home Use — page 289
- Inventory Control/Management — page 289
- Laser Fonts — page 289
- Legal — page 289
- Mailing List Programs — page 289
- Maintenance Management — page 290
- Manufacturing — page 290
- Medical — page 290
- Music — page 290
- Project Management — page 291
- Public Domain/Shareware — page 291
- Real Estate — page 291
- Sales/Marketing — page 291
- Statistics — page 291
- Surveys — page 292
- Taxes — page 292
- Terminal Emulation — page 292
- Time Management — page 293
- Utilities — page 293
- Word Processing — page 293

ADVERTISING SALES STAFF

Margaret O'Reilly
Publisher

Eric Cressy
Northern U.S.

Sharon Van Leuven
Western Ad Manager

Carol Watson
Southern U.S.

Deborah Tarantino
Eastern U.S.

ADVERTISING RATES & INFORMATION

The *PC World Catalog* serves as a cost-effective monthly meeting place for advertisers and volume purchasers. *Our readers don't want to shop, they want to buy!* And your message can reach them in two formats—classified or directory. Both are arranged by product category for easy reference.

Classified ads are sold by the column-inch (2-inch minimum). You must supply camera-ready type and artwork. Standard red is available as a second color.

Directory ads are sold at a minimum three-time rate of $358 per issue for a total of $1,074. You supply copy. We set type. For logos, add $225.

For further information regarding the *Catalog*, space closings and material deadlines, please call Toll-Free 800/435-7766. Within California, call 800/435-7760.

PC World
501 Second Street
San Francisco, CA 94107

PCW Communications, Inc.
An IDG Communications Publication

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

HARDWARE/Accessory Boards

Add Slots to IBM PC

The Addcard unit updates your genuine IBM PC or your Tandy 1000 by adding 4 more card slots. Easily installs in the existing chassis providing slots for Turbo, RAM, EGA, Disk Controllers, modems, tape backup, ports, & other cards. IBM PC model only $79, Tandy 1000 model only $89, + $3 P&H each. Visa/MC/COD.

Merak Industries
8704 Edna Dr.
Warren, MI 48093
313/562-9768, 800/231-4310, ext. 768

IBM PCs Use Mac Disks

MatchMaker lets you plug any Macintosh external floppy drive into an IBM PC. Half size card & software lets you copy to/from, view directory, initialize, or delete files on the Mac diskette. Works with PCs, XTs, ATs, & compatibles. The easy way to move information! $149 Visa/MC/COD/chk.

Micro Solutions Computer Products
132 W. Lincoln Hwy
DeKalb, IL 60115
815/756-3411

Motherboard Clock $59

SideClock does not use an expansion slot! The Innoventions' Clock/Calendar, installs easily by snapping into place. Never enter the time & date again, SideClock does it for you. Battery & Software included. 30-day $ back gtd. 2-year warranty. For XT, PC, PS-25 & compatibles. $59 + $3 s/h. Site discounts. Dealers welcome.

Aristo
16811 El Camino, #213-J
Houston, TX 77058
713/480-6288, 800/3ARISTO

IBM Reset Button!

At last a reset button for your IBM PC, XT, AT or PS/2 Mod 30. When "Ctrl-Alt-Del" doesn't work, IRATA-RESET will. Installs in minutes, no soldering. A must for hard disk users. Patent-pending design. Current users include Xerox, IBM, Ford & others. $24.95 + $2 s/h. No charge cards.

Irata-Reset
2562 E. Glade
Mesa, AZ 85204
602/926-7969

NEW! VERS. 2.0

BIGMOUTH™

***REAL VOICE** Digital Recording for your PC, XT, AT or Compatible*

- ◆VOICE MAIL SYSTEM
- ◆TELEMARKETING - Inbound & Outbound
- ◆SMARTEST ANSWER MACHINE
- ◆AUTODIAL-DATABASE
- ◆VOICEPAD™ - Voice for your Programs
- ◆PROGRAMMER'S TOOLKIT (optional $79.00)

*½ card, software, cables, & **speaker***

$239.00 + 5 s/h

(415) 652-9600

Talking Technology, Inc.
4383 Piedmont Ave. Suite B
Oakland, CA 94611

CIRCLE 521 ON READER SERVICE CARD

Name Brands ★ Low SS

EXPANSION BOARDS

AST Sixpackplus(64-384K)	$129
Sixpack Premium (256k-1M)	$209
Advantage (128k-1.5M)	$249
Rampage (64k-2M)	$209
Rampage 286 (512k-2M)	$329
Intel Above PC (64k-2M	$229
Above PC PS (64k-2M)	$259
Above 286 (512k-2M)	$329
Above PS 286 (512k-2M)	$359
Above Board 2 for PS2 50/60 (0k-2M)	$275
Inboard 386 PC (1M) .$769 . AT (0k)	.$949
Quadboard (0-384k)	$129
GRAPHICS CARDS	
HERCULES Mono:$189; .... Color	$159
QUAD Prosync:$219 ... VEGA Dlx ...	$219
ATI EGA Wonder	$199
HARD DRIVES	
SEAGATE Kits from 20mb	$299
MINISCRIBE Kits from 20mb	$299
PLUS Hard cards ..... from	$579
MEMORY . . 64k, 256k	Scall
FLOOPY DRIVES: Toshiba for PC, AT: $99; . 1.2MB: $119; 3.5":	$129
External 5-¼" drives for PS2	$279
COMPUTERS..AST, SAMSUNG	
Tape Backup..Maynard, Everex	

VLM Computer Electronics
10 Park Place, Morristown, NJ 07960
(201)267-3268 •Visa, MC, Check or COD

640K On MotherBoard

640K RAM without using an expansion slot. Upgrades allow easy insertion of 256K chips on system board. Highly reliable due to reduced heat & chip count. 100% comp. 30-day $ back gtd, 2-yr wrnty. COMPAQ Portable, Zenith151,161: $29; $119 w/mem. IBM XT, Portable & 3270: $39; $129 w/mem. IBM PC: $49; $139 w/mem. $4 s/h. Site discount, dealers welcome.

Aristo
16811 El Camino, 213-J
Houston, TX 77058
713/480-6288, 800/3ARISTO

Insurance

Sure it's insured?

SAFEWARE® Insurance provides full replacement of hardware, media and purchased software. As little as $39/yr. covers:

- Fire • Theft • Power Surges
- Earthquake • Water Damage
- Auto Accident • No lists of equipment required

For information or immediate coverage call:

1-800-848-3469
On Compuserve, GO SAF

SAFEWARE

SAFEWARE, *The Insurance Agency, Inc.*

CIRCLE 517 ON READER SERVICE CARD

REACH 1.1 MILLION BUYERS. ADVERTISE IN *The PC World Catalog.* CALL 800-435-7766 In CA: 800-435-7760

The Network Advantage

We offer a wide variety of multi-user services, support & products. Complete 3 user starter pack, cards, cables, Novell Netware, for $995. Diskless workstations $595. Complete 3 user system, workstations, cards, cables, Netware, 80286 40mb server, $4995. Multi-user accounting software GL/AR/AP/PR/INV $995. *Call today for free info Packet.*

The Network Advantage
605 Lapalco Blvd. Suite E2
Gretna, LA 70056
800/634-9693

Communications/Modems

H.P. LAZER JET II $1625.00
FAX Card, xt comp + scanner system $1595.00
• XT, Comp, 18MB S.P.C.C. Mem $795.00
• Voice Mail System $1195.00
Toshiba Laptops
T - 1000/1100 / $769/$1395.00
T - 3100/20 /$2225/$2625
SCANNERS
• P.C. Complete Scanner with software 200DPI $245.00
• Shape Scan 300DPI+Haftone with Card & Paint Brush for PC/Mac. $795.00
• Panasonic SP 505 Scanner 400 DPI $995.00
• Chinon Scanner CALL

FAX MACHINE $395.00

BEST FAX PAPER PRICING NATIONWIDE
CONVERT P.C. TO FAX MACHINE

Sharp FO300/500 $1195/1475	Sharp FO150/FO210 $882/1088	
Sharp FO 700 $1695	Sanyo 100/515 $1195/1575	
AT&T 3500/3510 $1395/$1595	Ricoh 10/20/60 $1220/$1550/Call	
AT&T 3520/3530 $1695/$2850	Toshiba 3010Q/3300 $1088/1240	
Panasonic KXF11 $1345	N.W.Bell 71001(1yr wrnty) $1175	
Murata M1200/M1600 $725/$925	Canon FAX 20 $1279	

Terms: Prepayment Prices Visa/MC+2% COD+2% Restock 20%
Telephone Products Center, 23591 El Toro Rd., #213, El Toro, CA 92630
(714) 739-9555 • FAX 714-670-2760

CATALOG PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

Peripherals

SAVE ON

9 TRACK TAPE SYSTEM

FOR IBM PC/XT/AT

- Mainframe to PC Data Transfer
- High Speed Backup
- All Software, Complete System
- Service and Support, easy Installation

call **(818) 343-6505** or write to:
Contech Computer Corp.
P.O. Box 153 Tarzana, Calif. 91356

CONTECH

CIRCLE 506 ON READER SERVICE CARD

Share 2 Printers!

This Buffered Automatic Printer Controller has 4 Parallel Inputs, and 2 Parallel Outputs! HP Laser Compatible! Multiple Copies and Numeric Display! 64K Buffer is Expandable to 256K! Automatic or Manual Operation! Your Best 4 to 2 Printer-Sharing Choice !!!

64K Model $279!

ManTech Computer Products

(918) 437-2600

Call for Best Price Switchboxes!

No Minimum. COD's and NAPO's accepted. Shipping + Handling added. 3% surcharge on MC/VISA. FAX No. (918) 438-6198
Prepaids: POB 690958 Tulsa,OK 74169

MaxTech

CIRCLE 511 ON READER SERVICE CARD

Plotters

The Zericon Model 3600-D Plotter Astounding price and performance for only $2295.

INTRODUCTORY OFFER $1,695 Call Now!

(including stand)

Zericon dares to compare value

- **Prices:** a full $1,000 less than our nearest competitor.
- **Compatibility:** operates with all popular CAD software supporting DM/PL™
- **Speed:** at 7 inches per second, the 3600-D offers the best price-performance ratio in its class.
- **Repeatability:** .001 inches assures you of drawing quality you can be proud of.
- **Unique:** X & Y axis scaling allows you to calibrate to 1 part in 10,000. Ideal for applications where scale is critical.
- **Vacuum** paper hold down assures perfect registration.
- **High Resolution Circles:** Suitable for PCB Artwork

CALL NOW AND WE'LL SEND YOU A FREE SAMPLE PLOT: (415) 490-8380

Dealer inquiries invited.

ZERICON
Stevenson Business Park
Box 1669
Fremont, CA 94538

DM/PL is a trademark of Houston Instrument

CIRCLE 532 ON READER SERVICE CARD

MISCELLANEOUS/Accessories

Custom Key Imprinting

Customize your keyboard with custom imprinted replacement keys, Keytop Shells, Snap-on KeyCaps & Keytop Labels. Small or large OEM runs. Also, FlexShield™ Keyboard Protectors, KeyStopper™ individual key lock-outs, vinyl templates, original Touchdown™ Keytop Expanders & more. FREE CATALOG.

Hooleon Corporation, Dept. PCWD
PO Box 201
Cornville, AZ 86325
602/634-7515; FAX 602/634-4620

Mouse Pads

Co. Logo Specialist. Grey, Green & Red Pads.
Size: 9¼" × 8" × ⅛"

- 12 pads w/logo $9.50
- 72 pads w/logo $7.90
- 144 pads w/logo $6.70
- 500 pads w/logo $6.30
- 1000 pads w/logo $6.10

ENTIRE pad imprintable. GUARANTEED to last. MULTI-COLOR jobs OK. SAMPLES w/logo $12.50.

Computer Expressions
3833 Chestnut St.
Philadelphia, PA 19104
800/443-8278

FIND THE WIDEST RANGE OF DP WORKSTATIONS, ACCESSORIES & SUPPLIES IN THIS FREE GLOBAL GUIDE

DIAL
1-800-8-GLOBAL
(1-800-845-6225)

GLOBAL
COMPUTER SUPPLIES
45 South Service Road, Plainview, NY 11803

CIRCLE 508 ON READER SERVICE CARD

Bar Coding

BARCODE BARGAINS

NEW - WANDERWAND™ BARCODE READER

Think of everything you would ever want in a barcode reader and you'll find it in the new ITS 5308 System! Programmable • Handheld, lightweight • Simple connection with standard RS 232 plug • Holds up to 48,127 characters • Discriminates between label codes, time stamp labels • Calculates and dumps scans • Wand included

ITS 5306 - PC Wand Barcode Reader. Emulates keyboard • Reads codes UPC, Codabar, 3 of 9, 2 of 5 interleaved • Works with IBM PC's and clones • Lowest cost - versatile, high quality!

PCDOS-MSDOS Printing Software. Generate your own labels on your existing Matrix printer • Call for details

International Technologies & Systems Corp.
1950 White Star Dr., Diamond Bar, CA 91765
PHONE: 1-(714) 861-7977 • TELEX 6502824734 MCI

GUARANTEED LOWEST PRICES
VISA and MASTERCARD ACCEPTED

ITS

CIRCLE 501 ON READER SERVICE CARD

BAR CODE & MAGNETIC STRIPE READERS for the IBM PC & PS/2

Simple & quick installation
No additional software or port
Metal wand & case

Also available:
Bar code printing software
Magnetic stripe encoders
Units for other computers & terminals
GSA pricing available

TPS ELECTRONICS
4047 Transport Street
Palo Alto, CA 94303
Telephone: 415-856-6833
Telex: (Graphnet) 371-9097 TPS PLA
FAX: 415-856-3843

CIRCLE 522 ON READER SERVICE CARD

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

LABELING SOFTWARE

For DOT MATRIX and Laser Printers (Epson/IBM/Okidata and LaserJet)

- Flexible format • Any size label
- Labels for bins, shelves, inventory - name tags
- Big text readable up to 50 ft.
- Bar Codes: 2 of 5, UPC/EAN, MIL-STD, AIAG, Code 39, etc.
- Auto-Incrementing
- Reversals
- Color Options
- Laser Soft Fonts
- File Input
- Very fast • Easy

Label above printed with $279 program. Other bar code programs from $49.

BAR CODE READERS

For PC/XT/AT & PS/2

- Attaches as 2nd Keyboard
- No software changes
- Rugged Metal Pen
- Reads 2 of 5, UPC/EAN, 128 Codabar, MSI, Code 39

PS/2 model.....$399
PC/XT/AT model.....$385
(upgradeable to PS/2.....$30)

ALSO: RS-232 Readers, Kimtron Readers & Mag. Stripe Readers

30 Day Money Back Guarantee!

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

QUIK-BAR™/readers

Window-driven, easy to use desktop bar code printing program with pre-formatted label designs. Enter custom data or print directly from ASCII files. Numerical auto-sequencing & data file "shuffler" built in. Only $169. High quality PC/XT/AT Quik-Bar readers: Only $369. Quik-Bar software & reader: Only $469.
Tempus Technologies, Inc.
108 N. Main St.
Auburn, IN 46706
219/925-6000

Hardware & Software

Give your IBM XT/AT, PS/2 instant barcode capabilities with the BM-BAR or BD-51. BAR-RIGHT Label Printing Software for dot matrix printers. Distributed by MICRO D. Readers & printers available for RS-232 based systems. For information on our complete line of barcode readers & printers CALL
BarComp Inc.
714/863-0901
FAX: 714/545-8542

Catalogs

PC Cables & Accessories

Our FREE Catalog includes hundreds of switches, Cables (Standard & Custom), Buffers, Data Converters, Signal Boosters, Surge Protectors & More for your PC. Share peripherals with LOW COST PC Switches. LOW Direct Prices, SAME DAY Shipping & Satisfaction Guaranteed! Write or Call for a FREE CATALOG Today!
Tipz Computer Accessories
PO Box 690
San Francisco, CA 94101-0690
800/367-8479, 415/626-4333

PCjr Expansion Products

Possibly the largest selection of PCjr products in the country. We don't just sell PCjr products, we design them.

- Speed Up Products
- Pseudo DMA Cartridges
- Second Floppy Disk Drives
- 3½ Disk Drives
- PCjr Optical Mice
- Monitor Adapters for PC's
- Parallel Printer Ports
- Full Size Keyboards
- Speech Attachments
- Joysticks, Cables, & Adaptors

Call or write to receive our free 32-page catalog of PCjr Add-On products. For even faster results, circle our reader service number.

PC Enterprises
"The jrProducts Group"
Box 292, Belmar, NJ 07719
(201) 280-0025 (800) 922-PCJR

CIRCLE 516 ON READER SERVICE CARD

IBM PCjr Specials

Full line of IBM PCjr hardware accessories including: Memory expansions, Second floppy drive, Hard drives, Cables, Larger keyboards, Modems, Printer expansions, Manuals, & software. Many more items are available. Send today for the complete catalog.
Computer Reset
Dept. PW, Box 461782
Garland, TX 75046-1782

Computer Insurance

SAFEWARE

- Busines Computers
- Home Computers
- Overseas Computers
- Leased Computers
- Computers Leased to Others
- Computers Taken to Shows
- Computers Held for Sale
- Others' Computers in Your Care

Call for complete information!
SAFEWARE
The Insurance Agency Inc.
2929 N. High St., PO Box 02211
Columbus, OH 43202
800/848-3469, 614/262-0539

CATALOG PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

Contracts

For Entrepreneurs

Legal forms for hardware/software developers. Employee agreement, non-disclosure form, contracts for sale (hardware and/or software), consulting, development, hardware/software maintenance, non-competition, copyright notices, software licenses, project delivery & more. Complete, documented, modifiable. $50.

Waters Publishing
8235 Douglas #1000
Dallas, TX 75225
800/445-9522, 214/357-7751

Data/Disk Conversion

Conversion Services

Conversion services to or from over 1000 computer systems:

- Mag tapes
- Micro Computers
- Mini Computers
- Word Processors
- Typesetters

Our conversion capabilities surpass most in the industry.

Pivar Computing Services, Inc.
165 Arlington Heights Rd., Dept. W
Buffalo Grove, IL 60089
312/459-6010

Data/WP Conversions

MAGNETIC TAPE TO DISK
DISK TO MAGNETIC TAPE
(800/1600 BPI)
DISK TO DISK
SPECIAL APPLICATIONS

Over 2000 Conversions Available. $35 per disk. Quantity discount available.

Magnetic Data Conversions Inc.
180 N. Michigan Ave. #1040
Chicago, IL 60601
800/621-9155, 312/726-6455

All Data Formats

TAPE TO DISK
DISK TO TAPE
(800/1600/3200)
ALL REEL SIZES

Conversion to and from most data base and word processing programs. Quick turnaround. Best prices and service.

The Mail Bag
218 6th St. West
Bonita Springs, FL 33923
800/624-4860 x20; 813/947-2198

Disk Copy Service

Duplication from 59¢

Affordable rates only 59¢ for 5.25" & $1.59 for 3.50" MS/DOS Disk Duplication. *Cumulative Purchase Plan* rates go even lower as you continue to order! *Price Includes:*

- *Quality Brown Disc Media*
- *Duplication + 100% Verify*
- *Label Application*
- *Quick Turn Around*
- *Guaranteed Products*

Diversified Systems Group, Inc.
PO Box 1114
Issaquah, WA 98027
800/255-3142, 206/392-0900

Software Duplication

One Stop Shopping
Custom Packaging
Copy Protection
Technical Support
Drop Shipping
Fast Turn-Around
Competitive Pricing
Maxell Bulk Diskettes
Satisfaction Guaranteed
"We are the Industry Leaders!"

MegaSoft, Inc.
PO Box 710
Freehold, NJ 07728
800/222-0490, 201/462-7628

PLACE YOUR AD IN *The PC World Catalog* TODAY.
800-435-7766
In CA: 800-435-7760

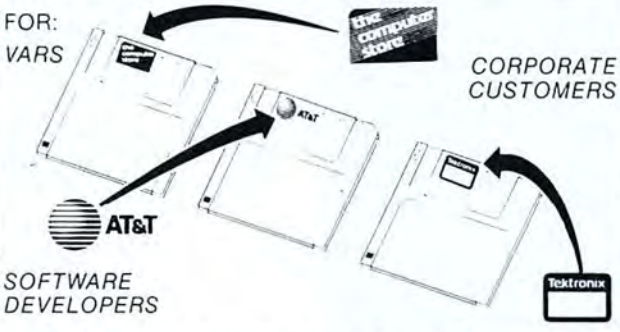
SOFTWARE PRODUCTION

- ★ Disk duplication
- ★ All formats
- ★ EVERLOCK copy protection
- ★ Label/sleeve printing
- ★ Full packaging services
- ★ Warehousing
- ★ Drop shipping
- ★ Fulfillment
- ★ 48-hour delivery
- ★ Consultation & guidance

Star-Byte, Inc.
713 W. Main St., Lansdale, PA 19446
800-243-1515 215-368-1200

CIRCLE 519 ON READER SERVICE CARD

"NEW" PRINTED 3.5" SHUTTERS



Permanent Identification of your Company, Information, or Products.

SOFTWARE DUPLICATION/PACKAGING

3.5" / 5.25" / HIGH DENSITY

WEST COAST TELECOM
CALL: (503) 620-1888

CIRCLE 528 ON READER SERVICE CARD

Disks

IT'S NOT 29¢ PLUS THIS AND THAT, IT'S

29¢

With a 2 for 1 replacement on bulk 5¼" if found initially defective within six months
With sleeves, tabs, labels

		EACH
5¼"	5¼" DS/DD Min. 100	
	Min. 50 (39¢)	29¢
	Color 5¼" DS/DD Min. 50	49¢
	5¼" IBM-AT HD Min. 50	79¢
	Box of 10 5¼" DS/DD (Min. 10)	$4.29
	Box of 10 Color 5¼" DS/DD	
	Free Plastic Case (Min. 5)	$5.99
3½"	3½" SS/DD	
	Min. 25 Subject to availability	99¢
	3½" DS/DD	
	Min. 25 Subject to availability	$1.09
Data	205' 40 MB Mini Cartridge	
	3m/DEI Compatible Min. 5	$15.90
	600' 120 MB Data Cartridge	
	Min. 5	$19.20

Immediate shipping—Guaranteed satisfaction
Call for greater discounts on larger orders

100% Lifetime Warranty

Shipping: $3.50 per min. order/$1.50 each addtl. lot
MC/VISA accepted

1-800-537-1600
Operator No. 174

MEP

Dept. No. 1523 P.O. Box 61000 San Francisco, CA 94161

CIRCLE 512 ON READER SERVICE CARD

REACH 1.1 MILLION BUYERS. ADVERTISE IN *The PC World Catalog.*
CALL 800-435-7766
In CA: 800-435-7760

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

Why waste your time formatting disks?

Preformatted disks save you time and money!

Memorex • Nashua • 3M

5¼" (from 48¢) • 5¼" HD • 3½" • 3½" HC

Call toll-free TODAY!

1-800-321-4668

In Colorado (303) 234-0871. Open 8:00 to 5:30 Mountain Time, Monday—Friday.

ALF

ALF Products, 1315F Nelson St, Denver, CO 80215

CIRCLE 502 ON READER SERVICE CARD

Publications

PCjr Lovers!

The Junior Report: The 32 page monthly mini-magazine just for you! Each issue is devoted to "How to's" for increasing PCjr compatibility, Q&A, & more. Acclaimed by *PC World* Nov. 6th, 1986, *Family Computing* April 1987. Call or write today for a free sample. $19.97/yr, Canada & Mex. $25.97 (US Funds).
The Junior Report
Dept. W, PO Box 59067
Schaumburg, IL 60159-0067
312/310-9033

Supplies

High/Res. Paper/Film

Get high resolution from plain paper laser printers, and color plotters. LASEREDGE™ high resolution Papers/Films are waxable for paste-up. The bright white background, denser image, and finer edge of line will allow enhanced capability for 300 dpi to reproduce on camera. Call or write for samples today. *Visa/MC.*
CG Graphic Arts Supply, Inc.
481 Washington St.
New York, NY 10013
800/342-5858

Laser Cartridge Recharge

Don't throw out empty toner cartridges. Sell them to us. Cartridge $6.50, cleaner $3, & box + packing $.50. • PRINTERS: HP, Apple, + more • COPIERS: Canon PC models • BUY OUR RECHARGED CARTRIDGES $50, Blu/Brn $70. We supply empty cartridge & felt cleaner. QC test sheet provided. Support available.
Michlin Computer Consultants Inc.
Laser Cartridge Division
3770 Plaza Dr. #1
Ann Arbor, MI 48108
800-63-Toner, 313/663-9800, Telex: 981520

$10 For Your Cartridge

We'll buy your empty Laser Printer/Canon PC Copier toner cartridges. $8/crtg. + $2/cleaning wand. HP, Apple, QMS, Corona, & more.
• For greater value, have your cartridges factory reconditioned, $44.95.
Original performance guaranteed. 18 years experience recycling data processing supplies & equip. Call for details!
Willow Products Corp.
3857 Willow Ave.
Pittsburgh, PA 15234
800/426-8196

Security Kits•Cust Cables

PC Lock secures PC, XT, PS2, & clones, including base, monitor, keyboard, & most peripherals & boards. Attractive 8' steel cable. Lock incl. No tools req. $back guarantee. $50 + $4s/h. Special kits also avail. for Mac & many others. Any length MacCables custom connect any devices. Std. 8' $29.95.
Mac Products
20231 San Gabriel Valley Dr.
Walnut, CA 91789
714/595-4838

MAXELL
100% CERTIFIED
5¼" BULK DISKS

5¼" DS/DD **59¢**
5¼" DS/HD **1.59**
3½" DS/DD **1.09**

Price based on quantity of 300 includes sleeves, labels and tabs.

800-222-0490
In NJ 201-462-7628

• 24 Hour Shipment •

MEGASoft
P.O. Box 710, Freehold, NJ 07728

Mailing Lists

FREE CATALOG

Over 2 million names on 75 owner/user lists: IBM, Apple, mini sites, resellers, stores, VARs, chains, mail order dealers, educational, UNIX, Pascal, COBOL, Lotus, *dBASE*, modem, investor, publications, clubs. Call/write for free catalog. NOTE: We do *NOT* sell hardware or software.
Targeted Marketing Inc.
Irv Brechner
Box 5125-W
Ridgewood, NJ 07451
201/445-7196

STOP Paying Too Much for Computer Supplies and Accessories!

Our all new 200 page, full color catalog has hundreds of quality brand name items at unbeatable prices!

• Computers • Monitors • Modems • Printers • WP/DP Paper & Forms • Labels & Binders • Diskettes & Cases • Reel & Cart Tape • Printer Ribbons • Surge Suppressors • Copiers & Supplies • Cleaning Supplies • and Much, Much More!

We even carry a complete line of computer furniture; PC carts, printer stands & sound covers, desks, chairs and more!

We ship within 24 hours directly to your home or office anywhere in the U.S. No minimum orders. Free shipping on prepaid supply orders of $50.00 or more (except case paper). 30 day money-back guarantee on all items!

Call or write today for free catalog and gift certificate

Toll Free Order Line M-F/8-5 EST
• VISA • 1-800-541-1050 • M/C•
in Michigan (313) 546-0360

Ask about our weekly specials and VU discount club
Special Programs for Large & Small Corporate Accounts

ACCESS SUPPLY
10831 CAPITAL • OAK PARK, MI 48237

CIRCLE 523 ON READER SERVICE CARD

Typesetting

High-Tech Typesetting

Transmit your text toll-free, error-free via modem to our fully automated typesetting system. $2 per thousand characters, $5 minimum. Same-day service. 200-typefaces, sizes up to 72 point. Send $20 ppd. for our 200 page guidebook, or call toll-free & use your MC/Visa/AmEx.
Intergraphics
106A South Columbus St.
Alexandria, VA 22314
800/368-3342 or 703/683-9414 in DC

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

SOFTWARE/Accounting

MicroMash Reviews
CPA. CMA. CIA. Each interactive program contains recent exam multiple-choice & essay/problems with text solutions. Cumulative records indicate future study areas & exam readiness. CPA Pass/Refund offer-individuals. Brochure & DEMO available. MS-DOS compatible. Individual, Office & College Pkgs. AmEx/MC/Visa.
MicroMash
14 Inverness Dr. E, F-104
Englewood, CO 80112
800/241-9700; in CO 303/799-0099

PC-FUND®
The leading fund accounting system for local governments and non-profit organizations. Modules include General Ledger, Payables, Encumbrances, Obligation Tracking, Receivables, Payroll, Budgeting, Fixed Assets and Donor Receipts. PC-FUND runs on the IBM-PC and compatibles under MS-DOS, XENIX, AND most LANs.
American Fundware, Inc.
Box 3028
Steamboat Springs, CO 80477
303/879-5770, 800/551-4458

Fixed Assets System
CFAAS™ is a powerful tool for fixed assets accounting which calculates separate financial & tax depreciation using all standard methods. Easy to learn & simple to use, it edit checks for tax code compliance & prepares tax worksheets. Updated for TRA86. $695. 30 day free trial. Visa/MC.
Comprehensive Microsystems, Inc.
609 Fifth Ave.
Safford, AZ 85546
602/428-7225

MIP Fund Accounting
The MIP Fund Accounting System meets the financial & managerial reporting requirements of not-for-profit & governmental organizations. Modules offered: G/L, A/P, A/R, Payroll, Encumbrance, Expenditure Budget, Revenue Budget & Lotus/dBASE Interface. MIP FAS is available for IBM XT/AT. Also, Network available.
Micro Information Products
505 East Huntland Dr. #340
Austin, TX 78752
800/647-3863, 512/454-5004

dBASE Business Tools
- GENERAL LEDGER
- ORDER ENTRY
- dINVOICER & A/R
- SALES ANALYSIS
- SERVICE BILLING
- ACCOUNTS PAYABLE
- PURCHASING/INVEN.
- JOB COSTING
- JOB ESTIMATING
- PAYROLL

$99 ea + s/h includes *dBASE* 2, 3 or 3+Source Code. MC/AmEx/Visa/chk/COD.
Datamar Systems
4876-W Santa Monica Ave.
San Diego, CA 92107
619/223-3344

CheckMaster™
Professional Check Management System. Keep accurate books without knowing double-entry accounting. Reconcile bank statements in minutes. Save accounting fees by sending transactions right to your accountant. Recover $395 cost quickly. Special money-back guarantee. Explore CheckMaster with $5 demo.
Microcomputer Specialists, Inc.
PO Box 795
Woodstock, VT 05091
800/833-1500, 802/457-4600

FUND Accounting
Automatically reports your most pressing info needs: Mgt. reports, financial stmts., budget comparisons, project expenses. FREE spreadsheet interface. Integrates with AR, AP, Payroll. PC-Network compatible. Demo, pre-sale set up, post-sale training/installation available. 30-days FREE phone support.
Executive Data Systems, Inc.
1845 The Exchange #140
Atlanta, GA 30339
800/272-3374, 404/955-3374

Professional Payroll
The DD payroll does it all. Unlimited deducts, all tax tables/split pays/recall feature/401Ks/fringe ben./garn./loans/EIC/net bonuses etc. State of the art entry features. Reports include W2,W3,941,940, 1099,SUI,etc. 100% MENU DRIVEN. Send $35 for 30 day trial, or $395 complete, 30 day money back.
Douglas Daniels Software Inc.
PO Box 1184
Great Neck, NY 11023
800/877-2232 x313, 718/343-1434

Business Applications

Diskette Labeler
Makes professional labels for 5.25" disks on your printer with combination of 23 character Title, 120 File Names, 10 lines of 80 character Comments, Complete Stats. Includes software, manual, 240 color labels (60 ea. of 4 colors) with permanent adhesive. For IBM & compatibles with IBM/Epson compatible dot matrix printer. $49 + $4 s/h.
WeedPatch Productions, Inc.
Box 716
Hockessin, DE 19707
800/451-0474, 302/239-9266

Linear Programming
MINI-MAX ($395) is saving a copper refiner $10,000 a month. "It's extremely easy to use," says an investment counselor in Oakland, CA. See how linear programming can boost your profits. The demo disk ($35) includes a Beginner's Guide and 70-page manual with 7 examples from business & industry.
ASC, Inc.
PO Box 32, Dept. P
Kingsville, TX 78363
512/595-1937 Telex 6713995

Save Legal Fees By Using LegalEase™

LegalEase™ is a simple, ready-to-use business and legal forms system for IBM® PC's with over 150 time-tested models for contracts, agreements, leases, notices and binding business forms. Edit with PC Write™ WordStar® MultiMate™ or any other standard word processing software. LegalEase™ is menu driven and was written for non-lawyers by a respected Boston attorney, Richard H. Gens.

Now! **The Real Estate and Corporate Modules of LegalEase.™** The Real Estate Module comes complete with a wide range of Real Estate forms. The Corporate Module contains all the basic legal forms for corporate meetings.

Now available! **The High Tech Module of LegalEase.™**

LegalEase: $129.95 (add $7.50 p&h). Both the Real Estate Module and the Corporate Module: $99.95 ea (add $7.50 p&h). Any combination of packages: take $10.00 off each package (add $10.00 p&h).

1-800-628-2828 Ext. 706

LegalEase™

HDG Software, Inc.
381 Old Jail Lane, Barnstable, MA 02630
For faster service, (617) 362-8109

CIRCLE 510 ON READER SERVICE CARD

Do You Ship by UPS®?
If you do, the Aristo Parcel Shipping System (APSS™), is for you! Meets all UPS requirements. Prints COD & regular labels, pickup manifest, etc. Saves customer list. Calculates zones & charges. Flexible setup. Online help. Optional scale interface. Easily modify zone & rate data. $395; 60 Day $ back gtd. UPS approval gtd. $5 full featured demo disk.
Aristo
16811 El Camino #213-J
Houston, TX 77058
713/480-6288, 800/3ARISTO

XA–Spreadsheet LP
World's Fastest linear programming system available today! Use *1-2-3/Symphony* for model formulation. Mixed 0/1 integer variables, generalized lower & upper variable bounds, advanced basis restarting, MPS format, & more. Price–$1 per constraint plus $300 up to a maximum of 1,000 constraints. Educational version $39.
Sunset Software Technology
1613 Chelsea Rd. #153
San Marino, CA 91108
818/284-4763, Telex 289019 SMMB

Advertisement

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

TRAVEL & ENTERTAINMENT EXPENSE REPORTS

- Recover all expenses
- Track cash advances
- Claim tax benefits

Build your tax deductions as you report expenses!

Touch 'n Go™ system includes 2 diskettes, fully indexed manual, 50 expense envelopes, FREE support hot line.

30 DAY NO-RISK TRIAL

FREE: $19 tax guide—yours to keep, even if you return the system!

ORDER TODAY! Only **$99** (plus $7.50 S&H, $106.50 total)

Quantic Corp.
44 Friendly Drive
Smithtown, NY 11787

Orders: (800) 628-2828 Ext. 478
Info: (516) 261-4938

MENUSYS

Menu Control & Security System

- Security for PC users.
- Use stand-alone or with LAN.
- On-line HELP message editor and notepad.
- Easy to install and run.
- 30-day satisfaction guarantee.
- For IBM PC, PC-AT, compatibles, and PS/2.

$79.95 per copy (LAN version $250)

INTESYS Corp.

The Solution Company

1111 International Parkway, Suite 113
Richardson, TX 75081

(214) 437-4797
1-800-356-3492

CIRCLE 533 ON READER SERVICE CARD

LOAN PLUS®

Fully Menu driven! Amazingly User-Friendly! Effectively organizes & monitors all phases of Loan Processing. Easy to track Payments. Produces Loan Amortization Schedules, Payment Receipts, Late Customers List, Late Notices, End of Year Statements, Loan Collection Report, Labels, etc. PC/MS-DOS/256K. Demo $9.95. Operating System $695.

ADVANCED PERFORMANCE Inc.
c/o The Software Place
156 Bay Area Blvd.
Wester, TX 77598, 713/338-2585

Sales Mgt. Software

Client Master is a powerful, easy to use, client software package. No more wondering what your last conversation was, losing phone numbers, forgetting to follow up.

- FILING SYSTEM
- MINI WORD PROCESSOR
- TICKLER FILE
- FORM LETTERS/ENV.
- LABELS/ROLODEX™/ETC.
- AUTO DIALER

ONLY *$149* • EVAL. *$10*
Computer Master Software
6505 S. Sepulveda
Los Angeles, CA 90045
800/MASTER1, 213/645-6585

MILP88-Mixed Integer LP

A general-purpose system for solving mixed integer linear programs w/up to 64 integers, 255 constraints & 1255 variables. Solves problems by applying an advanced version of the branch & bound method. Menu-driven w/many useful features similar to *LP88*. Requires 192K. $149 w/8087 support, user's guide. Visa/MC.
Eastern Software Products
PO Box 15328
Alexandria, VA 22309
703/360-7600

Church Applications

Romar Church Systems™

Membership-61 fields, alternate addresses; labels, letters, reports any field(s). Offering-256 funds; pledge option; statements; post 255x/yr. Finance-G/L w/budget; 500 subtotals & 99 depts; month & YTD reports anytime for any month. Attendance-8 service times, 250 events. 60 consec. weeks. Floppy 3½ & hard disk. Ad too short! Write!
Romar Church Systems
Attn.CJP
PO Box 4211
Elkhart, IN 46514
219/262-2188

ICMS

Most of our clients investigated or even tried the low-cost alternatives but, in the end, they chose the Integrated Church Management System. Don't sell your church short. In six years of providing state-of-the-art software to churches, we have never lost a client. To see why, call for a demo.
Omega C.G. Limited
377 E. Butterfield Rd. #675
Lombard, IL 60148
312/969-7799

REACH 1.1 MILLION SHOPPERS IN A SINGLE COLUMN!

With 1.1 million readers picking up *PC World* every month, there's no easier, faster, and more economical way to get your message across than to advertise in *The PC World Catalog*. Call us now and start getting your share of this valuable market!

CATALOG PC WORLD

Place Your Ad in *The PC World Catalog* Today...Call

800-435-7766
In CA: 800-435-7760

---

compuBIBLE™
A PRODUCT OF NASSCO INC

- Most comprehensive Bible program on market
- Rapid searching
- Integrates with virtually any word processor
- KJV, ASV, NIV, NKJV, RSV
- Ram resident version available

For information on all products call or write
NASSCO P.O. Box 65600-222
Lubbock, TX 79464
(806) 866-4223, (800) 262-7726

CIRCLE 514 ON READER SERVICE CARD

Parish Data System™

Comprehensive census/contribution program. Easy to operate, menu-driven. Family, member, financial info & reports fully integrated. Selective listings, labels; contribution, tuition statements; personalized letters. User can create own reports, letters. Other church programs available. Over 2000 users.
Parish Data Systems, Inc.
3031 W. Northern Ave. #121
Phoenix, AZ 85051
602/247-3341

PowerChurch Plus!®

Fast, friendly, reliable church administration system. Full fund accounting, mailing lists, membership, contributions, attendance, word processing, accts. payable, payroll, multi-user support, & much more–all for $695 complete. Uses up-to-date software technology. Unlimited capacity. FREE demo. Details:
F1 Software
PO Box 3096
Beverly Hills, CA 90212
213/854-0865

Communications

Computer-Telex-Link

Use your computer for telex communications! Replace that old telex machine with your PC & Cawthon's Computer-Telex-Link. Save Money! Save Time! Increase Productivity! Cawthon's Telex-Link is easy to install & easy to use. Since 1978 Cawthon has been linking computers to U.S. & overseas telex services. Many satisfied customers. Excellent support.
Cawthon Scientific Group
24224 Michigan Ave.
Dearborn, MI 48124
313/565-4000. Telex: 4970016 CAWTHON

CATALOG PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

PC-HOOKER

Bridges the Lap Gap

Hooker is a powerful and easy to use connectivity tool that hooks any two IBM PC compatibles together and transfer files at amazing speeds. Serial transfers exceed 115,000 baud, parallel is even faster, and nothing could be easier to use. You will be transferring files seconds after opening the package.

Hooker comes with everything you need. Software on 5 ¼" and 3 ½" disks, a Quick start user guide and a universal cable are all included. You supply the computers, and Hooker will do the rest.

Among its many standard features are Hooker DOS and Hooker Edit. Hooker DOS gives you instant access to the most commonly used commands, taking the drudgery out of using DOS. Hooker Edit includes many advanced features found in leading word processors.

For an additional $10 our new Hooker Plus version includes Hooker Phone which gives you complete telecommunication power. For a limited time only Amica is offering Hooker for the introductory price of $59.95, with a 30-day money back guarantee.

Hooker at a Glance

- Connect any two PCs
- Serial and parallel
- Exceed 115,000 baud
- Two way transfers
- DOS organizer
- Full text editing
- Talk mode
- Hayes modem support
- Print facilities
- Universal cable
- 5 1/4 and 3 1/2 disks
- PS/2 ready

AMICA

To Order call toll free
1-800-888-8455

102 South Main Street, Park Ridge, IL 60068 312-825-0110

CIRCLE 503 ON READER SERVICE CARD

Construction

Construction Management
Affordable, understandable software for builders. Job cost, billing time & materials or percent complete, payables, change order & retention tracking in one package. Prints checks, statements, bids, 30+ reports. Clear manual & help windows, backed by our professional phone support staff. $795.
Yardi Systems, Inc.
930 Laguna St.
Santa Barbara, CA 93101
805/966-3666

Cost Estimating System
Powerful, comprehensive system for building fast, accurate and competitive estimates. A complete, stand-alone program. Menu-driven, very easy to use. Over 30 types of reports. IBM XT/AT and compatibles. Hard disk 512K dBIII version with source code also avail. System $245, demo $15 (CA add tax), CK/MO/COD.
CPR International, Inc.
932 Richmond Street #101
El Cerrito, CA 94530
415/528-0581

Data Base

dQuery 2.0: SQL & QBE
dQuery 2.0 is an interactive query management system on dBASE files using SQL (IBM DB2 Compatible) & Query-By-Example. Its nice windowing facilities let users easily get more out of their dBASE files. $125.00. dQUERY/lib includes dQUERY 2.0 & C-callable lib. $195.00. Add $5.00 h/s. Prices go up 6/1/88.
Quadbase Systems Inc.
1567 Keith Drive
Campbell, CA 95008
408/866-0807

PLACE YOUR AD IN *The PC World Catalog* TODAY.
800-435-7766
In CA: 800-435-7760

Data Entry

Data Entry Emulator
Heads-down data entry for PCs. Fast & accurate preparation of batch data files. Formatting in minutes. Features include: auto-dup, 2 pass verification, constants, format chaining, range checks, table lookups, batch totals, 129 keyboard option, and much more...30 day trial period. ONLY $395.
Computer Keyes
21929 Makah Rd.
Woodway, WA 98020
206/776-6443

KeyEntry III®
The most widely used data entry system *in the world*. Unsurpassed in "heads-down" environment, and for *all* other types of data entry. You won't see the ease or full potential of PC-based data entry until you see KeyEntry III. Complete Evaluation Copy (all programs & documentation) just $42.50 delivered.
Southern Computer Systems, Inc.
2732 Seventh Ave. South
Birmingham, AL 35233
800/533-6879, 205/251-2985

VDE–Viking Data Entry
The premier data entry system. Full-featured to replace key punch & keydisks. Full screen "FORMS", double-key verify, wide variety of options, crossfoots, subtotals, batch balancing, duplicating, statistics, skipping, etc. Character, field & record level validations. $120-600. Also for minis.
Viking Software Services, Inc.
2815 East Skelly Dr.
#816, Tulsa, OK 74105
918/745-6550

Follow The Leaders
6 of the 10 largest corporations in America have chosen DPX to lead them into PC-Based Data Entry. Call now for evaluation copy of RODE/PC–$40 (refundable) + $6 shipping. RODE/PC is a *complete solution* allowing stand-alone or networked PCs to replace all types of key-to-disk systems.
DPX
20823 Stevens Creek Blvd. #130-W
Cupertino, CA 95014
408/973-9292, TELEX 701111

Development Tools

Character Window Driver
ANSI.SYS emulation. Faster, easier. Expanded features. • Up to 32 separate windows • Popup windows • Complete sound/color control • Expanded cursor control. Written in assembly using BIOS. Small (under 8Kb). Linkable .obj module with complete documentation & examples. Customization avail. Call/write. Only $99 + s/h. (UT res. add sales tax).
Integrated Software, Inc.
PO Box 189
Centerville, UT 84014
801/292-8655

Educational

Instant Replay III
Build Demos, Tutorials, Prototypes, Music, Presentations, Timed Keyboard Macros, & Menu Systems. Includes Screen Maker, Keystroke/Time Editor, Program Memorizer, & Animator. Received Great Reviews! Simply The Best. 60 day satisfaction money back guarantee. IBM & Compatibles. $149.95 U.S. chk/credit card. Demo Diskette $5. No royalties.
Nostradamus Inc.
3191 South Valley St. #252
Salt Lake City, UT 84109
801/487-9662

Teacher Turned Author!
Courseware Authoring System. Create great instructional courseware in minutes. No programming. No Royalities. Mix color graphics & text. Imbedded drawing system. Recordkeeping & fast editing. Prices $119-485. Demo Disk $15. IBM PC/XT & Compatibles.
Raster Sciences, Inc.
P.O. Box 3477
Longwood, FL 32779
800/233-4465(tone) 8555;
305/889-8555

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

Know Your World
- Build-a-Continent
- Name-the-Country
- Name-the-Capital
- Find-the-Country
- Travel-the-World

Five activities to learn all the countries of the world & 600 cities. Uses maps of all continents, the USA, & the Caribbean. Fun for all! 5¼ or 3½ disks. Requires 256K & CGA. $39.95 by chk/Visa/MC.
Soft Horizon
PO Box 2115
Harker Heights, TX 76543
817/699-0493

Would You Like to Know?
- Your I.Q.?
- Memory Level?
- Response Time?
- Coordination?
- Visual Perception?

Expand your mind with MENTOR-™–software that lets you explore your hidden talents. Over 58 psychometric exercises, incl. 25 complete IQ tests
- IBM PC/comp • 256K
- Graphics board • $49.95
- Visa/MC.

Heuristic Research, Inc.
3112-A West Cuthbert
Midland, TX 79701
- *Orders and info: 800/443-7380.*

Engineering

Structural Design
Fast, highly interactive, integrated programs for structural analysis & design of BEAMS, COLUMNS, TRUSSES & FRAMES of any material. Easily mastered programs result in dramatic time savings while producing efficient, accurate designs. Specify PC, XT or AT & send $25 for demonstration disk to:
C-Squared B-Squared Software Design, Inc., Dept. A-1
461 Bush St., Suite 220
San Francisco, CA 94108
415/391-7309

Simulation
GPSS/PC is a full-power version of GPSS, the most popular mainframe simulation language. Specifically designed for interactive use on today's high-speed microprocessors, it is loaded with features such as interactive graphics & animation. Using GPSS/PC, predict the behavior of complicated real-world systems.
Minuteman Software
PO Box 171/W
Stow, MA 01775-0171
800/223-1430 x315, 617/897-5662 x315

Eng./Sci. Graphics
Engineering/scientific graphics. *OMNIPLOT [S]* (screen graphics) & *OMNIPLOT [P]* (plotter driver) provide integrated eng./sci. 2D & 3D graphics w/NO PROGRAMMING! Menu-driven, flexible, professional. Choice of formats: tabular/line, contour, 3D wireframe & more! *OMNIPLOT [S]*: $195. Add *[P]*: both $295.
Microcompatibles
301 Prelude Drive
Silver Spring, MD 20901
301/593-0683

Electronics CAD/CAE
Free 56 page Application Guide & Catalog • Circuit Analysis • Root Locus • Thermal Analysis • Plotter Drivers • Engineering Graphics • Signal Processing • Active/Passive Filter Design • Transfer Function/FFT Analysis • Logic Simulation • Microstrip Design • PC/MS-DOS • Macintosh • Visa/MC
BV Engineering
2023 Chicago Ave., Suite B13
Riverside, CA 92507
714/781-0252

Entertainment/ Games

STATBOOK SERIES
Features include printing of player/team game, y-t-d & lifetime stats; team/league leaders & team standings. Number of players/teams limited only by disk space. Ideal for high school, college, amateur and professional teams/leagues. Football $69, baseball/softball $59, basketball $49 and hockey/soccer $49. Also league scheduler $55. MC/Visa.
RJL Systems
106 New Haven Ave.
Milford, CT 06460
203/878-0376

New! Lotto Picker™ Plus
BE THE NEXT LOTTO MILLIONAIRE! Lotto Picker Plus v2.0 lets you store winning Lotto, Keno, & Pick 3/4 numbers & choose 1 of 3 statistical modes (hot, due, or unbiased) to wheel what might be your million dollar ticket! All U.S. & Can. games included. Never obsolete or copy-protected. New features–same low price. IBM/others. $34.95 (+4.55 sh).
GE Ridge Services, Inc.
170 Broadway, #201PW
New York, NY 10038.
Orders 800/634-5463 x293. Inq. 718/317-1961.

LAS VEGAS HOLD'EM
The fast, exciting game played in the World Championships of Poker. You play against 7 opponents, with different skill levels & styles. A tough, cut-throat game–try to knock the other players out before they get you. Detailed manual with rules, advice on betting. Runs in color or mono, with card graphics. $35 from
Manhattan Software
PO Box 148
Peterborough, NH 03458
800/432-5656 Visa/MC/AE orders,
603/924-9998 info/catalog

Campaign Promises™
Presidential Election Game. –DIRTY TRICKS, Promises, Luck –Ads, State Organizations, and –Elections. Up to six players. Tutorial disk inc. IBM/comp., 256K, Color best/mono OK. Specify 5¼" or 3½" disk. Only $32.95 plus S&H ($3.50). Demo $5.95 plus S&H ($2). CT res. add 7.5% MC/Visa/chk.
Front Runner Software Company
PO Box 435-W
Collinsville, CT 06022-0435
phone Orders: 203/233-3144

FUNDGRAF©
GRAPH & find best performing mutual funds or stocks. Graph PRICE and/or MOVING AVERAGE (any span). Superimpose graphs for comparison. Calculate relative strength RATINGS. Generate buy & sell SIGNALS when trend changes. FREE brochure. DEMO disk $10. FUNDGRAF disk with data for 32 funds for 4 years $100. MC/Visa/chk.
Parsons Software
Dept. C, 1230, West 6th St.
Loveland, CO 80537
303/669-3744

LOAN MAKER™ $89.95
Godfather of Loan Calculation & Amortization Programs. Instantly computes results. Used by CPAs, atty., banks, etc. Makes amort schedules for Level, Specified Amt., & Decreasing Pymts for any time period. Balloon Pymts. Save/Recall/Delete schedules. IBM/comp. Superb manual. Demo $2; demo + manual $20, credited on program. Visa/MC/AmEx/chk.
Powder River Properties, Ltd.
1510 Stone St.
Falls City, NE 68355
402/245-2029 (24 hr)

Financial

MONEYCOUNTS®

ONLY $16!

Easy-to-use CPA-designed money management/accounting system for home and business. Checking, credit card management, smart checkbook balancer, budgeting, financial statements, graphics, financial data base with three-way look up, inquiry reports, online help, pop-up calculator, tutorial, lots of capacity (up to 999 accounts/24000 entries per year) and much more. **Not copy protected.**

New Version 4.0 ***Now includes:***
- ***Financial calculator*** ***computes interest rates, loan and balloon payments, prints loan amortization schedules***
- ***Automatic entries***
- ***Journal entries***

And More!

Call or send $16 + $3 shipping/handling • Check VISA MC
1-800-223-6925 • In Canada 319 395-7300

Parsons Technology
Dept W
373 Collins Road NE
Cedar Rapids, Iowa 52402

CIRCLE 515 ON READER SERVICE CARD

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

Execamort™ Amortizer+

Loan Amortization's simple/complex, extra pymts, points/fees, APRs(per Reg. Z), balloons, solve for unknowns, yields/IRR, PV, FV, store/retrieve, more. IBM PC/XT/AT/PS2/compat. Simple yet complete–great for client services. Acclaimed nationwide by Banks/CPAs/CUs/Finance/Legal/R.E./S&Ls. $149.95 + $4 shipping. Visa/MC/AmEx.

Electrosonics
36380 Garfield #1
Fraser, MI 48026
800/858-8448, 313/791-0770

Lease Vs Buy Made Easy

Lease Vs Buy is a complex decision amidst changing tax laws & AMT. Hamlet, "To Lease or Not to Lease", is an extremely sophisticated PC program that will analyze these decisions with precision. Very fast, easy to use, color windows. $595 with 60-day money back guarantee. Call Ellen Dahlquist.

Decision Systems, Inc.
75 South Fifth St., M101
Minneapolis, MN 55402
612/338-2585

Investment Software

- *Stock Portfolio System*, a complete portfolio manager, incl 13 reports, tie to Dow Jones or manual update. Handles diversified investments.
- *Market Link*, auto fetch up to 120 quotes up to 8 times in unattended mode. Tie to DJ or Source. Bridge quotes to *1-2-3*.
- *Wall Street Techniques*, complete charting & momentum analysis. Tie to Source or DJ.

Free brochure + 100% rebate offer.

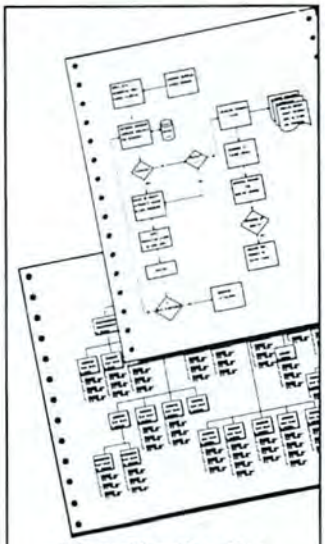
Smith Micro Software
PO Box 7137
Huntington Beach, CA 92615
714/964-0412

The Right Time System

The Stock, Index & Futures programs generate accurate Buy/Sell signals for individual stocks, indexes & commodities. The software was developed by an expert portfolio manager for his own personal use & are now available for any smart trader who wants to make quick profits. Call or write for free info.

T.B.S.P., Inc.
2265 Westwood Blvd. #793
Los Angeles, CA 90064
213/312-0154

Flow Charting



Flow Charting II+: Where ideas take shape

Flow Charting II+ will amaze you with its speed, power and simplicity.

- update and print charts as fast as the situation changes
- see your revisions right away—no long wait for charts to be hand drawn
- select 26 standard shapes; 10 text fonts
- tutorial manual makes learning easy
- runs on IBM or compatibles. Only $229.

For more information, see your local retailer or call
1-800-672-3470, ext. 897 California
1-800-538-8157, ext. 897 USA
408-629-5044 International

PATTON & PATTON
Software Corporation
81 Great Oaks Blvd., San Jose, CA 95119

CIRCLE 529 ON READER SERVICE CARD

GRAFPLUS™

Power Pack Your PrtSC Key! **Only $49.95**

Grafplus™ turns any IBM or compatible graphics application into a powerful communicator by printing exactly what you have created on your computer screen.

- Print in color, black-on-white, white-on-black
- Scale the image to any size
- Print vertically or horizontally
- Work with virtually any bit-mapped dot matrix, laser, or inkjet printer
- **Link into Pagemaker or Ventura**

Jewell Technologies
4740 44th Ave. S.W.
Suite 203
Seattle, WA 98116
206-937-1081

CIRCLE 525 ON READER SERVICE CARD

FORTRAN Graphics!

Now get complete graphics support on screen, printer or plotter. Grafmatic (EGA, Herc.), Plotmatic (HP, HI plotter), Printmatic (printer) give you 2-D & 3-D graphics support w/MS, Lahey or R/M FORTRAN. Optional font module too! $135 each. Discount for 2 or more programs.

Microcompatibles
301 Prelude Drive
Silver Spring, MD 20901
301/593-0683

CGA◆Hercules Graphics

Mode—MGA™ allows you to use business graphics, games, BASIC graphics & other CGA specific software with your Hercules Monochrome Graphics adaptor & monochrome monitor. Works with all CGA programs. $79.95 (+ $5 s&h), for the 4K—TSR version. 30-day unconditional money back guarantee. Free brochure avail. Call/write:

T.B.S.P., Inc.
2265 Westwood Blvd. #793
Los Angeles, CA 90064
213/312-0154

The Food Processor® II

Analyzes diets, recipes & menus with 2400 foods & 30 nutrients & exceptionally complete data base-few missing values. Many features-easy to use-outstanding reviews. Installed in Corporate wellness programs-schools-colleges-hospitals-homes nationwide. $250. IBM & Mac. Specify & send for FREE DEMO DISK!

ESHA Research-Nutrition Systems
PO Box 13028
Salem, OR 97309
503/585-6242

HouseCall™

Home medical encyclopedia. Designed by doctors for consumers. Input symptoms via simple menu format. HouseCall gives likely diagnosis + information about the condition. You can also access data via topical index. Over 400 diagnoses! SPECIAL: $49.95 protected or $59.95 non-protected for hard disks, + $5 s/h.

Rocky Mountain Med. Software
5680 Greenwood Plaza Blvd.
Englewood, CO 80111
800/233-3556

FamilyCare™ Software

This medical diagnostic expert system spares expensive, unnecessary trips to a physician by guiding you quickly through possible symptoms & giving you specific directions for medical care, home treatment, & medications. Includes hundreds of symptoms, injuries, & diseases of newborns through teenagers.

FamilyCare™ Software
(Div. of Lundin Laboratories)
29451 Greenfield Rd. #216
Southfield, MI 48076
800/426-8426, 313/559-4561

Graphics

35mm Slide From Your PC

COMPUTER SLIDE EXPRESS converts graphic files produced on the IBM PC into brilliant 35mm color slides with color resolution 400% better than your monitor. Leave your printouts behind. Use high-resolution color slides (up to 4000 line) at your next presentation. COMPUTER SLIDE EXPRESS $9/slide.

Visual Horizons
180 Metro Park
Rochester, NY 14623
716/424-5300

Health

Diet Wise–Energy Wise

Ideal for individuals interested in nutrition, fitness, weight control, or special diets. ENERGY WISE calculates calories used in exercise & daily activities. DIET WISE analyzes diets, recipes, & menus. Designed by Registered Dietitians. $39-$120. PC/MS-DOS. Also inquire about NUTRIPAK PROFESSIONAL version.

Nutritional Data Resources
PO Box 540
Willoughby, OH 44094
800/NDR-DIET, 216/951-6593

Advertisement

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

Home Use

Family Reunion
New version 3.2 provides 32 types of charts, worksheets & reports, including address labels, birthday lists, pedigrees, group sheets, descendants, histories, facts, indexes. Powerful data entry & search capabilities, fancy screens, *many* user options, fast, fun, easy to learn! $195 (refunded if not satisfied). MC/Visa/AmEx/COD. Superior value!
Personal Software Company
1580 E. Dawn Dr.
Salt Lake City, UT 84121
800/327-9835, 801/943-6908

Where Did My Money Go?
Track 38 expense categories, 15 income sources, 22 accounts & a budget. Graph income or expenses by month. So simple to use that it doesn't even have a manual! Uses spreadsheet & checkbook formats. Monthly & annual reports. On-screen help. 5¼ or 3½ disks. 256K & any monitor. $39.95 by chk/Visa/MC.
Soft Horizon
PO Box 2115
Harker Heights, TX 76543
817/699-0493

ROOTS™
Genealogy Software to Make *Your* History

ROOTS III (new!).....$250.00
ROOTS II.....195.00

CALL TODAY FOR FREE CATALOG
(800)327-6687
In California, call (415)967-1900

COMMSOFT
2257 Old Middlefield Wy. Mtn View, CA 94043

CIRCLE 505 ON READER SERVICE CARD

FAMILY ROOTS™
Do it YOUR way! Huge variety & capacity for your family history. Makes pedigree & descendants charts, group sheets, individual sheets, indices, histories, address labels, searches, & much more. Free brochure & sample printouts. Satisfaction guaranteed. Any PC or compatible. $185. MC/Visa/AmEx welcome.
Quinsept
Box 216
Lexington, MA 02173
800/637-ROOT, 617/641-2930

Inventory Control/ Management

"THE COLLECTOR"™
Organize your collectibles (stamps, coins, dolls, antiques, trains, you name it) all on one disk. Single disk holds up to 4000 items. Has unlimited capacity. Sorts alph/numeric with cost/cur val at touch of key. For PC/PCjr/XT/AT or similar (128K-DOS 2.0+). Write/Call for free brochure, or $65 + $3 s/h. Visa/MC.
The Third Rail
3377 Cimarron Dr.
Santa Ynez, CA 93460
805/688-7370

Mr. QuarterMaster
Features: receipts & issues updating; inventory, reorder usage and other reports; file maintenance; issue slips/invoices; reorder points adjusted automatically or manually. Price: $123. Manual alone with demo: $23. Specify stockroom or retail version. Also available: Sales reporting, P.O., Estimating & Multi-whse I.C. systems.
RJL Systems
106 New Haven Avenue
Milford, CT 06460
203/878-0376

dFELLER Inventory
A business inventory program written in modifiable dBASE source code. The menu-driven program lets you locate items by inventory name or number. It keeps track of reorder points, vendors, average cost, & other info $150. dFELLER PLUS with Purchase Orders & History $200. Requires *dBASE II* or *III* or *III PLUS*.
Feller Associates
550 CR PPA, Route 3
Ishpeming, MI 49849
906/486-6024

Stock-Master 4.0
This commercial grade, high performance inventory system for Mfgrs has Stock Status Rptg, Trend Analysis, Purchase Order Tracking, QC Rptg, Transaction History Detail Analysis, Multiple Whse Locations, Bill of Materials & Purchase Order Writing. On minis since 1978, expanded/priced for micros. Demo avail.
Applied Micro Business Systems
177-F Riverside Ave.
Newport, CA 92663
714/759-0582

Laser Fonts

Big Laser Fonts
Break the font size barrier on your LaserJet. Print 79 pt, 158 pt. big fonts (over 2 inches). Also includes .1", .2", .3" and .5" fonts. Co-exists with any soft fonts. Print from *WordStar*, Lotus, ANY program. $159 includes 20K Resident Printer Management/Print program. Fast Batch Font Download. Easy to Use. 30 Day $$ Back.
Worthington Data Solutions
417-A Ingalls St.
Santa Cruz, CA 95060
800/345-4220, 408/458-9938

Easy Font Downloading
Forget cartridges! FASTfont makes softfonts on your LaserJet Plus, 500, or II EASY! Menu select any soft fonts by title into a group; include setup margins, size, etc. Use one group for Lotus, one for your word processor. Complete LaserJet setup with one command. Downloads 4-10 times faster than DOS COPY. FASTfont-$79. 30 day $ back.
Worthington Data Solutions
417-A Ingalls St.
Santa Cruz, CA 95060
800/345-4220, 408/458-9938

Legal

L-PLOT...
A Metes & Bounds program to quickly plot on screen and print plats from virtually any description, measurement or scale! Calc. EOC, plots multi-tracts, edits, saves & more. Use as a CAD tool to precisely draw, calc areas and angles of any shape or configuration. IBM/comp w/MGA, CGA, EGA. Under $200. $15 (refundable) demo.
LAN/SCAN, Inc.
PO Box 6863
Abilene, TX 79608
214/824-6419

Will-Planner™
Tutors you in estate-planning concepts & terms. Creates a comprehensive will & trust for your circumstances & state of residence. Designed by attorneys for laypersons. Personal Version uses 2 floppies or hard drive $79.95; Family Version uses hard drive $89.95 (plus $5 shipping, $10 foreign).
Noetic Technologies Corp.
PO Box 3085
Englewood, CO 80155
orders & info: 303/770-2380

Mailing List Programs

Pony Express XL 2000
For commercial & large lists. Fast machine code multisort. Prints labels 1-5 across, single line or user-defined format. Also CHESHIRE FORMAT. Records selected by user-defined codes, zips or zip ranges. Auto repeat for ease of record entry, corrections & deletions. Phone list option. Includes full function word processor. Merges w/most other word processors. $238.
Computech
975 Forest Ave.
Lakewood, NJ 08701
201/364-3005

ZIP DIRECTORY ON DISK
- 90,000 zip codes with city, state, county. Speed data entry. Compatible with most database software. On disk or tape.
- CLEAN-A-LIST–Program that finds and fixes address errors in mailing lists.
- ASSIGN-A-ZIP–Street data files for 5-digit zip assignment.

1-800-431-2577

DCC DATA SERVICE, INC.
1200 18th St. N.W. Ste. 704
Wash., D.C. 20036 • 202-452-1419

CIRCLE 507 ON READER SERVICE CARD

Sapana's Mail Programs
- Mail-Track-I ($49.95)
- Mail-Track-II ($95)
- Mail-Track-III ($195)
- Mail-Track-II Plus ($195)
- Mail-Track-III Plus ($295)
- Mail-Bulk-Rate-II ($195)
- Mail-Bulk-Rate-III ($295)
- Mail-Second-Class-II ($295)
- Mail-Second-Class-III ($395)
- TrialDisk 5.25" ($2.95)
- TrialDisk 3.5" ($3.95)
- Free Catalog

Sapana Micro Software
1305 South Rouse–PCWD
Pittsburg, KANSAS 66762,
316/231-5023

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

PostWare Mailing System
Automate mail prep. Reduce postage by up to 5¢ per piece! PostWare assigns carrier route numbers, sorts by US Postal Service regs & prints labels in pkg. & sack mailing order. Sack tags, tray labels & mailing reports. Works w/*dBASE III, DataEase*, Smart, Power-Base & others. Also ASCII.
- 1st & 3rd Class-$195
- 2nd Class-$395
- Carrier Route-$300

PostalSoft
515 Division St.
LaCrosse, WI 54601-4544
800/831-6245, 608/784-3500

ProMark DMS
Database, Word Processor & Mail Merge, 50 user defined fields, indexes, unlimited sorting & selecting. Prints labels, lists & letters. Menu driven, easy to use. Comes with excellent manuals & tutorial disk. FREE DEMO DISK, 68 point comparison chart & Literature. For IBM PC/XT/AT, 256K.
ProMark Software Inc.
106-314 E. Holly
Bellingham, WA 98225
800/663-4687

"The Mail Order Wizard
is one very powerful program. It offers a catalog business all the computing routines it needs-and then some!...gives new meaning to the hackneyed phrase, 'user friendly'... Written in Assembler, it operates with lightning speed... very serious software, a 'must see.'" *Catalog Age*. $970. Demo, $12.
The Haven Corporation
802 Madison, Dept. W
Evanston, IL 60202
800/782-8278, 312/869-3434

Lists & Labels
Mailing list software w/many extras. Menu-driven w/2 address lines, 2 ph.#s, 2 dates, 9-digit zip, codes, & comments. Pull your list of codes up on-screen! Hard-copy reports; on-screen browse. Combine/recall filters, design your labels, & analyze your lists. IBM/compats. $159. Free brochure.
ELSWARE
PO Box 9
Camarillo, CA 93011
800/422-2408

Maintenance Management

Maintenance & Inspection
An integrated maintenance management system, including parts inventory, with clients in Fortune 500 companies, utilities, hospitals, schools, manufacturing & service industries etc. The online system provides operational, planning & analytical reports such as work orders, schedules, skill & inventory requirements, budget reports & reports that summarize history of work performed.
Penguin Computer Consultants
PO Box 20485
San Jose, CA 95160
408/997-7703

Manufacturing

Mini Myke
ENTRY LEVEL MANUFACTURING SYSTEM for make to order, make to stock, process & repetitive mfg. Fully integrated acctg/dist/mfg system costs $5790. EASY to install & use—expands with options—grows to full MYTE MYKE MRPII system without loss of investment. Avail on PCs, Novell, Xenix, UNIX.
M & D Systems, Inc.
3885 N. Buffalo Rd.
Orchard Park, NY 14127
716/662-6611

SUMIT MRP
DATA BASE oriented. Includes Material Requirements Planning, WIP Accounting, BOM, Standard Costing, Material/Inventory, Order Entry, Purchasing, & General Accounting (AR, AP, GL); all fully integrated. REVELATION with PC-DOS or network; or PICK Operating System. DOS demo diskette: $10 prepaid.
SUM Data Systems, Inc.
1200 N. Pacific Coast Hwy.
Hermosa Beach, CA 90254
213/410-0022

Shop Floor Control
A stand-alone system for scheduling, monitoring & control of mfg. Includes routings, work orders, labor feedback, W/O & Job tracking, employee & work center perf., backward/forward scheduling, Capacity Planning, on-line WIP & historical data inquiry. Single/multi-user. Demo disk, instr. & manual $10.
Production Systems Inc.
526 South E St.
Santa Rosa, CA 95404
707/526-1294

ManuFACT™
Materials Management, BOM & PO $2250—Job Cost $800. Used by private label mfgrs, Fortune 100 & job shops with sales of $2MM-$40MM. Multi user/lot location/co. Unit of Measure, "what if" & req. planning. Tracks standard/actual cost for labor/burden/material. WIP router. Cyclic count. Acctg avail. & much more.
Synergistic Systems, Inc.
429 Honeyspot Road
Stratford, CT 06497
203/378-7871

Manufacturing Inventory
Integrated Inventory Control, Bills of Material, & Purchase Orders with direct accounting interface, priced at only $995. Special money-back guarantee. Read the review in the 12/86 issue of *PC World*, pp. 246-251, or explore MISys yourself & print sample reports using our demo ($5 ppd).
Microcomputer Specialists, Inc.
PO Box 795
Woodstock, VT 05091
800/833-1500, 802/457-4600

MFG. Control System
A comprehensive system for repetitive or job shop type manufacturers consisting of: B/M, Inventory, Order Processing, Purchasing, Mat. Req. Planning MRP, MPS, Shop Floor Ctrl. & CRP, Cost devel., Job & W/O Costing, Accounting. 1 yr. warranty included. Train & consult avail. Compare our system & prices for best value.
Production Systems Inc.
526 South E St.
Santa Rosa, CA 95404
707/526-1294

Medical

Medical Systems w/ECS
All PPM products have electronic claims submission (ECS) to Medicare & commercial carriers, paper claims too.
- *PC*CLAIM $89.95, claims only.
- *PC*CLAIM w/ICD's, CPT's & HCPC codes $229.95.
- *PC*CLAIM PLUS claims only w/patient file. Complete a claim in one minute $459.

Physicians Practice Management
1810 South Lynhurst, Ste. Q
Indianapolis, IN 46241
317/248-0357; 800/428-3515 (Nat'l); 800/792-3525 (IN)

Medical Systems w/ECS
*THRESHOLD™ $1,995 claims, A/R, patient billing. *THRESHOLD $3,995 claims, A/R, patient billing, complete practice mgt. statistics, analysis. *CLAIM*NET Nationwide claims clearinghouse. Full 100% credit on product upgrade. PC*CLAIM & PC*CLAIM PLUS both house 30-day $ back grts. IBM PC/XT/AT/comp., MS-DOS, 256K.
Physicians Practice Management
1810 South Lynhurst, Ste. Q
Indianapolis, IN 46241
317/248-0357; 800/428-3515 (Nat'l); 800/792-3525 (IN)

Medical/Dental Systems
Support for more than 130 machines. Featuring paper & electronic claims, patient billing, appointments, diagnostic data base, word processing, financial histories, payroll, accounts payable, & general ledger. Single & multi-user systems. Starting at $199.95. 2,400 Dealers.
CMA Micro Computer
55888 Yucca Trail #6
Yucca Valley, CA 92284
619/365-9718

Music

SongWright IV
Music Processor prints professional sheet music, songs, scores with text, chords, symbols. Compose, edit, copy, record, transcribe, play, transpose to any key. Bass/treble, multiple staves, all meters. MIDI optional. IBM/Epson/Star printers; CGA/Hercules graphics. $89.95. Send for free sample output.
SongWright Software
Route 1, Box 83
Lovettsville, VA 22080
703/822-9068

Advertisement

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

Project Management

$59 Gantt Miracle

PROTRACS offers easy project management at an affordable price. Track 400 tasks in every project by responsibility & priority. Produce 6 standard (& unlimited custom) reports, & 4 different Gantt charts in 2-month or annual formats. Windows, popups, custom calendar, swift sorting & searching, LAN compatible. Elegant, simple, very fast, & only $59.95.
Applied MicroSystems, Inc.
PO Box 832
Roswell, GA 30077
404/475-0832

Public Domain/ Shareware

$3 Software for IBM PC

Hundreds to choose from, word processors, data bases, spreadsheets, games, x-rated, lotto, communications, business, music, bible, art, education, language & useful utilities for making your computer easier to learn. Most programs have documentation on the disk. Write for your FREE catalog today!
Best Bits & Bytes
PO Box 8245, Dept. W
Van Nuys, CA 91409
818/781-9975

$ SAVE $ SAVE $ SAVE $
ON IBM-PC SOFTWARE!

AS-EASY-AS (Great Spreadsheet. 256k & graphics.)
PC-WRITE (Classic Word Processor. HP Laser support.)
GL/AR/PR/AP (4 Accounting programs. Fast!)
PC-FILE+ (2 disks. Super Database Management.)
PC-DESKTEAM (9 useful utilities. Clock, calc., notes...)
PC-STYLE (Writing Style Analysis Program.)
PFROI (Portfolio Management System.)
MONO GAMES (6 Monochrome arcade games.)
COLOR GAMES (7 CGA arcade games. Frog, Kong...)
RES (Real Estate System. Hard Drive Required.)
MR. BILL (2 disks. Time Billing System. Very versatile.)
ELEM ED 2 (Educational games for 4-9 year olds.)
GRADES (Gradebook database for teachers.)
INVENTORY (2 complete inventory systems.)
PC-TUTOR (DOS & keyboard tutorial. Very interactive.)
PC-PROMPT (On-line DOS manual. Memory Resident.)
FASTYPE (Typing practice/tutorial program.)
BIBLEQ (Old & New Testament quiz game.)
TIME & MONEY (Home budgeting program.)

Any 10 disks for $29.95
Single Disks are $5.00 each.
Add $1 for 3 1/2" disks.
All orders add $3 shipping.
MC/Visa Welcome. $10.00 Min.
Call or Write for FREE Catalog.

SOFT/PLUS RESEARCH
759 S. State St. Suite 109
Ukiah, CA 95482
(800) 843-3882 US
(707) 462-3118 CA
(707) 463-1240 Fax

CIRCLE 518 ON READER SERVICE CARD

PUBLIC DOMAIN/SHAREWARE
* 800 Disks/10,000 Pgms
* LOWEST Prices !!!
* 24 Hour Processing
* Complete Catalog in 27 Diff. Categories
* Send $1 for Catalog and Get $2 Back

CCS, INC.
309 RUSSO DRIVE
HAMDEN, CT. 06518
(203) 248-4241

CIRCLE 524 ON READER SERVICE CARD

Real Estate

• Property Mgt Plus/88 •

New version which looks up tenants & posts rent by Tenant Name. Prints.. Bank Deposit Slips, Rent Statements, & Automatic Checks. Reports.. Late Rents, Vacancies & Expired Leases. Posts Management Fees, Pays Owners & does 1099s. Saves up to 80% of accounting time & is the EASIEST system to use! Special Price: $375.
Realty Software
1926 S. Pacific Coast Hwy. #229
Redondo Beach, CA 90277
213/372-9419

Management & Analysis

• "Real Property Management" $395/$595 for residential & commercial properties & other bookkeeping. Flags delinquent tenants; prints budgets, checks, invoices & 1099s. No retyping of recurring data.
• "Real Analyzer" $195 for deciding when to buy, sell, exchange, or refinance.
Visa/MC. 30 day money back.
Real-Comp Inc.
PO Box 1210
Cupertino, CA 95015
408/996-1160

Property Managers

Two systems to match your exact property management needs. *Rental Manager* handles all tenant activities; features built-in general ledger. Flexibility allows multiple properties per owner. *Condo Manager* is designed for community associations. Handles member payments, charges, & generates accounting reports.
Coleman Business Systems
3654 Arcadian Dr.
Castro Valley, CA 94546
415/581-7125

Property Management

Comprehensive program for managing residential & commercial properties. Many management reports including operating statement, delinquent rent, lease expiration & transaction register. Provides check writing, check reconciliation, posting of late fees, recurring expenses–$495. Investment analysis-$245.
Yardi Systems, Inc.
930 Laguna St.
Santa Barbara, CA 93101
805/966-3666

Motel/Hotel Mgt System

Designed for properties that rent on a short term basis. Automatic search for available rooms, check-in check-out reports, current occupancy report, confirmations & mailing labels, guest check-out statements, history file, & more. Fast access, user-friendly, mono/color. $795 Complete, Demo $15.
Contemporary Computer Services Inc.
PO Box 6158
Fernandina Beach, FL 32034
904/277-4170

Apartment Building Mgt.

Site Manager™ software keeps owners constantly informed of daily management details effecting profits. Resident managers simply "fill in the blanks" for automated record-keeping. Reports are automatically generated & transmitted to the owner for follow-up, giving them total control without being there. Versions also available for owner/managers. $295-$895.
Skyline Systems
PO Box 21845
Seattle, WA 98111
206/282-9462
Dealer Inquiries Welcome.

Loan Amortization

AmPack is a straightforward loan-amortization software package designed by a CPA & tax attorney. *AmPack* supports variable rates, graduated, skipped, & principal-only payments. Also includes balloons, negative amortizations, customized schedules, loan analysis, & more. $49.50 + $5 s/h. MC/Visa.
Softflair, Inc.
8753 Park View
Milwaukee, WI 53226
414/778-7200

REAL—HELP™ $69.95

Investment Analysis. Detailed analysis forecasting long/short term Return On Investments using "what if" situations. AMORTIZATION schedules that compensates for variable int./payments, balloon or full term. DATABASE with powerful sort/search function. Payment Comparison to define your best terms.
Accurate Investment Co.
PO Box 42002
Plymouth, MN 55442
612/559-8375

Sales/Marketing

Name Generator

NAMER™ is a $99 software/data base package for creating new company, product & service names. 11 different name generation methods & an electronic naming thesaurus containing over 10,000 name-parts in 500+ categories. NAMER is used by thousands of companies to create names like Talent Pulse (headhunters), Coral-Ice (perfume) & Pandora's Secrets (candy).
Salinon
7430 Greenville
Dallas, TX 75231
800/722-0054, 214/692-9091

Statistics

BMDP Stat Software

Pick & Choose for Your PC. BMDP offers 40 programs for data analysis. But you can choose any combination to suit your needs. From simple statistics & plots, to t-tests, ANOVA, stepwise regression, time series, frequency tables, survival analysis & more! Hard disk req'd. Call for free catalog.
BMDP Statistical Software, Inc.
1440 Sepulveda Blvd. #316
Los Angeles, CA 90025
213/479-7799; FAX: 213/312-0161

NCSS-5.0

ALL NEW spreadsheet style. Multiple & stepwise regression, ANOVA, time series, discriminant, factor, cluster, principal components, t-tests, contingency table, nonparametrics. Easy interface to Lotus, *dBASE*, etc. Sort, join, merge data base. $99. Visa/MC.
NCSS-PC
865 East 400 North
Kaysville, UT 84037
801/546-0445

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs

High performance STATISTICAL SYSTEM

Limited time price $149.

STATS+

A powerful, elegant, and super-fast statistical package integrated with complete data management and dynamic graphs. Comprehensive selection of descriptive, inferential, and exploratory statistics with forecasting. STATS+ features intelligent, two-way interfaces to data from Lotus, Symphony, dBIII+, and other programs. **For more info look for our ads in most computer journals, ask your dealer, or contact StatSoft.** Price $245 (+$5 ship/handl).

StatSoft 2325 E. 13th St., Tulsa, OK 74104 (918) 583-4149

Overseas offices: **StatSoft of Europe** (Hamburg, FRG), ph.: 040/4200347; **StatSoft UK** (London, UK), ph.: 07072 71166; **Hearne Software** (Melbourne, Australia), ph.: 613-497-4276

CIRCLE 520 ON READER SERVICE CARD

StatPlan III

Easiest to use statistics program available. Complete range of statistics: curve fitting, crosstabs, correlation, multiple regression, t-tests, time-series analysis, etc. Graphics with printer/plotter output. Capable of handling up to 50,000 data points. Interfaces with Lotus files. Demo disk available. $179.
The Futures Group
76 Eastern Blvd.
Glastonbury, CT 06033
203/633-3501

StatPac Gold™

Landslide Victory! Best statistical & forecasting package of 1987. *PC World* Vertical Market World Class Awards. Fast, accurate, reliable & user-friendly. Includes data manager, basic & advanced statistics, tables, windows, graphics & utilities. Quality at a low price. Call.
Walonick Associates, Inc.
6500 Nicollet Ave. S.
Minneapolis, MN 55423
800/328-4907

STATISTIX II

Comprehensive, powerful and incredibly easy-to-use. Full screen editor, transformations, linear models (ANOVA, regression, logit, PCA, etc), ARIMA, most standard stat procedures. Clear, well organized documentation. Satisfaction guaranteed. $169 PC DOS, $99 Apple II.
NH Analytical Software
PO Box 13204
Roseville, MN 55113
612/631-2852

Spreadsheet Statistics

NEW! 23 comprehensive statistics & forecasting modules for analyzing LOTUS worksheets. Low cost $24.95 each. Easy to use. Includes tutorial. Ideal for vertical markets. Basic & advanced statistics with graphics & many user-definable options. Compare. Nothing else comes close. Free brochure.
Walonick Associates, Inc.
6500 Nicollet Ave. S.
Minneapolis, MN 55423
612/866-9022

Forecasting is EASY

with PRO*CAST 2.0. All you need to know is your past history. Complete time series analysis from linear trend to Box-Jenkins. Auto/manual modes. Built-in editor. Reads .WKS & ASCII. Great graphics! Not copy protected. $295 with 30-day money back guarantee. Demo $10.
Fleming Software
PO Box 528
Oakton, VA 22124
703/591-6451

Surveys

The Survey System

A complete, easy-to-learn package for the entry, editing, processing & presentation of questionnaire data. Produces banner format crosstabs & related tables, statistics (incl. regression) & bar charts. Also codes & reports open-ends. All reports are camera-ready. CRT interviewing option available.
Creative Research Systems
15 Lone Oak Ctr., Dept. W
Petaluma, CA 94952
707/765-1001

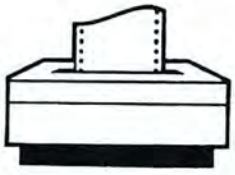
Taxes

W-2 (Copy A) on Floppy

The W-2 MAG program makes an IRS/SSA format floppy from a data entry screen or imported ASCII file. Includes manual & application forms.

- Used nationwide
- Menus, user friendly
- Step-by-step data entry
- Prints W-2 forms
- Free phone support
- PC compatible, 1 floppy, 256K, hard disk, DOS 2.1 or later.

Illinois Business Machines Inc.
Dept. PC, 1403 Box 310 Troy Rd.
Edwardsville, IL 62025
618/692-6060



Terminal Emulation

Get the whole story on graphics terminal emulation.

To find out more about software that lets your PC emulate TEKTRONIX™ 4105/6/7/9 and DEC VT100™ terminals, call or write:

GRAFPOINT
4340 Stevens Creeks Blvd., Suite 280, San Jose, CA 95129 (408) 249-7951

CIRCLE 509 ON READER SERVICE CARD

REACH 1.1 MILLION BUYERS. ADVERTISE IN *The PC World Catalog.* CALL 800-435-7766 In CA: 800-435-7760

Terminal Emulation

EM220 VT220 and VT102 emulator. Includes file transfer, screen scroll back, and many other features.

EM4105 TEK 4105/4010 Color graphics emulator with VT220 emulation. Supports EGA/VGA, high resolution hardcopy, pan/zoom, and EM220 features.

Diversified Computer Systems, Inc.
3775 Iris Avenue, Suite 1B
Boulder, Colorado 80301 (303) 447-9251

Trademarks: VT 102, VT 220 — Digital Equipment Corp.; Tektronix — Tektronix Inc.

CIRCLE 531 ON READER SERVICE CARD

CATALOG

PC WORLD

Shop *The PC World Catalog* for fast solutions to your PC needs.

Time Management

SKED
Lists imminent events by date. Can auto-repeat each by number of days, weeks, months, years and/or the nth or nth-to-last instance of a weekday in a month; individual warning period. Highly intuitive; no commands to learn. Uses your pop-up editor. Demo: $3 refundable. Full: $45. Checks. S/h incl.
Henry Gardiner
2701-C W. 15th #614
Plano, TX 75075
214/423-6875

Utilities

Opt-Tech Sort/Merge 3.0
Extremely fast Sort/Merge program. Run as a DOS command or CALL as a subroutine. Unlimited filesizes, most languages, datatypes & filetypes supported including Btrieve & dBASE. Advanced features include record selection, record reformatting & much more! Call or write for more info. MS-DOS $149, Xenix $249.
Opt-Tech Data Processing
PO Box 678
Zephyr Cove, NV 89448
702/588-3737

PC MAGAZINE EDITOR'S CHOICE

Direct Access 4.1

- User-Defined Menu System (400 Menu Options)
- Single Keystroke Access
- Usage Tracking
- Complete Password Protection
- Built-In File Finder
- And More

$89.95

P.O. Box 1104
Eau Claire, WI 54702
Call Toll-Free
1-800-242-6368
for Dealer Nearest You

DELTA TECHNOLOGY INTERNATIONAL

CIRCLE 530 ON READER SERVICE CARD

IBM Uses CP/M & Apple!
"The best CP/M to DOS converter" *PC* mag. 4/85. UniForm PC transfers files/formats/reads & writes DIRECTLY TO 200 CP/M disk formats on your IBM PC, XT, AT (also 96 TPI & 8"). Use normal DOS commands. $62.95 + $3 s/h. By Micro Solutions. NEW! MatchPoint card copies Apple DOS & CP/M files to IBM. BOTH products at $185 + $3 s/h. Dealers invited.
Blue Heron
1108 S. Second St.
DeKalb, IL 60115
815/758-2355

Copy II PC
Backs up most protected software quickly & easily. Even runs many popular business programs from your hard disk - conveniently! (Call for list). For IBM PC/XT/AT/some compatibles. Updated regularly. Not copy-protected, of course! (Also avail. for Apple/,Mac, C64/128, Atari ST.) $39.95 + s/h. Visa/MC/chk.
Central Point Software, Inc.
9700 SW Capitol Hwy. #100
Portland, OR 97219
503/244-5782

Word Processing

Word For Word
Converts documents, two-ways, between any of 12 word processors & 3 communication formats: *WordStar, WordPerfect, MultiMate, OfficeWriter, Volkswriter, PFS, Writing Asst, Microsoft Word, XyWrite, DisplayWrite* (DCA/RFT), "Smart" ASCII, EBCDIC. Preserves all formatting. $149. LAN version avail.
Mastersoft, Inc.
4621 N. 16th St., Ste. A-108
Phoenix, AZ 85016;
Orders: 800/624-6107, ext 102; Info: 602/277-0900

WordPerfect™ Add-On
TURN *WordPerfect*™ INTO A SCIENTIFIC WORD PROCESSOR. Display & print complete Greek & math symbol sets. Key hardware supported. Includes display chip, printer downloading program & free custom printer definitions & macros w/proof of purchase of *WordPerfect*. Call for flyer & ordering info. ONLY $75.
Scientific Word Processing Enhancements
8320 N. Lockwood Ave.
Skokie, IL 60077
312/677-4270

PC-Write™ Ver. 2.71
Fast, full featured word processor, with spell check, screen clip, mail-merge, split screen, macros. Easy to use. Supports 400 printers. Software, User Guide, & Tutorial on 2 disks for $16. Try it, then register for $89 and get User Manual, 1 year support, newsletter & 2 upgrades. 90-day guarantee. Visa/MC. CALL TODAY!
Quicksoft
219 First N. #224-PWOC
Seattle, WA 98109
800/888-8088

WordPerfect: FastPrint
Accelerates *WordPerfect* proportional printing on typical Diablo-compatible daisy-wheel printers by 2.2 times, or 88% of non-proportional rate. Demo disk: $3, refundable. Fully functional: $45. Checks. PC/MS-DOS 2.0 or greater. S/h included.
Henry Gardiner
2701-C W. 15th #614
Plano, TX 75075
214/423-6875

MouseMenus
High quality menu programs provide mouse access to virtually all functions of *WordPerfect 4.1 & 4.2, WordStar 3.31 & 4.0 & 2000*, or *MultiMate ADV II*. Why remember finger contorting function-key commands? Boost speed, while saving memory & time. Specify brand, $49 + $5 s/h, in MA add 5% tax.
MouseMenus, Inc.
PO Box 1020,
Brookline, MA 02146
617/964-0067, order 800/641-3322 x1020, in MO 800/492-3322 x1020

AT's DON'T NEED 360KB DRIVES

The 1.2MB drive has long been known to **READ** but **NOT** reliably **WRITE** on 360KB floppies. With **"CPYAT2PC"** 1.2MB drives **CAN** reliably **WRITE** 360KB floppies saving a slot for a second hard disk or backup tape. **"CPYAT2PC"** (Not Copy Protected) offers the preferable **SOFTWARE SOLUTION.**

- **NO** software or hardware modification
- A 360K drive is **NOT** required
- **"CPYAT2PC"** program resides on hard disk
- Runs on IBM PC/AT and COMPATIBLES i.e. Compaq Deskpro 286/386/III, AT&T 6300+, HP Vectra, Sperry PC/IT, Tandy 3000

Only $79.00 + $4.00 S/H VISA, MC, COD, UPS-B/R
ORDER TOLL FREE 1-800-523-8777
TELEX EZLINK 62873089
Dealer Inquiries Invited

VISA · master charge

MICROBRIDGE COMPUTERS
655 Skyway #125 • San Carlos, CA 94070
CA 415-593-8777 • NY 212-334-1858

CIRCLE 513 ON READER SERVICE CARD

CATALOG

PLACE YOUR AD IN *The PC World Catalog* TODAY.
800-435-7766
In CA: 800-435-7760

PRODUCTS FEATURED IN THIS ISSUE

Reader Service Number

Accounting

601 Accpac BPI Accounting, Computer Associates Int'l, page 130

Add-On Board

602 BocaRAM/30, Boca Research, page 126
603 Designer VGA, Orchid Technology, page 124
604 Designer VGA-2, Orchid Technology, page 124
605 D-Z Option Speed Up Kit, Innovation Computer Corp., page 257
606 Hot Shot/286, AST Research, page 174
607 JLaser Plus, Tall Tree Systems, page 238
608 LaserMaster CapCard, LaserMaster Corp., page 238
609 QuadMEG PS/Q, Quadram, page 130
610 Ten Time, Konan Corp., page 120

Computer System

611 Hyundai Super-286, Hyundai Electronics America, page 124
612 PC Terminal, Hyundai Electronics America, page 124
613 SupersPort, Zenith Data Systems, page 119
614 SupersPort 286, Zenith Data Systems, page 119
615 TurbosPort 386, Zenith Data Systems, page 119
616 Vectra ES/12, Hewlett-Packard, page 170

Data Base Management

617 Paradox 386, Borland Int'l, page 128
618 PicturePower 1.7, PictureWare, page 15
619 Q&A 3.0, Symantec Corp., page 128
620 Zoomracks II, Quickview Systems, page 210

Desktop Publishing

621 Adobe Font Library, Adobe Systems, page 227
622 Adobe PostScript Typefaces, Alcatel Qume, page 227
623 Alphabets, Wilkes Publishing, page 227
624 Balifonts, Janus Assoc., page 226
625 Byline, Ashton-Tate, page 162
626 ClickArt, T/Maker, page 223
627 ClickArt EPS Illustrations, T/Maker, page 223
628 Conofonts, Conographic, page 226
629 Desktop Art, Dynamic Graphics, page 223
630 Digit Art, Image Club Graphics, page 223
631 Font Effects, SoftCraft, page 229
632 Font Factory Library, The Font Factory, page 226
633 FontGen IV+, VS Software, page 229
634 Font Pac, Metro Software, page 227
635 Fontware, Bitstream, page 227
636 Glyphix, SWFTE Int'l, page 227
637 The Graphic Link, PC Quick-Art, page 228
638 Headline, Corel Systems, page 228
639 Hewlett-Packard SoftFonts, Hewlett-Packard, page 226
640 Hijaak, Inset Systems, page 228
641 Hotshot Grab, Symsoft, page 228
642 HotType, Image Club Graphics, page 223
643 Hyphenation Dictionary for Ventura Publisher, Edco Services, page 222
644 Laser FX, Postcraft Int'l, page 228
645 Laser FX-Pak, Postcraft Int'l, page 228
646 LePrint Headliner, LeBaugh Software, page 228
647 LJ Fonts, Weaver Graphics, page 227
648 Magic Font, Computer Editype Systems, page 226
649 Newfont, Corel Systems, page 229
650 The Office Publisher, Laser Friendly, page 194
651 Office Series Typefaces, Alcatel Qume, page 226
652 PageMaker Portfolio: Designs for Business Communications, Aldus Corp., page 222
653 PageMaker Portfolio: Designs for Newsletters, Aldus Corp., page 222
654 PC Quick-Art, PC Quick-Art, page 223
655 Pizazz, Application Techniques, page 229
656 Professional Series Typefaces, Alcatel Qume, page 226
657 PS Portfolio, Lexisoft, page 229
658 Publisher's PicturePacks, MGI, page 223
659 Publisher's Type Foundry, ZSoft, page 229
660 SDP Font Library, Lexisoft, page 226
661 SoftCraft Font Editor, SoftCraft, page 229
662 Spellbinder Art Library, Lexisoft, page 223
663 Standard Series, SoftCraft, page 226
664 Style Sheet Secrets, New Riders, page 222
665 Supplemental Font Pak, VS Software, page 229
666 Tabin, Corel Systems, page 222
667 Table Manners, The Desktop Publishing Group, page 222
668 Typefoundry Series, SoftCraft, page 227
669 Ventura Designer Stylesheets, BCA/Desktop Designs, page 222
670 Ventura Utilities, Corel Systems, page 222
671 VP/Fonts, The Laser Edge, page 229
672 VP/Saddle, The Laser Edge, page 222
673 VP/Tabs, The Laser Edge, page 223
674 VPToolbox, SNA, page 222
675 VS Library, VS Software, page 227
676 Windows Clipart, Micrografx, page 223
677 WYSIfonts, SoftCraft, page 229
678 ZFonts, Straightforward, page 227

Disk Drive

679 DoublePlay, Rodime, page 255

Display

680 2Page Display, Verticom, page 184
681 MultiSync II, NEC Home Electronics, page 182
682 MultiSync GS, NEC Home Electronics, page 126
683 MultiSync MonoGraph, NEC Home Electronics, page 120

Input Device

684 Force Stick, Tactron Scientific, page 128
685 Microsoft Mouse, Microsoft Corp., page 258
686 Numerikeys, Genest Technologies, page 126

Integrated Software

687 VenturPlan, Venture Software, page 122

LAN Software

688 Tapestry/8, Torus Systems, page 130

On-Disk Publication

689 Small Business Consultant, Microsoft Corp., page 14
690 Stat Pack, Microsoft Corp., page 14

Operating System/ Environment

691 Personal DeskMate 2, Tandy Corp., page 13
692 Professional DeskMate, Tandy Corp., page 13
693 OS/2, IBM, page 230

Printer

694 AST TurboLaser/PS, AST Research, page 149
695 IBM Personal Pageprinter, IBM, page 150
696 NEC Silentwriter LC890, NEC Information Systems, page 148
697 QMS-PS 810, QMS, page 151
698 Qume Scripten, Qume Corp., page 149
699 RuggedWriter 480, Hewlett-Packard, page 190

Scanner

700 MegaScan II, Advanced Vision Research, page 159
701 Model 730, Datacopy Corp., page 155
702 MSF-300C, Microtek Lab, page 158
703 PC Scan 2020, Dest Corp., page 156
704 ScanJet, Hewlett-Packard, page 157

Security

705 Computer insurance policy, Data Security Insurance, page 247
706 Computer insurance policy, Safeware, page 247
707 The Lock Kit, Inmac, page 247
708 Maximum security system, Anchor Pad, page 247

Spreadsheet

709 1-2-3 release 3, Lotus Development Corp., page 134
710 VP-Planner Plus 2.0, Paperback Software Int'l, page 198

Telecommunications Software

711 Boyan D3, Boyan Communications, page 204

Utility

712 DS Optimize 1.00a, Design Software, page 238
713 Flash 5.0, Software Masters, page 238
714 Mace Utilities, Paul Mace Software, page 238
715 The Norton Utilities, Advanced Edition, Peter Norton Computing, page 238
716 Pelpak, Hewlett-Packard, page 238
717 Q-DOS II 2.0, Gazelle Systems, page 210
718 S.F.E. Utilities, Bourbaki, page 126
719 SideKick Plus, Borland Int'l, page 13
720 Snapshot, Aldus Corp., page 122

Word Processing

721 Manuscript 2.0, Lotus Development Corp., page 130
722 WordPerfect 5.0, WordPerfect Corp., page 138

PC WORLD
The Magazine for PC Decision-Makers

Please print or type all information.

Name *Title*

Company

Address *City, State, Zip (zip code needed to ensure delivery)*

Phone: Area code/Number

FREE PRODUCT INFORMATION

Circle the number(s) for free information.

☐ Check this box and fill in the appropriate information to subscribe to *PC World*. You will be billed $19.97 for a 1-year (12-issue) subscription (U.S. only).

(1-250)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250		

(251-500)

251	252	253	254	255	256	257	258	259	260	261	262
263	264	265	266	267	268	269	270	271	272	273	274
275	276	277	278	279	280	281	282	283	284	285	286
287	288	289	290	291	292	293	294	295	296	297	298
299	300	301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320	321	322
323	324	325	326	327	328	329	330	331	332	333	334
335	336	337	338	339	340	341	342	343	344	345	346
347	348	349	350	351	352	353	354	355	356	357	358
359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382
383	384	385	386	387	388	389	390	391	392	393	394
395	396	397	398	399	400	401	402	403	404	405	406
407	408	409	410	411	412	413	414	415	416	417	418
419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442
443	444	445	446	447	448	449	450	451	452	453	454
455	456	457	458	459	460	461	462	463	464	465	466
467	468	469	470	471	472	473	474	475	476	477	478
479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500		

CATALOG INFORMATION

501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

EDITORIAL INFORMATION

601	602	603	604	605	606	607	608
609	610	611	612	613	614	615	616
617	618	619	620	621	622	623	624
625	626	627	628	629	630	631	632
633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648
649	650	651	652	653	654	655	656
657	658	659	660	661	662	663	664
665	666	667	668	669	670	671	672
673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688
689	690	691	692	693	694	695	696
697	698	699	700	701	702	703	704
705	706	707	708	709	710	711	712
713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728
729	730	731	732	733	734	735	736
737	738	739	740	741	742	743	744
745	746	747	748	749	750		

Expires 8/16/88 **N1** **MAY 1988**

PC WORLD
The Magazine for PC Decision-Makers

Please print or type all information.

Name *Title*

Company

Address *City, State, Zip (zip code needed to ensure delivery)*

Phone: Area code/Number

FREE PRODUCT INFORMATION

Circle the number(s) for free information.

☐ Check this box and fill in the appropriate information to subscribe to *PC World*. You will be billed $19.97 for a 1-year (12-issue) subscription (U.S. only).

(1-250)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250		

(251-500)

251	252	253	254	255	256	257	258	259	260	261	262
263	264	265	266	267	268	269	270	271	272	273	274
275	276	277	278	279	280	281	282	283	284	285	286
287	288	289	290	291	292	293	294	295	296	297	298
299	300	301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320	321	322
323	324	325	326	327	328	329	330	331	332	333	334
335	336	337	338	339	340	341	342	343	344	345	346
347	348	349	350	351	352	353	354	355	356	357	358
359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382
383	384	385	386	387	388	389	390	391	392	393	394
395	396	397	398	399	400	401	402	403	404	405	406
407	408	409	410	411	412	413	414	415	416	417	418
419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442
443	444	445	446	447	448	449	450	451	452	453	454
455	456	457	458	459	460	461	462	463	464	465	466
467	468	469	470	471	472	473	474	475	476	477	478
479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500		

CATALOG INFORMATION

501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

EDITORIAL INFORMATION

601	602	603	604	605	606	607	608
609	610	611	612	613	614	615	616
617	618	619	620	621	622	623	624
625	626	627	628	629	630	631	632
633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648
649	650	651	652	653	654	655	656
657	658	659	660	661	662	663	664
665	666	667	668	669	670	671	672
673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688
689	690	691	692	693	694	695	696
697	698	699	700	701	702	703	704
705	706	707	708	709	710	711	712
713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728
729	730	731	732	733	734	735	736
737	738	739	740	741	742	743	744
745	746	747	748	749	750		

Expires 8/16/88 **N2** **MAY 1988**

PC WORLD
The Magazine for PC Decision-Makers

Please print or type all information.

Name *Title*

Company

Address *City, State, Zip (zip code needed to ensure delivery)*

Phone: Area code/Number

FREE PRODUCT INFORMATION

Circle the number(s) for free information.

☐ Check this box and fill in the appropriate information to subscribe to *PC World*. You will be billed $19.97 for a 1-year (12-issue) subscription (U.S. only).

(1-250)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212	213	214	215	216
217	218	219	220	221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250		

(251-500)

251	252	253	254	255	256	257	258	259	260	261	262
263	264	265	266	267	268	269	270	271	272	273	274
275	276	277	278	279	280	281	282	283	284	285	286
287	288	289	290	291	292	293	294	295	296	297	298
299	300	301	302	303	304	305	306	307	308	309	310
311	312	313	314	315	316	317	318	319	320	321	322
323	324	325	326	327	328	329	330	331	332	333	334
335	336	337	338	339	340	341	342	343	344	345	346
347	348	349	350	351	352	353	354	355	356	357	358
359	360	361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380	381	382
383	384	385	386	387	388	389	390	391	392	393	394
395	396	397	398	399	400	401	402	403	404	405	406
407	408	409	410	411	412	413	414	415	416	417	418
419	420	421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440	441	442
443	444	445	446	447	448	449	450	451	452	453	454
455	456	457	458	459	460	461	462	463	464	465	466
467	468	469	470	471	472	473	474	475	476	477	478
479	480	481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500		

CATALOG INFORMATION

501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600

EDITORIAL INFORMATION

601	602	603	604	605	606	607	608
609	610	611	612	613	614	615	616
617	618	619	620	621	622	623	624
625	626	627	628	629	630	631	632
633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648
649	650	651	652	653	654	655	656
657	658	659	660	661	662	663	664
665	666	667	668	669	670	671	672
673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688
689	690	691	692	693	694	695	696
697	698	699	700	701	702	703	704
705	706	707	708	709	710	711	712
713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728
729	730	731	732	733	734	735	736
737	738	739	740	741	742	743	744
745	746	747	748	749	750		

Expires 8/16/88 **N3** **MAY 1988**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD
The Magazine for PC Decision-Makers

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD
The Magazine for PC Decision-Makers

Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PC WORLD
The Magazine for PC Decision-Makers

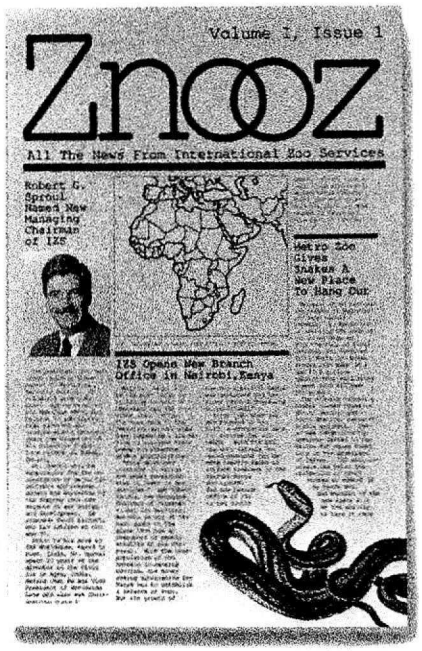
Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906

ADVERTISERS INDEX

Get more information—circle the appropriate number on the reader service card.

Reader Service Number	
49	Acer Technologies Corp., pages 136-137
114	Adobe Systems, Inc., pages 66-67
71	Advanced Digital Corp., page 31
128	Advanced Logic Research, Inc., page 10 End Users
129	Advanced Logic Research, Inc., page 10 Dealers
—	Aldus Corp., pages 196-197
2	ALPS America, pages 24-25
306	American Small Business Computers, Inc., page 259
14	Amstrad, page 173
—	Arlington Computer Products, pages 306-307
16	Ashton-Tate, pages 82-83
302	ATI Technologies, pages 132-133
52	Bedford Software Corp., page 216
20	Bible Research Systems, page 26
66	Big Blue Disk, page 58
87	Borland, Int'l., page C2,P1
88	Borland, Int'l., page 5
21	Borland, Int'l., page 7
93	Breakthrough Software, page 207
108	Breakthrough Software, page 175
24	Bulldog Computer Products, pages 114-115
3	Casi-Rusco, page 86
155	Central Point Software, Inc., page 270
94	CMS Enhancements, Inc., page 103
—	Compaq, pages 116-117
44	Complete PC, The, pages 249-251
—	CompuAdd, pages 32-57
4	Compuclassics, page 262
200	Computer Discount Warehouse, page 305
91	Computer Expo, page 308
116	Computer Mail Order, pages 89-96
58	Computer Support Corp., page 260
127	Cougar Mountain Software, page 102
—	DAC Software, Inc., page 129
—	Damark, Int'l., page 261
271	DCA/Crosstalk, page 99
46	Departmental Technologies, Inc., page 215
113	DEST Corp., pages 186-187
60	Diskette Connection, page 98
—	Dow Jones News/Retrieval, page 29
68	Fox Software, Inc., page 193
67	Fox & Geller, page 252
118	Glorious Union Informaton Systems, Inc., page 254
122	Great Western Electronics, page 26
—	G.E. Information Systems, page 84
35	Hauppauge Computer Works, Inc., page 235
79	Haventree Software, Ltd., page 88
26	Hewlett Packard, page 107
29	Hewlett Packard, page 109
39	Hewlett Packard, page 111
117	Hewlett Packard, page 256
90	Hummingbird Communication, Ltd., page 167
78	Hyundai, page 269
—	H&E Computronics, page Outsert
83	IMSI, page 104
—	Informix Software, Inc., pages 72-73
121	International Battery Corp., page 30
236	KAO Corp., page 201
41	Kenosha Computer Center, page 303
98	Kensignton, page C3
99	KeyTronic, page 87
103	Laser Connection, page 81
—	Lotus Development Corp., page 69,70,199,185
252	Macola Software, page 123
100	Magnavox, page 23
96	Manhattan Graphics, page 28
112	Mannesmann Tally, page 265
—	Maxell, page 8
73	Micro Way, page 211
—	Micrografx, page 20
—	Micrologic Corp., page 181
—	Microsoft Corp., pages 64-65, 191, 100-101
110	Microtek, page 141 End Users
111	Microtek, page 141 Dealers
65	Montgomery Grant, page 299
113	NBI, pages 212-213
—	NEC Home Electronics, pages 236-237
253	NEC Information Systems, Inc., page 217
132	Nitro Micro, page 301
17	Office Automation Systems, Inc., page 246
—	Oracle, page 17
15	Orc Technologies, page 302
—	PC Connection, Inc., pages 176-179
135	PC Network, The New, page 304
144	Peachtree Software, page 131
106	Personal Computer Products, Inc., pages 62-63
201	Personal Computer Support Group, pages 78-79
220	Personal Computer Support Group, page 127
61	Research Development Systems, Inc., page 80
224	Revelation Technologies, Inc., page 205
174	707 Computer Sales, page 309
166	Samna, page 183
163	SBT, page 74
31	Secure-It, Inc., page 98
283	Shamrock, page 245
97	Sigma Designs, page 11
—	Signal Research, Inc., page 253
101	Softcraft, Inc., page 269
—	Softline, page 209
18	SoftLogic Solutions, Inc., page 121
76	Software Link, The, page 27
77	Software Link, The, page 77
—	Software Spectrum, page 266
64	Stanford Systems, page 15
115	Starflite Telemarketing, page 300
189	Statsoft, page 68
48	SuperSell Software, Inc., page 273
124	3M, pages 60-61
197	Tandy/Radio Shack, page 22
—	Telemart, page 189
151	Timeworks, page 12
32	TOPS, pages 18-19
—	Toshiba, page 9
207	Tussey Computer Products, pages 168-169
123	T-Maker Company, page 203
102	Unison World, page 140
11	Ven-Tel, page C4
—	Warehouse Data Products, page 248
216	Wells American, page 71
—	Xerox Corp., pages 296-297
126	Z-Nix Company, Inc., page 267
219	Z-Soft, page 125

You can make communi



Start with something simple. Our style sheets make it easy.

Xerox Ventura Publisher is compatible with MS-DOS software, so you can build and edit documents from an incredibly rich variety of sources.

Including word processing, spreadsheet, graphics, and illustration programs.

You'll be amazed how quickly you create your first document.

For years, the PC has helped users create documents that are full of impressive facts, figures, and ideas.

There's just one area that's been overlooked. How to turn all this information into impressive looking documents.

With most word processing software, about all you can do is import a few charts into a document. So most people try to cut and paste by hand. Or worse yet, work with a desktop publishing program that creates more problems than it solves.

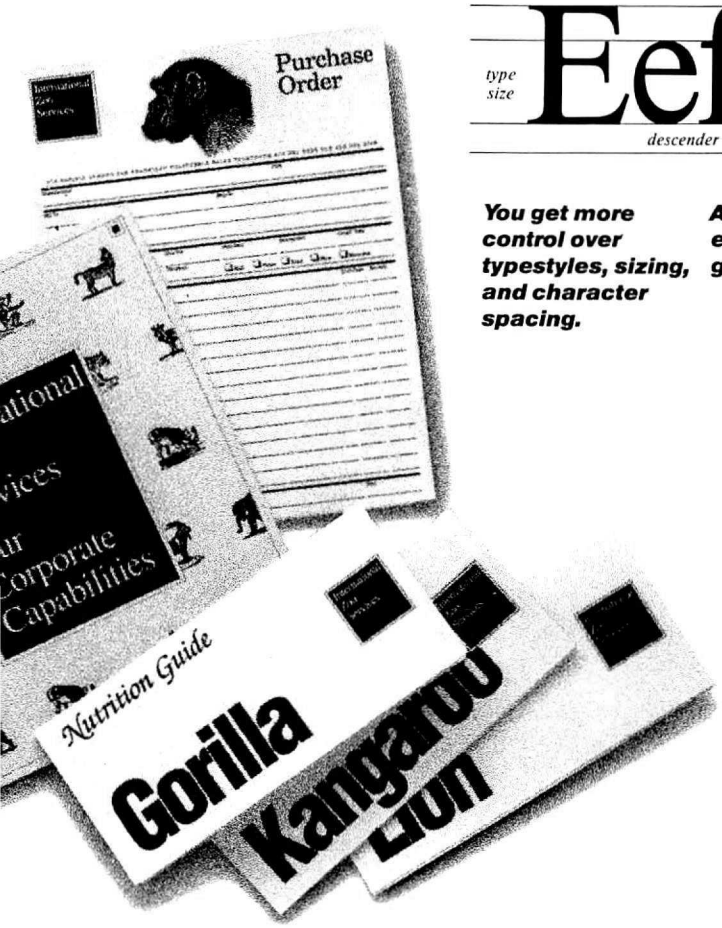
That's where Xerox Ventura Publisher™ makes a huge difference. Because it lets you create the best-looking documents you've ever produced. No matter if you're a complete beginner. Or if you do document processing for a living.

By using our predesigned style sheets, you can create great-looking documents right away. But the more you use this program, the richer it gets. With Xerox Ventura Publisher, you get greater control over typestyles, illustrations, and layout. Which lets you make every page look more professional.

XEROX® is a registered trademark of XEROX CORPORATION. Ventura Publisher™ is a trademark of Ventura Software, Inc. MS-DOS is a registered trademark of Microsoft Corporation.

XEROX

cations a chore. Or an art.



type size

Eefg

ascender
x-height
descender

You get more control over typestyles, sizing, and character spacing.

And every other element that goes on the page.

How far can you go? The only limit is your imagination.

Xerox Ventura Publisher has won awards from almost every leading PC publication, including the World Class Award from PC World. And no wonder.

You won't believe how good it feels to create documents like these.

To watch your work evolve right in front of your eyes. And turn into a statement about you and your company that nobody else could make.

And you get control over the whole document. If you make a change on one page of a long report that affects other pages—whether it's the design, text flow, page number, or whatever—the program will automatically manage that change on every page that's involved. And when you're ready, it's easy to generate tables of contents, lists of illustrations, and indices.

If you'd like to know more, just fill out this coupon, and we'll send you detailed information on Xerox Ventura Publisher. Including the name of your nearest authorized Xerox software dealer. Who can show you the most impressive fact of all. How it feels to use a program that makes you and your documents look this good.

Team Xerox.
We document the world.

Xerox Ventura Publisher

Call 1-800-TEAM-XRX (1-800-832-6979), Ext. 289C or send this coupon to Xerox Corporation, P.O. Box 24, Rochester, NY 14692.

☐ Please tell me the name of my nearest Xerox dealer.

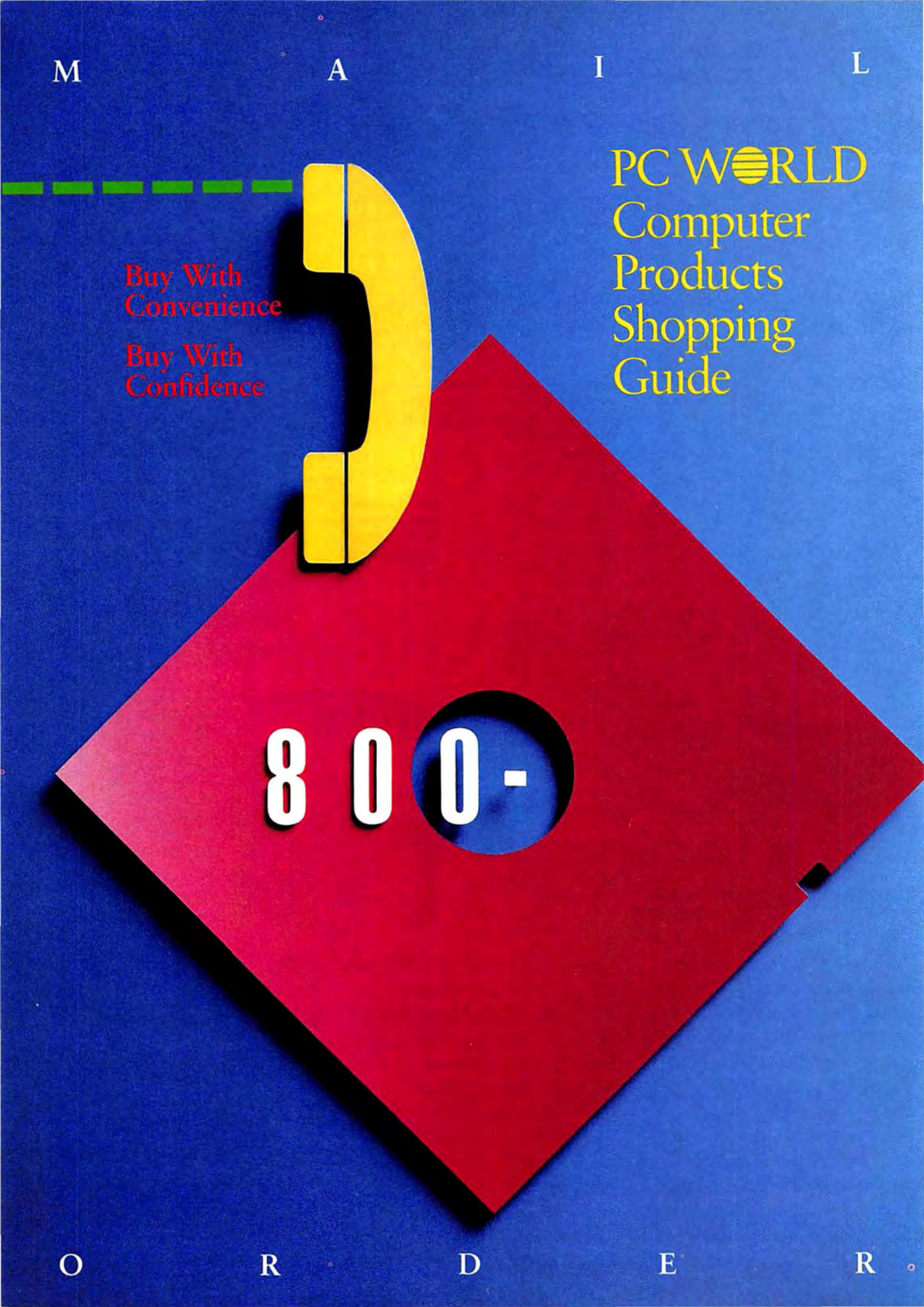
☐ Please send me more information. 0415-5-88

Name

Company Title

Address City

State Zip Phone


M A I L
PC WORLD
Computer
Products
Shopping
Guide
Buy With
Convenience
Buy With
Confidence
800-
O R D E R

MONTGOMERY GRANT

PC World 5/88

IN NEW YORK & OUTSIDE CONTINENTAL USA CALL
(212) 732-4500
FOR CUSTOMER SERVICE CALL MON-FRI/9 AM-4 PM
(718)965-8686

WAREHOUSE ADDRESS: 33 34th St., Brklyn NY 11232
FOR ORDERS CALL TOLL FREE
1-800-345-7059
1-800-345-7058
OPEN 7 DAYS A WEEK FOR ORDERS: MONDAY-FRIDAY:9AM-7PM / SATURDAY & SUNDAY: 9:30AM-6PM EDT

FOR MAIL ORDERS & INQUIRES PLEASE WRITE TO:
MONTGOMERY GRANT
MAIL ORDER DEPT.
P.O. BOX 58
BROOKLYN, N.Y., 11230
FAX NO. 2125641497
TELEX NO. 422132HMOLLER

EPSON EQUITY 1+

IBM PC/XT COMPATIBLE PACKAGE

- 640K RAM w/Clock Calendar
- 360K Drive
- Keyboard
- Serial/Parallel Ports
- Box of 10 Diskettes
- 12" High Resolution Monitor

$769

Same Pkg. w/One Floppy & 20 MB Hard Drive **$1029**

Same Pkg. w/Two 360K Floppy Drives **$849**

IBM XT

HARD DRIVE PACKAGE

- IBM XT Computer
- IBM Keyboard 256K RAM Expandable to 640K
- 360K Disk Drive
- 20MB Hard Drive
- Package of 10 Diskettes (Monitor Optional)

$1499

IBM XT Package with 2 360K Floppy Drives **$1279**

IBM PERSONAL SYSTEM 2 MODEL 50

w/720K Floppy Drive & 20MB IBM Hard Drive

$2599

Personal System II Model 25	$1049
PS II Model 25 w/Color Monitor	$1299
PS II Model 60 w/44MB Hard Drive & 1 720 k Floppy Drive	$3569

IBM Personal System II Monitors

8503 Mono	$229
8512 Color	$459
8513 Color	$519

IBM PERSONAL SYSTEM 2

MODEL 30 PACKAGE

- IBM Computer
- Two 720K Drives
- 640K RAM
- Built-in Graphics
- Serial/Parallel Ports
- Optional 12" Monitor

$1199

PS/2 Model 30 w/720 Floppy Drive & 20MB IBM Hard Drive **$1599**

NEC POWERMATE I PACKAGE

IBM PC/XT/AT COMPATIBLE

- 8/8286 8 MHz Processor
- 640K RAM
- 1.2 MB Floppy
- 12" Monitor

$1299

w/NEC 20 MB Hard Drive.....**$1529**

POWERMATE II with monitor **$1879**

HARD DRIVES

HARD DRIVES & CARDS

SEAGATE

20MB 1/2 Ht. w/Controller	$269
30MB 1/2 Ht. w/Controller	$319
40 MB 1/2 Ht. w/Controller	$449

MINISCRIBE

40MB 1/2 Ht. w/Controller	$369
CMS 20MB Card	$339
CMS 30MB Card	$379

SANYO PR-3000

L.Q. Daisy Wheel Printer

$99.50

PRINTERS

EPSON		STAR	
FX-86E	$319.95	NX-1000	$169.95
FX-286E	$469.95	NX-15	$289.95
FX-800	$429.95	NB-2410	$399.95
LQ-800	$389.95	NB-2415	$559.95
LQ-850	$489.95	IBM Pro-printer II	$369.95
LQ-500	$329.95		
LQ-1050	$659.95	*OKIDATA*	
EX-800	$419.95	OKI-120	$189.95
EX-1000	$459.95	OKIMATE20	$139.95
PANASONIC		OKIDATA180	$219.95
1080I-II	$159.95	**Laserjet Series II**	
1092	$289.95	hp	$1649
1091i-II	$189.95	*IMB EXPANDER*	$349
KX-P 1524	$499.95		
TOSHIBA			
321-SL	$479.95		
341-SL	$649.95		
351-II	$799.95		

LEADING EDGE MODEL D PACKAGE

- 512K RAM Computer
- Keyboard
- 360K Floppy Drive
- 4.7-7.16 MHz
- 12" Monitor
- 8088-2 Processor

$799

Same Pkg. w/20 MB Hard Drive...**$1049**

BLUE CHIP

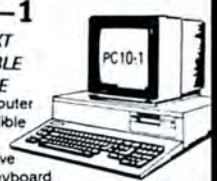
IBM PC/XT COMPAT. PKG. W/ MONITOR

512K RAM Expandable to 640K • 360K Floppy Disk Drive • 12" Monitor • Box of 10 Diskettes • Game Disk **$499**

W/20 MB HARD DRIVE....$759

commodore PC10-1

IBM PC/XT COMPATIBLE PACKAGE



- PC10-1 Computer
- 512K Expandible to 640K
- 360K Disk Drive
- Enhanced Keyboard
- Serial & Parallel Ports
- 12" Monitor & Adapters
- Package of 10 Diskettes
- All Hook-up Cables

$529

Same Package with 20MB Hard Drive **$789**

VENDEX HEADSTART PC/XT COMPATIBLE

4.7 MHz. • Dual Floppy Drives • 7 Expansion Slots • 512K Expandable to 768K • Parallel & Serial Ports • Mouse • Available in Color or Monochrome System • Over $1000 Worth of Software-NO CHARGE!

Mono System **$849**

Color System **$999**

AMSTRAD

IBM PC/XT COMPATIBLE PACKAGE

INCLUDES MOUSE & FREE SOFTWARE

512K • One 360K Drive • Clock Calendar • MonoGraphics Card • Serial and Parallel Ports • Mono Monitor • Mono Stand

$599

Same Pkg. with 20 MB Hard Drive **$849**

apple PACKAGES

- Apple IIC or IIE Keyboard
- 5.25" Disk Drive
- 12" Monitor
- All Hook-up
- Cables and Adaptors
- Package of 10 Diskettes

APPLE IIC $579 **APPLE IIE $779**

Apple IIGS Computer • 3.5" Drive • Apple RGB Color Monitor Pckg. of 10 Diskettes • All Cables & Adapters • Apple Software **$1379**

MAC PLUS Computer Package	$1579
IMAGEWRITER II Printer	$449
MAC SE Computer w/Dual Drive	$1949
MAC SE Computer w/20MB APPLE Hard Drive	$2599
APPLE MAC II	CALL

LAPTOPS - MONITORS - AMIGA

TOSHIBA

TOSHIBA 1000
720K Floppy Drive
• 512K RAM • 4.77 MHz • Super Twist LCD Screen

$749

NEC MULTISPEED H.D.	$2199
NEC MULTISPEED EL	$1369
NEC MULTISPEED	$1099
TOSHIBA 1200	$2199
TOSHIBA 3100/20	$2979
TOSHIBA 1200	$2295
ZENITH 181	$1449
ZENITH 183	$1999
SPARK by DATAVUE 640K w/2720K DRIVES	$1049
SPARK EL	$1149

COMMODORE 1084 RGB Color Monitor	$285
THOMSON 14" CGA Monitor	$289
THOMSON ULTRA SCAN	$469
MAGNAVOX EGA Monitor	$339
with EGA Card	$459

Commodore AMIGA 500 IN STOCK-CALL FOR LOW PRICE!

AMIGA 2000 IN STOCK

ALL PERIPHERALS IN STOCK

A-501 512K EXPANSION • A-1010 3.5" FLOPPY DRIVE • A-1020T 5.25" DISK DRIVE WITH TRANSFORMER • A-2088D BRIDGE CARD • A-1084 RGB COLOR MONITOR • A-1680 MODEM • A-1060 SIDECAR • A-2090 HARD DRIVE CONTROLLER FOR A-2000 • A-2010 3.5" INTERNAL DISK DRIVE FOR A-2000 • A-2052 2MB EXPANSION FOR A-2000

commodore 128 PACKAGE

- Commodore 128 Computer
- Commodore 1571 Disk Drive
- Commodore 1902 Color Monitor
- Commodore 1515 80 Column Printer

$699

commodore 64/c PACKAGE

- Commodore 64/C Computer
- Commodore 1541 Disk Drive
- Computer Printer
- 12" Computer Monitor

$399

AMIGA 500 w/1084 **$779**

AMIGA 500 w/1084/1010 **$979**

NO ADDITIONAL SURCHARGE FOR CREDIT CARD ORDERS

Certified checks, bank checks, Mastercard, Visa, AMEX, Diner's Club, Carte Blanche, Discover Card and C.O.D.s accepted. No additional surcharge for credit card orders. Non-certified checks must wait 4-6 weeks clearance. Money orders are non certified checks. Please add 5% for shipping and handling. Minimum shipping charge is $10. APO, FPO and PO Box addresses—please call for shipping charges. N.Y. residents add applicable sales tax. Prices and availability subject to change without notice. Not responsible for typographical errors. Return of defective merchandise must have prior return authorization number, or returns will not be accepted. IBM PC/XT are registered trademarks of International Business Machines Corp. All orders can be shipped Air Express – call for details. For your protection, we check for credit card theft.

Circle 65 on reader service card

CALL FOR PRICING ON ALL OTHER NAME BRAND PRODUCTS

Starflite Telemarketing

HEAD FOR THE FUTURE WITH US

1-800-423-7347 IS THE NUMBER TO CALL FOR THE BEST PRICES IN THE STATES 1-800-423-734

COMPUTERS

AMSTRAD

XT 1 DRIVE MONO	$ 542.00
XT 1 DRIVE 20MB MONO	$ 947.00
XT 2 DRIVE 20MB MONO	$1023.00
(COLOR SYSTEM AVAILABLE ADD $150.00)	

ARC

XT 2 DRIVE 10MH	$ 731.00
286 20MB 12MH	$ 1767.00
286 40MB 12MH	$ 1962.00
386 40MB	$ 2997.00

AT&T

6300 1 DR	$ 748.00	6300 2 DR	$ 799.00
6300, 20MB	$1054.00	6310 20MB	$ CALL
6312, 30MB	$1925.00	6386 40MG	$3492.00

HP VECTRA

ES12 MODEL 20	$2325.00
ES12 MODEL 22	$2654.00
ES12 MODEL 40	$2990.00
ES12 MODEL 42	$3412.00

LEADING EDGE

MODEL D, 2 FLOPPY DRIVES, 512K	$ 867.00
MODEL D, 1 DRIVE, 20M	$1292.00
MODEL D, DRIVE,30 M	$1395.00
(INCLUDES AMBER MONITOR-COLOR ADD $150.00)	

NEC

POWERMATE I	$1132.00
POWERMATE I 20MG	$1312.00
POWERMATE II	$1312.00
POWERMATE II 20MG	$1895.00
POWERMATE 386	$2897.00
MULTISPEED LAPTOP	$1487.00
MULTISPEED EL LAPTOP	$1789.00

TOSHIBA

TOSHIBA 1100 LAPTOP, 1 DRIVE	$2274.00
TOSHIBA 3100/20	$3245.00

WYSE

WYSE PC286, 1 DRIVE	$1350.00
WYSE PC386, 1 DRIVE, 40MB	$2250.00
WYSE PC386, 40MB HARD DRIVE	$3030.00

ZENITH

ZF 181 2 DRIVE PORTABLE	$1579.00
ZF 183 20mb PORTABLE	$2319.00
ZF 286 40MB DESKTOP	$2386.00
ZF 386 40MB DESKTOP	$5792.00

SPECIAL SYSTEMS

STARFLITE HAS DESIGNED THE COMPLETE TOTAL PACKAGE FOR THE PROFESSIONAL BUSINESSMAN. THESE PACKAGES INCLUDE TOP NAME PRODUCTS CONFIGURED FOR YOUR TOTAL BUSINESS SOLUTION AT VERY RESONABLE PRICING.

ACCOUNTING PACKAGE

STARFLITES ACCOUNTING PACKAGE IS DESIGNED AROUND A VERY FLEXABLE AND WELL SUPPORTED ACCOUNTING PACKAGE.

DESKTOP PUBLISHING PACKAGE

STARFLITES DESKTOP PUBLISHING SYSTEM BRINGS THE PUBLISHING WORLD RIGHT TO YOUR OFFICE AT THE BEST POSSIBLE COST

CAD

STARFLITES CAD PACKAGE INCLUDES EVERYTHING NEEDED IN A TOTAL CAD SOLUTION.

CALL FOR CONFIGURATION AND PRICING ON ALL PACKAGES

PRINTERS

CITIZEN

120D	$174.00
MSP10	$ 257.00
MSP25	$ 388.00
224	$1095.00

PANASONIC

1080i	$179.00
1091i	$195.00
1092i	$335.00

EPSON

LX800	$184.00	LQ 850	$437.00
EX1000	$999.00	LQ 1050	$549.00
FX86E	$324.00	LQ 2500	$869.00
FX286E	$429.00		

NEC

P6	$ 449.00
P7	$ 615.00
P2200	$ 377.00
3550	$ 741.00

OKI

OKIMATE 20	$ 125.00
ML 182	$ 235.00
ML192 PLUS	$ 315.00
ML193 PLUS	$ 455.00
ML 292 PLUS	$ 516.00
ML 393 PLUS	$ 858.00

TOSHIBA

P321SL	$ 499.00
P341E	$ 679.00
P351 S/P m2	$ 979.00
P351C m2	$1150.00

NISSHO

2405	$799.00
2410	$1047.00

LASER PRINTERS

AST LASER PRINTER	$ CALL
CORONA LASER PRINTER	$ CALL
HP LASER JET 500 PLUS	$ 2175.00
HP LASER JET II	$1688.00
HP DESKJET	$ CALL
QUAD LASER LS1101	$2599.00

PLOTTERS , SCANNERS & DIGITIZERS

HP 7440A	$961.00	HI DMP-42	$ CALL
HP 7475A	$1342.00	HI DMP-5	$ CALL
HP 7550	$2794.00	HI DMP-52MP	$ CALL
HP 7570	$3984.00	HI DMP-56A	$ CALL

HP SCANJET	$947.00
DEST SCANNER	$ CALL
SUMMASKETCH12X12	$654.00
SUMMASKETCH12X18	$1470.00

MONITORS

COLOR

AMDEK 600S / 722	$347.00/ 442.00
NEC MULTISYNC	$ 499.00
NEC MULTISYNC II	$ 549.00
NEC MULTISYNC XL	$1992.00
TAXAN 635/650/720	$397.00/457.00/299.00
THOMPSON COLOR	$ CALL
VIKING 1	$ CALL

MONOCHROME

AMDEK 310A/410A	$142.00/126.00
AMDEK 1280	$ 687.00
LEADING EDGE GREEN/AMBER	$ 99.00
MAGNAVOX	$ 89.00

INTERFACE CARDS

AST VGA	$ 314.00
ATI WONDER CARD	$ 199.00
IBM MONO/PRINTER	$ 59.00
HERCULES MONOGRAPHICS +	$ 179.00
HERCULES COLOR	$ 149.00
HERCULES INCOLOR	$ 329.00
PARADISE AUTOSWITCH EGA 350	$ 179.00
PARADISE VGA	$ 289.00
QUADRAM PROSYNC	$ 349.00
STB CHAUFFEUR	$ 189.00
VIDEO 7 VEGA DELUXE	$ 299.00
VIDEO 7 VGA ADAPTER	$314.00

MULTIFUNCTION BOARDS

AST ADVANTAGE W/128K	$329.00
AST ADVANTAGE PREMIUM	$349.00
AST 6 PACK PLUS W/384K	$164.00
AST 6 PACK PREMIUM W/256K	$199.00
AST ADVANTAGE /2	$219.00
BOCA BOARDS	$ CALL
ORCHAID BOARDS	$ CALL
EVEREX MAGIC CARD II W/384K	$159.00
EVEREX MINI MAGIC W/0K	$ 69.00
ZUCKER BOARD	$ 59.00
INTEL ABOVE 286 W/512 K	$329.00
INTEL ABOVE PS/2 86 W/512K	$329.00
INTEL INBOARD 386 W/ADAPTER	$1290.00
ORCHID TINY TURBO	$ 279.00

COMMUNICATION BOARDS

AST 5251-11 PLUS/5251-1 2	$ 589.00/499.00
DCA IRMA 2	$ 687.00
DCA IRMA 3279 GRAPHICS	$1247.00
DCA FORTE 3270 W/SOFT	$ 936.00
SDLC ADAPTER	$ 199.00
3270 CONNECTION	$ 442.00
3278/79 ADAPTER	$ 529.00

MODEMS

EVEREX 1200B/2400B	$102.00/199.00
HAYES 1200/1200B	$286.00/267.00
HAYES. 2400/2400B	$419.00/379.00
LEADING EDGE 1200/2400	$ 79.00/158.00
SMARTEAM 1200 EXT	$127.00
VEN-TEL 1200/2400 INT	$187.00/299.00
VEN-TEL 1200/2400 EXTERNL	$225.00/389.00

NETWORKING

STARTER KITS

WESTERN DIGITAL 3 NODE LAN KIT	$ CALL
TOKEN RING KIT 4 NODE KIT	$4350.00
ARCNET 286 STARTER KIT	$2175.00
ETHERNET 86 STARTER KIT	$2265.00

INTERFACE CARDS

ARCNET PC110 LANBOARD	$297.00
ARCNET PC210 LANBOARD	$297.00
ETHERNET PLUS BOARD	$299.00
G-NET INTERFACE CARD W/CABLE	$297.00
ORCHAID PC NET ADAPTER	$274.00
PC LAN ADAPTER	$ CALL
TOKEN RING ADAPTER	$495.00
STARLAN NETWORK ADAPTER	$199.00

ACCESSORIES

ARCNET PASSIVE HUB	$ 76.00
ARCNET ACTIVE HUB	$587.00
BASE EXPANDER	$ 59.00

SOFTWARE

NOVELL 286 SOFTWARE	$1645.00
NOVEL ELS LEVEL 1	$445.00
STARLAN NETWORK SOFTWARE	$ 97.00

FAX MACHINES

AT&T	$1689.00
JETFAX	$ CALL
MICROFAX BOARD	$ CALL
PANASONIC KX-F115	$1454.00
XEROX	$1992.00

TELEPHONE SYSTEMS

COMPUTER ANSWER MACHINE

WATSON	$ CALL
AUTOMATED RECPTIONIST	$ CALL

AT&T MERLIN

410 UNIT	$1010.00	5 BUTTON PHONE	$ 240.00
820 UNIT	$ CALL	10 BUTTON PHONE	$ CALL
1030 UNIT	$ CALL		

COMDIAL

(CALL FOR CONFIGURATION AND BEST PRICING)

CALL FOR COMPLETE CONFIGURATIONS AND ACCESSORY ITEMS INSTALLATIONS AVALABLE

HARD DRIVES

SEAGATE

20MB ST-225	$289.00	20MB 4025	$450.0
30MB ST-238	$317.00	30MB 4038	$550.0
40MB ST-251	$389.00	40MB 4051	$399.0
20MB 3.5	$ CALL	80MB 4096	$895.0
40MB 3.5	$ CALL		

MINISCRIBE

40MB AT	$385.00	20MB 3.5	$299.00
80MB AT	$859.00	40MB 3.5	$ CALL

MAYNARD

MAYNSTREAM 60 W/CONTROLLER	$795.00

IOMEGA

BERNOULLI 10+10	$1381.00
BERNOULLI 20+20	$1599.00

IRWIN

40 MB INTERNALTAPE BACKUP	$537.00

MOUNTAIN

20MB CARD	$ 549.00	20MB CARD	$552.0
30MB CARD	$ 815.00	40MB CARD	$834.0

PLUS

SOFTWARE

WORD PROCESSING

BORLAND SPRINT	$219.00
PFS: PRO WRITE	$114.00
MICROPRO WORDSTAR 2000 PLUS	$219.00
MICROSOFT WORD 3.11 PS/2 FORMAT	$229.00
MULTIMATE ADVANTAGE II	$257.00
MULTIMATE PROFESSIONAL	$249.00
WORDPERFECT 4.2	$199.00
XYWRITE III	$326.00

DATABASES

ANSA PARADOX 2.0	$399.00
D-BASE III PLUS	$389.00
RAPID FILE PS/2 FORMAT	$237.00
INTERNATIONAL REFLEX	$ 87.00
PFS: PROFESSIONAL FILE	$142.00
Q & A VERSION 2.0	$198.00

SPREADSHEETS

JAVELIN PLUS	$159.00
LOTUS 1-2-3 PS/2 FORMAT	$309.00
SUPERCALC 4	$274.00
PFS: PRO PLAN	$117.00

INTEGRATED

FRAMEWORK II	$397.00
SYMPHONY	$444.00
PFS FIRST CHOICE	$ 89.00

PUBLISHING

ALDUS PAGEMAKER	$482.00
THE PRINT SHOP	$ 99.00
HARVARD PROFESSIONAL PUBLISHER	$ CALL
PFS: FIRST PUBLISHER	$ 59.00
NEWSROOM PRO	$ 55.00
SPRINGBOARD CERTIFICATE MAKER	$ 47.00
UNISON NEWSMASTER	$ CALL
VENTURA DESKTOP PUBLISHER	$499.00

GRAPHICS

CHARTMASTER	$209.00
DIAGRAM MASTER	$189.00
MAP MASTER	$139.00
SIGN MASTER	$139.00
HARVARD PRESENTATION GRAPHICS	$227.00
LOTUS FREELANCE PLUS PS/2 FORMAT	$225.00

COMMUNICATION

RELAY GOLD	$137.00
CROSSTALK XVI	$ 89.00
CARBON COPY PLUS	$119.00

LANGUAGES AND UTILITIES

BORLAND TURBO C	$ 59.00
TURBO PASCAL	$ 65.00
DESQVIEW	$ 37.00
SIDEKICK	$ 57.00
NORTON UTILITIES	$ 79.00
BROOKLIN BRIDGE	$ CALL

ACCOUNTING

DAC EASY	$ 59.00
PEACHTREE COMPLETE II	$169.00
ARMOR EXCABLER PLUS PER MODULE	$350.00
OPEN SYSTEM	$ CALL
CTA MODIFING ACCOUNTING SYSTEM	$ CALL

CAD

DESIGN CAD	$164.00
GENERIC CAD	$ 59.00

(OTHER CAD PACKAGES AVAILABLE $CALL$

Don't wait, call Starflite now, most orders shipped within 48 hours

1-800-423-7347

If you find a better price, call us before you buy.

High Volume Bids Welcome.

All sales final except defective products within the first 15 days which we will repair or replace at our option. Price reflects 3% cash discount. Returns are subject to restocking charges. Prices and availability subject to change without notice.

Starflite Telemarketing
P.O. Box 685
Nitro, W.Va. 25143

MC/VISA WELCOME

.CALL FOR OUR FREE CATALOG.

Circle 115 on reader service card

SHIPPED FEDERAL EXPRESS® PRIORITY 1 FOR NEXT BUSINESS DAY DELIVERY

NITRO MICRO OVERNIGHT

ORDERING & INFORMATION
CALL FREE
1 800 382-3888

$ 1649

NEW!
Add DDL & Postscript
with
Imagen
PC Publisher KIT
NITRO Introductory Price
$1549
Regularly $1995

LASERJET SERIES II
includes FREE Toner Cartridge

Acer

1100
80386 16 MHz
No Wait States
1MB RAM

$ 2669

ON-SITE Warranty

NEC

POWERMATE 1 DUAL 1.2MB	$1282
POWERMATE 1 20MB	$1643
POWERMATE 1 40MB	$1915
POWERMATE 2 20MB	$1917
POWERMATE 2 40MB	$2228
POWERMATE 2 66MB	$2873
POWERMATE 386	$2741
POWERMATE 386 40MB	$3314
POWERMATE 386 66MB	$4019
POWERMATE 386 130MB	$4954
Portable Powermate 20MB	$2449
Portable Powermate 40MB	$2978

ORIGINAL NEC COMPONENTS
ALL MODELS INCLUDE KEYBOARDS

AT&T

6300	$ 789
6300 WGS	$ NEW
6310	$ 1629
6386 WGS	$ 3298
Keyboard	$ 119
Monochrome	$ 198
Color Display	$ 559
MS-Dos/Basic	$ 84

T1000	$ 809
T1100 Plus	$1488
T1200	$2489
T3100/20	$3188
T5100	$4925

TOSHIBA

CALL FOR BEST PRICES ON

AST

PREMIUM PRODUCTS

WYSE

PC 286 **$1857**
80286 12.5 MHz,
No Wait States,
1MB RAM, 9 Exp. Slots,
1.2MB Drive, & MS-DOS

PC 386 **$2598**
80386 16 Mhz,
No Wait States,
1MB RAM, 10 Exp. Slots,
1.2MB Drive, & MS-DOS

SAMSUNG

SAMSUNG S-300 **$ 789**
4.77/8 MHz, 512K, 360K drive, 6 exp. slots, monographic card, keyboard, Parallel, Serial, MS-DOS 3.2 & GWBasic, One Year Warranty

SAMSUNG S-500 **$ 1198**
80286 10 MHz, 512K, 1.2M drive, 8 exp. slots, monographic card, keyboard, Parallel, Serial, MS-DOS 3.2 & GWBasic, One Year Warranty

ZENITH

181
$1589

183
20MB
$2349

PLUS 20MB HARDCARD	$ 539
PLUS 40MB HARDCARD	$ 688

Seagate

20MB Internal with controller	$ 298
30MB Internal with controller	$ 328
40MB Internal for AT's	$ 649
80MB Internal for AT's	$ 877

MICE

Microsoft **LOGITECH**

MOUSE with		MOUSE with	
Paintbrush	$ 118	C7 Serial	$ 99
Windows 2	$ 139	Gen. CADD	$ 169
EasyCADD	$ 128	PFS 1st Pub	$ 159
for PS/2	$ 118	320 dpi Hires	$ 127

NEC

MULTISPEED	$ 1339
MULTISPEED EL	$ 1629
MULTISPEED HD	$ 2569

MODEMS

Hayes **U.S. Robotics**

1200B	$259	1200 Int.	$109
2400B	$389	2400 Int.	$198
1200 Ext.	$289	1200 Ext.	$119
2400 Ext.	$419	2400 Ext.	$198

Pagemaker	$455	MS Excel	$319
Ventura 1.1	$489	MS Word 4	$289
Paradox 2	$445	MS Works	$134

SCANNERS

HP Scanjet	$1398
PGS LS-300	$ 739
DEST Scan i	$2049
Ast Turboscan	$1298
Datacopy 730	$2488

PRINTERS

EPSON **CITIZEN**

LX-800	$ 209	120D	$179
FX-86E	$ 335	180D	$199
FX-286E	$ 489	MSP-40	$341
LQ-500	$ 349	MSP-45	$471
LQ-850	$ 524	MSP-50	$438
LQ-1050	$ 673	MSP-55	$537
LQ-2500	$ 837	Premier35	$526
GQ-3500	$1359	Tribute 224	$685

VIDEO ADAPTERS

HERCULES Monographics Plus	$177
HERCULES Color Card	$155
HERCULES Incolor Card	$298
NFC GB-1 Adapter	$339
NITRO Monographics Adapter	$ 69
PARADISE Autowitch 480	$169
PARADISE VGA Plus	$278
PARADISE VGA Professional	$408
QUADRAM Prosync VGA	$339
QUADRAM Ultra VGA with mouse	$382
VIDEO-7 Vega Deluxe	$238
VIDEO-7 Vega VGA	$295

MONITORS

AMDEK

432 Mono	$ 219
732 Color	$ 497
1280 w/card	$ 748

AST

Monochrome	$ 168
EGA Color	$ 498

EPSON

Monochrome	$ 139
Color	$ 398

NEC

Multisync II	$ 599
Multisync GS	$ 236
Multisync Plus	$ 892
Multisync XL	$2039
Monograph	$1411

SIGMA DESIGNS

Laserview 15"	$1436
Laserview 19"	$1799

THOMSON

4120 Color	$ 298
Ultrascan	$ 678

ZENITH

1390 VGA	$ 538
1490 VGA FT	$ 688

POWER FAX!

NEC BIT V

$1984

OVER 30% OFF

HEWLETT PACKARD

Plotters

7440 Colorpro	$ 882
7475A 6 PEN	$1288
7550A 8 PEN	$2544
7570A Draftpro	$3690

Printers

Laserjet II	$1649
1MB Cart	$ 359
Deskjet	$ 706
Paintjet	$ 985

VISA MasterCard

SHIPPED FEDERAL EXPRESS® PRIORITY 1 FOR NEXT BUSINESS DAY DELIVERY

NITRO MICRO OVERNIGHT
120 West Main Street
Carmel, IN 46032
800 382-3888

Please add 3% for shipping & handling

NO SURCHARGE FOR CREDIT CARDS and we do not charge until we ship. All items subject to availability and price change. All standard orders are sent FEDERAL EXPRESS® Priority One for next business day delivery. YES, backordered items on standard orders are always sent FEDERAL EXPRESS® Priority One.

Circle 132 on reader service card

If you're looking for the best price on an IBM compatible PC, *You're looking at them now.*

Call toll-free (800) 648-7402
In Mass: (800) 562-9202

	$569 XT TURBO	$949 AT TURBO	$2295 AT 386-16MHz	$1495 AT-LCD PORTABLE
BASE MONOGRAPHICS SYSTEM				
Intel Processor	8088	80286	80386	80286
Clock Speed	4.77/8 MHz	6/10 MHz	6/16 MHz	6/10 MHz
Ram on Motherboard	512 KB	512 KB	1024 KB	640 KB
B.I.O.S.	PHOENIX	PHOENIX	AWARD	PHOENIX
Toshiba Floppy Drive	1-360 KB	1-1.2 MB	1-1.2 MB	1-1.2 MB
Keyboard Style	84 Keys	101 Keys	101 Keys	84 Keys
Power Supply	150 Watt	200 Watt	200 Watt	165 Watt
Monitor	SAMSUNG 12" Hi-Res Amber Monitor with Tilt and Swivel			
Monographics Card	HERCULES Compatible Monographics Adapter Card			
Ports	Parallel	Parallel, Serial, Game & Clock Calendar		
Free Software	Yes	Yes	Yes	Yes
Free Disks	Yes	Yes	Yes	Yes
Three Year Warranty	Yes	Yes	Yes	Yes
Toll Free Service Lines	Yes	Yes	Yes	Yes
BASE MONOGRAPHICS SYSTEMS with				
SEAGATE 20MB & W-D Controller	$ 909	$1289	$2635	$1835
SEAGATE 30MB & W-D Controller	941	1321	2667	1867
SEAGATE 40MB & W-D Controller	1126	1506	2852	2052
SEAGATE 60MB & W-D Controller	1176	1556	2902	2102
SEAGATE 80MB & W-D Controller	1640	2020	3366	N/A
EGA COLOR SYSTEM Base System Featues Plus SAMSUNG 14" EGA Monitor Enhanced Graphics Card	$ 979	$1341	$2687	
EGA COLOR SYSTEM with				
SEAGATE 20MB & W-D Controller	$1319	$1681	$3027	
SEAGATE 30MB & W-D Controller	1351	1713	3059	
SEAGATE 40MB & W-D Controller	1536	1898	3244	
SEAGATE 60MB & W-D Controller	1586	1948	3294	
SEAGATE 80MB & W-D Controller	2050	2412	3758	

SUPER TURBOS	**XT SUPER TURBO**	**AT SUPER TURBO**	**AT SUPER 386-20 MHz**
INTEL Processor	8088	80286	80386
Clock Speed	4.77/10 MHz	6/12 MHz	6/20 MHz
Ram on Motherboard	512 KB	1024 KB	1024 KB
B.I.O.S.	PHOENIX	EDEN	AWARD
Add to above prices	+ $30	+ $343	+ $660

Total Satisfaction Guarantee

We are so confident in our quality products that we provide a total satisfaction guarantee. This means that any system bought from us may be returned within 30 days from the date it was shipped for a full refund of your purchase price. Returned items should be shipped back to us in the same condition in which they were sent.

Three Year Limited Warranty

We also offer a three-year limited warranty, which warrants each system we manufacture to be free of defects in materials and workmanship for three full years. During the three-year period we will repair or replace, at our option and at no additional cost any defective products properly returned to us.

Toll-Free Technical Support

Our toll-free technical support lines 1-800-648-7402 (in MA 1-800-562-9202) allowing your unlimited access to our highly trained technicians. When problems do occur, 90% are solved over the phone.

Payment Terms

We accept MasterCard, VISA, money orders, certified check, personal checks (allow 10 days for processing).

Credit approved companies, universities and government agencies may use purchase orders on N-15 terms.

ORC
TECHNOLOGIES

50 Howe Avenue
Millbury, MA 01527
Phone: (617) 865-0211
FAX: (617) 865-1853

Circle 15 on reader service card

KENOSHA COMPUTER CENTER

PACKARD BELL TURBO XT only $1099

4.77 and 8 MHZ • Switchable • 640K Ram • 1 Floppy Drive • 20 MB Seagate Hard Disk • Parallel and Serial Ports • Clock • Mono/Color Graphics Card • Monochrome Amber Monitor • AT Style Keyboard • 135 W power supply • DOS & Basic • 1 year warranty

TRW Warranty Service

KENOSHA COMPUTER CENTER

SALES LINE OUTSIDE WISCONSIN

1-800-255-2989

(in Wisconsin Call 414-697-9595)

Shipping & technical assistance 414-697-9595

WUGO CLASSIC 286 10 MHZ AT

Base System

only $1099

10 MHZ • 640K • 1.2 Floppy Drive • Clock • Enhanced Keyboard • 200 W Power Supply

A little more expensive, but worth it. Call for details on Wugo's 3-year warranty and for brochure on this machine.

IBM

Model 30 w/20 MB	$1725
Model 50	$2699
Model 60 w/44 MB	$3395
Model 60 w/70 MB	$3795
Model 80 w/44 MB	$4449
Model 80 w/70 MB	$4995

COMPAQ

286 Deskpro w/640K, 40MB	$2395
386 Deskpro Model 60	$5575
386 Deskpro Model 130	$6950
386 Deskpro Model 300	$9195
Portable II Model II	$1995
Portable II Model IV	$2875
Portable III, 20MB	$3695
Portable III, 40MB	$4195

AST

Model 80	CALL
Model 90	CALL
Model 120	CALL
Model 140	CALL

AT&T 6300

640K, 20MB	$1199
640K, 30MB	$1249

LAP TOPS

Zenith 2 drives	$1695
Zenith 183-193	$2295
NEC Multispeed EL	$1495
NEC Multispeed HD	$2295
Toshiba 1200	$2295
Toshiba 3100	$3095
Toshiba 5100	$4895

CHIPS

64K Ram Chips	CALL
256K Chips	CALL
8087-3/8087-2	$109/$149
80287-6MHZ	$155
80287-8MHZ	$239
80287-10MHZ	$289
80387-16MHZ	$479
80387-20MHZ	$729

HARD DISKS

SEAGATE

20MB w/contr ST225	$279
30MB w/contr ST238	$299
30MB for AT ST4038	$469
40MB for AT ST251	$399
40MB for AT ST251-1	$469
80MB for AT ST4096	$869

PLUS

Hard Card 20MB	$539
Hard Card 40MB	$695

SOFTWARE

D Base III Plus	$379
Framework	$389
IBM Displaywrite IV	$299
Lotus 123	$309
Managing Your Money 4.0	$119
Microsoft Word	$215
Multimate Adv. II	$249
R Base System V	$409
Symphony	$429
Ventura Desktop Publ.	$499
Word Perfect 4.2	$195
Wordstar 2000 Plus	$199
Wordstar Pro 4.0	$209

MONITORS

Compaq VGA	$539
NEC Multisync II	$589
NEC Multisync Plus	$899
Thomson Ultrascan	$479
Packard Bell Color	$259
Packard Bell EGA	$369
Princeton Ultrasync	$509

Prices and availability subject to change

GRAPHICS CARDS

ATI EGA Wonder	$185
ATI VIP VGA	$269
Compaq VGA	$459
Everex Enhancer	$135
Everex Edge	$179
Hercules Color Card	$145
Hercules Graphics Plus	$179
NEC GB-1	$199
NEC NVA 1024	$799
Paradise Autoswitch 480	$149
Paradise VGA	$249
Quadram EGA Plus	$199
Quadram ProSync	$275
Quadram Ultra VGA	$299
Sigma VGA	$249
STB EGA Plus	$159
Vega Deluxe	$199
Vega VGA	$279

MULTIFUNCTION CARDS

AST 6 Pack Plus 384K	$199
AST 6 Pack Prem. 256K	$195
AST Advantage 128K	$299
AST Advantage Prem. 512K	$339
AST Rampage PC w/256K	$249
AST Rampage AT w/512K	$325
AST Flashpack	$289
AST 5251-11 Plus Enhanced	$579
Intel Above Board PC	$229
Intel Above Board PC P/S	$259
Intel Above Board 286	$319
Intel Above Board 286 P/S	$349
Irma Board	$695
Orchid Tiny Turbo 286	$299
2MB & 4MB Upgrades for PSII	CALL

MICE

Logitech Serial or Bus	$74
w/Paint	$99
w/Cadd	$119
w/Publisher	$129
Microsoft Serial w/Paint	$99
Microsoft Bus w/Paint	$99
Mouse Systems Serial	$106
Mouse Systems Bus	$115

PRINTERS

EPSON

LX 800	$189	LQ 1050	$659
FX 86E	$289	LQ 500	$319
FX 286E	$429	LQ 2500	$819
LQ 800	$369	EX 800	$389
LQ 850	$489	EX 1000	$479

OKIDATA

192 Plus	$309	292 Plus	$459
193 Plus	$459	293 Plus	$589
182	$219	294 Plus	$849

*290 Series includes module

NEC

P6	$435	P9XL	$1099
P7	$619	P2200	$339
P5XL	$879		

HEWLETT-PACKARD

Laserjet II	$1699
Memory Upgrade	CALL
Quietjet	$499
Deskjet	$799

IBM

Proprinter	$389
Proprinter XL	$559
Proprinter X24	$549
Proprinter XL24	$759

MODEMS

Everex 1200/2400 Int.	$89/$179
Everex 2400 External	$279
Hayes 1200	$279
Hayes 1200B Alone	$244
Hayes 1200B w/Software	$279
Hayes 2400 ext	$419
Hayes 2400B int	$377
Hayes 2400B w/software	$419
US Robotics 2400 Int	$179
US Robotics 1200 ext	$119
US Robotics Cour. 2400	$339
2400 Internal IBM PSII	$199

MISCELLANEOUS

Kensington Masterpiece	$90
Masterpiece Plus	$99
150W Power Supply	$75
AB Switchbox	$35

No charge for MasterCard or Visa. We will ship COD on a cash or cashier's check basis only. Shipping & handling 3% — $6 minimum; AK and HI slightly higher. 15% restocking charge on returned items. Purchase orders accepted from Fortune 1000, Government institutions, schools and universities. 2% shipping discount available on orders over $2000 if prepaid by check.

KENOSHA COMPUTER CENTER
2133 91st St
Kenosha, WI 53140

KENOSHA COMPUTER CENTER

Circle 41 on reader service card

The New PC NETWORK

RENT SOFTWARE BEFORE YOU BUY †

COMPAQ DESKPRO COMPATIBLE

THE™ 386/16 ✦ 1MB BASE SYSTEM

- 1MB ram • 32 bit 16MHZ operation • 200 Watt power supply • 101 key keyboard • 1.2MB Mitsubishi floppy drive • Western Digital hard/floppy controller • Phoenix Bios.

$1,790.00* Bare Bones System Available $1,595.00*

386/16 1MB RAM w/42MB Seagate Hard Drive $2,225.00*

THE™ 286/12 ✦ 512K BASE SYSTEM

- 512K Expandable to 1MB on the Motherboard. • 6-12 MHZ Keyboard or Toggle Switch Selectable. • Room for up to 4 1/2 Height Drives or 2 Full Height Drives. • 200 Watt PS. • 101 Key 'AT' Style Keyboard. • Phoenix Bios.

$690.00* 100% IBM AT COMPATIBLE

286/12 w/1.2MB Mitsubishi Floppy/W.D. WA2 H.DC FDC $915.00*

286/12 w/40MB Seagate HD/1.2MB Mitsubishi Floppy $1,395.00*

THE™ SYSTEMS INCLUDE 15 DAY FREE HOME TRIAL.

THE™ TURBO PC/10 ✦ 256K BASE SYSTEM

- **AT style keyboard** • IBM Compatible Bios • Mitsubishi Floppy Drive • 4.77-10MHZ • 150 Watt FCC approved power supply • AT style case w/keylock, LED indicator & reset switch • 256K RAM

84303540 **$349.00*** 100% IBM PC, XT COMPATIBLE

PC/10 w/640K/1 Floppy/20MB HD (84303520) $799.00

PC/10 640K/2 Floppies (84303510) $554.00

PC/10 w/640K/1 Floppy (84303500) $449.00

BUY NOW AT ~~DISCOUNT~~ WHOLESALE PRICES!*

SOFTWARE

- ASHTON-TATE *Dbase III +* $341.90*
- ASHTON-TATE *Framework (5.25")* 362.50*
- ASHTON-TATE *Multimate Advan. II* 228.90*
- BORLAND INT. *Quatro* 95.00*
- BORLAND *Paradox 2.0* 389.00*

BORLAND *Turbo Pascal or Turbo Basic* 57.00*
BORLAND *Turbo Pascal 4.0* 57.00*
DAC SFT. *DAC Easy Accounting* 53.00*

- IBM *PC DOS Ver. 3.3* 80.00*

LOTUS DEVELOPMENT *Freelance +* 299.00*

- LOTUS DEVELOPMENT *Lotus 1-2-3* 268.00*
- LOTUS DEVELOPMENT *Symphony* 392.00*

MECA *Managing Your Money 4.0* 107.00*
MICROPRO INTER. 4.0 *Wordstar Prof.* 215.00*

- MICROSOFT *Word 4.0* 196.82*

MICROSOFT *"C" Compiler* 244.80*
MICROSOFT *Quick Basic 4.0/Windows* 55.08*

- PEACHTREE SFT. *Acctng Sys II* 127.01*

TURNER HALL *Note It or SQZ* 45.00*

- WORDPERFECT *Wordperfect 5.0* ..... CALL

XEROX CORP. *Ventura Publisher* 459.00*

SOFTWARE AVAILABLE IN 3 1/2" MEDIA. CALL FOR PRICES.

HARD DRIVES, DRIVE CARDS, & TAPE BACKUP

- THE™ *20MB Hd Disk Card* $319.00*
- THE™ *20MB 1/2 Ht. Hd. Disk Kit* 259.00*

IOMEGA *Bernoulli II 20MB Int.* 902.00*
IRWIN *64MB Int. Tape for IBM PS/2* 595.00*
IRWIN *145 40MB Internal Tape* 395.00*
MAXTOR *380MB Int. ESDI HD* 3,899.00*

- MINISCRIBE *3650 40MB 1/2 Ht* 335.00*

MINISCRIBE *6085 71MB Full Ht* 759.00*
MINISCRIBE *6128 110MB RLL Full Ht* 885.00*
PLUS DEVEL. *Hardcard 20* 519.00*
PLUS DEVEL. *Hardcard 40* 639.00*
PRIAM *230MB/12MS Hard Disk* 2,100.00*

- SEAGATE *ST-251 42MB/40MS HD* 399.00*

SEAGATE *ST-4096 80MB Full Ht* 789.00*
SEAGATE *ST-225 20MB Hd. Disk* 259.00*

MONITORS

AMDEK
1280 ..... $625.00* 730V $353.00*

IBM
8512 ..... 420.00* 8513 ..... 510.00*

MAGNAVOX
Multi-Mode 435.00*
8762 14" Color RGB 249.00*
9CM053 14" EGA 319.00*

MITSUBISHI
Diamond Scan (800x550) 459.00*
EGA 1430C (640x350) 379.00*

NEC

- Multisync II JC-1402 ..... 568.00*

Multisync GS 169.00*
Multisync XL 1,995.00*
Multisync Plus 872.00*

PRINCETON

- ULTRA-SYNC 432.27*

HX-12 Plus ..... 369.00* Max-12E 128.00*
LM-300 ..... 465.00*

SONY
1303 13" Trinitron Multiscan 519.00*
1302 13" Trinitron Multiscan 637.50*

- THE™ Amber 12" TTL 85.00*

COMPUTER SYSTEMS

AST *Model 80* $1,368.00*
AST *Model 120* 1,935.00*
AST *NEW! 386 (All Models)* ..... CALL
AT&T *6300 640K 1 Drive* 765.00*
AT&T *6300 W/1 Dr/20MB HD* 1,025.00*
COMPAQ *Deskpro 286 /40MB* 2,325.00*
COMPAQ *Deskpro 386/60MB* 5,165.00*
COMPAQ *Deskpro 386 130* 6,530.00*
COMPAQ *Deskpro 386 300* 8,500.00*
IBM *PS/2 Model 30* 1,459.00*
IBM *PS/2 Model 50* 2,450.00*
IBM *PS/2 Model 80-41* 4,100.00*

DISPLAY CARDS

- A.T.I. *VIP VGA* $255.00*

A.T.I. *EGA Wonder* 169.00*
HERCULES *Graphics Card Plus* 162.00*
HERCULES *IN COLOR CARD* 279.00*
ORCHID *Designer VGA (IBM PC/XT)* 239.00*

- ORCHID *Designer VGA (IBM PS/2)* 379.00*
- PARADISE *Auto 480* 149.00*

PARADISE *VGA Plus Card* 255.00*

- THE™ *Super EGA* 135.00*
- THE™ *Super EGA 800 (800 x 600)* 159.00*
- THE™ *H720 Mono Card/PP* 59.00*
- THE™ *Color Card* 59.00*

VIDEO 7 *Vega Deluxe* 209.00*
VIDEO 7 *Vega VGA* 229.00*

MATH CO-PROCESSORS

INTEL *80287 10MHz Co-Processor* $299.00*
INTEL *80287 8MHz Co-Processor* 235.00*

- INTEL *8087-2 Math Co-Processor* 142.00*

INTEL *80387-19 Co-Processor* 475.00*

LAPTOPS/PORTABLES

COMPAQ PORT. III MODEL 40 *W/640K, 1.2MB Dr., 40MB HD.* $3,995.00*

- NEC MULTISPEED HD *W/20MB* 2,195.00*

TOSHIBA T1000 LAPTOP *W/512K, 3.5" 720K Dr., MS-DOS, Super Twist* 739.00*

- TOSHIBA T1200 *W/1MB/20MB HD* 2,125.00*

TOSHIBA T3100/20 LAPTOP *W/640K, 3.5" 720K Dr., 20MB HD, MS-DOS* 2,895.00*

- TOSHIBA T3200 *W/1MB RAM* 3,440.00*

TOSHIBA T5100 *W/2MB RAM, 40MB HD, 1.44MB DD, DOS, Gas Plasma* 3,975.00*

FAX MACHINES

SHARP *FO210 Business Fax Machine* $1,110*
SHARP *UX-80 Fax Machine* 956.00*
SHARP *Fax Paper FO20PR6 Box of 6 Rolls* 22.00*

THE™ PC/10 ✦ MONOCHROME SYSTEM

With 640K, 360K Mitsubishi floppy disk drive, mono graphics adapter, 1 serial 1 parallel, game port, clock calendar 101 key keyboard. Phoenix bios. 84303565 **$559.00***

PC/10 w/Color Card 84303575 $559.00*

PC/10 w/EGA Card/640x480 Resolution 84303585 $649.00*

LOWEST PRICING ON CUSTOM CONFIGURATIONS!

PRINTERS

CITIZEN

- 180D $159.00*

MSP-50 ..... 359.00* Trib. 224 ..... 569.00*
MSP-45 ..... 389.00* Prem. 35 ..... 425.00*

EPSON

- LX800 ..... 185.00*

LQ500 ..... CALL LQ1050 ..... CALL
FX286E ..... CALL EX800 ..... CALL

HEWLETT PACKARD

- Laserjet II 1,570.00*

NEC

- LC890 ..... 2,990.00*

P6 ..... 399.00* P9XL 985.00*

- P7 Pinwriter 553.28*
- P2200 Dot Matrix 335.00*

OKIDATA

- Laserline 6 ..... 1,225.00*

193+ ..... 419.00* ML294+ 690.00*
ML 393 ..... 899.00* ML 292+ 349.00*

Panasonic

- 1080i 154.33*

1092i ..... 299.00* 1592 ..... 385.00*

SEIKOSHA

SK-3000 ..... 329.00* SP-180AI 139.00*

TOSHIBA

P321SL ..... 463.00* Pagelaser 12 ..... 2,395.00*
P351 MDL II 950.00*

PLOTTERS/DIGITIZERS/SCANNERS

HOUSTON INSTRUMENTS *All Models* ..... CALL

SUMMAGRAPHICS
Summasketch Plus (12x12) $369.00*

SUMMAGRAPHICS
Summasketch (12x18) 569.00*

MICE, ACCESSORIES

- LOGITECH *Logimouse +* $79.00*
- LOGITECH *Hi-Res Mouse* ..... CALL

MICROSOFT *Bus/Ser Mouse w/Paintbrush* 93.50*
MICROSOFT *Bus/Ser Mouse w/Windows* 125.00*
CENTRAL PT *Copy II Option Brd* 70.00*
CURTIS *Ruby + w/Fax Protector* 63.00*
KENSINGTON *Masterpiece +* 99.00*
MACH III *Mach III Joystick* 30.25*
COMPUTER ACC. AVAILABLE ..... CALL
PTI *Datashield S100* 52.00*
FUJI *3 1/2" DS/HD Box of 10* 45.00*
TRIPP LITE *IBAR 4-6* 48.00*

- THE™ *101-Key Keyboard* 59.00*
- THE™ *84-Key Keyboard* 49.00*
- THE™ *150 Watt P/S* 69.00*
- THE™ *200 Watt P/S* 99.00*

CHIPS *Set of 9 64K (120NS)* ..... CALL
CHIPS *Set of 9 256K (120NS)* ..... CALL
DISKETTES *(25) Hi Den -IBM AT* 32.50*
DISKETTES *(50) 5-1/4 DS/DD* 17.50*

MODEMS

- HAYES *Smartmodem 2400* $384.00*

HAYES *Smartmodem 1200* 259.00*
HAYES *1200B w/Smartcom* 259.00*
HAYES *2400B w/Smartcom* 389.00*

- THE™ *1200 BAUD External* 99.00*
- THE™ *1200 BAUD Int. w/Software* 79.00*
- THE™ *2400 BAUD External* 169.00*
- THE™ *2400 BAUD Int. w/Sft* 149.00*
- US ROBOTICS *HST 9600* 599.00*

MULTIFUNCTION CARDS

AST *Advantage Premium* $270.00*
AST *Six Pack Premium* 185.00*
INTEL *Above Board AT w/128K of 2MB* 319.00*
INTEL *Above Board w/64K of 2MB* 215.00*
ORCHID *Tiny Turbo 286* 239.00*
ORCHID *Twinturbo 12* 375.00*

- THE™ *Multi 384 w/0K P/S/G* 67.00*
- THE™ *Multi 1.5MB w/0K P/S/G* 119.00*
- THE™ *Multi I/O AT w/P/S/G* 60.00*
- THE™ *Multi I/O w/P/S/G/CLK/CAL* 60.00*
- THE™ *2MB Ram Card w/0K of 2MB* 99.00*

DRIVES

AMDEK *Laser Drive 1 CD-ROM* $580.00*
CMS *Int. 20MB HD w/Ctrl-PS/2* 269.00*
CMS *Same as Above w/40MB* 399.00*
CMS *360K Ext PS/2 Floppy* 229.00*
MITSUBISHI *3 1/2" FD w/2MB* 95.00*
MITSUBISHI *360K 1/2 Ht. Dr +* 85.00*

- THE™ *1/2 Ht. Add-On Floppy* 75.00*

†RENT SOFTWARE BEFORE YOU BUY

Members are eligible to join The NEW PC NETWORK's Business and Game Software Rental Libraries to evaluate products for a full 14 days or 30 days to see if they meet your needs. Just 35% OF THE MEMBER WHOLESALE PRICE.* **We feature hundreds of new titles.**

*All prices shown are wholesale and reflect a 3% cash discount. The NEW PC NETWORK Members pay just 8% above the wholesale price, plus shipping and handling. Minimum shipping $4.00 per order. International orders call for shipping & handling charges. Money orders, personal and company checks please allow 7 working days to clear. All prices subject to change. Products subject to availability.

1-800-621-S-A-V-E

In ILLINOIS: 1-312-280-0002

TECH SUPPORT: 1-312-280-0280
CUSTOMER SERVICE: 1-312-280-1567
Fax: 1-312-943-6010 Telex: 510-601-5955

PCW058

Monday-Friday: 8:30AM-6:00PM
Saturday: 10:00AM-4:00PM

VISA MasterCard AMERICAN EXPRESS

The NEW PC NETWORK
320 West Ohio, Chicago, Illinois 60610

Circle 135 on reader service card

COMPUTER DISCOUNT WAREHOUSE™

AT&T *The right choice*

6300 w/640K 1 Drive $849.20
6300 w/640K 2 Drives 934.42
6300 w/640K 1 Floppy, 20 Meg .1159.60
6300 w/640K 1 Floppy, 30 Meg .1187.70
6300 w/640K 1 Floppy, 40 Meg .1410.90
6312/6386 WGS.....CALL

All AT&Ts include keyboard. Monitor and DOS additional.

TOSHIBA

1100 Plus.....$1519.10
3100 w/20 Meg 2998.50
1000.....869.41
1200.....2237.55
3200 .....SPECIAL BUY
5100 .....NEW MODEL

WHY PAY RETAIL?

Nobody Sells For Less

CALL FOR LOWEST CUSTOM QUOTES

PACKARD BELL

PB88 (XT Turbo) 640K, 1 Floppy, DOS & GW-Basic, Serial/Parallel, Color/Monochrome Adapter & Keyboard.....$699.64
VT286 (AT Compatible) 8 MHz, 0 Wait State, 640K 1.2M Floppy, Serial/Parallel, F/H Controller, Keyboard $1299.36

SAMSUNG

S-300 4/8 MHz, 512K, 6 Slots S/P/C, Monographics board, DOS, Keyboard
S-300, 1 Floppy $749.50
S-300, 20 Meg 989.95
S-300, 40 Meg 1117.82

S-500 AT Compatible 8/10 MHz, 8 Slots, S/P/C, Monographics Board, DOS, Keyboard
S-500, 1.2M Floppy $1095.45
S-500, 20 Meg 1469.80
S-500, 40 Meg 1624.45

HARDWARE, SOFTWARE & PERIPHERALS AT *DISCOUNT* PRICES

COMPUTERS

AST

MDL 80.....$1570.70 MDL 170.....$2949.36
MDL 90.....1879.15 MDL 300 .....3380.40
MDL 120.....2219.05 MDL 340 .....4099.65
MDL 140 .....2599.55 MDL 390 .....5540.40

WYSE

MDL 2108 ....$1082.50 MDL 2214 ....$1868.30
MDL 2112.....1568.20 MDL 3216.....2658.05

IBM PS2

MDL 30, 2 dr ..$1272.20 MDL 60, 70 Meg .LOWER
MDL 30, 20 Meg .1725.17 MDL 80, 40 Meg ..IBM
MDL 60, 40 Meg...SAVE MDL 80, 70 Meg..PRICES

COMPAQ™

Deskpro 286, Model 1.....$2138.55
Deskpro 286, 40 Meg.....2629.10
Deskpro 286, 70 Meg.....2940.20
Deskpro 386, 40 Meg.....4662.05
Deskpro 386, Model 60, 20 MHz.....5579.30
Deskpro 386, Model 130, 20 MHz.....7059.92
Deskpro 386, Model 300, 20 MHz.....9168.20
Portable II, Model 2.....1896.10
Portable II, Model 4.....2797.00
Portable III, Model 20.....3577.85
Portable III, Model 40.....4159.33

PACKARD BELL

PB88 (XT Turbo) 640K, 1 Floppy, DOS, S/P/C, Monitor Adapter & Keyboard.....$699.64
PB88 w/1 floppy, 20 Meg.....956.80
VT286 (AT Compat.) 10 MHz, 0 Wait State, 1.2M Floppy, S/P/C, F/H Cont. & Keyboard 1299.36
VT286 w/20 Meg.....1573.50
VT286 w/40 Meg.....1724.10

TOSHIBA

T1100 Plus ...$1519.10 T1000 .....$799.41
T3100, 20 Meg 2998.50 T1200 .....$2237.55
T3200 ...SPECIAL BUY T5100....NEW MODEL

NEC

NEC Multispeed.....$1348.64
NEC Multispeed EL.....1499.76
NEC Multispeed HD w/20 Meg.....2365.77
NEC Powermate 2, 40 Meg .....NEW
NEC Powermate 2, 66 Meg .....LOWER
NEC Powermate 386, 66 Meg .....NEC
NEC Power mate 386, 130 Meg .....PRICES

ZENITH

Z-183 .....ALL ZENITH MODELS
Z-183, 20 Meg.....IN STOCK
Z-386.....CALL FOR PRICE

Other Computers Available Upon Request

DRIVE CARDS

MINISCRIBE 30 Meg Flashcard $425.96
MOUNTAIN 20 Meg/ 30 Meg 549.40/ 819.80
PLUS DEVELOPMENT 20 Meg 569.40
PLUS DEVELOPMENT 40 Meg 799.80
WESTERN DIGITAL 30 Meg 416.30

DRIVES FOR ATs & 286s

MINISCRIBE 40 Meg 28ms $609.40
MINISCRIBE 80 Meg 28ms 849.45
PRIAM 40 Meg hard disk.....669.55
PRIAM 60 Meg hard disk.....798.95
PRIAM 130 Meg hard disk 1989.40
SEAGATE 4038 30 Meg hard disk 499.80
SEAGATE 4053 40 Meg hard disk 599.98
SEAGATE 4096 80 Meg hard disk 739.59
360K floppy drive.....110.12

PRINTERS

CITIZEN

120D .....$159.55 MSP40.....$308.45
124.....485.10 MSP45.....449.20
180D .....178.85 MSP50.....375.64
224.....658.30 MSP55.....479.66
MSP10.....276.20 Premiere 35 ...457.17

DICONIX by Kodak

150P / 300 .....$309.17 / 479.17

EPSON

EX800.....CALL LX800.....ALL
EX1000.....CDW™ LQ500.....EPSON
FX86e.....FOR BEST LQ850.....MODELS
FX286e.....PRICE LQ1050.....IN
Call for Accessories LQ-2500.....STOCK

IBM

Pro Printer II ..$447.95 Quietwriter III..$1346.82

NEC

Color P6 .....$539.74 Color P7 .....$699.12
P6 80 col .....439.22 P7 136 col.....609.35
P5XL.....899.75 P9XL.....1035.70
P2200 .....364.65 8850 .....1040.79
3550.....719.12 CALL FOR ACCESSORIES

OKIDATA

Okimate 20 ...$122.74 ML 182P $232.50
ML 182S .....279.76 ML 192 Plus ...329.50
ML 193 Plus ...456.48 ML 292 Plus ...377.44
ML 293 Plus ...516.55 ML 294 .....747.10
ML 393 .....949.55 LASERLINE 6 .1229.30

PANASONIC

1080i .....$179.60 1091i $219.85
1092i.....334.28 1592 .....433.44
1595 .....459.45 3131.....274.32
3151.....409.52 1524.....579.10

TOSHIBA

P321SL .....$494.85 P351-2 Color .$1199.95
P341SL .....634.17 P351SX 1944.05

LASER PRINTERS

AST Turbo Laser/EL.....$1496.45
H-P Laser Jet Model 2 .....1749.40
H-P Deskjet.....689.00
NEC LC850/LC860.....IN STOCK
NEC LC890 Postscript.....3295.60

PLOTTERS, DIGITIZERS & SCANNERS

CALCOMP

1023.....$3838.38 1043.....$6535.15
1042.....7539.95 1044.....10,305.06

SUMMASKETCH

12x12 .....$376.30 12x18.....$632.50

HEWLETT PACKARD		HOUSTON INSTRUMENTS	
HP7440A	$968.30	HI DMP-42	
HP7475A	1417.44	HI DMP-52	
HP7550	2926.56	HI DMP-52MP	
HP7570	3931.20	HI DMP-56A	
HP SCANJET	SAVE	HI DMP-61	
		HI DMP-62	

FAX MACHINES

From Here to Anywhere in 18 Seconds

BELL OFFICE Faxline .$1370.52
PANASONIC KX-F115 ..1463.56
SHARP FO-150 .....1078.80
SHARP FO-210 .....1199.28
SHARP FO-500 .....1735.95
TOSHIBA 3010 .....1314.44

FLOPPIES, DRIVES & TAPES

1/2 height floppy drive $99.00
MINISCRIBE 20 Meg 1/2 height w/cont. .329.14
MINISCRIBE 30 Meg 1/2 height w/RLL ..345.95
SEAGATE 20 Meg 1/2 height hard drive .295.69
SEAGATE 30 Meg 1/2 height w/RLL.....309.72
SEAGATE 40 Meg 1/2 height 432.50
GENOA 60 Meg int. tape.....734.60
GENOA 60 Meg ext. tape.....895.10
GENOA 125 Meg int. tape 995.85
IOMEGA BERNOULLI 10+10 .....1395.25
IOMEGA BERNOULLI 20+20 .....1629.99
IOMEGA 20 Meg 1/2 height int. 995.55
IOMEGA 20+20 External 5¼ 1795.73
IRWIN 10 Meg tape backup 259.34
IRWIN 20 M/40 M Internal Tape...399.10/539.20
MOUNTAIN 4440 int.....368.80
MOUNTAIN 4440 ext.....547.75

NOVELL NETWORKING

SANTA CLARA Diskless Workstation $640.40

SOFTWARE & STARTER KITS

WESTERN DIGITAL 3 Node LAN kit w/Western Digital software.....$720.34
Entry-level 286 Starter Kit, 4 Users.....599.50
Entry-level 286 Starter Kit, 8 Users .....SAVE
NOVELL 286 Software w/Keycard 1569.09
NOVELL SFT Netware Level I 2148.66
NOVELL SFT Netware Level II V2.1 .....2757.60
Nondedicated Netware Software 286 w/Keycard 1569.09

INTERFACE CARDS

ARCNET PC110 LANBoard $199.27
ARCNET PC210 LANBoard 269.50
ETHERNET Interface Connector 349.80
ETHERNET Plus Board (for 286) 709.74
G-NET Interface Card w/cable.....299.52
WESTERN DIGITAL Ethernet Cards.....269.10

ACCESSORIES

ARCNET Passive Hub $85.00
ARCNET Active Hub 534.98
Ethernet Terminators 37.50

All Sales People are Novell trained and authorized. Call CDW for all your Networking Hardware & Software.

MONITOR INTERFACE CARDS

CDW™ color card w/p .....$ 99.00
CDW™ monographics card w/p 99.00
GENOA Spectrum (color monographic w/p)168.75
HERCULES color card w/p 146.16
HERCULES monographics plus w/p 179.84
HERCULES Incolor Board 299.00
TAXAN MONOGRAPHIC w/p 99.00

MONOCHROME MONITORS

AT&T Monochrome Monitor.....$189.40
AMDEK 310A/ 410A 129.99/ 149.99
AMDEK 1280 .....679.78
COMPAQ monochrome monitor 188.46
IBM PS2 8503 .....187.90
NEC Multisync GS 184.52
PGS MAX 12E amber color 139.40
PACKARD BELL Green or Amber.....89.95
TAXAN 123 Green/ 124 Amber ...119.50/ 124.05

COLOR GRAPHIC MONITORS

AT&T Color Monitor $543.69
AMDEK color 600T / 722 .....349.24/ 444.49
IBM PS2 8512 Color 428.40
IBM PS2 8513 Enhanced Color 498.20
SAMSUNG RGB Comp 238.60
PGS HX-12 Plus 417.15
TAXAN 650/720 .....469.90/299.80

VGA & EGA PRODUCTS

VGA & EGA MONITORS

COMPAQ VGA monitor $548.68
LOGITECH EGA Monitor 474.75
NEC Multisync II 609.76
NEC Multisync PLUS 888.10
NEC Multisync XL 19 inch 1974.46
PGS HX-12E Hi-Resolution RGB 469.32
SONY Multiscan 635.25
TAXAN 770 PLUS 499.40
ZENITH Z-1490 .....768.31

VGA DISPLAY CARDS

AST VGA $314.60
ATI VGA VIP.....307.24
GENOA VGA .....SAVE
PARADISE VGA 297.68
QUADRAM ULTRA VGA.....299.80
ORCHID VGA 278.14
VIDEO-7 VGA.....314.15

EGA DISPLAY CARDS

ATI Wonder Card.....$199.95
GENOA Super EGA Hi-Res 800 x 600 ...234.40
LOGITECH EGA Card w/mouse 217.18
NEC GB-1 640x480.....239.43
PARADISE Auto Switch EGA 480 .....169.65
QUADRAM Prosync.....285.40
VIDEO 7 Vega Deluxe.....249.74

MODEMS, COMMUNICATIONS & EMULATIONS

AST 5251-11 Plus.....$619.04
EVEREX 1200B/2400B 109.90/199.50
HAYES 1200.....289.60
HAYES 1200B 269.20
HAYES 2400 .....424.68
HAYES 2400B 379.65
IRMA 3278/79 Courier 695.17
TOSHIBA 1200 Baud 274.73
US ROBOTICS 1200B HAYES compat. 108.45
US ROBOTICS 1200 External 129.10
US ROBOTICS 2400B 199.70
VEN-TEL 1200 Int./1200 Plus 194.50/228.88
VEN-TEL 2400 Int./2400 External .299.10/389.44
Smartcom/Crosstalk 78.95/96.85

CHIPS

8087-2/8087-3 .....$159.33/122.50
80287-6/-8/-10 .....174.30/299.55/339.25
80387-16/80387-20.....497.68/789.44

MISC. & ACCESSORIES

A-B Switching Box (par. or serial) $39.95
KENSINGTON Masterpiece.....99.99
KENSINGTON Masterpiece Plus 118.40
KEYTRONICS 5151 IBM or AT&T 149.95
KEYTRONICS 101 .....104.65
QUADRAM Micro Fazers 140.40
Printer Cable (IBM to Centronics) 6 ft. 19.99
XT Power Supply 150 Watt.....69.95

BATTERY BACKUP & SURGE

PERMA POWER 6 Outlet Surge Supp. ...$29.40

TRIPPLITE

BC-450 .....$419.78 LC-1200 .....$136.85
BC-1200 .....748.55 LC-1800 .....189.75
4 Outlet 44.25

DATASHIELD

500 Watt .....$560.05 1200 Watt $994.75
800 Watt .....638.50 6 Outlet Surge...27.85

MICE

LOGITECH Logimouse Bus Version.....$109.06
LOGITECH Logimouse C7 .....89.95
LOGITECH Logimouse C7 w/publisher ...124.85
MICROSOFT Mouse (Bus Version) 119.34
MICROSOFT Mouse (Serial Version) 131.26
MOUSE SYSTEMS (Serial Version) 99.55
MOUSE SYSTEMS (Bus Version) 108.77

MOST ORDERS SHIPPED WITHIN 48 HOURS.

Call CDW™ for custom quotes on products not listed.

If you find a better price call us before you buy.

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE™ NOW!

Nationwide Toll Free

(800) 233-4426

In Illinois (312) 498-1426

FAX (312) 291-1737

Credit card charges are not submitted until time of shipment

MasterCard VISA AMERICAN EXPRESS Card

Word Perfect 4.2 5¼/3½	$199.90/214.90
dBase III + 5¼/3½	399.00/424.00
Lotus 1-2-3 5¼/3½	305.00/327.00
Paradox Version 2.0	399.00
Ventura Software Version 1.1	499.00
MICROSOFT Word V.4/Excell	243.50/319.30

Credit Card charges are not submitted until time of shipment. On all hard drive orders and orders under $200.00 please add $5.00 handling fee. Non-defective returns subject to restocking fee. All prices reflect 3% discount for cash. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. TM - Registered trademarks of IBM and COMPAQ.

HIGH VOLUME BIDS INVITED
730 Anthony Trail
Northbrook, IL 60062
FAX-A-BID (312) 291-1737

A518

Circle 200 on reader service card

Arlington Computer Products gives you the best prices on IBM PCs...

IBM AT 339 (8 MHZ)

1.2 Floppy, 512K,
30 MB Hard Disk
w/Monochrome Monitor ... ***$3895***
w/Color Monitor ***$4095***

IBM XT

CALL FOR CUSTOM CONFIGURATIONS

IBM PERSONAL SYSTEM II

Model 30, 2 floppies w/Monochrome Monitor	***$1475***
Model 30, 20 MB w/Monochrome Monitor	***$1899***
Model 50, w/Monochrome Monitor	***$2875***
Model 60, w/44 MB and Monochrome Monitor	***$3649***
Model 60, w/70 MB and Monochrome Monitor	***$4095***
Model 80, w/44 MB and Monochrome Monitor	***$4695***
Model 80, w/70 MB and Monochrome Monitor	***$5395***
Model 80, w/115 MB and Monochrome Monitor	***$8395***

w/Color Monitor add $250

...and COMPAQ too!

COMPAQ 286

DESKTOP — 1 Drive
640K, 40 MB, Monitor ***$2695***
PORTABLE II MODEL IV —
1 Drive 640K, 20 MB ***$2850***
PORTABLE III —
1 Drive 640K, 20 MB ***$3695***
w/40 MB ***$4195***

COMPAQ DESK PRO

1 Drive, 640K, 20 MB
Green or Amber Monitor ***$1695***

COMPAQ 386

Model 40 (16 MHZ) ***$4495***
Model w/60 MB-20 MHZ..... ***$5579***
Model w/130 MB-20 MHZ ***$6950***
Model w/300 MB-20 MHZ ***$9395***

COMPAQ PORT. 386

Model 40 ..... ***$5799***
Model 100 ..... ***$7375***

COMPATIBLE SYSTEMS

WUGO 10 MHZ TURBO XT

10 MHZ keyboard switchable clock speed, 640K Ram, 1 floppy drive, 20 MB hard disk, parallel and game ports, clock calendar, monochrome graphics adaptor, monochrome monitor, 3 year limited warranty.

$1149

DRIVES & TAPES

360K Floppy for PC $99
360K Floppy for AT $115
20 MB Tape for XT. $399
20 MB Tape for AT. $339
40 MB Tape for AT
or Compaq 386.... $459

EVEREX

60 MB Internal $679
60 MB External ... $679

SEAGATE HARD DISKS

20 MB for XT (ST225) . $279
30 MB for XT (ST238) . $299
40 MB for AT (ST251) . $399
40 MB for AT (ST251-1)$479
80 MB for AT $869

PRIAM HARD DISKS

40 MB $679
60 MB $819
130 MB $1999

IOMEGA

10 + 10 Bernoulli w/Controller..... $1489
20 + 20 Bernoulli w/Controller..... $1829

External 5¼" for PSII $279
PLUS hard card 20 MB..... $539
PLUS hard card 40 MB..... $699

VIDEO BOARDS

ATI EGA Wonder $189
ATI VGA $269
Compaq VGA $499
Everex EGA Autoswitch.. $139
Graphics Card..... $79
Hercules Graphics Plus .. $179
NEC GB1 ..... $229
Paradise Autoswitch 480 . $169
Paradise EGA $319
Quadram Prosync $239
STB EGA Plus..... $239
Vega Deluxe..... $239
Vega VGA $289

MICE

Mouse Systems..... $99
Microsoft..... $109
Logitech $74

MONITORS

AMDEK

310A..... $129
410A..... $149
600 ..... $349
722 ..... $439

PRINCETON

MAX12..... $149
HX12 ..... $415
HX12E $449
Ultrasync $529

IBM

8502 ..... $199
8512 ..... $459
8513 ..... $519
NEC Multisync II $589
NEC Multisync Plus $879
SAMSUNG Color $259
SONY Multiscan..... $599

Arlington Computer Products, inc.
3025-E S. MALMO
ARLINGTON HEIGHTS, IL 60005

VISA MasterCard AMERICAN EXPRESS

FOR ORDERS & SYSTEMS QUOTES:

800-548-5105

CUSTOMER SERVICE AND IN ILLINOIS 312-228-6333
SHIPPING 312-228-6333
TECHNICAL ASSISTANCE 312-228-1470
FAX 312-228-0516

Prices and Availability Subject To Change Without Notice

Bringing you the best in IBM compatible peripherals since 1984.

OUR EPSON PRINTER PRODUCTS ARE SO GOOD WE NEED TO SHOW THEM OFF!

LX 800	*FX 286E*	*LQ 500*	*LQ 850*	*EX 800*
$189	*$399*	*$319*	*$489*	*$389*
FX 86E	*LQ 800*	*LQ 2500*	*LQ 1050*	*EX 1000*
$289	*$369*	*$819*	*$659*	*$479*

PRINTERS

EPSON

LX 800	$189	LQ 1050	$659
FX 86E	$289	LQ 500	$319
FX 286E	$399	LQ 2500	$819
LQ 800	$369	EX 800	$389
LQ 850	$489	EX 1000	$479

OKIDATA

192 Plus/193 Plus	$299/$449
292 w/Module	$449
293 w/Module	$589
393	$959
Pacemark	$1749

TOSHIBA

321 S/L/341 S/L	$499/$659
351 SX	$1010

NEC

P6	$435	P7	$619
3550	$729	P9XL	$1089
P5XL	$859	P2200	$349

PANASONIC

1080 I	$189	1091 I	$199

IBM

Quietwriter III	$1189
Proprinter II	$389
Proprinter X24	$549
Proprinter XL	$549
Proprinter XL24	$739

HEWLETT-PACKARD

Laserjet II	$1699
1 MG Upgrade	$339
2 MG Upgrade	$629

SOFTWARE

Crosstalk	$109
D Base III Plus	$379
Framework	$349
IBM Displaywrite IV	$299
Lotus 123	$299
Managing Your Money	$125
Microsoft Word	$209
Multimate Adv. II	$259
Norton Utilities	$59
R Base System V	$409
Smartcom	$49
Symphony	$429
Ventura Desktop Publ.	$499
Volkswriter III	$145
Word Perfect 4.2	$199
Word Perfect Library	$59
Wordstar 2000+	$239

MODEMS

HAYES

1200	$289
1200 B Alone	$259
1200 B w/Software	$289
2400	$429
2400 B	$429
Everex 300/1200 w/Software	$99
Everex 2400 Internal	$179
Everex 2400 External	$249

MULTIFUNCTION BOARDS

Everex Magicard 384K	$169
AST 6 Pack w/384K	$189
AST 6 Pack Premium w/256K	$219
AST Advantage	$259
AST Rampage PC w/256K	$239
AST Rampage AT w/512K	$339
Orchid Tiny Turbo	$279
Intel Above Board PC	$239
Intel Above Board PC P/S	$279
Intel Above Board AT	$329
Intel Above Board AT P/S	$349
Irma Board	$695
AST 5251-11	$529
AST 5251-11 Plus Enhanced	$599

CHIPS

64K Ram Chips	9 for $15
256K Chips	each $4.50
8087-3	$109
8087-2	$149
80287	$159
80287-8MHZ	$249
80287-10MHZ	$299
80387-16	$469
80387-20	$749

★ ISSUE HIGHLIGHTS ★

AST RAMPAGE AT W/2 MEGABYTES	*NEC MULTISYNC MONITOR*	*MICROSOFT MOUSE*	*ZENITH 2 DRIVE LAPTOP*	*EPSON PRINTER STAND W/PRINTER PURCHASE*
$649	*$589*	*$109*	*$1695*	*$15*
EVEREX 300/1200 MODEM W/SOFTWARE	*SEAGATE 30MB HARD DISK KIT*	*HP LASERJET II*	*NEC MULTISPEED EL*	*D BASE III*
$99	*$299*	*$1699*	*$1695*	*$379*

Arlington Computer Products, inc.
3025-E S. MALMO
ARLINGTON HEIGHTS, IL 60005

FOR ORDERS & SYSTEMS QUOTES:
800-548-5105
CUSTOMER SERVICE AND IN ILLINOIS 312-228-6333
SHIPPING 312-228-6333
TECHNICAL ASSISTANCE 312-228-1470
FAX 312-228-0516

Prices and Availability Subject To Change Without Notice

NOW SERVING 24 HOURS A DAY — 7 DAYS PER WEEK

EXPOLINK NETWORK ELECTRONIC ORDER SYSTEMS

IF YOU HAVE A 1200/2400B MODEM IN YOUR PC JUST DIAL 713-953-7407 AND ENTER "BETA" OR CALL FOR DETAILS DURING BUSINESS HOURS AT 784-0990

EXPO SUPER TURBO
30 MB SYSTEM

$885

- 10 MHz/4.77
- 512K (640K-ADD $50)
- 360K FLOPPY DRIVE
- 30 MB SEAGATE HARD DRIVE
- MONO/GRAPHICS/PARALLEL ADAPTER
- HI—RES MONITOR
- AT KEYBOARD
- 1 YEAR WARRANTY
- 3 HOURS FREE TRAINING
- COLOR MONITOR UPGRADE ADD $195

EXPO 286
40 MB SYSTEM
$1497

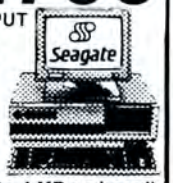
10 MHz 0 WAIT
12 MHz THRUPUT

- 80286 CPU
- 512K (640K-ADD $50)
- 1.2 FLOPPY DRIVE
- 40 MB SEAGATE HARD DRIVE
- MONO/GRAPHICS/PARALLEL ADAPTER/CLOCK/CALENDAR
- HI-RES GREEN/AMBER MONITOR
- AT KEYBOARD
- 1 YEAR WARRANTY
- 3 HOURS FREE TRAINING

NOW 80 MB SEAGATE IN STOCK

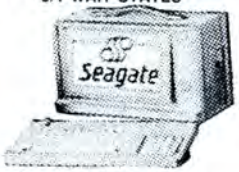
EXPO 386
80 MB SYSTEM
$2795

24 MHz THRU PUT



- INTEL 80386 (32 BIT)
- 1 MB RAM (Upgradeable to 4 MB on board)
- 64K CHANCE MEMORY 0 WAIT
- 1.2 MB FLOPPY DRIVE
- 80 MB SEAGATE HARD DRIVE (28 MSC)
- SERIAL/PARALLEL/CLOCK CALENDAR
- RESET/TURBO LIGHT IN DICATOR CASE 5 DRIVE SLOT
- 101 ENHANCE KEYBOARD
- 200 W. POWER SUPPLY
- 1 YEAR WARRANTY
- 2 HOURS FREE TRAINING

EXPO PORTABLE IV
286 12 MHz
40 MB SYSTEM
0/1 WAIT STATES



$1875

- PHOENIX BIOS
- 512K RAM (1MB RAM-ADD $150
- 1.2 MB FLOPPY DRIVE
- 40 MB SEAGATE HARD DRIVE
- HI—RES LC. DISPLAY
- 640 X 200 PIXEL (80 X 25 LINES)
- AUTO SELECT 110/220V
- FIVE EXPANSION SLOT
- EXTERNAL RGB/COLOR PORT
- DIMENSIONS 8¼ (H) X 9½ (W) X 15¾ (D)
- 386 MODEL ALSO AVAILABLE

Seagate HARD DRIVE SALE!

ST-225 20 MB KIT $267
- 20 MB Hard Drive System includes
- Controller Cables
- Instructions

ST-238 30 MB KIT $297
- 30 MB ALL Hard Drive System includes
- Controller Cables
- Instructions

40 MB HI-SPEED $419
- AT Drive
- 28 MSC ST 251
- (Controller is optional)

• ST-4026 $299
20 MB AT Drive
(Full Height 38 MSC.)

• ST-4038 $499
30 MB Drive
(Full Height 38 MSC.)

• ST-4096 $895
80 MB Drive
(Full Height 28 MSC)

IRWIN TAPE BACK

10 MB XT/86
Model 110D
$201
Works with PC/XT/AT&T Compaq & Clones

40 MB/286/386
Model 145D
$495

60 MB 286/386
Model 165D
$595

AST Premium 286 — Seagate

$2195
10 MHZ/WAIT
40 MB
SYSTEM

- 640 K RAM
- 1.2 MB Floppy Drive
- 40 MB Seagate (28 MSC) Drive
- Serial/Parallel/Clock
- 101 Enhance Keyboard
- MS DOS 3.2+ Basic
- 1 Year Nationwide Warranty

AST PREMIUM 386 — CALL NOW

AT&T

$1395
MODEL 6300
30 MB
SYSTEM

- 360K Floppy Drive
- 640K RAM
- 30 MB Seagate Hard Drive
- Monochrome Display
- Hi-Res Graphics
- Parallel/Serial/Clock/Calendar
- Keyboard

AUTHORIZED AT&T DEALER

MODEMS

Everex 1200B	Int.	$ 85
Anchor 1200B	Int.	$ 75
Everex 2400B	Int.	$179
Anchor 2400B	Int.	$179

EVEREX EXTERNAL - CALL

FLOPPY DRIVE

720K 3.5" DRIVE	$139
1.4MB 3.5" DRIVE	$199
1.2MB 5¼" DRIVE	$119

ADD ON CARDS

MOTHERBOARD
- 8088-2 (4.77/8MHz) OK..... $99
- 8088-1 (4.77/10 MHz) OK..... $149
- 80286-10 (6/10 MHz) OK..... $325
- 80386-16 (6/10/16 MHz) OK $1595

MEMORY CARD
- 2.5 MB Multi-Function Serial/ Parallel/Game Port..... $175
- 2MB LIM Card (16 bit) Intel Above Board Compatible..... $149
- 4 MB AT or 386 Memory Card (16 bit) OK..... $295
- 384K XT MF Card Serial/Parallel/ Clock/Game Port OK..... $105

I/O CARD
- Serial RS-232 Adapter..... $40
- SERIAL/PARALLEL/AT/XT Game Port..... $50
- 2nd Serial Option Kit..... $35
- MULTI I/O Floppy/Serial/Parallel/ Clock/Game Port..... $80
- I/O PLUS Serial/Parallel/Clock/ Game Port..... $65

VIDEO CARD
- Mono/Graphics w/Parallel..... $55
- Color/Graphics Parallel Card RGB or Compatible..... $60
- EGA (640/400 Res.) MDA/CGA/ EGA..... $149
- Genoa Super EGA & System Super EGA (800x600 Res.).... $225

POLICY
Returned items must be as new, not modified or damaged, with all manuals, warranty card, and packaging intact. Returned items must be with the Return Authorization No. on the shipping label. NO CREDIT issued after 30 days from the date of shipment. Restocking fee 20%

COMPUTEREXPO®

TEXAS # 1 IBM™ COMPATIBLE COMPUTER CENTER

11238 WILCREST GREEN, HOUSTON, TEXAS 77042

ORDERS LINE ONLY
1-800-622-EXPO

INQUIRE 713-784-0990
SERVICE 713-784-7817

Seagate, Hercules, Hayes, Everex, Diamond, IBM, XT, AT & CES are registered trademarks of their respective companies.

Circle 91 on reader service card

SAVE MONEY ON COMPUTERS

COMPUTER PRODUCTS AT THE LOWEST PRICES

WE ARE YOUR NETWORKING SPECIALIST.

COMPUTERS

THE ALL NEW IBM PERSONAL SYSTEM 2

MODEL 25 MONOCHROME 2 FLOPPY	$1,045.00
MODEL 25 MONOCHROME 2 FLOPPIES	$1,222.00
MODEL 25 COLOR 1 FLOPPY	$1,339.00
MODEL 25 COLOR 1 FLOPPIES	$1,499.00
MODEL 30-002 (2 720K FLOPPIES)	$1,259.00
MODEL 30-021 (20MB HARD DRIVE)	$1,699.00

80286 SYSTEMS

MODEL 50-021 (20MB HARD DRIVE)	$2,655.00
IBM MODEL 60 & 80	ON SPECIAL!!

IBM PERSONAL SYSTEM/2 DISPLAYS

MONOCHROME 8503	$199.00
COLOR-8512 (14")	$476.00
COLOR 8513 (12")	$539.00
COLOR 8514 (16")	$1,162.50

NEW PERSONAL SYSTEM 2 SOFTWARE

IBM DOS 3.3	$96.00

LAPTOP COMPUTERS

NEC MULTISPEED 640K, 2 3-1/2" FDD	$1,385.00
NEC MULTISPEED EL, BACKLIT	$1,599.00
NEC MULTISPEED HD	$2,360.00
TOSHIBA 1000 IN STOCK	$875.00
TOSHIBA 1100 PLUS	$1,499.00
TOSHIBA 1200	$2,290.00
TOSHIBA 3100-20	$3,089.00
NEW! TOSHIBA 3200	CALL
NEW! TOSHIBA 5100	CALL
ZENITH 181 640K, 2 3.5" FLOPPIES	$1,639.00
ZENITH 183 640K, 1 3.5" FLOPPY, 10MB HARD DRIVE	$2,199.00
ZENITH 183 640K, 1 3.5" FLOPPY, 20MB HARD DRIVE	$2,340.00

NEW IBM PRINTERS

IBM PROPRINTER II	$439.25
IBM PROPRINTER XL24	$839.20
IBM QUIETWRITER III PRINTER	$1,299.00

WYSE COMPUTERS AND TERMINALS

MODEL 2108	$1,080.00
MODEL 2108-20	$1,410.00
MODEL 2112	$1,499.00
MODEL 2112-40	$2,299.00
MODEL 2214	$1,799.00
MODEL 2114-40	$2,599.00
MODEL 3216-01	$2,499.00
MODEL 3216-40	$3,339.00
AT STYLE ENHANCED KEYBOARD	$109.00

TERMINALS

MODEL 30 GREEN OR AMBER	$309.00
MODEL 50 GREEN OR AMBER	$379.00
MODEL 60 GREEN, AMBER OR WHITE	$339.00
MODEL 85 GREEN OR AMBER	$469.00
MODEL 60 KEYBOARD	$115.00

***** LASER XT AND SSI 286 SPECIALS *****

NATIONALLY RENOWNED LASER XT W/256K, 1 FLOPPY	$499.00
LASER XT W/640K, 2 FLOPPIES, MULTI I/O CARD, TTL MONOCHROME MONITOR MONOGRAPHICS BOARD, TURBO 10 MHz MOTHERBOARD	$799.00
SPECIAL! SSI AT 286-10, 512K, 1.2MB FLOPPY, HD/FD CONTROLLER, AT STYLE KEYBOARD, 8 EXPANSION SLOTS, 195 WATT POWER SUPPLY, FULL 1 YEAR WARRANTY	$1,119.00

COMPAQ™ SPECIALS

DESKPRO MODEL II 256K, 2 360K FLOPPIES	$1,243.00
SPECIAL! DESKPRO 286 MODEL I	$1,889.00
DESKPRO 286 W/40MB HARD DRIVE	$2,599.00
DESKPRO 286 W/80MB HARD DRIVE	$2,999.00
DESKPRO 386 W/40MB HARD DRIVE	$4,660.00
DESKPRO 386 MODEL 60, 20MHz	$5,559.00
DESKPRO 386 MODEL 130, 20MHz	$7,029.26
DESKPRO 386 MODEL 300, 20MHz	$9,159.00
*** NEW COMPAQ PORTABLE III ***	IN STOCK

AST SPECIALS

AST MODEL 80	CALL
AST MODEL 90	FOR
AST MODEL 120	BEST
AST MODEL 140	PRICE
AST MODEL 170	IN STOCK
AST MODEL 300, 340 & 390	IN STOCK

NOVELL NETWORKING

TURNKEY NETWORK SYSTEM

80MB 286 FILE SERVER, ARCNET PC TERMINALS, LOADED SOFTWARE, CABLES, TERMINATORS AND TEES. EVERYTHING. PLUG IN & TURN ON	
4-USER	$6,199.00
6-USER	$8,999.00
8-USER	$10,899.00

OPERATING SYSTEMS

NEW! ADV. NETWARE 286 V 2.1 SFT	$2,599.00
ADV. NETWARE 286 V 2.0A	$1,499.00
ADV. NETWARE 286 SFT I	$2,096.50
ELS 4-USER SOFTWARE	$429.00

CARDS

ARCNET	$169.00
ETHERNET	$259.00

WORK STATIONS

ARCNET PC TERMINAL	$799.00
ETHERNET PC TERMINAL	$699.00

MISC. NETWORKING ITEMS

MOUNTAIN 40MB TAPE BACKUP	$469.00
ARCNET ACTIVE HUB	$535.00
ARCNET PASSIVE HUB	$85.00
ELGAR INTELLIGENT 1000 WATT UPS W/SOFTWARE	$899.00
APC MONITOR COMPATIBLE 1000 WATT UPS	$1,199.00

MONOCHROME MONITORS

HYUNDAI TILT SWIVEL AMBER	$85.00
TAXAN 123 GREEN MONOCHROME	$105.50
TAXAN 124 AMBER MONOCHROME	$110.00
AMDEK 310A AMBER MONOCHROME	$129.00
AMDEK 410A AMBER MONOCHROME	$149.00
WYSE 530 GREEN OR AMBER	$175.36
COMPAQ MONOCHROME MONITOR	$191.00
PGS MAX-12E AMBER	$139.00
WYSE 700 1280 X 800 RES. W/GRAPHICS CARD	$767.20
AST DISPLAY MONOCHROME MONITOR, 14" BLACK & WHITE	$179.50

COLOR MONITORS

SAMSUNG COLOR 640 X 200	$279.00
SPECIAL! MAGNAVOX COLOR MONITOR	$269.00
TAXAN 720 COLOR MONITOR	$299.50
TAXAN 635	$397.50
PGS HX-12E	$459.00
SPECIAL! AMDEK COLOR 600T	$349.00
AMDEK COLOR 722	$444.00

EGA MONITORS

AST EGA DISPLAY	$509.25
MAGNAVOX EGA	$389.00
SAMSUNG EGA MONITOR	$389.00
SPECIAL! GOLDSTAR EGA MONITOR	$359.00
NEW! TAXAN 770 MULTISYNC	$539.00
COMPAQ VGA MONITOR	$524.25
NEW! NEC MULTISYNC II	$599.00
NEC MULTISYNC PLUS 14" 960 x 720	$885.00
NEC MULTISYNC XL 19" 1024 x 768	$1,955.00
ZENITH **FTM** ZCM-1490	$689.00

DISK DRIVES

MINISCRIBE 20MB 3.5" W/WD #8425	$299.00
SEAGATE ST225 20MB W/CONT.	$289.00
SEAGATE ST238 30MB W/RLL CONT.	$309.00
SEAGATE ST251 40MB 1/2 HEIGHT - AT	$419.00
20MB MINISCRIBE HARD CARD	$399.00
30MB MINISCRIBE HARD CARD	$419.00
PLUS HARDCARD 20 / 40	$559.00 / $670.00
SPECIAL! 40MB 1/2 HGT. MINISCRIBE	$350.00
SPECIAL! SEAGATE ST4096 80MB W/ON-TRAC	$760.00
FUJITSU 360K 1/2 HGT. FLOPPY	$83.00
COMPAQ 360K HGT. FLOPPY	$47.00
TAXAN TDM-5 5.25" EXTERNAL FDD FOR IBM PS/2	$249.00
BERNOULLI BOX 10+10	$1,395.00
SPECIAL! BERNOULLI BOX 20+20	$1,599.00
NON BOOTABLE CONTROLLER	$159.00
BOOTABLE CONTROLLER	209.00
SPECIAL! IRWIN 10MB TAPE BACK-UP	$259.00
IRWIN 20MB AND 40MB INTERNAL TAPE BACK-UPS	IN STOCK
ARCHIVE 40MB TAPE BACK-UP UNIT FOR XT/AT	$339.00

CARDS

MULTI I/O	$69.99
MONOCHROME GRAPHICS W/PP	$69.85
ATD HERCULES COMPATIBLE W/PP	$95.00
TAXAN 535 MONOCHROME W/PP	$79.00
HERCULES GRAPHICS CARD PLUS	$179.00
IBM MONOCHROME W/PP	$197.00
COLOR GRAPHICS CARD	$69.00
COLOR GRAPHICS CARD W/PP	$89.00
HERCULES COLOR CARD W/PP	$146.00
NEW HERCULES INCOLOR CARD	$249.00
TAXAN 555 COLOR CARD W/PP	$189.50

EGA AND MEMORY CARDS

EPIC 480, EGA, CGA, MDA, HERC, 640 X 480 VIDEO 7 COMPATIBLE	$149.00
PARADISE AUTOSWITCH EGA 640 X 480	$199.00
QUADRAM EGA	$199.00
VIDEO 7 VEGA DELUXE	$239.00
NEC GB-1 640 X 480 RES.	$239.00
NEW! GENOA SUPER EGA HI-RES. 800 x 600 RESOLUTION	$235.00
STB VGA EXTRA, VGA, EGA, CGA, MONO	$259.00
ATI WONDERBOARD, EGA, VGA, CGA	$219.00
STB VEGA EXTRA, VGA, CGA, EGA, MONO	$249.00
GENOA SUPER VGA HI-RES PLUS	IN STOCK
NEC MVA 1024	$829.00
VIDEO 7 VGA	$314.00
QUADRAM ULTRA VGA CARD	$339.00
PARADISE VGA CARD	$296.00
AST VGA CARD	$314.50
ATI VGA VIP CARD	$307.00

MODEMS

2400 BAUD INTERNAL MODEM W/ SOFTWARE	$175.00
ATD 300/1200 BAUD W/PCTALK III	$89.00
USR SPORTSTER 1200 EXTERNAL	$128.00
USR SPORTSTER 1200 HALF INTERNAL	$108.00
USR SPORTSTER 2400 INTERNAL W/SOFTWARE	$199.00
EVEREX 1200BAUD INTERNAL	$109.00
EVEREX 2400BAUD INTERNAL	$199.00
EVEREX 2400BAUD EXTERNAL	$289.00
NEW LOWER PRICING AVAILABLE	
HAYES SMARTMODEM 1200 EXTERNAL	$289.00
HAYES SM1200B W/SMARTCOM II	$289.00
HAYES SMARTMODEM 1200B W/HW INTERNAL – NO SOFTWARE	$250.00
HAYES SMARTMODEM 2400 EXTERNAL NO SOFTWARE	$424.00
HAYES SMARTMODEM 2400B W/SOFTWARE	$424.00
HAYES SMARTMODEM 2400B INTERNAL HARDWARE ONLY	$379.00
EXTERNAL MODEM CABLES	$15.00
IBM 5250 EMUL 2.12 CONV KIT	$633.75

PRINTERS W/ FREE CABLE

CITIZEN 120D, 80 COL, 120 CPS	$169.75
CITIZEN 180D, 80 COL, 160 CPS	$178.00

SPECIAL OF THE MONTH

CITIZEN MSP40, 80 COL, 200 CPS	$299.00
EPSON LX-800 W/TRACTOR FEED	$219.00
EPSON FX-86E	$309.00
EPSON FX-286E	$439.00
EPSON EX 800	$429.00
EPSON EX 1000	$499.00
EPSON LQ 500	$339.00
EPSON LQ 850	$519.00
EPSON LQ 2500	$869.00
SPECIAL! NEC P2200	$339.00
NEC P660 80 COL	$425.00
NEC COLOR P660	$530.50
NEC P760 136 COL/216 CPS	$580.00
NEC COLOR P760	$699.00
NEC P560 XL	$879.00
NEC P960 XL	$1,035.00
NEC 3550 SPINWRITER	$719.00
NEC 8850 SPINWRITER	$1,039.00
PANASONIC 1080i	$199.00
PANASONIC 1091i	$219.00
PANASONIC KX-P1595	459.99
DESTINY LASER X1 H-P COMPAT., 4 MONTHS FREE SERVICE W/TRW	$1,599.00
OKIDATA ML182 PLUS FOR IBM	$243.49
OKIDATA ML192 PLUS FOR IBM	$329.00
OKIDATA ML193 PLUS FOR IBM	$440.00
OKIDATA ML292E	$377.44
OKIDATA ML293E	$515.50
INTERFACE MODULE FOR 292/293	$94.99
SPECIAL! OKIDATA ML393 P/SERIAL	$949.00

NEW!

TOSHIBA P321 SL W/TRACTOR	$499.00
TOSHIBA P341 S/L	$665.00
TOSHIBA P351 SX W/TRACTOR	$1,050.00
HP LASERJET SERIES II	$1,740.00
HP DESKJET INKJET PRINTER	$695.00
HP 7475A PLOTTER	IN STOCK
SUMMASKETCK 12 X 12	$399.00
SUMMASKETCH 12 X 18	$679.00
DICONIX 150P BY KODAK, BATTERY POWERED PORTABLE PRINTER	$309.00
DICONIX 300 WIDE CARRIAGE, BATTERY POWERED PORTABLE PRINTER	$529.00

DISKETTES

3-1/2" DS/DD FOR PS/2	$22.00
5-1/4" DS/DD FOR AT	$12.45
5-1/4" DS/HD FOR AT	$21.99

CHIPS

80387-16	$545.00
80387-20	$749.00
8087-2 (FOR COMPAQ DESKPRO)	$169.00
80287-6 (FOR AT & AT COMPATIBLES)	$179.20
80287-8	$255.00
80287-10	$335.00
COMPAQ 386 1MB UPGRADE	$390.00

AUTHORIZED WYSE DEALER • ALL SOFTWARE MINIMUM 30% OFF • MOST ORDERS SHIPPED WITHIN 48 HOURS • WE HAVE THE LOWEST PRICE, CALL US BEFORE YOU BUY IT ANYWHERE ELSE • CORPORATE BIDS OR HIGH VOLUME BIDS WELCOME. CALL **(800) 426-2489,** AND ASK FOR AMY

TECH HOT LINE (312) 537-3970 • TOLL FREE ORDER LINE (800)/426-2489

WE HAVE ALL YOUR COMPUTER NEEDS AT THE BEST PRICE AND WE GUARANTEE IT!

CALL **1-800-426-2489**

or in Illinois **312-537-3600**

FAX: **(312) 537-2850**

Orders under $200, please add $5 for handling. Prices reflect 3% cash discount. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. Returns are subject to a restocking charge. Prices are subject to change without notice.

VISA MasterCard accepted

707 COMPUTER SALES 707 Dartmouth Drive Buffalo Grove, IL 60089

Circle 174 on reader service card

The Aha Principle and the Whack Corollary

Steve Bass

So what's the problem with IBM?" asked my friend Harry one day, busy interacting with QuickBASIC 4.0.

"What problem?" I parried, not wanting to be the bearer of bad news.

"Come on," he responded between debugs, "we haven't seen an edition of *Exchange* in months." Actually, it had been considerably longer since IBM sent our user group an issue of its excellent on-disk support magazine.

"Maybe it just became too expensive," I suggested, concentrating harder on the monitor's QB4 code.

"Humph," he humphed, turning back to his ill-designed AT keyboard. Harry didn't know the history.

It began with Gene Barlow, IBM's former group support manager, whose job it had been to watch over user groups. He managed a telephone support staff, a toll-free bulletin board, and best of all, this unique on-disk publication.

Started in early 1984, *Exchange* was brilliant, slick, and practical—full of great utility programs and tips. It was widely disseminated by user group librarians, keeping the IBM name ever in front of the multitudes.

But the *Exchange* of disks came to a screeching halt in 1985 when the monthly turned into a much less valuable hard-copy magazine. Of course, IBM still kept its bulletin board open to user group activists; it even supplied a meeting room for the first User Group Summit at COMDEX/Fall '86.

But soon the magazine was coming out every other month, then quarterly; then it shrank to a 4-page newsletter. Late last year, it finally merged into something called *Systems*, a mainframe-oriented journal with very little to say about PCs. The Blue giveth and the Blue taketh away.

Meanwhile, bulletin board access and support staff were cut back; the offer of COMDEX meeting space was withdrawn, and Barlow finally was transferred to "a real job."

"Harry," I began diplomatically, "maybe IBM is miffed because of all the clones that users are buying."

"Hell," he exploded, "I'm a loyal IBM user. Just look at this hardware!"

"Let me explain it another way," I persevered. "In Gestalt therapy, patients are encouraged to explore their problems from different angles and to discover their own solutions through flashes of insight. It's called the Aha Principle.

"For example, after years of not knowing that our user group existed, Microsoft saw the light late last year; then, when 300 representatives from 60 user groups showed up at our COMDEX/Fall summit, a lot of other vendors 'discovered' us as well."

"But what about IBM? They were there too, right?"

"Ah, yes, well, we may need to apply a slightly different technique with IBM. We call it the Whack Corollary, as in whack them upside the head with a two-by-four to get their attention."

Harry quickly grasped the next step. "Let's invite everyone to the COMDEX/Spring summit! IBM will fall in line when they see everyone else supporting us."

"Oh, they'll all be there," I reassured him, "Microsoft, Intel, Lotus—everyone. But..."

"Of course," mused Harry, by now thumbing through the IBM clone ads in Saturday's paper, "if you have to whack them, maybe it's already too late."

"I sure hope not," I said. "Say, are you going to finish this program, or what?" ●

Steve Bass is a family therapist in private practice and president of the Pasadena, California, IBM Users' Group.

Switch on a serious surge suppressor.

With test after test proving that 70-90% of all PC malfunctions can be traced to power problems, a surge suppressor is the first accessory you should buy for your PC. But don't put your trust in just any surge suppressor. Get one that gives your whole system superior protection. One that's engineered to the highest specifications.

Meets IEEE 587-1980 Category A	✓
Meets IEEE 587-1980 Category B	✓
UL Listed	✓

The right surge suppressor passes all the tests.

Get a Kensington Master Piece® or Master Piece Plus. They're the most popular PC surge suppressors. And the most serious. Because at Kensington, we're dedicated to giving your PC the best possible protection.

That's why Master Piece and Master Piece Plus are equipped with our unique two-stage surge suppression circuit, containing a high-speed silicon semiconductor for the quick reaction necessary and heavy-duty metal oxide varistors for the brute force required to keep even the largest surges from penetrating into your system.

That's why the plus in Master Piece Plus is additional modem surge suppression circuitry to protect your modem from surges, spikes and noise on the telephone line.

And that's why the circuitry in both models can handle anything an electrical storm or your local power company can offer—up to 6,000 volts with a 3,000 amp follow-on current. (That's the kind of superior performance that passes not only UL* testing, but Categories A and B of the strict IEEE† specification 587-1980 as well.)

Now, this may look to you like we're taking more than the necessary precautions. And actually, we are. But after all, isn't that what you expect from a serious surge suppressor?

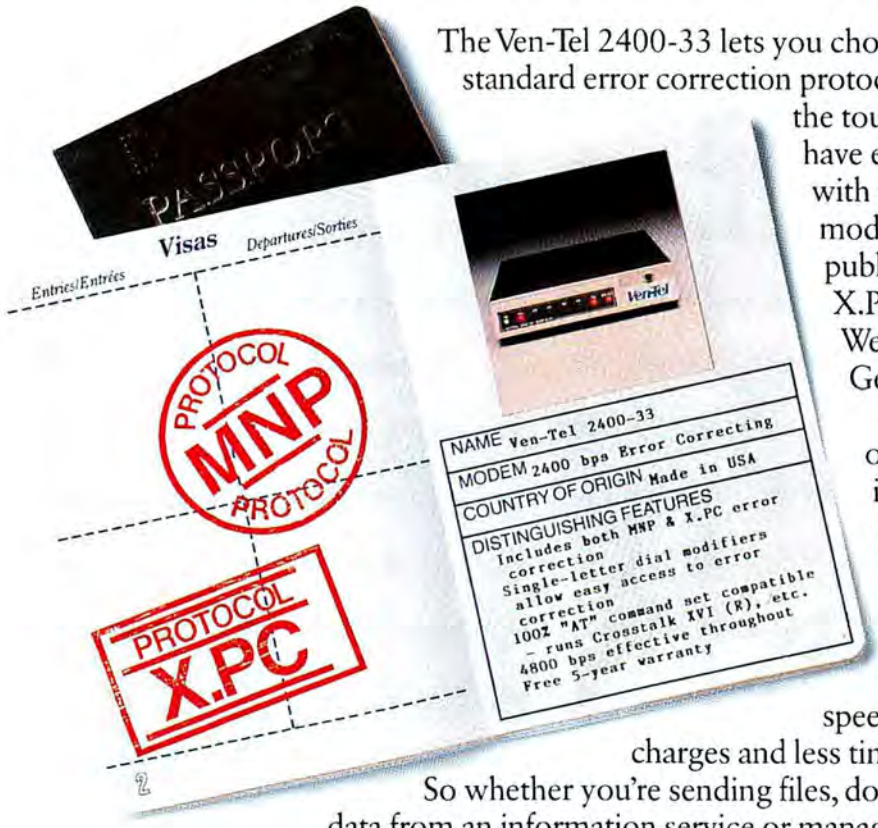
Master Piece ($149.95) and Master Piece Plus ($159.95). For more info, or a dealer near you, call (800) 535-4242. In NY (212) 475-5200.

KENSINGTON™

*Underwriters Laboratories Inc. †The Institute of Electrical and Electronics Engineers. © 1987 Kensington Microware Ltd.

Circle 98 on reader service card

The error correcting modem that ensures safe passage for your data– no matter where it's traveling.



The Ven-Tel 2400-33 lets you choose between the two standard error correction protocols (X.PC and MNP) at the touch of a key. So you'll have error free connections with over 350,000 MNP modems *and* with major public data networks using X.PC–like Tymnet, MCI, Western Union and GE Geisco.

And the 2400-33 not only protects your data, it's faster than *any* non-error corrected modem. MNP Level 5 data compression can double your throughput up to 4800 bps—and higher speeds mean reduced phone charges and less time spent transmitting.

So whether you're sending files, downloading expensive data from an information service or managing your personal portfolio, you'll know that your critical data is 100% correct.

The Ven-Tel 2400-33. The only modem that guarantees your data a flawless trip... no matter where it's traveling.

Ven-Tel
Modems

Our free booklet, "How To Select The Correct Modem," contains specific information about the 2400-33 and our full line of modems. To request your copy, call 800-538-5121.

Circle 11 on reader service card