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THE BUSINESS MAGAZINE OF PC PRODUCTS AND SOLUTIONS

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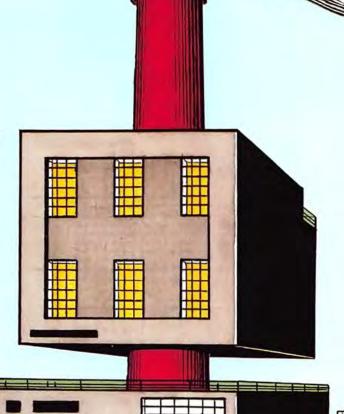


FAST ATs FOR UNDER \$2000

BARGAIN-BASEMENT XTs

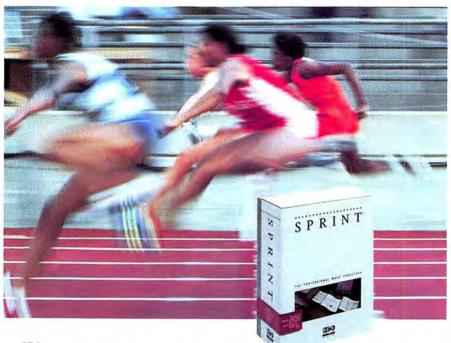
13 MONOCHROME MONITORS

EASY
DATA MANAGERS





# Introducing Sprint, the fast track to performance word processing



Why walk when you can Sprint®? Sprint is fast. Very fast. It scrolls fast, edits fast, switches between files fast, offers fast shortcuts and proves that the fast way is the only way.

# Revolution in word processing: Sprint automatically saves your words as you type

With Sprint's revolutionary "Auto-Save" you'll never lose work again. Everything happens in the background. You never notice. But if the power goes out, even if you haven't saved your work, nothing is lost.

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# Sprint is for beginners and professionals

Sprint puts beginners on the fast track to performance word processing and immediately puts professionals in control of small and large documents. Sprint is the quick-study, fast entry for beginners. It's easy, so you learn fast. As well as "Auto-Save" you also get online Help. a 100,000-word speller that checks your spelling as you type (just like Borland's famous Turbo Lightning®), and a 220,000-word synonym list that lets you pick the right word. right now.

Prices and specifications subject to change without notice.

\*Interfaces included free for a limited time only.

# Sprint gives professionals the power to customize Sprint

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# Revolution in word processing: Sprint is "habit compatible"

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What this means to you is that you can go with the one you already know, but get much faster, better, and more professional results without having to learn a new program. Sprint is habit compatible, a revolutionary idea in today's software industry.

Furthermore, when you move to Sprint you can bring your files with you because Sprint understands and exchanges files with a variety of word processors. Sprint comes with files conversions for WordStar, WordPerfect, Microsoft Word,

# See how fast you can Sprint!

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Typographically, Sprint supports word spacing, automatic kerning and ligatures, as well as character substitution for items like typographers' quotation marks. Sprint has long document support including a variety of index functions, structured headings, tables of contents, figures and cross references. However you use

	Save File <sup>1</sup>	Top to Bottom <sup>2</sup>	Go To Line 1500	Search & Replace <sup>3</sup>	Find Unique Word
Sprint 1.0	5.9	7.5	.1	1.6	3.3
WordPerfect 4.2	41.1	7.5	5.4	6.6	6.2
WordStar 4.0	4.4	8.1	4.7	17.1	13.8
MS Word 4.0	9.7	49.4	N/A	4.6	7.0
MultiMate	1.0	21.0	N/A	13.4	20.6

Tests were performed on an Acer 286 (8 MHz), 640K RAM, 'File size 103K, 21636 lines.

314 occurrences, Times shown are in seconds, (Benchmark details available upon request.)

it, short documents, long documents or in between, you look great when you Sprint.

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Maximum file size	Disk	Disk	Disk	4MB	128K
Thesaurus (integrated)	•	•	•	•	•
Windows Open (maximum)	6	2	8	1	1
Files Open (maximum)	24	2	8	1	1
Cross-Reference (dynamic)	•	0	0	0	0
Indexing Options	7	1	3	3	0
Snaking Columns (chg # on same page)	•	•	Not same pg.	0	•
Parallel Columns	•	•	•	•	•
H-P LaserJet Support	Full	Partial	Full	Partial	Full
PostScript Support	Full	Text	Full	0	Text
Mouse Support (integrated)	•	0	•	0	0
AutoSave (without interruption)	•	0	0	0	0
Define Shortcuts Dynamically	•	0	0	0	0
Run Alternative User Interface	•	0	0	0	0
Verify spelling as you type	•	0	0	0	0
Fully programmable macro language	•	0	0	0	0
Suggested List Price	\$199.95	\$495.00	\$450.00	\$495.00	\$565.00

# CONTENTS

# REVIEW

# 100 Business-Class ATs

TJ Byers

If you don't need 386-specific software, low-cost 286s offer great performance at an unbeatable price. We look at five systems under \$2000.

# 108 XTs for Bargain Hunters

Lewis Perdue

Why waste money on an AT when a high-speed XT clone can fill the bill for most DOS applications? Here are five ways to spread cheap computing power around the office.

# 116 Five Flat-File Favorites

Ellen J. Sander and Marlene Nesary

In applications where relational power is overkill, easy-to-use flat-file data managers make sense. But they're not all alike.

# 124 Viewers' Choice: 13 Monochrome Monitors TJ Buers

If you need to cut your systems budget, a monochrome monitor can be a nocompromise solution. We look at 13 monitors offered as standard equipment with many PC purchases.



Compaq's 386s, a downsized computer at a popular price, page 82

On a tight budget? Monochrome monitors make a wise choice, page 124













# DEPARTMENTS

# 6 In This Issue

Our hardware experts unite to deliver an incisive look at low-cost systems.

### 13 Top of the News

Mike Hogan

- · New IBM PS/2s land with
- a thud.
- Borland readies Quattro/ Surpass spreadsheet hybrid.
- Toshiba plans tabloid-size laser printer.
- VGA-quality laptop displays are coming.

# 19 David Bunnell

IBM's strategy to bust Far Eastern clones may turn out to be its worst mistake ever.

### 29 Letters

Dear IBM: Get serious about SAA.

### 3 Richard Landry

Write your own applications? New software will make it easier than you think.

### 47 Stewart Alsop

A shopping list for the ideal computer.

# 63 On IBM

William F. Zachmann
Will the Presentation Manager really dominate the
world of graphic user
interfaces?

# 69 Industry Outlook

Edited by Eric Bender

- Microsoft tops \$600 million in sales.
- UNIX gets a boost from renegade manufacturer Sun.
- Thermal printers plug a hole in the market for highquality color output.

 Owl ports Guide's hypertext capabilities to the data management world.

### 80 Preview

- IBM fixes problems at the low end and boosts the high end with a better Model 50 and a line of new Model 70s.
- Compaq introduces the first computer based on the 80386SX microprocessor, plus a 25-MHz 386 with 6-MIPS performance.

# 86 Product Outlook

Mike Hogan

- Netpro 386/25, Simple-Net's 5½-MIPS 386 system
- Three high-resolution multiscan monitors from Mitsubishi

### 134 The Hardware Shelf

Edited by Michael Goodwin

- AST's Premium/386 and IBM's 20-MHz PS/2 Model 80-111 both offer highperformance multimastering capability. So which is the better buy?
- Tandon's PAC 286 Plus gives the convenience of shock-resistant, removable hard disks, but high price may blunt its appeal.
- Epson's LQ-1050—the perfect 24-pin dot matrix printer?
- · Three Micronics motherboards can bring your AT into a 386 world.

### 164 The Software Shelf

Edited by William Rodarmor and Scott Spanbauer

- With SideKick Plus, Borland turns its desktop accessory into a multitasking environment.
- $\bullet$  Info-XL 1.0 takes a simple approach to personal information management.
- An array of new features makes Turbo Pascal 4.0 more powerful and easier to use.
- Show Partner F/X 3.0 and IBM Storyboard Plus 1.0 map the high and low roads to desktop presentations.

# FEATURE

# 184 Shareware Comes of Age

Judy Getts

Low price, liberal licensing, and responsive support are some of the reasons companies are choosing "pay if you like it."

# 190 Buyers' Guide: Best of Shareware

George Campbell

Our shareware expert picks the best products in word processing, data base management, spreadsheets, communications, graphics, and utilities.

# HOW TO

# 196 Word Speedup Tips

George Campbell

Here's a set of clever ways to make this sometimes-sluggish word processor perform at top clip.



PC World rounds up over 40 of the best shareware applications for business and provides tips on where to get them, page 190

Cover illustration by Brian Cronin

- QIC's pocket-size Mini Modem with full-size features
- Linus Write-top, a laptop that stores handwriting as ASCII text
- IntelliPort PS8, a multiuser board for PS/2s that supports up to eight terminals
- Telepower+, a program for conducting mass mailings via fax

### 90 Briefly Noted

- IntelliForm, an AI-based form-creation program
- WordStar Professional 5.0
- Project Calc and Decision Analyst, two tools for 1-2-3-based project management

# 94 Update

- Professional Write 2.0, Professional File 2.0
- · Framework III
- Epson Equity II +
- EasyCAD2
- Saba Page Reader 2.0
- MindReader 2.0

### 201 Consumer Watch

Anita Amirrezvani Liquidators can offer astounding bargains on firstrate products.

# 209 The Help Screen

Karl Koessel Can you damage an AT by standing it on its side?

# 217 Star-Dot-Star

Edited by Tom Swan PC World introduces Developer's Toolbox, our new guide to programming tools for in-house developers.

# 225 Tech Notes

Robert M. Carr
For the present, PostScript
is more a good idea than an
output standard.

# 231 PC World Catalog

A convenient buying guide to PC products and services.

# 251 Products Featured in This Issue

More information for PC World readers.

### 252 Advertiser Index

# 276 Another Angle

Michael G. Rubin
Users won't tap the benefits
of data base managers until
software firms make them
easier to use.

# PC W\(\beta\)RLD

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organizes
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Then works
like a
spreadsheet for
sophisticated

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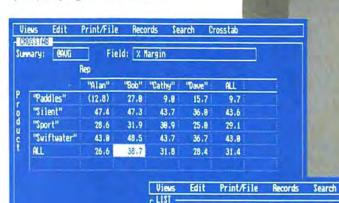
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Date

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... or split your Reflex screen to show several views at once—and watch your data change as you edit!

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FO	Quantity: 81 Sales 5: 56,558	\$ Hargin Avg \$ Ha	GRAPH	50000		- J
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Bob Weeks, Chicago Computer Guide 99

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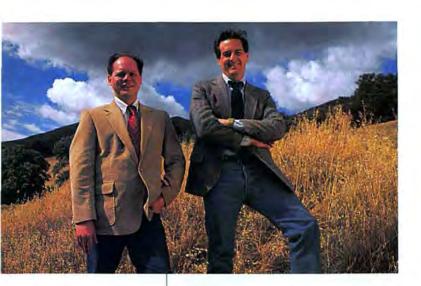
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# **Buyer Be Smart**



TJ Byers (left) and Lewis Perdue review lowcost XT and AT clones. he high-priced, high-performance products may get most of the attention, but it still pays to watch the low end of the PC marketplace. For the price of a single IBM PS/2 Model 80, for example, you can pick up 6 AT clones—or 11 XT clones—with enough change left over to pay for an impressive shareware library. But do these inexpensive alternatives deliver the performance you need? This month, we asked two top reviewers to look at five AT and five XT clones and answer the question definitively.

Authors TJ Byers ("Business-Class ATs") and Lewis Perdue ("XTs for Bargain Hunters") brought unique backgrounds to the assignment. Perdue has worked as an investigative reporter for the Washington Post; more recently, he managed PC operations and user support for a Los Angeles-based public relations firm. Byers earned his B.S. in electrical engineering and worked on NASA's Surveyor mission before becoming a computer journalist. (Byers had a busy month—he also wrote "Viewers' Choice: 13 Monochrome Monitors" for PC World.)

For less than \$2000, each AT clone included a 40MB hard disk and a monochrome monitor and graphics card; yet in NSTL tests they compared favorably with better-known systems costing thousands of dollars more. Our five XT look-alikes averaged well under \$1200, complete with 20MB hard disk and monochrome graphics. At that price, they demand serious consideration in any PC budget.

Among the ATs, Byers found that "there's little difference in performance or price. Most of the systems use quality, off-the-shelf parts and offer two-year warranties."

Perdue found the same was true of the XTclass machines. "When it comes to parts," he reports, "these systems are just about clones of each other. Pull the cover off, and you genuinely need a scorecard to tell the differences."

Is there a danger to buying a bargain-basement system through the mail? "These are not computers for the first-time user," Perdue warns. "You have to shop carefully. The biggest downside is lack of support—and you don't have a right to expect much support at those prices."

Also in this issue: Judy Getts ("Shareware Comes of Age") talked with the pioneers of try-before-you-buy software, while George Campbell ("Buyers' Guide: Best of Shareware") sifted through hundreds of not-quitecommercial programs to find the very best. Campbell also contributed "Word Speedup Tips," an essential reference for anyone who's ever lost patience with Microsoft's flagship word processor. If you don't need the complexity-or the price tag-of the heavyweight relational data base managers, check out "Five Flat-File Favorites." And don't miss a new feature in PC World: You'll find bright red Power Tips-short productivity boosters for every application-scattered throughout the magazine.

Ed Both

Ed Bott Managing Editor

# SideKick Plus Gives Your PC the Power of Communication!

Get full communications capabilities without leaving Quattro-or any other application you're using



Ready-to-use scripts make it easy to log onto MCI, Compu-Serve, or BIX

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- A complete outliner that lets you open nine files at once
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- All taking up as little as 72K of your computer's RAM

Minimum System Requirements: For IBM PS/2, IBM family of personal com-puters, and all 100% composibles. Operating system: PC-DOS (MS-DOS) 2.0 or later, Minimum system memory: 384K bytes, Minimum resident memory sine: 72K. Hard disk required. Supports both EMS and extended memory.

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**66** The built-in communications program is very impressive . . . Unlike most communications programs (including some that cost twice as much as SideKick), the new SideKick lets your computer communicate with another machine while you are running another

-Lawrence Magid, Washington Post 99

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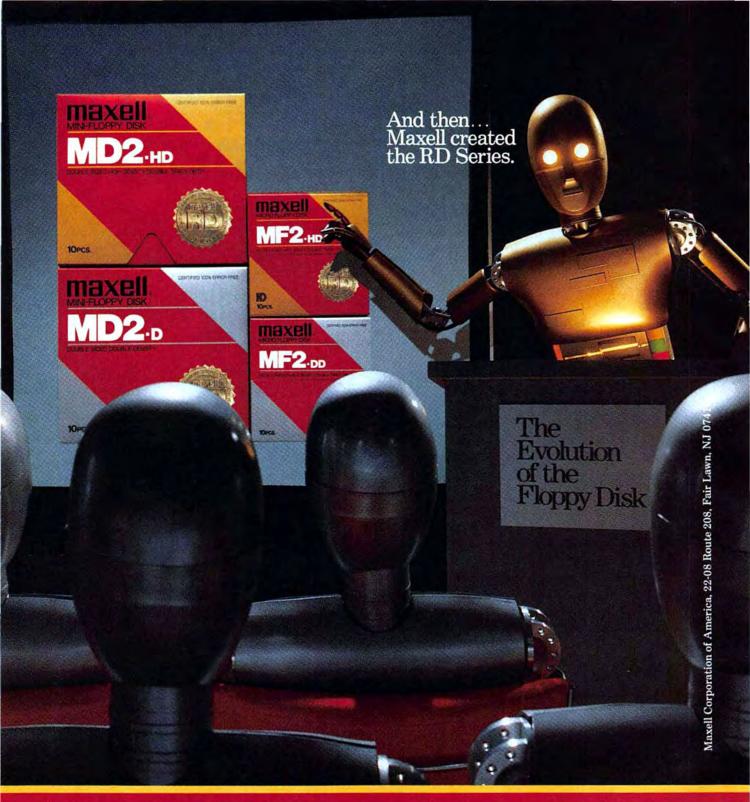
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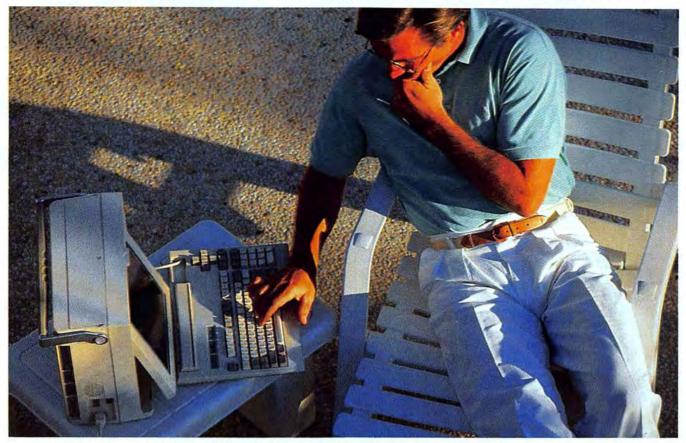
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Plus it's portable. Which means you can use it anywhere. At work. At home. Or on the road. It boggles the mind.

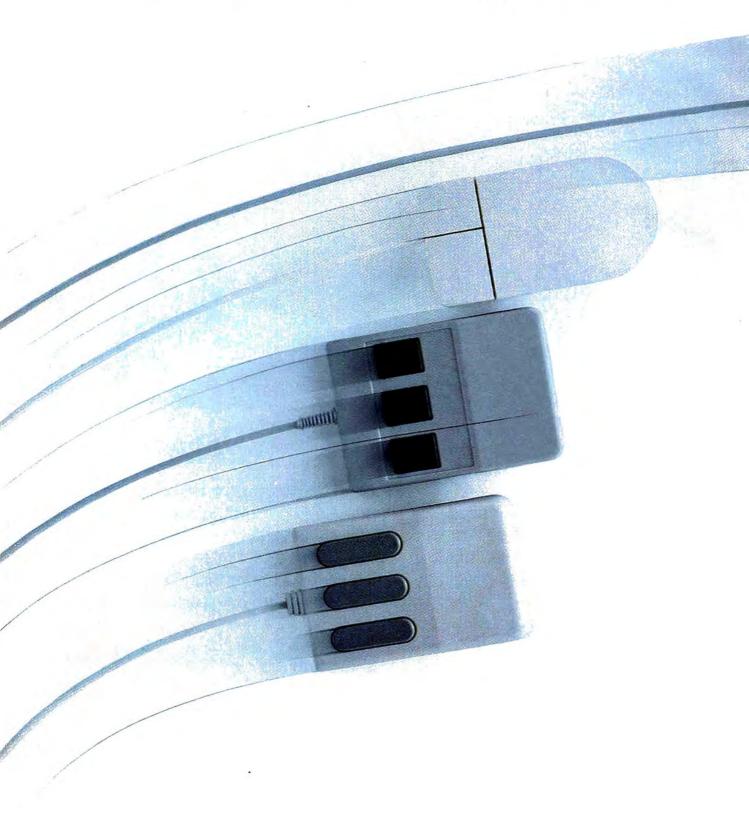
And speaking of mind boggling, check out what's under the hood: Intel 80286™

technology, full-size internal AT-compatible expansion slots, an optional internal modem, 20 or 40 MB hard disk and EGA resolution on a backlit LCD display. Call 1-800-343-4418 and find out more about PowerMate Portable from NEC. The quick pick-me-up for the "Thank Goodness it's Monday" crowd.

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name of the dealer nearest you, call 1-800-343-4418. In Canada, call 1-800-387-4313. NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

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Let's face it. With so many different mice on the market. making the right choice has been a confusing decision.

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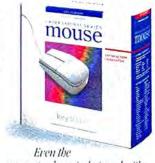
Because now Key Tronic introduces the Professional Series™ Mouse, the mouse that's backed by an unbeatable satisfaction guarantee. If you are not completely satisfied for any reason, return it to Key Tronic for a replacement. Or your money back.

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getting started, for example. Key Tronic's documentation is written in clear and easy-tofollow English - instead of

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mouse package is designed with your satisfaction in mind.

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spreadsheets — faster and easier.

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antee, and it's sure to be the mouse you'll reach for first.

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> find out more about the mouse that's guaranteed to make you a winner.

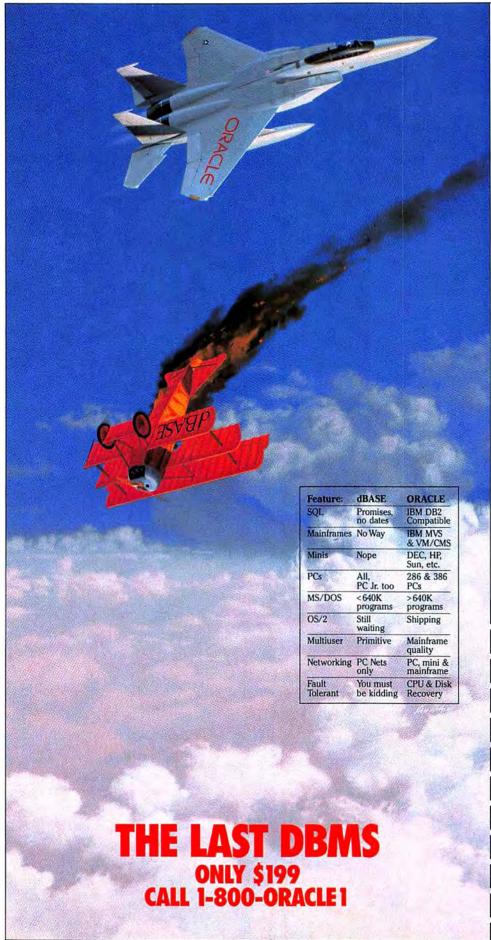
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# TOP OF THE NEWS

# New PS/2s Raise Questions

Analysts
Downplay
Product
Line "Fixes"

The PS/2s IBM introduced in June were intended to "fix" the Model 50, put 80386-based computers on the desktop, and extend the line's performance (see the IBM Preview in this issue). But some analysts feel that the introductions create more problems for IBM customers than they solve. IBM answered speed and storage complaints about the Model 50 with a Model 50 Z featuring 35 percent faster throughput and up to 60MB worth of storage. However, the three-slot 50 Z is faster than the Model 60, which offers seven slots and larger hard disks-forcing users to choose between processor speed and expandability. At \$4595 with a 60MB disk, the 50 Z is also \$1200 cheaper than the Model 60-71. Similarly, IBM's high-end desktop 386, the 25-MHz Model 70-A21, runs up to half again as fast as the former top-of-the-line Model 80-311. But customers again must choose between the Model 70's speed and the similarly priced Model 80's greater I/O and storage options. International Data Corporation analyst Will Zachmann concludes that current Models 50, 60, and 80 are "rendered obsolete by and lack any coherence with the new models." The debuts reveal Models 60 and 80 for "the PS/2jrs they always were," asserts Zachmann. "It must leave customers who bought these things feeling like they've been had." Industry analysts had expected more powerful models, perhaps including portables, and a significant DOS upgrade. Given heavy discounting on PS/2s, they also anticipated much more extensive price cuts on existing models than IBM actually made.

# **VGA Coming to Laptops**

Manufacturers Bypass EGA Graphics in a Race to VGA Laptop makers are skipping over EGA-quality graphics and racing to be first with a VGA-compatible display. Yamaha Systems Technology Division, the chip maker responsible for the display controller employed in approximately 80 percent of the laptops on the market, has developed single-chip controllers for both EGA and VGA graphics on laptops. But laptop manufacturers are looking past EGA's 640 by 350 resolution to the 640 by 480 of VGA, reports National Marketing Manager Bob Starr, who expects to see VGA-quality monochrome displays in a laptop sometime around the first of the year. Color is also a possibility with

Yamaha's new EGA- and VGA-compatible controller chips, scheduled for fourth-quarter release. But screen makers have achieved only CGA-quality color resolution so far, and they don't want to release color before achieving VGA quality, says Starr. The current monochrome standard for laptops and transportables is the so-called double-scan CGA, which produces 640 by 200 resolution text and graphics on 640 by 400 electroluminescent, gas plasma, liquid crystal, or CRT displays. "The interesting thing," adds Starr, "is that no one is developing a [PS/2] Micro Channel implementation. They are sticking with the AT bus."

# Borland Buys Surpass Technology

Quattro/Surpass Hybrid to Come This year's spreadsheet war has claimed its first casualty with Borland International acquiring the rights to Surpass spreadsheet technology for an undisclosed amount of cash and stock. Borland president Philippe Kahn would not elaborate on what changes this may mean for Quattro, except to say that five Surpass engineers will join the Quattro team at Borland's Belmont, California, R&D facility. However, Surpass Software Systems CEO and principal stockholder Seymour Rubinstein predicts that the next iteration of Quattro will look more like Surpass, acquiring the latter's ability to link worksheets and, possibly, its rich windowing interface. Rubinstein, who has sunk \$2 million into

Surpass, previously sought a merger with a Canadian company as an inexpensive way to go public and raise the \$3 million that he estimates his company would have needed to survive. Surpass will be withdrawn from the market, but its 5000 users will be supported by Surpass Software through the end of the year, and they can buy the current or next version of Quattro for \$49.95. "This acquisition will position Borland to become the leading competitor in the spreadsheet wars," predicts Rubinstein, "because it will have the best technology combined with marketing excellence." Kahn reports 130,000 copies of Quattro sold to date.

# TOP OF THE NEWS

# **Disk Saver Debuts**

Utility Formats a Hard Disk Without Data Loss Veteran PC technologist Steve Gibson has developed a software program that he claims will do what has heretofore been impossible—reformat a hard disk without destroying its data. SpinRite promises to rescue users from many kinds of hard disk crashes. But its principal application is to recondition Winchesters whose read/write heads have "drifted" out of alignment after months of use. When that happens, the disk's interleave ratio (the number of times a platter revolves as the disk reads contiguous data sectors) often slips from the typical 3:1 into higher ratios, and unidentified defects on a platter come under the heads. SpinRite speeds up hard disk throughput 50 to 600 percent,

says Gibson, by realigning platter sectors to the heads and to one another so that contiguous sectors are read in as few as two revolutions. The program also identifies unmapped defects by applying 82 test patterns to every byte. Data at risk is moved to safe sectors, and the "bad" sector is set aside. "It took me all of 1987 to create this product," reports Gibson. "It's 500K of assembly source code." His firm, Gibson Research of Laguna Hills, California, has not yet formally introduced the program. But more than 3000 copies of *SpinRite* have sold for \$59 each and Gibson reports back orders of about 1500 units.

# Toshiba Tabloid Laser Due

Printer Could Open Up New Markets With 11-by-17-inch Printing Toshiba America reportedly is working on a competitively priced laser printer that will address a potentially lucrative subset of the laser printer market. The product will be aimed at accountants, financial analysts, and others who need to print large spreadsheets, as well as engineers who create A-size (8½ by 11) or B-size (11 by 17) drawings. Additionally, the printer will let desktop publishers print tabloid-size publications in-house and position graphics across the fold of two 8½-by-11-inch pages printed side by side. Such users are estimated to make up 20 percent of the laser printer market, and Toshiba figures that they are willing to pay a

premium commensurate with the new printer's capabilities. While most hardware companies these days offer some kind of laser printer, Toshiba's product reflects the company's corporate strategy of avoiding commodity markets and focusing on those where it can add value with features based on its own technology. The new printer will utilize an 8-ppm Toshiba laser engine and a modular design for easy upgrades, plus a PostScript-compatible page-description language and up to 8MB of memory. Name, price, and release date have not been finalized.

# Borland Offers Word Processor

Will Unique "Soft" Interface Be Right for Everyone?

Claiming that no one word processor is right for everyone, Borland International has introduced a program that it hopes will be just that. Having burgled the once-secure domains of Microsoft and Lotus with inexpensive turbo languages and Quattro, Borland hopes for a repeat performance in the more fragmented word processing arena. Borland's Sprint gives the user the opportunity to completely customize its "soft" interface to his or her own way of working. Also available are optional command sets that copy WordPerfect and other popular word processors, while automatic background conversion routines make Sprint files compatible with those of the leaders. Recognizing two other market requirements, Borland has made Sprint fast and added desktop publishing features such as style sheets, kerning, and support for long documents, PostScript, and numerous printers and

fonts. Targeting ease of learning as well as ease of use, *Sprint* offers both a pop-up menu system and shortcuts around the menus for experienced users. It provides macros for executing multiple commands, supports multiple documents in up to six on-screen windows, and automatically saves file changes in the background between keystrokes. "Our goal is to be the number three word processor within a year," asserts Product Manager Jonathan Prusky, who claims that *Sprint* became the number one word processor in France three months after its February release there. *Sprint* began shipping in June for \$199.95 plus \$99 for all the alternative user interfaces. Borland has been demonstrating it in public for more than a year. ●



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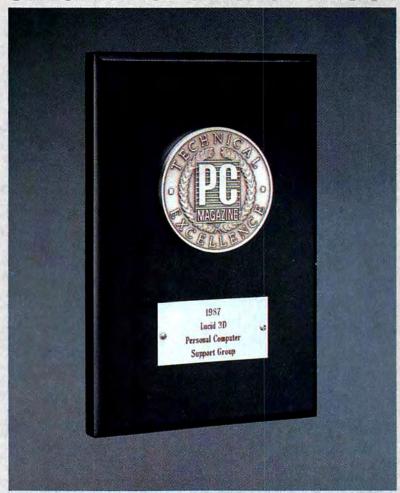




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Lucid is as simple as the pictures show. And you don't have to write formulas to do that. All you do is look at the other file, navigating through easy, point and shoot directories. When you come back up (with one key) the link is made automatically 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



Fig. 1. Let's get the detail on those ad costs, just move the widebar to that cell and press one key (grey +).

Co-Winner of the 1987 PC Magazine Award for Technical Excellence The other winner: Microsoft's Excel

"The Best idea I've seen for

a spreadsheet in years"

D7: C:\BUDCET\ADGER.LCB,D13 12 04am Jan 1, 1988 F1 for help or F18 for menu

June 1988

1,994,987

Expense Budget

Jim Seymour, Columnist, PC Magazine, PC Week



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.

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.

# 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



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.

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# IBM's Imperialism: Boon or Boomerang?

IBM's demand for retroactive royalties from PC clone makers means only one thing:

bad news for Big Blue.



David Bunnell

he way some American personal computer companies act, you'd think that Asian manufacturers of PC clones are just one step above international drug pushers.

In the 1880s some provincial Americans referred to the "Yellow Peril," by which they meant the thousands of Chinese who came here to build railroads and work in mines. Laws were passed preventing Chinese people (and later Japanese and Filipinos) from immigrating to, or becoming citizens of, the United States.

Americans today are not so blatant in expressing racism or national discrimination. We speak instead of "protecting" the U.S. market from cheaper foreign products, which more often than not are manufactured somewhere in Asia. A number of politicians have even made the "Asian invasion" a theme in their campaigns.

In the personal computer industry, we hear concern expressed about the flood of cheap PC clones from Taiwan, South Korea, Hong Kong, and Singapore. Now the People's Republic of China is slowly gearing up to tap the low end of this already low-end market. And pressure is mounting here to stem the tide of PC imports. IBM's recent moves—licensing its patents for the PS/2 and demanding a retroactive license fee for patents on PC technology—are part of the great American surge toward protectionism. IBM is actually demanding that clone firms pay at least 1 percent of their PC revenues.

That maneuver came about after IBM apparently permitted Tandy and Dell Computer to develop their own PS/2 clones. IBM appears to have a cross-licensing agreement with Tandy that allows the Ft. Worth, Texas-based computer firm to produce PS/2 clones without paying royalties. And it also seems that Dell is paying either no royalties or at most very low ones.

Meanwhile, Compaq Computer announced it is setting aside money to pay IBM in the event that it is ever required to pay a licensing fee on the patents.

Clearly, IBM's demand for retroactive royalties is aimed right at the Asian clone makers. Those companies, which include South Korea's Hyundai and Daewoo and Taiwan's Acer Technologies, don't have cross-licensing agreements with IBM because they don't have the profit margins that would make such (continues)

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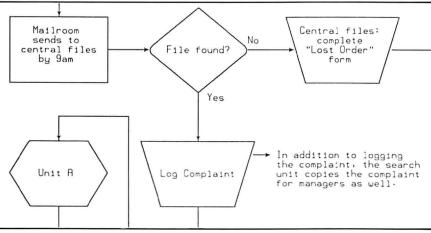
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March 10, 1987 issue, page 278

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Thousand Island Park, NY 13692 Telefax(G3): (613) 544-9632 agreements feasible. Instead, they play a low-cost, high-volume game.

In attempting to freeze the Asian players out of the personal computer market, IBM is making two mistakes. First, to the extent that it's behaving jingoistically, IBM is in danger of closing itself off from worldwide opportunities. This will certainly hurt the company in the long run, because the computer market is truly global, not limited to the United States.

Second, by assuming this seemingly antiforeign stance, IBM may inadvertently be validating those who believe that the PS/2, the Micro Channel, and the Presentation Manager may not be essential to life, liberty, and the pursuit of happiness. I'm beginning to hear foreign computer makers (and even some American firms) say things like, "The old bus is fine," and, "Maybe we can even create our own bus structure." Because of the very slow development of the PS/2 and the Micro Channel, Big Blue's push for retroactive rovalties will backfire. There's no PS/2 steak yet; they can only sell the sizzle.

This whole exercise is an attempt by IBM to regain control of the PC market. But it may be too late for that.

As I see it, IBM would rather go after a company like Taiwan's Acer Technologies, which has been selling about \$500 million worth of clones each year, than do battle with Compaq or Tandy or another U.S. computer firm.

Naturally, IBM expects the U.S. business community and Stateside public sentiment to rally to its side. Instead of looking like a greedy monopolist trying (continues)

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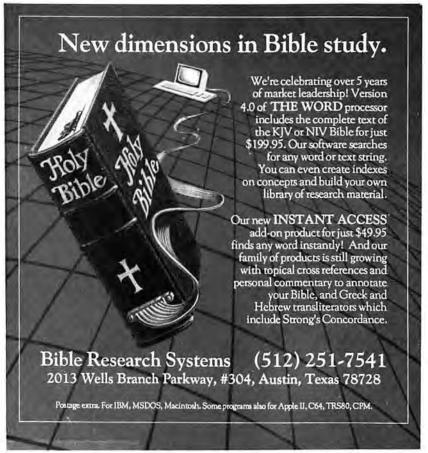
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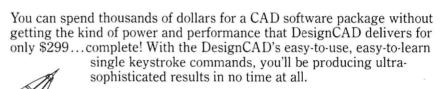
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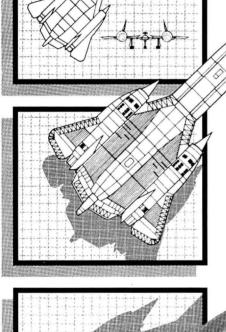


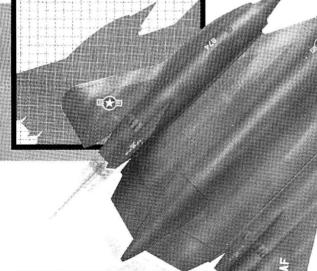
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# LETTERS

Reactions and responses from the PC World community

# When IBM Speaks...

In "A Few Minutes With..." [Industry Outlook, PCW, April 1988], William Lowe, president, IBM Entry Systems Division, is quoted as saying, "We're interested in encouraging applications that are compliant with the Systems Application Architecture [SAA], and we're happy to have other applications that aren't."

The last part of Mr. Lowe's quote seems to contradict the first part. SAA's success depends on the number of applications that follow it, and "happily" accepting applications that don't is not the way to reap the benefits of the consistent user interface SAA promises.

Jerald Levinson Kannakakai, Hawaii

# Get It Straight, Please

In his column "Happy Birthday, PS/2" [On IBM, PCW, April 1988], William F. Zachmann writes, "Never mind that Compaq's Deskpro 386 blows away the PS/2 Model 80 on performance." Yet on page 164 of the same issue, a performance table comparing the Model 80, the Deskpro 386, and the Tandy 4000 shows the Model 80 to be as fast as or faster than the Deskpro 386. Am I missing something?

Richard Allphin Jamestown, Rhode Island

Although the 16-MHz PS/2 Model 80-71 edged ahead of the Deskpro 386 Model 40 (also 16 MHz) in the NSTL performance tests whose results were printed in our April issue, Mr. Zachmann informs us that his remarks referred to the latest Compag and IBM hot rods available at the time of his writing-the 20-MHz Deskpro 386/20 and the PS/2 Model 80-111. NSTL's January 1988 PC Digest tests of these last two machines show the Compaq to be significantly faster than the IBM. -Ed.

# **Smashing Windows**

I just finished Robert Luhn's "Still Waiting for Windows/386" [PCW, April 1988], and I'm exhausted—from setting up and working Windows/386 in my mind's eye. I groaned at having to sift through eight READ.ME files, moaned at losing system speed, got frustrated with the PIF files, cursed editing WIN.INI, and growled at the interface.

The review saved me the expense of purchasing Windows/
386 and wasting many hours of valuable time. Too many products wind up on the dust-collecting shelves as a result of reviews that only scratch the surface—
for fear of offending a big advertiser. PC World's close look at (continues)

products is to be congratulated.

Thank you for filling the gaps.

Bob Brody

Los Angeles, California

# Through Microsoft Windows, Darkly

In the last several months the computer press has praised the OS/2 Presentation Manager. "This is the future of computing," we are told. One of the big benefits: The Presentation Manager will have *Microsoft Windows*' Macintosh-like user interface. That interface may be attractive and fun to use, but as a long-time *Windows* user, I can tell you we're in deep trouble if

the Presentation Manager is anything like its inspiration.

Every Windows application I have used has numerous bugs. Printing from Windows is painfully slow, and opening a desktop accessory is a tedious process. Why can't Microsoft include pulldown access to the utilities, as GEM and the Macintosh do? Saving desktop preferences is another missing capability—something that GEM and the Mac's Finder both offer.

If Microsoft wants success for Windows, much less for the Presentation Manager, it had better get the bugs out and reappraise the usefulness of the Windows interface.

OS/2 is IBM's vehicle to convince corporate America that its products are superior to those of other computer companies.

Based on what I've seen so far, the contest isn't even close.

Patrick John Ramsey Dearborn, Michigan

# **New and Improved**

Four years ago, I tried a year's subscription to *PC World*. Although your articles were filled with technical data, I didn't renew my subscription because product assessments weren't thorough and perceptive enough. I just didn't have the time to include the old *PC World* in my large stack of periodicals.

By chance, your April 1988 issue caught my eye, perhaps because of the line at the top of the



cover that reads: "OS/2 Now" and "Windows/386." These are the topics for 1988. Inside, I was impressed with Mike Hogan's Product Outlook coverage of @Base for 1-2-3. Mr. Hogan understands the difference between spreadsheet and data base tools and, more important, that spreadsheets can be powerful tools for analyzing data bases. @Base is a kludge, but I agree that using such a tool for the job is still better than devising another monolithic 1-2-3 worksheet.

I like the new PC World. Keep up the good work.

Craig E. Dupler Address Unavailable

# **Bring Back the Homespun Look**

For the most part I like the new look of PC World. It's clean, easy to read, and makes good use of graphics and charts while retaining the well-written reviews and features that made me buy your magazine in the first place. A PC World article is like a good conversation-informative and humorous, but not pedantic.

What I don't like about the new design is the columnists' photographs. The informal headand-shoulders shots have been replaced with serious full-length poses straight out of GQ. You look like a bunch of Republicans. I like to read your magazine, but please, lighten up the photographs.

Elaine B. Williamson Anchorage, Alaska

# **Nice Threads**

When I receive my copy of PC World each month, I always start by reading David Bunnell's editorial, followed by Letters, which, I must confess, has the same kind of appeal as an Ann Landers column. Folks, this is great reading; David, keep up the chatter. However, the real reason I'm writing is to tell you that the double-breasted suit you guys are handing around is real sharp, but it looks best on Zachmann. You should declare the suit a bonus and let him keep it.

Lee Patrick Virginia Beach, Virginia (continues)



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# The Ultimate in Security

William Urschel's *Quattro* review ["Quattro Goes 1-2-3 Better," *PCW*, April 1988] inspired me to write about a problem I have encountered with the program.

I spent many hours building a confidential worksheet for my company, which I password protected by carefully following Borland's instructions. The first time I retrieved the worksheet, it came up fine, but subsequent attempts produced an error message stating that the password was incorrect.

A Quattro technician at Borland informed me that the company is aware of a password bug that sometimes introduces random passwords, even in nonpassword-protected worksheets. Although I don't doubt that Borland will eventually correct the problem, I can't help but wonder why they didn't warn registered users.

Mirko Najman Los Angeles, California

# **A Devilish Business**

Your recent "Buyers' Guide: Ventura Publisher and PageMaker Tools" [PCW, May 1988] lists Straightforward as a provider of downloadable fonts. The fonts and font support software offered by Straightforward were licensed from Mephistopheles Systems Design in an agreement

which has subsequently been terminated. At this time, Straightforward has no right or title to, interest in, or authorization to sell or license the sale of the listed fonts.

David W. Harralson Mephistopheles Systems Design Hollywood, California

# **Rack of Ages**

I enjoyed Michael Ham's review of Zoomracks II [The Software Shelf, PCW, May 1988], a program I use daily. I find Zoomracks useful for a wide range of applications—it's probably the last piece of software I would give up. Still, reading a review (continues)

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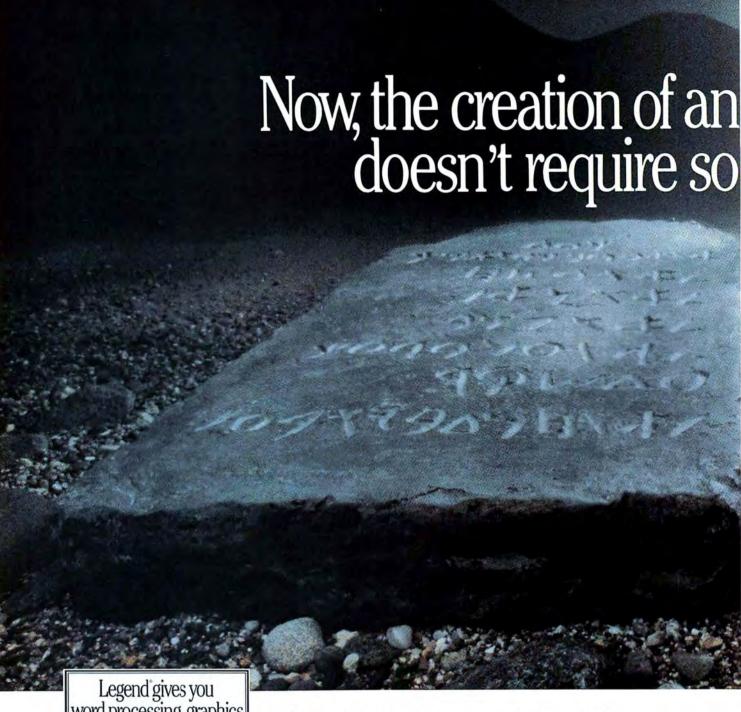
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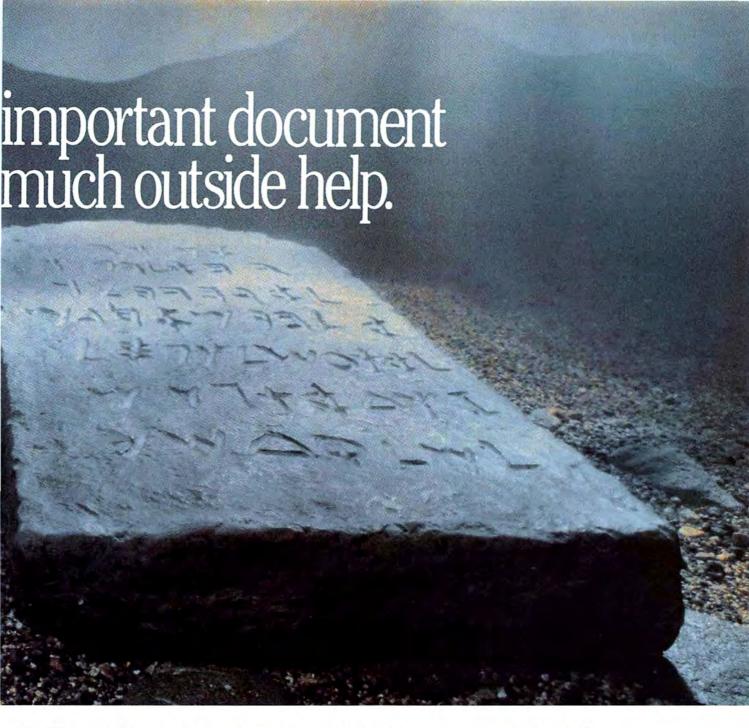
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of a program you've already purchased can be an exercise in remorse.

In this case Mr. Ham's review was balanced and fair, but it could benefit from a couple of clarifications. First, although Zoomracks' menu structure seems confusing, its menus, like 1-2-3's, become superfluous to the experienced user, and each command in the program can be invoked with a few keystrokes. Second, he states that the program's help command isn't context sensitive. Although the standard <F1>-invoked help file is not context sensitive, the <Shift>-<F1>-invoked file is. Martin S. Brown Walnut Creek, California

## Graphics Adapter Clarification

Although we appreciate the mention of the Hercules Graphics Card Plus in your WordPerfect 5.0 Preview ["WordPerfect Desktop Publisher," PCW, May 1988], the article's description of our product was inaccurate. It states that users of a "Hercules InColor Card or Graphics Card Plus and a multiscan monitor" can view multiple font styles on screen during editing. In fact, the Graphics Card Plus is a monochrome display adapter designed to drive an IBM monochrome or compatible monitor only and does not work with most multiscan displays. We don't want our potential customers, the many owners of old monochrome adapters, to think they must buy

a new monitor to benefit from the Hercules enhancements.

Andrew Fischer
Director of Operations
Hercules Computer
Technology
Berkeley, California

#### Corrections

The Features Evaluation table that accompanies Patrick Marshall's WordStar 2000 release 3.0 review (The Software Shelf, PCW, April 1988) contains an error. The "maximum header/footer lines" entries for WordPerfect 4.2 and Microsoft Word 4.0 should read yes rather than deficient.

(continues)

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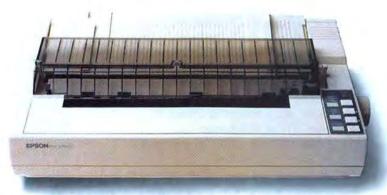
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## Knowledge is

initiation (COMP)

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You'll find one at the back of this issue.

PC W\|RLD

The Magazine for PC Decision-Makers

Due to an editing error, the "PROS:" comments for David Weinberger's review of Q-DOS II 2.0 (The Software Shelf, PCW, May 1988) incorrectly state that the program does not have a directory tree listing.

Lewis Perdue's review of the AST Hot Shot/286 (The Hardware Shelf, PCW, May 1988) is incorrect in regard to on-board memory-caching RAM and the function of the board's DIP switches. In fact, the Hot Shot/ 286 does have 16K of cache RAM, and readers should disregard the problems attributed to its absence. The board's DIP switches control what ranges of RAM addresses and ROM addresses are to be cached. PC World regrets these errors.

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

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The powerful new release of WordPerfect, the world's No.1 selling word tage of some important new WordPerfect features that you *can't* use if you

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## WordPerfect 5.0 With Hercules RamFont

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# The Cure for MacEnvy.



For years PC users have been conditioned to think of their computers in certain terms. Dependable. Versatile. Dull. To get superior graphics, some claimed that you need a different type of computer altogether. They said *their* computer was everything the PC wasn't. Easy to use, Graphically exciting. Fun. PC owners were, well, *green* with MacEnvy.

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a basic drawing program. And Micrografx software supports hundreds of printers like HP's LaserJet<sup>TM</sup> and PaintJet.<sup>TM</sup> All PostScript<sup>TM</sup> devices, too.

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## Build Your Own Application

It's not as crazy as it sounds.

The right set of tools may make creating your own fully customized programs easier than 1-2-3.



Richard Landry

t's an unfortunate fact of life that virtually no application comes ready to use right out of the box. As most of us have discovered somewhere along the line, a "timesaving" program can take so much effort to master that in the end it might have been better not to buy it at all.

That's not the way it's supposed to be. Personal computers became hot items in part because they promised to free people from depending on somebody else to write a program that got the job done. You'd think software developers would take the hint and produce applications that make it simple for average users to crank out work on their own terms. But as the author of this month's Another Angle testifies, that doesn't seem to be the case. Heavy-duty areas-data base management in particular-usually require a programmer to wrest the needed functionality from an application. Meanwhile, the average user waits.

So it's refreshing to see a few small companies trying to break this logjam by coming up with new ways for everyday users to tie their applications together into customized environments. Significantly, many of these products are being developed for Microsoft Windows—but they're taking Windows places it's never been before.

Bridge/286 and Bridge/386 are two good examples. Developed by a Cambridge, Massachusetts, company named Softbridge, these programs operate in a fashion no more intimidating than the DOS batch language. But like an environment-wide macro language (which Windows currently lacks), they allow users to integrate standard characterbased applications such as Word-Star with Windows-based programs such as Excel into a unified system designed for a specific task.

Bridge menus form a shell around applications, which helps the user treat these programs simply as tools to do a job—updating monthly sales figures, for example. With help from an experienced batch-file writer, a novice user can juggle multiple applications to turn out results that he or she could otherwise produce only after months of training.

Similarly, hDC Computer Corporation's WindowsManager provides a simple way for users (continues)

to treat applications as tools to do a job. By filling out fields and checking boxes in what looks like an enhanced Windows PIF Editor, users can tie programs into "sets" to be called up with a click on a menu. WindowsManager also adds another nice touch: a facility to install Windows programs like the Clock or the Calendar as Macintosh-like desk accessories that can be accessed from within any application.

In both cases, these products put the effort of learning an application in the background so that users can focus on specific problems in the foreground. If the little guys who created this software have the insight to help users leverage the power of a personalized workstation, then shouldn't the big guys be able to do it too? Maybe so.

Hewlett-Packard's NewWave environment permits users to tie Windows applications together in a far more ambitious manner than either Bridge or WindowsManager. NewWave blurs the boundaries between applications; instead of manipulating a spreadsheet or word processor or graphics program, NewWave users focus on the task of creating and editing documents. Click on text, and you're in the word processor. Click on numbers, and up pops the spreadsheet. Edit the numbers, and the graph automatically reflects the change. It's that simple. NewWave takes the concept of integration beyond anything PC or Mac users have seen before. Every document is its own customized NewWave environment.

The problem, of course, is that applications must be written

specifically to take advantage of the NewWave environment. So unless Microsoft and IBM adopt it as their own, NewWave may end up as yet another great idea that failed for lack of marketing muscle. Until Apple took out its corporate club and started whaling on Microsoft and Hewlett-Packard in court, it looked as though Microsoft just might incorporate NewWave technology into a future release of Windows, and perhaps into the OS/2 Presentation Manager as well. Now the future isn't so clear.

But it's small wonder that Apple reacted so vehemently to the prospective alliance. *NewWave* represents a way for PC applications to jump a couple of years ahead of those on the Mac. Here's hoping that the court finds a worm in Apple's suit before too long.

Given the state of application software, it's no surprise that a recent PC World reader survey revealed that almost 60 percent of you perform programming of some sort. Most of that is done in BASIC, but a large percentage of you use Pascal, and many program in dBASE as well. And this figure doesn't even include those of you who create 1-2-3 macros or use a general-purpose macro processor like Keyworks or SuperKey. What do these results reflect? Not that you're all churning out professional-level applications, but that you're hard at work turning your PCs into customized environments that boost your productivity and that of your co-workers.

To respond to your needs, we've added a new monthly feature geared specifically to inhouse application developers. Called Developer's Toolbox, you'll find it inside Star-Dot-Star, edited by Contributing Editor Tom Swan. Tom's an experienced programmer who's spent the last ten years helping users become proficient in languages such as Turbo Pascal. Each month he'll review one or more products aimed at increasing the productivity of in-house application developers. I hope you'll find Developer's Toolbox a useful addition to PC World.

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

### **POWER TIP NO. 2**

## DOS Redirection for Long Lists

To print a directory listing that spans more than one screen, use the DOS redirect function. The redirection symbol > channels output from DOS commands—such as DIR, CHKDSK, and TREE—to a printer or a file. To print a massive directory list, type DIR > PRN and press <Enter>. To create an ASCII file containing a directory listing, type DIR > filename and press <Enter>.

George Campbell Los Osos, California Next in

## PC W\(\beta\)RLD

### September

#### **Business Survival**

Nothing can make or break a company faster than its ability to manage its money and predict its cash flow, A PC-based accounting system is a coherent, protected, productive way to handle the lifeblood of your business-it may be the best investment you'll ever make. PC World evaluates the core modules of three popular, high-quality accounting packages for small to midsize companies.

### 24-Pin Salute

For cost-effective, allaround office printing at a fraction of the cost of a laser printer, you can't beat a 24-pin dot matrix printer. PC World takes a look at seven versatile machines that can whip out letter quality text and high-resolution graphics, with carbon copies to boot.

Plus, what every manager and business professional needs to know: How to make an informed decision about whether to buy or lease computer equipment for your office. And, how to buy spreadsheet templates that handle your tax, investment, and other financial needs.



## Will adding more Xenix users crush your AT?

You know that overhead can kill you. In fact the terminal I/O overhead from just 4 Xenix users can seriously degrade performance of your AT-based system.

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"... 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 perhorsepower basis, it could be called the cheapest boost available for an XT."

Mark Welch, InfoWorld (Rated #1)

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"Lightning is almost mandatory...." -Steve Manes, PC Magazine Best of 86 review

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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.

#### 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 than boards by Orchid, Quadram, P.C. more, unlike competing REAKTHRU 286-12

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

> 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.

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.



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## A Manifesto for the Future

Computer users, stop buying the line that faster's always better!

> Stewart Alsop issues a proclamation about what he'd like to see manufacturers really deliver.



Stewart Alsop

just got yet another press release from yet another PC manufacturer proclaiming yet another speed record, this time for a machine sporting an 80386 processor that runs at a clock speed of 25 MHz. In the past three years, we have moved rapidly from 8088 processors going 4.77 MHz to 8086 processors going 6 MHz to NEC V20 processors going 7.8 MHz to 8088-2 and 80286 processors going 8 MHz to 80286 processors going 10 and then 12 MHz to 80386 processors going 16 and then 20 and now 25 MHz. This would seem to represent real progress.

They say that if a Rolls Royce were built by a computer manufacturer, it would get 100 miles to the gallon and cost \$4.95 (or something to that effect). Well, I'm not so sure. After six years, the computer industry is now offering us a machine that goes the equivalent of 100 miles an hour and costs about \$4000. I, for one, am bored by this accomplishment.

I've got a 16-MHz 80386 machine on my desk. DOS, 1-2-3, WordPerfect, and dBASE run like maniacs on that machine. But the fact is, I'm still using 1-2-3 (introduced in 1983), Word-Perfect (introduced in 1984), and dBASE (introduced in 1982). All I hear about really neat new software like PageMaker, Excel,

Designer, Omnis Quartz, and Snapshot is how slow that stuff is and how it really takes a fast 80386 machine to make it work.

I got into this business because I was excited by the possibilities. But I'm getting tired of vendors telling me why it's going to take so long to get to those possibilities, particularly when they turn around and tell me how powerful and fast their iron is. In fact, there are plenty of ways for them to improve that have nothing to do with speed.

Operating system. I'm tired of waiting for IBM et al. to get their act together; I suspect that things are moving slowly on this front because of a raging lack of vision at the top. I want an operating system that includes all the goodies promised for OS/2multitasking, memory protection, and automated communications between programs, to name a few-but I don't want it to compromise on performance. I also want its designers to aggressively prepare for new technologies, so that developers have standard specifications to support in those areas.

User interface. I'm singularly unexcited by early versions of Presentation Manager. From what I've seen, PM (as it is coming to be known) is a bare-bones (continues)

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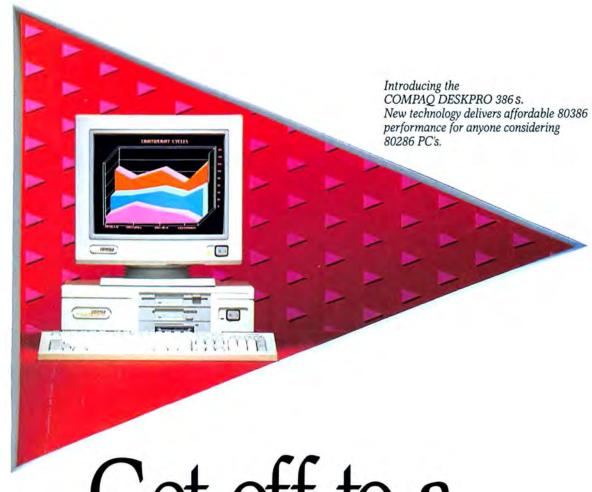
user interface. Its file-management shell, for instance, not only breaks no new ground but also leaves out major features that were innovations in third-party DOS shells several years ago. How can you call a user interface easy to use when it still forces you to name files with eight characters, all in capital letters? How can you have a desktop metaphor where major elements of the desktop are missing? Call me dumb, but I thought the purpose of the desktop metaphor was to offer choices via familiar objects so you would know intuitively what to do without having to think about how the computer works.

Graphics. On the surface, VGA graphics seem pretty snazzy. You get adequate resolution to display text alongside graphics. You get a one-to-one aspect ratio (finally) that allows you to display a square on screen that will actually print as a square, not a rectangle. In the primary graphics mode, you get 256 colors on screen out of a palette of 256,000. But first reports indicate that it's hard to get good performance out of VGA graphics running on an 80286 machine without any assistance. And basic, proven technology-in coprocessors, palettes, and system resources-allows manufacturers like IBM and its minions to provide much better graphics without much more effort.

Sound. You may think that little beep your machine produces is sound. It isn't. It's a miserable excuse for not giving more thought to the user. The applica-(continues)

## Accelerate.





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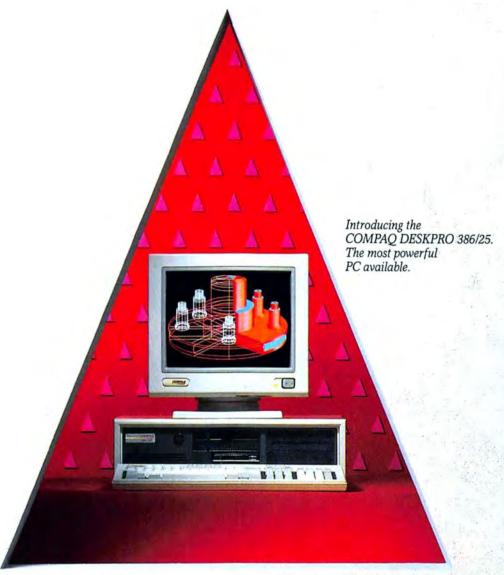
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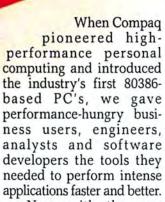
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Whatever you predetermine, it delivers.

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System requirements: 100 percent IBM PC compatibility, 128K RAM and DOS 2.0 or greater. IBM is a trademark of International Business Machines. SideKick, Borland International. Distributed by Kenfil, 800-662-0505.

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- Computer Reseller News

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- Esther Dyson

1988 CES Software Innovation Award

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#### STEWART ALSOP

tion of sound in computers is fairly primitive, but it's an area where major gains could be made to enhance ease of use and productivity. Imagine that when you deleted a file you had a choice of three sounds-breaking glass, the scream of somebody falling into a pit, or a pistol shot-to reinforce the dialog box that asked if you really wanted to delete that file. That might make you pay a little more attention when deleting files. Imagine also that when an OS/2 application was finished processing its task in the background, it actually said, "I'm finished, Stewart" in a voice that sounded like the HAL computer in the movie 2001. None of that will happen until the computer has a built-in sound processor and the system software standardizes the way applications use the sound.

Networking. If your company is networked, with more than two or three work groups all bridged and connected, you may have noticed certain problems: For one, either you have to use the same electronic mail package as everyone else or you can't talk to the networks that use other packages. The reason is that networking personal computers is an exercise in the worst chaos ever foisted on unsuspecting computer users. IBM, for instance, appears to have favored token ring networking over ethernet, primarily because no one else had adopted the token ring and so IBM could control the specifications for it. Meanwhile, computer companies confront a choice of at least four ma-(continues)



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jor networking schemes, all of which work differently and have different problems. In such chaos, even a major manufacturer with real insight won't be able to specify a standard way for electronic mail messages and addresses to be broadcast over dissimilar networks.

Communications. If you think networking is hard to understand, try getting your PC to talk to a mainframe or minicomputer (much less another PC by modem)—it's like to trying to turn an aircraft carrier around. But mainframe and minicomputer hardware and software developers are finally realizing that their commercial health and wealth depend on writing software that recognizes that PCs

are the primary way to communicate. Even so, PC users are usually forced out of whatever environment they're used to and into what's politely called "terminal emulation," which is really just an excuse so lazy programmers can avoid dealing with real users.

Product design. Last but not least (contrary to what most PC manufacturers would like to believe), it's time we got some decent product designers involved in developing personal computers. One great feature of IBM's PS/2 models is that they don't require screwdrivers or other tools to disassemble. But compatibles and peripherals makers have to get their act together. If I encounter one more monitor, printer, modem, or cable that requires me to pull out my tool set to detach it, I'll scream. It

doesn't cost any more money or take any more time to provide a screw with ridges on the head that you can tighten with your fingers. And it certainly would make life easier.

So that's it, a manifesto for what I expect from manufacturers. When I read a press release from a manufacturer that claims its machine actually does something new, instead of just doing the same old thing even faster, then I'll sit up and take notice. And I suspect I'm not alone in that regard.

Stewart Alsop is editor and publisher of P.C. Letter and a contributing editor for PC World.

## HIS ISSUE'S HIGHLIGHTS

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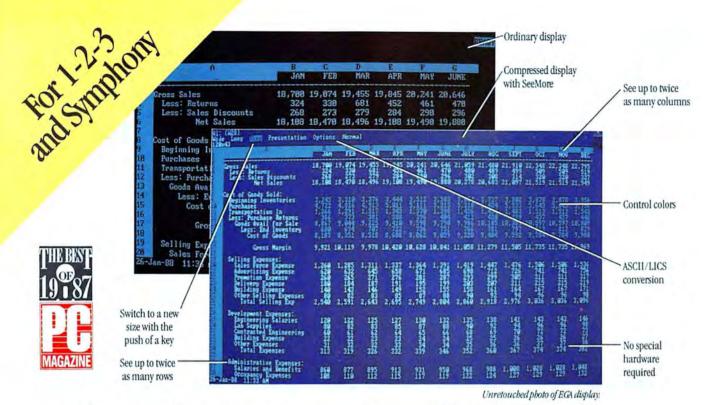
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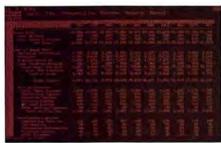
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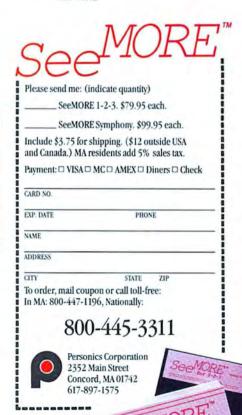
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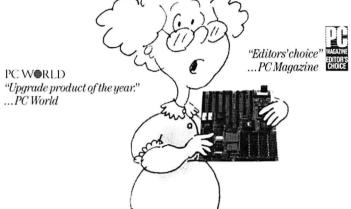
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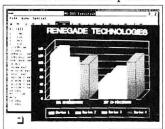
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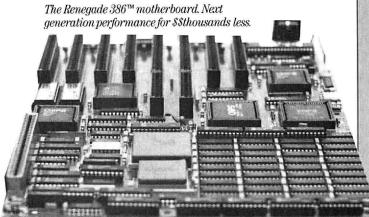
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## Toshiba's 6.4 Pound T1000 Is the Lightest Laptop Yet



BY HOWARD MARKS

Big advances have been made in DOS-compatible laptop computers in the last year. Back lighting and supertwist LCDs have made screens sharper than ever, miniaturized hard disks from IVC beauty and the property of the proper from JVC have expanded stor

top computer.

Toshiba America, which had a lot to do with this laptop revolution, is bucking the trend lts new T1000 sacrifices a few of the amenities we've come to expect from new laptops but de-livers the essentials in a sturdy 6 4 pound package

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less being more. The design is brilliant DOS is stowed on a ROM chip for instant booting. The 12% by 2 by 11 inch package fits in an ordinary briefcase It runs on a charce fo 5 hours and can keep u

A couple of pounds heavier than Tandy's Model 100. its fa

Of course, Toshiba was un der pressure to come up w some A tariff imp ovem'n

LAN Magazine

**A Major Technological** Feat. There Is Nothing That Comes Close To The T1000.

By Harry Newton

This is another one of my biased test drives. I like this product. I use it. I am writing this test drive on it, sitting in bed. is so ne gorgeous luxury.

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### PC WEEK

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By Stephen Sagman

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## The OS/2 Presentation Manager and Its Rivals

The graphic user interface is the game of the future.

Does IBM's Presentation Manager have what it takes to win, or are other players gaining on Big Blue?



William F. Zachmann

he most important struggle among computer vendors today is the battle to define the user interface for the business user. Personal computers are going to be the "front end" even for enterprise-wide systems. Controlling the definition of that front end will give a vendor powerful advantages in the future.

Almost everyone agrees that the winner will be a graphic user interface. That means that the present command-line interface of PC-DOS and MS-DOS will be replaced over the next few years. The critical question for IBM is whether it can establish the OS/2 Presentation Manager as the dominant alternative.

The Presentation Manager in OS/2 1.1 is the focus of IBM's effort to bring the ease of use of a graphic user interface to the desktop. The Presentation Manager is also a key element of IBM's Systems Application Architecture; it is the foundation of SAA's common user interface.

The Presentation Manager is not without rivals, however. Apple Computer, first with the Lisa and then the Macintosh, has offered a graphic user interface for over half a decade. The Macintosh's consistency among applications plus its ease of learning and ease of use has made it wildly popular with several million users.

From another quarter, Sun Microsystems and AT&T are offering Open Look. This powerful graphic user interface is built on top of a UNIX System V. It was developed under an agreement with Xerox—in fact, much of the original R&D for the modern graphic user interface was done at the Xerox Palo Alto Research Center in the 1970s.

In addition, there are various versions of Microsoft Windows, which is the basis of the OS/2 Presentation Manager as well as the foundation of Hewlett-Packard's NewWave. These versions offer yet another alternative to the Presentation Manager for those who don't want to incur OS/2's overhead costs. Still other contenders include Digital Equipment Corporation's DEC Windows, DRI's GEM, and even character-mode alternatives like Tandy's DeskMate.

A graphic user interface requires a high-resolution graphics adapter and monitor, making it possible to display both text and graphics. Combined with the appropriate printer or other output devices, basic graphics capabilities open the door to applications such as desktop publishing that are difficult if not impossible to (continues)

use with older systems that have character-based displays.

The key to the importance of graphics capabilities, however, is that they give the user an easier way to understand, learn, and interact with the computer.

The point of entry for the user of a graphic user interface is a cursor-control device (commonly a mouse), which permits direct manipulation of the screen. Rather than having to tell the computer what to do, the user simply picks from choices displayed on the screen.

By making it easy for the user to act, the graphic user interface greatly reduces the need to remember, for example, special function-key or <Ctrl>- or <Alt>-key combinations required for particular actions.

Since applications for a graphic user interface conform to common ways of doing things, considerable consistency across different applications is possible. Common actions include cutting and pasting text or graphics, saving and retrieving files, and getting help. The user, facing a new application, thus already knows how to do these things.

But all graphic user interfaces are not alike in their potential benefits, and all users are not alike in what they want from their system. For many experienced MS-DOS users, for example, a graphic user interface may at least initially be uncomfortable. People who know DOS well and who readily think in terms of commands, files, and directories may feel that a graphic user interface makes it more difficult to do the things they used to do.

There are limits to what the graphic user interface can do, too. Word processing, for example, requires that the user cope with the keyboard, no matter how helpful the mouse may be for certain things. A complex data base remains complex whether or not the user relies on the graphic user interface. And the cost of any graphic user interface system is high—a barrier for many people.

Yet even for the MS-DOS power user, eventual migration to a graphic user interface is almost guaranteed by the much wider range of applications it makes possible. But with so many different and incompatible candidates vying to become the definitive standard for the graphic user interface on the desktop, can we automatically assume that the OS/2 Presentation Manager will be the winner? Is IBM's strategic effort to make it the standard sure to be successful? Or will one of the other contenders emerge victorious?

The answer, quite simply, is that barring a major catastrophe in Microsoft and IBM's development efforts between now and the end of the year, the OS/2 Presentation Manager is virtually certain to become the standard graphic user interface for business users. The Presentation Manager offers all the key benefits of the graphic user interface to the dominant world of IBM and compatible systems and will unquestionably draw the great majority of those systems' users. Ultimately, the graphic user interface represented by the Presentation Manager and Windows will dominate because of the sheer power of IBM and Microsoft: They simply can't be beat.

Apple's Macintosh has done very well by being the first product to offer a graphic user interface at an affordable price. Still, it is a proprietary environment, and the economics of trying to make it a multivendor standard just don't work in Apple's favor.

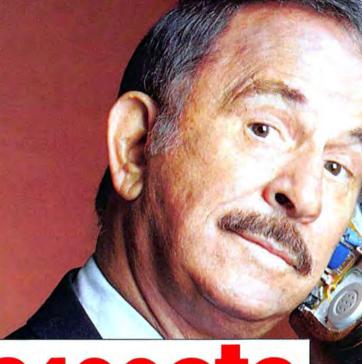
And Apple's advantage of being the only game in town is fast disappearing. Unless the U.S. court system has gone completely mad, Apple's legal fantasies about owning the graphic user interface haven't a chance.

While Apple will certainly continue to maintain a significant minority share of the market, the OS/2 Presentation Manager is a far more logical migration path for most current PC-DOS and MS-DOS users. What's more, its linkage to the other features of OS/2 that enable major application development on micro platforms will make it the dominant choice for most corporate users.

UNIX-based alternatives, whether AT&T and Sun's Open Look or UNIX windowing graphic user interfaces from other sources, are also unlikely to claim more than a minority segment of the market. While they have a strong base in the scientific and technical areas and are likely to make some inroads into the office, they are no more likely to displace OS/2 than is Apple's Macintosh.

The primary problem with UNIX is in defining a single alternative to the OS/2 Presentation Manager and getting everyone to agree to it. Other UNIX vendors have opposed AT&T and Sun's efforts to define the standard with Open Look. All of this (continues)

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Circle 302 on reader service card

f=Prev Page, 4:Next Page, PgUp=Prev Command, PgDn=Next Command, REIUR



## DESIGN OUR N AND WE'LL NAM

The engineers at ALPS aren't the only ones who come up with great printer ideas. Our customers do, too.

And now we've found a way to reward your efforts. The "ALPS Design Our Next Printer Contest."

Just tell us what you'd like to see in a new PC printer. If yours is the best idea selected,

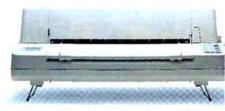
we'll actually use it in our next printer, name the printer after Y-O-U, and give you a free ALPS LPX600 laser printer. Five runners-up will receive free ALPS dot matrix printers.

Now if you're wondering what sort of ideas we're looking for, here are a few we've recently put to good use:

"Why not make a jam-proof 24-pin printer









## EXT PRINTER E ITAFTER YOU.

for under \$500?" led to our new Allegro 24 and its unique flatbed design. "How about a 24-pin printer with 9- and 18-pin emulation, paper parking and two built-in type fonts?" resulted in our new enhanced ALQe series. And "Laser printers should have larger memories and greater versatility" inspired our rugged new LPX600, with 2MB of

built-in RAM and over 40 downloadable fonts.

If you've got an idea this good, tell us about it. For your free contest entry package, call 800-828-ALPS. In California, 800-257-7872. Or write to ALPS America, 3553 North First Street, San Jose, CA 95134.

And watch your name go down in printer history.





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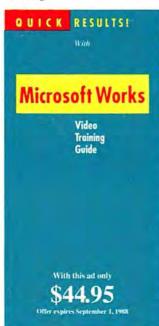
Circle 2 on reader service card



From the publisher of PC World magazine...

## Learning Microsoft Works Can Be As Easy As Watching TV

This unique and easy-to-follow video guide gives you the framework to accomplish everyday tasks with Microsoft Works.® Discover the overall process of creating a work product, and how to apply the program to your own needs. You'll learn quickly and comfortably, and you don't need your computer—just sit back and watch. Whether you're a computer novice or an experienced user, there's no better way to get up and running!



Fundamentals: An overview of Works modules and how they work together, how data is organized, using Works menus, handling files

Word processing: Entering, formatting, and correcting text, block operations, spell-checking, printing documents

Spreadsheets: Determining worksheet layouts, entering labels and formulas, formatting, copying ranges, printing spreadsheets, creating simple charts

Data Management: Designing forms, entering data, displaying data in various views, queries and record searches, sorting Communications: Setting parameters, logging on and off with communications services, receiving and sending mail, creating automated sign-on scripts

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serves to confuse users about UNIX alternatives and to delay software development.

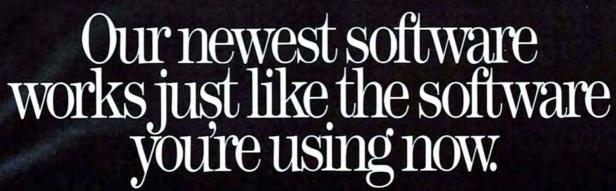
In fact, UNIX's best chance to win a significant place on office desktops may well be to implement the OS/2 Windows Presentation Manager over X/Window. Otherwise, chances that a UNIX-based graphic user interface will become the dominant standard are slim.

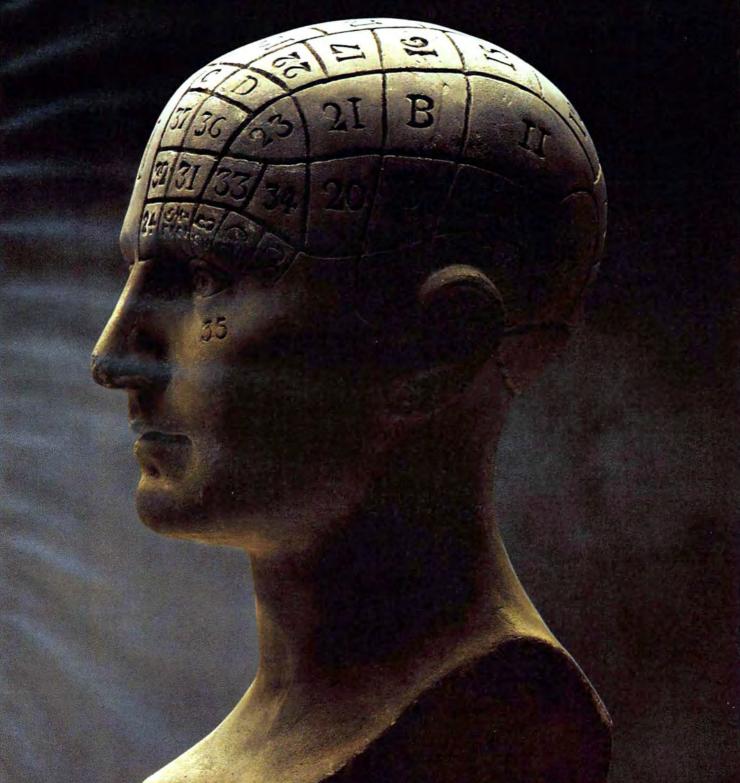
Other options from individual vendors, DEC in particular, may succeed within their installed base. There is little or no chance, however, of these being anything other than niche options.

The one serious competitor of the OS/2 Presentation Manager over the next couple of years will be Microsoft's own Windows. Windows 2.03 and Windows/386 offer a user interface that is effectively identical to that of the Presentation Manager without requiring the substantial system resources that OS/2 demands. Cost also will help determine whether IBM's OS/2-based Presentation Manager or Microsoft's DOS-based Windows will prevail.

Until powerful Intel 386—based (or 486-based) systems with upwards of 4MB of memory and at least 60MB or 70MB of disk storage are readily available in the \$2000 to \$3000 range, the majority of users just won't be able to afford systems capable of running OS/2 and the Presentation Manager with satisfactory performance. In the meantime, Microsoft Windows will provide the best way to benefit from a graphic user interface on an inexpensive MS-DOS system. ●

William F. Zachmann is senior vice president at International Data Corporation.





# Introducing Agas as a way to put yo

If you're the type of person who's too busy to read an ad, read this ad.

Cover to cover.
Because you'll
learn about an extraordinary new tool that will

help you work, think and create better than you ever have before.

A tool that will help you manage people, projects, ideas, plans and information with incredible efficiency.

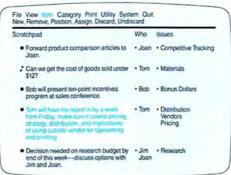


A tool that will help you avoid slumping into your chair, shaking your head, and asking, "How will I ever get this done?" We call it Agenda,

the personal information manager.

Agenda does all the things your brain is too busy to think about.

As bright as your brain is, it's notso-terrific at storing and bringing order



Items. You dump in the facts, ideas, and thoughts. And Agenda will do the filing.

Bonus Dollars     Distribution	Research	<ul> <li>Have Tom break down market research results into best case/worst case scenarios.</li> </ul>	• Tom	Marketing
Vendors Pricing  • Research	Distribution Vendors Pricing	<ul> <li>Tom will have his report in by a week from Friday, make sure it covers pricing, strategy, distribution, and implications of using outside vendor for typesetting and printing.</li> </ul>	• Tom	Marketing
Research	Distribution	♪ Do Tom and Bob think we need to adjust distribution mix?	• Torn Bob	Marketing Sales
s, and thoughts.		es. How does Agenda disp you want.	lay ca	tegories?

to lots of details and random pieces of information.

Agenda allows you to dump facts, ideas and thoughts into your PC as they come to you without having to structure the information in advance.

Agenda's filing system is a more sophisticated version of this filing system. You can put items anywhere you want. You can view them any way you want. And you can have access to them anytime you want.

Brandied la



# enda. Think of it ur mind on disk.

File: C: \AGENDA \ FILES \ ISSUES View. Issues by Person		06/21/88 11:00		
Issues	John	Priority	When.	
Research	<ul> <li>Decision needed on research budget by end of this week discuss options with Jim and Joan.</li> </ul>	• High	• 06/25/88	
Competitive Tracking	<ul> <li>Forward product comparison articles to Joan.</li> </ul>	• Low	• 07/07/88	
000000	Rai	Priorry	When	
Distribution	<ul> <li>Do Tom and Bob think we need to adjust distribution mix?</li> </ul>	• High	• 06/22/88	
Bonus Dollars	Bob will present ten-point incentives program at sales conference.	Medium	• 06/29/88	

Views. Looking at the same information through different views gives you an informed perspective. And Agenda helps you arrange your data any way you want so you can understand it better,

formulate new ideas better and extract the answers you need better.

Which means, now you can concentrate more on using your information. And less on processing it.

#### Welcome to our pad.

The first thing you'll notice about Agenda when you boot it up is its unintimidating "scratch" pad.

The scratch pad lets you jot down any random items of information without worrying about where to file them.

You then assign your items to categories that you create. Once you do this, Agenda will do all your filing automatically. And thanks to Agenda's *multiple filing capabilities*, if the information is relevant in more than one place, Agenda

will put it in several categories at once. This makes it easy to view your items



In fact, you could say Agenda recalculates text the way a spreadsheet program recalculates numbers.

# It answers all yo important, it questio

If you're a manager, your job is all about making smart, focused decisions.

It's about establishing priorities and delegating responsibility. It's about solving problems and anticipating new ones. What a coincidence. That's Agenda's job, too. And we've prepared a situational model to demonstrate.

Don't use a toy to sell toys.
In this model, you're a
manager in a toy
company

that has to get its newest products
into the important

Fig. C. AGENDA FILES TRADESHOW View Trade Show Activities When Date: 07/14/88

Part 07/05/88 09:50

When Function

Pat 07/05/88 B Booth Setup list for the boothy to Friday's meeting.

Call warehouse in two weeks to trady getting booth ready for shipment.

Talk to Ken tomorrow about renting carpeting for the booth.

Fig. C. AGENDA FILES TRADESHOW 07/05/88 09:50

When Function

O7/05/88 09:50

Tom 07/05/88 B Booth Setup Shipping

Fig. C. AGENDA FILES TRADESHOW 07/05/88 09:50

Tasks Who When Function

O7/05/88 09:50

Tom 07/05/88 B Booth Setup Shipping

Fig. C. AGENDA FILES TRADESHOW 07/05/88 09:50

Tasks Who When Function

O7/05/88 09:50

O7/05/88 09:50

O7/05/88 B Booth Setup Shipping

Shipping

Fig. C. AGENDA FILES TRADESHOW 07/05/88 09:50

Tom Shipping

Tasks Who When Function

O7/05/88 B Booth Setup Shipping

Shipping

O7/05/88 B Booth Setup Shipping

O7/05/88 O7/05/88 B Booth Setup Shipping

O7/05/88 O7

Toys" trade

Type "Call Korean factory a week from Thursday"
and Agenda's "When Date" feature converts the
expression into a calendar date.

show in New York. This means dealing with facility managers, shippers, booth builders, show rental managers and your staff, to name a few.

Let's arrange your Agenda categories so you can prioritize the thousands of tasks you have to address.

First, enter the tasks on your scratch pad and add a "People" category. Now, let Agenda know who's responsible for what and, voilà, it automatically assigns every single project.

For example, if you named Dave as head of the shipping department,
Agenda will take every-

Agenda constantly keeps you informed about every detail that needs your attention. So you always know what's going on and you always have answers, And you're never caught without one of these.

# ur questions. More ns all your answers.

Show Rentals	Who	When
<ul> <li>Talk to Ken tomorrow about renting carpeting for the booth.</li> </ul>	• Ken Pat	• 07/06/88
1 Make sure to ask Pat on Thursday about renting extra table for the booth.	- Pat Ken	- 07/07/88
To Teste	Who	When
<ul> <li>See if new Mr. Celery Sox toy will be ready to display. Get an answer today.</li> </ul>		• 07/05/88
<ul> <li>Stop by and see Pat tomorrow regarding new toys she wants to include in the exhibit.</li> </ul>	• Judy Pat	• 07/06/88

You don't need to spell everything out for Agenda. If you're looking for the "Toy Display" category, type "to" and Agenda will find a match.

File: C.: AGENDA FILES TRADESHOW
View: By Booth Setup Tasks: (When date: 07/05/88-07/07/88)

Who

Get a blow-up of the exhibit hall floor plan tomorrow.

Pat

Did Pat inspect the booth for any damages from the tradeshow in Chicago? Better check with her first thing tomorrow.

Talk to Ken tomorrow about renting carpeting for the booth.

Stop by and see Pat tomorrow regarding new toys she wants to include in the exhibit.

Make sum to ask Pat on Thursday about renting extra table for the booth.

Agenda's filtering feature lets you "narrow" views. For example, you can look at all items due in the next two days regarding booth set-up.

thing you've typed in about shipping and put it in the "Dave" category.

Let's say Dave asks Judy to get an "Invincible Guy Action Figure" prototype shipped in from Korea.

Just let Agenda know, and it'll put

all the Korean shipping information in the "Judy" category, too.

Agenda lets you play with  $\checkmark$  information.

The point is, you can depend on Agenda to put every piece of minutia at your fingertips.

ees are available to take over for a rep who called in sick. The next minute you might want to rearrange the toy groupings so you can make sure your big seller, "Mr. Banana Shoes," is positioned with your new "Mr. Celery Sox."

Then, you can analyze whether you should build a display or rent one. Call in a new employee or an experienced one.

One minute you

might want to see

block radius of the

you might want to

which rental companies are within a ten

show. Another minute

Or whether Mr. Banana Shoes is sitting next to the right toy or the wrong one.

Agenda lets you rearrange and look at things differently from the way you did before. Projects, schedules, speeches, curriculums, briefs. Even people.



# Agenda is for e too busy to get

Ever spend hours sifting through papers, memos and notes looking for information without actually

ever getting anything done?

Do you find yourself so busy keeping track of what you're supposed to do that you don't have the time to actually do it? In this model, we're going to show you how Agenda solves all that.

Try running this shoe.

Let's pretend that you're a product manager for a huge athletic footwear company.

Your mission, should you decide

to accept it, is to come up with a new shoe concept that will help the

company reach its

File: C: \AGENDA\FILES\BRAINSTORM

Category Manager

Brainstroming

Who; Whose Idea
Jonathan, John
Susan: Sure
Bill
Janet
Dorothy; Dot
Subject
Designers
Petaler
Designers
Petaler
Designers
Petaler
Designers
Petaler
Tenucial
Tenu

Agenda's category manager keeps track of your information structure as it evolves, so you can concentrate on your ideas.

sales goals. You've called a meeting with the other company bigwigs to brainstorm. They have hundreds of ideas and suggestions, all seeming to have nothing to do with each other.

You can use Agenda to record and make sense of their input.

Now, let's create your categories. Let's assume "designers," "retailers" and "focus groups" are big concerns

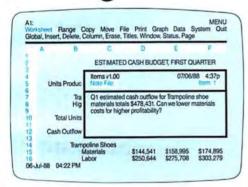


Agenda keeps you on top of every schedule, neeting, memo, article, conversation, project and

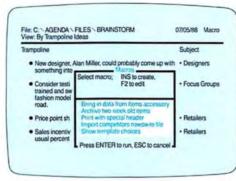
crisis in your office. Making it a lot

easier to put out fires.

# veryone who's any work done.



Agenda's pop-up capability makes it easy to record new ideas at anytime, even while you're using other stand-alone applications.



Agenda can remember up to 19 macros for each file. This means you can program it to execute complex tasks with the touch of one key. Which makes working with evolving information a significantly easier task.

Interested in a relationship?

Eventually, patterns and common links will develop and you'll be

able to give structure to your random thoughts. Perhaps you'll identify a trend in trampoline shoes. Or you'll hop into the high jump market.

Instead of sitting around wondering how you're going to figure it all out, you'll be able to get right

to work.

Because you'll know what work needs getting to.

You can have on-line data from anywhere in the world fed into Agenda. You'll get only the data you need because Agenda shows only the information that fits into the structure you've created.

to everyone. As well as "projections" and even "trends."

These will serve as good titles for your categories. (But, as you know, you can create categories any way you want, any time you want. Because Agenda has been designed to file the way you file and, on a broader scale, think the way you think.)

As you start compiling bits of

information on your scratch pad, Agenda will automatically put them in any number of categories where they are relevant.



# The last item on our Agenda: Call.

We could go on with many more examples of how you can use Agenda to work smarter.

We could tell you how it can help you prepare your legal briefs. Solve police work. Recruit personnel. Write speeches. Manage sales accounts. Put together business plans. Track competitive information. Develop college curriculums. Organize health histories. Sort and index libraries. The list goes on and on.

But we'd rather invite you to try

Agenda for yourself.

For \$15, we'll send you a demo kit that contains working software you can actually use (except you can't print or save your work). Or, if you prefer, we'll send you a VHS videotape that

demonstrates sample applications with some examples we've

cooked up.

Just call 1-800-345-1043. And ask for demo kit AEA-3058 for the 3.5" version or demo kit AEA-3053 for the 5.25" version.

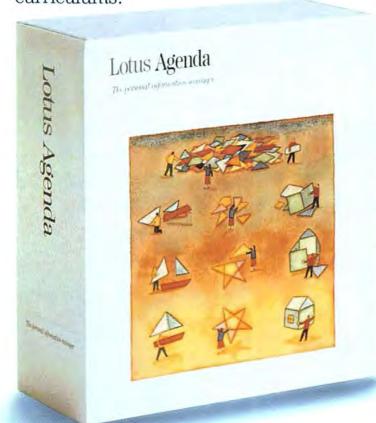
Or you can ask for videotape

AEA-3063.

Then you'll get to see first hand what you've already read about here:

Whatever business you're in, you're in business with Agenda.

Lotus, Agenda



# INDUSTRY OUTLOOK

Edited by ERIC BENDER

Sales, Profits Just Keep Rising

# Microsoft Rolls Ahead on All Market Fronts

Pushing Into OS/2 Networking



As PC sales boomed, everything came together for Microsoft, remarks president Jon Shirley.

House so big keep growing so fast?

As it races past the \$600 million mark, Microsoft is extending its lead as the largest independent vendor of microcomputer software. And profits are more than healthy—in fact, the Redmond, Washington, giant earns more than Borland International sells.

President Jon Shirley cites three reasons why sales and income both soared by more than 60 percent during the past year. First, "The number of machines sold is outdoing everyone's expectations." Second, Microsoft began unleashing a barrage of new products in the second half of 1987. Third, there is increased market share for existing products: "With Word, for example, every version [has produced] a notable improvement in penetration.

"We've had all of those things going for us at the same time," says Shirley.

DOS, the archetypal money mill, runs on more than 20 million machines worldwide; and lately, IBM has led the development work. "One of the big goals for DOS is not to have any divergence between what IBM sells and what other manufacturers sell," Shirley explains. He adds that DOS is not

going to roll over and die now that OS/2 is appearing. Outsiders expect a major upgrade this summer with ease-of-use enhancements and improved disk partitioning.

Although the Windows operating environment presents far from a similar success story, Microsoft has shipped almost 2 million copies and stands firmly behind the product. Windows is "not a static product," Shirley says. "We will address a number of key issues—make it easier to install, help with memory requirements, and increase the speed and performance."

The firm's big guns are trained on OS/2, though, and Shirley claims a great deal of support from the development community. Standard Edition 1.1, with the Presentation Manager interface, is on schedule for October delivery. Naturally, Microsoft emphasizes OS/2 network products as well. "Our fastest growing internal group in terms of people is our networking organization," Shirley says. He expects the first offering, the LAN Manager, to be "a major contribution to our business."

Languages remain a key market; this year Microsoft has released OS/2 versions of its standard languages and is moving toward releases for the Presentation Manager. The company does not currently plan to introduce new languages but is very interested in (continues)

# UNIX Tries to Turn Professional

Sun's Desktop Turns On the Heat

W ill AT&T's veteran UNIX operating system quietly capture millions of desktops where DOS now reigns supreme?

"UNIX is going to be a major player on the desktop, in all markets and in all applications," declares Scott McNealy. "Don't cede the desktop to OS/2 (continues on page 76)

#### Software Street Pricing



Source: Wohl Associates

Many resellers give hefty discounts for popular application packages, but most street prices haven't dropped significantly in the past year, Wohl Associates research shows. Prices do dip just before a major update appears, as Ashton-Tate's dBASE is currently demonstrating.

# Color Thermal Printers Carve Out a Niche

Heating Up the Printer Market



Sure, that VGA monitor sitting on your desk looks plenty impressive. But a color monitor is something of an island—it still may lack a practical way to translate screens into hard copy output.

Although color laser printers are beginning to appear on the market, their prohibitive price (\$25,000 and up) remains beyond the budgets of most users. At the other end of the spectrum, the Hewlett-Packard PaintJet costs only \$1595 and fills some jobs, but it lacks resolution and speed.

Color thermal-transfer printers, however, are emerging as an attractive alternative. For anywhere from \$4000 to \$10,000, you get output suitable for professional presentations.

William Coggshall, president of Desktop Presentations, a research firm in Mountain View, California, predicts that 20,000 color thermaltransfer printers will sell this year and four times that many by 1992.

"When you consider their combination of cost

### Microsoft

(continued)

low-end products like Quick C.

Microsoft's business applications, currently headed by Word and Excel, start with one low-end product, Works; the rest are in-depth productivity applications. Microsoft won't add versions for large multiuser computers, but Shirley acknowledges that as networking arrives, "there's a natural progression from tools aimed at the individual to tools aimed at a groupfor example, in document preparation."

Microsoft began pursuing foreign markets in the early 1980s, and its overseas offices are all staffed by local people. It does and quality, you see that these printers are quickly becoming a potent solution to the need for color hard copy," says Stanley Klein, editor of the S. Klein Newsletter on Computer Graphics in Sudbury, Massachusetts.

Color thermal-transfer printers apply color to paper by means of a heated printhead. Working one line at a time, the printhead melts color inks stored in a wax-based "inksheet" that is pressed against the page. Most inksheets contain four colors (black, blue, magenta, and yellow) that can be blended to create literally millions of different hues. Resolution varies from 150 to 300 dots per inch; throughput typically ranges from one to three pages per minute.

Thus far, the market has been dominated by Ja-

48 percent of its business overseas, "and if you consider the number of machines sold around the world, that's what the percentage ought to be," Shirley says. (But few micro software firms match that figure; Lotus, for example, sells 33 percent of its products abroad.)

With more than 2500 employees worldwide, one of Shirley's biggest headaches is finding room for everyone. Another is finding management talent, but promoting from within the ranks has paid off, he feels.

Industry analysts may speculate about sluggish acceptance of OS/2 and the effect of Apple's lawpanese suppliers. Coggshall ranks the top five players as Seiko, Mitsubishi, CalComp, Panasonic, and Tektronix.

Though prices are falling, color thermal-transfer printers do require fairly expensive supplies. And far too few software packages properly support them, Klein says.

Coggshall predicts that the printers will have a limited life span as the color output device of choice. Eventually, color laser printers, which will be faster and cheaper to operate, will come down in price. "But they're really quite a few years away. Before color laser printers became widespread, we'll first have to see color photocopiers become accessible." -Daniel Brogan

suit over Windows. But Shirley sees a positive future for OS/2. And, he says, "so far, the impact of the Apple suit has been fairly minor. If there were long-term uncertainty, that would hurt us—and the longer it went, the more it would hurt."

Shirley sees two areas of potential vulnerability. First is that Chairman Bill Gates remains irreplaceable, particularly as technology visionary. Second is Microsoft's relationship with IBM, but Shirley claims that "it's never been better." Overall, he says, the future looks bright: "We think we have a good vision of where the industry is going and what our place will be." -E. B.

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- (720 x 348) w/Parallel Port (2nd)
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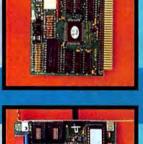
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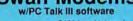
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# Repainting the Desktop Publishing Picture

Z-Soft Adds Graceful Grays

As PCs transform themselves into ever-moredazzling graphics engines, the business challenge is to convince users of the real benefits of driving those engines. As software pioneer Z-Soft crosses into new territory and reaches for a larger audience, it's turning to a big partner, Mediagenic, for marketing and distribution assistance.

Z-Soft already claims more than 900,000 users for *PC Paintbrush* and its descendants. In the past year, the Marietta, Georgia, firm has found a home in graphics for desktop publishing and is grabbing fresh opportunities with gray-scale support and design-your-own-font capabilities.

This leading-edge technology comes from a startup that began on the flimsiest of shoestrings. Chairman Mark Zachmann, 33, quit his teaching job in 1983 to try his hand at paint packages. "I took all the money I had in the world, which wasn't a lot," he recalls. His fledgling firm grew slowly, working out of Zachmann's basement until early 1985. "The neighbors were sure we were smuggling drugs."

PC Paintbrush spun off PC Paintbrush Plus, whose added features include the ability to run scanners directly. Desktop publishing addicts eagerly snapped up this new package but complained about working with only a



PCs with gray-scale support are racing toward print shop quality, says Z-Soft's Mark Zachmann.

fraction of a full, bitmapped, 300-dpi page. Publisher's Paintbrush, released in early 1987, addressed this concern with "zoom-out editing."

Last September, PC
Paintbrush Plus and Publisher's Paintbrush became the first PC packages exploiting shades of
gray to improve images on
screen and in hard copy
output—heralds of a radical expansion for desktop
publishing.

PS/2-style analog monitors provide good examples of the excellent image quality that gray-scale technology can furnish at a reasonable price. And, Zachmann points out, gray scaling gives you much greater control over the image. For instance, if you scan a photograph and create a standard black-and-white image and then resize it, the result can be ugly, because

the scanned patterns of black dots just aren't arranged for the new size. A gray-scale image, which holds a lot more information, looks much more like the original. This approach does require massive amounts of memory and an expensive typesetter, although Zachmann expects to see gray-scale laser printers within two years.

Publisher's Type
Foundry, which debuted
last year, is a unique tool
for conjuring up typographic fonts. "I expect a
year to pass before anyone understands what it
does," Zachmann says.
Then, he thinks, the package will become a basic
desktop publishing tool.

As Z-Soft adapts its product family to work with OS/2's Presentation Manager, "we're also significantly changing our philosophy when it comes to the *Paintbrush* family," Zachmann says. Today the paintbrush is a familiar symbol, "but there's trouble with features like

the color eraser, because that doesn't exist in nature," he says. Upcoming offerings "will offer a raft of tools that you just don't use today."

Z-Soft employs about 40 people, and it has always been profitable. *Soft-letter* estimates 1987 revenues at \$4.4 million.

But can a small, feisty firm compete when giants like Lotus muscle in? No, Zachmann says, not in the long term, not without some major help. "In three years, this will be a big boys' game, and there's nothing we can do about that."

Thus Z-Soft agreed in May to be bought by Mediagenic, formerly Activision, a Mountain View, California-based firm roughly ten times Z-Soft's size and known primarily for entertainment software. Zachmann expects Z-Soft to remain an independent subsidiary and exploit Mediagenic's distribution and financial strengths. —E. B.

## **Building the Core Business**

Demand Seen for Tape Backup

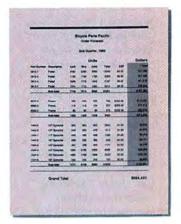
Nay, you may not need to hook more than a gigabyte of storage to your PC. But some of Core International's customers do, and Core lets them throw together systems that go up to 3GB.

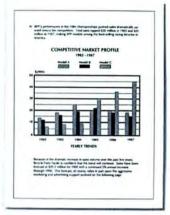
Core's particular forte is big, fast hard disks, but it offers a full range of disk drives, tape units, and backup software. "None of our competitors sells the complete solution," says President Robert Andrew. "You have to buy from four different suppliers and hope that the whole thing will work together."

Although it grew famous for high-end hardware, the company started out in the mid-1970s as a software/consulting firm. Founder Hal Prewitt entered the hard disk market in 1981, with an (continues)

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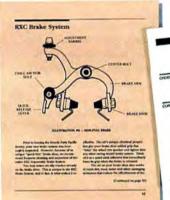






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## **Hypertext Wins Respect**

Owl Sends Guide on Diverse Paths

A pple's *HyperCard* has made a big splash, but these days you can even buy hypertext software from IBM—at least in Europe, where IBM sells a version of Owl International's *Guide*.

What is hypertext, and why are the crowned heads of computerdom scrambling for a bite? In the broadest sense, hypertext is the free-form, user-defined linking of information in a threedimensional format. The term is thrown at products ranging from information managers such as Lotus's Agenda and Persoft's Ize to text management systems such as Seaside Software's askSam.

Guide, a more generic hypertext product that runs under Windows, at first appears to be a mildmannered word processor. But users can hide reference text behind words, phrases, and graphics or set up button linkages that call up information from other files. Subsequent users can click on the buttons, jumping from reference to reference until they reach the desired level of detail. A hypermedia capability even lets you call other applications or control peripherals such as videodisk players.

Guide first appeared in Macintosh form in 1986, then on the PC the following year. Owl, founded in 1985 as the marketing arm of a Scottish software developer, has become the "largest hypertext development group in the world," claims William Nisen, president of the

Bellevue, Washington, firm.

HyperCard, bundled free with the Macintosh, differs from Guide in adopting a card-file structure rather than a word processing framework, limiting the length of linked information to a card the size of a screen, and not allowing you to jump to a particular word. But HyperCard documents are easier to design. HyperCard will find use as a programming environment, whereas Guide will act more as a medium for hypertext publishing. Both products will be widely imitated.

Hypertext products are especially handy for culling information from large textual data bases. "The more data that is available, the more hypertext flourishes," says Nisen. Automated maintenance systems represent a key application, and computer-based training



Owl's William Nisen claims the company is "the largest hypertext development group in the world."

tied to interactive video also seems promising. But most business users will first encounter hypertext in an information management program or an application's help facility (as with Aldus's *PageMaker*).

"You're not going to see a lot of people creating hypertext data bases," (continues)

## Tape Backup

(continued)
offering for an IBM machine that predated the
PC, but the business really kicked off in 1984 when
the AT's hard disk suffered from demonstrable glitches.

"Hal was one of the first to see the problem," Andrew remembers. Core quickly came out with a solid alternative, topped the entry with high-visibility ads suggesting the IBM drives should be dumped to create an artificial reef, and lapped up the business.

Today there's plenty of competition, but Core has grown to employ 135, not counting manufacturing staff. "A very large percentage of our products still go into IBM computers, and a lot of those belong to true Blue customers," Andrew says. "I really don't know why IBM doesn't put in better drives."

In contrast, Core keeps pressing forward in magnetic disk technology. It was the first to introduce Enhanced Small Device Interface models in May 1986, four months before Compaq did and a year before IBM. Today the product line ranges up to 380MB models with 16ms access times.

Additionally, Core is preparing itself for a plunge into optical storage. "We made a decision to bypass WORM [write once, read many] technology" and wait for erasable equipment, Andrew notes.

Tape drives represent another bright opportunity. Currently, research shows that less than one-tenth of disk drives holding more than 40MB are backed up on tape, Andrew says. But he predicts that in two years manufacturers will bundle tape-backup systems with all but low-end drives. "It's in the disk manufacturer's best interest to do that."

The tape drive market has suffered heavily from incompatibility, but dominant tape supplier 3M is entering the drive market with a high-reliability 84MB Mini Data Cartridge design. (Core is writing the accompanying software.) "3M never wanted to come out with a tape cartridge unit, but it decided to make a major play in the market, partly to protect its investment." Andrew remarks, He hopes that the Mini Data Cartridge will finally nail down a standard. "If 3M can't do it, nobody can." -E. B.

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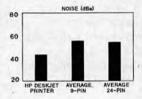
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#### UNIX

(continued)

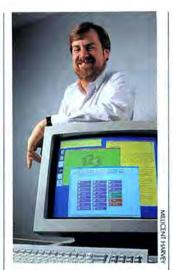
just yet. UNIX is ahead right now."

These fighting words come from the president of Sun Microsystems, a company whose workstation sales have exploded to a billion dollars a year, turning the six-year-old firm into Silicon Valley's fastest-rising star. With AT&T faltering and other vendors offering the operating system merely as an option, Sun is becoming the UNIX standard bearer in the hypercompetitive PC environment where DOS is king and OS/2 is heir apparent.

Sun's chosen weapon is the 386i, the first machine that uses Intel's 25-MHz 80386. Accompanied by appropriate high-end hardware, it starts at \$8000 and climbs rapidly.

More crucial is Sun's system and network software. Like OS/2, Sun's UNIX-based operating system supports large memory and true multitasking. Unlike OS/2, it supports 32-bit processing on the 80386, which dramatically speeds numbercrunching tasks like those involved in computeraided design. Also unlike OS/2, the 386i can run multiple DOS applications. Sun manages all this through an icon-based desktop manager with context-sensitive hypertext help; this will evolve into the even more elegant Open Look interface that Sun and AT&T are currently designing.

The 386i also bundles in hardware and software connections to Sun's sophisticated networks,



Sun's Barry James Folsum expects an "acceleration of enthusiasm" for UNIX among software vendors.

with automated installation facilities that Sun claims will allow normal humans to unpack a machine and get it running on the net in less than 30 minutes.

The target is not just Sun's traditional technical user but all those in the rapidly converging worlds of high-end PCs and lowend workstations. One prime example would be a financial firm trying to automate a trader's desk, suggests Barry James Folsum, vice president and general manager of Sun's East Coast division in Billerica, Massachusetts. "People try to do that with PCs, but they just don't have the system software," he claims. Sun also sees opportunities in electronic publishing, project management, work-group office automation, legal applications, and many other niches.

Exploiting these opportunities, however, requires a rich selection of application packages, and this has been UNIX's greatest weakness. During the past year Sun's McNealy forged an alliance with AT&T computer head Vittorio Cassoni to build an open standard merging the conflicting dialects that have plagued UNIX for years. But other vendors took offense. complaining that they would get new releases months after AT&T and Sun products hit the market. UNIX took two body blows in May when Cassoni abruptly returned to Olivetti, and seven major vendors (including IBM and Digital Equipment Corporation) announced plans to jointly breed their own strain of UNIX.

While industry observers enjoy this bizarre spectacle, and many doubt that the joint effort will accomplish anything, most see the UNIX bandwagon being pulled in two directions. Folsum acknowledges the potential for confusion, but insists that variations between the two versions will be small.

Lotus and Ashton-Tate have committed to UNIX development (although not with overwhelming zeal), and Folsum predicts "an acceleration of enthusiasm" among PC software suppliers. Sun intends to intensify that mood by creating a slim, trim UNIX version for machines with 4MB of memory.

"Sun's used to selling tens of thousands of workstations," Folsum says. "We're getting ready to sell hundreds of thousands—or millions."

—E. B.

## Hypertext

(continued)

says Maureen Fleming, editor of the *Software Industry Bulletin* in Stamford, Connecticut. "But people will use CD ROMbased hypertext documents created by the information industry and catalog publishers."

Finding that hypertext in its purest form may be too chaotic for large-scale applications, Owl has launched a network-based document management package called *Idex* that combines *Guide*'s hypertext engine with traditional data base techniques.

Hypertext's major stumbling block is the time and planning required to set up the linkages. Owl is looking to artificial intelligence to streamline this process. "One person's linkages are another person's sausages," quips Nisen. "AI could help to develop webs of knowledge, so that you could generate linkages predicated on the needs of the user."

As software designers sort out the problems and promises of hypertext, the market remains small. But the moves by IBM and Apple, and hints of upcoming Microsoft products, suggest that hypertext's time is at hand.

—Eric Brown

Daniel Brogan writes a column on personal computing for the Chicago Tribune; Eric Brown is a PC World contributing editor. ●



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# **IBM Puts More Power** on the Desktop

Big Blue upgrades the Model 50 and hauls its 80386 machines up off the floor.

Eric Bender

BM executives freely admit that almost from the beginning, PS/2 customers asked for a zippier Model 50 and for ways to transfer 80386 performance from floor-standing towers onto a desk. That's exactly what the giant manufacturer began delivering in June with its more powerful desktop Micro Channel Architecture models, epitomized by a new 25-MHz 80386 machine

The much-belittled and much-bought-Model 50 has reemerged with zero-wait-state operation and up to 60MB of hard disk storage, boosting performance by as much as 35 percent. The Model 50 appears to have estab-

PC World Previews are informal assessments of products that at press time were still in the development stage. Complete reviews-including features evaluations and performance testing—will appear only after a product is officially released.

lished the visual standard for PS/2s: All the new 386-based Model 70s closely resemble the Model 50 and fit into the same 161/2-by-141/2-by-51/2-inch box, but they have fast hard disks as large as 120MB. The products are also competitively priced -at least in comparison to offerings from Compaq Computer.

#### Big Blue: Speed King?

IBM's newest heavyweight contender is the Model 70-A21, a 25-MHz powerhouse scheduled to ship in September. Priced at a thought-provoking \$11,295, this zero-waitstate machine is said to be capable of running half again as fast as the top Model 80. "It will be the fastest PC on the desktop, bar none," declares William Lyons, general manager for personal systems merchandising, National Distribution Division. The A21 includes an Intel 82385 cache memory controller with 64K of 30ns RAM, 2MB of 80ns RAM



If you've seen one of this summer's crop of PS/2s, you've seen them all—from the outside, anyway. This is the Model 70-A21, a 25-MHz 80386-based machine.

expandable to 8MB available on the system board. and another 8MB on a 32bit memory board. It also has a 1.44MB floppy drive; VGA graphics; one Micro Channel 16-bit and two 32bit expansion slots; and a 23ms, 120MB, 31/2-inch internal hard disk with an integrated Enhanced System Device Interface controller. A 25-MHz 80387 coprocessor is optional.

How is all that gear crammed into the box? The A21-and for that matter, all the other new models-exploits surfacemount technology on both sides of the system board and stands some components vertically. ("Desktop real estate is very scarce, so we're going up, like Manhattan," explains one IBM developer.) The A21 also places processor,

coprocessor, and memorycaching chips on a functional island anchored just above the main board.

Leveraging other inhouse technology, all the new systems incorporate homegrown 1-megabit DRAM and can be expanded to 16MB with 1MB or 2MB modules. The 120MB drives, based on high-density "thin film" designs, represent a sixfold increase in the capacity of IBM's 3½-inch hard disks.

The two other Model 70 configurations, Models 70-121 and 70-E61, are both available now and run at slower clock speeds than the A21. They operate at zero to two wait states without memory caching. The 20-MHz Model 70-121 ships with 2MB of memory and a 120MB hard disk for \$7995. The 16-MHz Model 70-E61, yours for \$5995, incorporates 1MB of RAM and a 60MB hard disk. At press time, a similarly equipped Compaq Deskpro 386/20, which does have memory caching and a 130MB drive, weighed in at \$9499, while a 16-MHz Deskpro 386 with a 40MB drive cost \$6499.

#### Z Upgrade

"The new 50 is faster than any popular AT compatible now sold," claims William Lowe, head of IBM Entry Systems Division. Two Model 50 Zs debuted (the Z stands for zero wait state). These machines replace the orig-

inal model's 150ns memory with speedy 85ns chips and come with larger, faster disks. A Model 50-061 with its 27ms 60MB drive will cost \$4595, while the 50-031, which includes a 39ms 30MB drive, will go for \$3995. By comparison, a 12-MHz Compaq Deskpro 286 with a 40MB drive is priced at \$4199.

Beginning in September, IBM will allow current Model 50-021 owners to replace their 20MB drives by snapping in the new 60MB device for \$1695. (The 50-021, like the newer desktops, ac-

cepts only one internal hard disk, leaving owners with no obvious role for their old drives.)

IBM isn't selling a faster-memory upgrade; the system board was completely recast for the Z. IBM shrank the board 30 percent, melding 65 logic components into five gate arrays, among other moves. IBM expects the higher levels of integration, combined with the new disks, to boost reliability by 30 percent. The firm's engineering goals continue to emphasize reliability, often over performance.

IBM has not eliminated any existing machines and it hasn't cut pricing as broadly as expected, given the PS/2s' pandemic heavy discounting. Prices have been lowered on several floor-standing offerings. The high-end Model 80-311 has moved from \$13,995 to \$11,995, the 80-111 from \$10,995 to \$8995, and the 80-71 from \$8495 to \$7995. The Model 60-71 was trimmed from \$6295 to \$5795.

Overall, the product debut leaves IBM's line with a wide range of price/performance points. The evolution may also create a little numerical confusion, because now some Model 50s are faster than the Model 60s and some Model 70s are quicker than some Model 80s.

IBM is far from abandoning its towers; plans for enhanced versions of the floor-standing units are under way. But in time, suggests Lowe, those machines will get less personal. "Their primary role in life will be as network servers." ●

Eric Bender is PC World's East Coast editor.

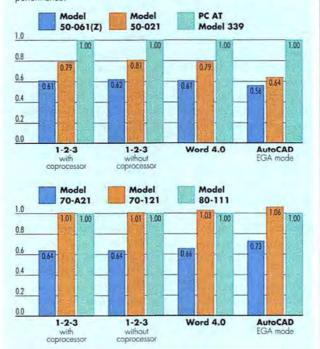
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#### PS/2 Applications Benchmarks

Running DOS applications, IBM's new top-end 80286- and 80386-based desklops (top and bottom) show significant performance boosts over earlier models, according to preliminary tests for PC Digest by NSTL. For 80286 benchmarks, the time of the 8-MHz IBM PC AT Model 339 is established as an index of 1.00; for 80386 tests, all times are indexed to the 20-MHz IBM PS/2 Model 80-111. The smaller the number, the faster the performance.



# Compaq 386s: Small Wonder

Compaq introduces the 80386 PC "for the rest of us"

—a small but mighty powerhouse based on Intel's new
80386SX processor.

Mike Hogan

ost market watchers were skeptical two years ago when Compaq Computer broke ranks and introduced an 80386 computer before IBM had bestowed its blessing on the technology. At the time, Compaq president Rod Canion acknowledged that most users were content to cruise along on their 10-MHz ATs. But he reasoned that his 16-MHz Deskpro 386 would find a home among computeraided-design engineers, desktop publishing aficionados, and power spreadsheet and data base jockeys.

But not even Canion understood just how many power users (or would-be power users) are out there. His company has been selling 80386 systems as fast as it can roll them off the line. Meanwhile IBM, Advanced Logic Research, AST Research, and others are gleefully filling every order that Compaq can't while pumping up demand for their own models.

The 80386 market looks like a hot day at the speedway with contenders wrangling over horse-power—16 MHz, 20 MHz, and now, several entries based on Intel's turbocharged 25-MHz 80386.

But the market is about to broaden dramatically. Intel has just announced another chip that promises to bring 80386-based processing power to those of us who have thus far been kept out of the fast lane by the price or size of today's 80386-based systems.

And true to its track record, Compaq has grabbed the lead again with its new model, the Deskpro 386s, a downsized computer at a popular price—"the 80386 for the rest of us," as Vice President of Sales and Marketing Michael Swavely describes it. The Deskpro 386s is a fully functional 80386 priced at

less than half what you'd shell out for Compaq's other new offering, the Deskpro 386/25.

#### Step Up to a Smaller Platform

How do they do it? The design starts with the processor. The 80386SX is a repackaged version of the standard 80386. Like the original 80386, the 80386SX performs 32bit processing internally. However, it looks like an 80286 to the rest of the system, with 24 address lines and 16 data lines. instead of 32 each. The pin reduction helps make the 80386SX, sometimes called the P9, about 30 percent cheaper than its predecessor, and corresponding system circuitry is also less expensive. Compaq also saves money by producing the Deskpro 386s on assembly lines already tooled up for its other 80386 machines. But the price is mainly a reflection of the company's desire to bring you up from 80286 machines (for a few dollars more, of course).

A small-footprint machine (less than 15 by 16 inches), the Deskpro 386s is particularly attractive to the general business user, with prices beginning at \$4000 depending on configuration. By comparison, the 12-MHz Deskpro 286 and the 10-MHz IBM PS/2 Model 50 are priced between \$3000 and \$3600, and the state-of-the-art Deskpro 386/25 starts at \$10,000.

But don't let the Deskpro 386s's diminutive price and footprint fool you. You get all the benefits of a straight 80386, including the ability to create multiple virtual machines for multitasking. The 80386SX runs all the software an original 80386 does, although 32bit software moves data in and out of the chip only half as fast as on a regular 16-MHz 80386 because of the 16-bit external data path.

Frankly, that shortcoming won't be much of an annovance. Even now, two years after the first 80386 CPU hit dealer shelves, only a handful of applications take full advantage of 80386 capabilities such as 32-bit instructions; and an 80386 version of OS/2 remains a distant dream. In the meantime, the Deskpro 386s will run your 16-bit software 90 percent as fast as the standard 16-MHz 386 (again, it takes a hit because of the data bus), and control programs like Quarterdeck's Desqview or Microsoft Windows/386 will let you run multiple applications simultaneously in virtual mode without OS/2.

Overall, throughput is 40 percent faster than that of a Deskpro 286, Compaq says. So you get the CPU platform of tomorrow at an affordable price today, with the 80386 speed that appeals to the power user in all of us.

#### Integration and More Integration

Like other Compaq 80386 machines, the Deskpro 386s has a concurrent bus design, with memory running at processor speed, while input/output takes place at 8 MHz to ensure compatibility with the installed base of add-on boards. The Deskpro 386s comes with 1MB of memory on the motherboard, and as much as another 12MB can be added to a



Compaq's Deskpro 386s takes advantage of Intel's new 16-MHz processor to deliver inexpensive 80386-based computing in a small package.

dedicated 16-MHz, 16-bit memory expansion slot.

That leaves four 8/16bit slots free for expansion boards, and you won't have to waste them on disk or video controllers. The Deskpro 386s integrates many standard functions on the motherboard, including a hard/ floppy disk controller and a 640-by-480 VGA-compatible Video Graphics Controller (VGC) with 16-bit video RAM that Compaq claims displays graphics and scrolls text up to 50 percent faster than competing products. Parallel, serial, and pointing device ports are built in as well.

Compaq still refuses to ratify the 3½-inch floppy drive standard, instead offering it as an option to a 5¼-inch, 1.2MB drive. The Deskpro 386s accepts up to four storage devices, which can include two 20MB, 40MB, or 110MB hard drives and a 40MB or 135MB tape drive.
Both the 20MB and 40MB drives have 29ms access times, while the 110MB drive has a 1:1 interleave and a 25ms access time.
Disk caching is included, adding a 35 to 69 percent performance advantage, depending on the hard disk.

The 386s comes in three models: the Model 20 and Model 40-whose names bespeak their principal difference, the size of their hard drives-and a floppy-only Model 1 for networks or multiuser systems. You choose your display from among Compag's VGA-compatible color and monochrome monitors. The Model 1 will sell for \$3799, the Model 20 for \$4499, and the Model 40 for \$5199; all are available immediately.

Naturally, Compaq isn't abandoning the per-

formance race—as evidenced by the Deskpro 386/25 unveiled alongside the Deskpro 386s. The 386/25 boasts several new feature enhancements besides the faster processor. The 6-MIPS machine comes with a 110MB or 300MB hard disk drive and incorporates more surface-mount and Compag custom-gate-array technology on the system board. The 386/25 offers both a 25-MHz Intel 80387 coprocessor and a single-chip version of the Weitek coprocessor that runs two to three times faster than the 80387. For those who really, really need storage, Compaq now offers an external subsystem that will provide any of its 80386 systems with up to 600MB. The Deskpro 386/25 Model 110 will sell for \$10,299 and the Model 300 for \$13,299; both are available immediately.

The 386/25 is an impressive machine. But "for the rest of us," the Deskpro 386s still promises to overshadow its larger cousin. Sometimes, less is more. 

■

Mike Hogan is PC World's News Editor.

Compaq Deskpro 386/25, Compaq Deskpro 386s

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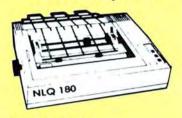
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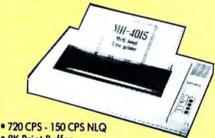
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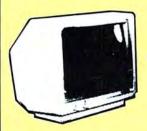


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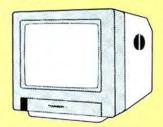
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#### PRODUCT OUTLOOK

#### 86 PRODUCT OUTLOOK

#### Netpro 386/25

With system memory expandable to 32MB and 5.5-MIPS processing, Simple-Net's 80386-based computer is the equal of many a mini.

#### **Diamond Scan Monitors**

Mitsubishi's three versatile color monitors adjust to multiple scanning frequencies for VGA and beyond, yet have the accuracy of fixed-frequency displays.

#### Mini Modem

On the road? QIC Research's pocket-size modem has the big-time talents to keep corporate data and electronic mail within reach.

#### **Linus Write-top**

Look, Ma, no keyboard! Use a stylus to write directly on the detachable screen of this ingenious laptop, which stores handwriting as ASCII characters.

#### IntelliPort PS8

Create a low-cost multiuser system with your PS/2 and Computone's add-in board and share data and files among eight terminals or PCs.

#### Telepower+

The prize module in Lantor's versatile ten-part program merges a data base with a mass-mailing list to fax letters for direct marketing campaigns.

#### 90 BRIEFLY NOTED

#### IntelliForm

Mind Path's AI-based program lets you create forms—complete with prompts and help messages—to guide users in making correct entries.

#### **WordStar Professional 5.0**

What does 5.0 have that 4.0 doesn't? Three hundred new features, from an SAA-compatible interface to automatic file saves and ASCII conversions.

#### **Project Calc, Decision Analyst**

Two new tools for *I-2-3*-based project management. Play "what if" with deadlines and costs, and automate cumbersome decision techniques.

#### **PC Password**

With its encryption algorithm in an EPROM chip, Computer Commodities' add-on board plus software provides the ultimate in password security.

#### **Lotus 1-2-3 Video Training**

Soft Vision's 1-2-3 training program plays on your VCR, teaching basic spreadsheet skills.

#### 94 UPDATE

#### Professional Write 2.0, Professional File 2.0

Expanded file compatibility, improved formula and calculation abilities, and new import/export powers highlight these two upgrades.

#### Framework III

You'll find a built-in E-mail system, an enhanced outliner, and new import/export functions in the latest release of Ashton-Tate's integrated package.

#### Epson Equity II+

Epson's space-saving AT compatible adds a faster microprocessor with switchable clock speeds.

#### EasyCAD2

Rewritten in assembly language for enhanced performance, Evolution's low-cost CAD package has doubled its inventory of features.

#### Page Reader 2.0

Evelyn Woods, listen up: Saba Technologies' improved hand-held OCR scanner can now take in the equivalent of 400 words per minute.

#### MindReader

What's new with this AI-based shareware word processor? A helpful interface, larger file capacity, user-definable colors, and full DOS path support. PC product announcements

and upcoming releases

Netpro 386/25

#### PC Social Climber

You can't be too rich or too thin, and your computer can't be too fast or have too much memory. Simple-Net Systems, heretofore best known for its low-cost local area networks, aspires to the ideal with its Netpro 386/25.

The heart of the Netpro 386/25 is an 80386 processor beating at a strong 25 MHz with zero wait states—the fastest processing available on a PC. In fact, the Netpro, capable of processing more than 5.5 MIPS, is as fast as most minicomputers.

The rest of the computer is equally impressive. System memory starts at 4MB—about four times the normal amount—and expands to 8MB on the system board and to 32MB using fast 100ns memory add-ons in the system's two proprietary slots. Capacity is further enhanced with a 64K static memory cache accompanying the Intel 82385 cache controller.

Simple-Net considers its progeny best suited for action as a design work-station or file server on a LAN. Equipped with your choice of either an MGA, VGA, or 8514 (1024 by 768 pixels) display board, the 386/25 provides built-in appeal for CAD/CAM users. Its EtherLAN Plus

Ethernet adapter and software also make it network ready. After installing Netpro's graphics card, disk controller, and Ethernet adapter, you have available two 32-bit memory slots and two 8/16-bit and one 8-bit expansion slots.

Naturally, the Netpro 386/25 has enough processing power, memory, and storage capacity to run OS/2 as well as DOS. It also gives you a choice of 80MB or 140MB storage capacity, with an average access time of under 25ms.

You choose between a \$12,499 system with an 80MB hard disk and a 5¼-inch floppy, and a \$13,499 system with a 140MB hard disk and both a 5¼-and a 3½-inch floppy. You can opt for OS/2 for \$325 or DOS 3.00 for \$125. Simple-Net Systems, 545 W. Lambert Rd., Ste. A, Brea, CA 92621; 714/526-5151.

Diamond Scan Monitors

#### Multiscanning the VGA Horizon

Graphics equipment already comes in more acronyms than you'd find in a bowl of alphabet soup, and vendors show no sign of slowing down. So how can you ensure that the color monitor you buy today will be able to handle the graphics standard of tomorrow (or the day after)?

If VGA has already become the minimum graph-



Keep your high-res graphics options open with Mitsubishi Diamond Scan monitors such as the HL6905, which adjusts to a variety of color/ graphics adapters at VGA quality and beyond.

ics resolution you can tolerate, or if desktop publishing or computer-aided design software is in your future, you may be ready for Mitsubishi Electronics' Diamond Scan multiple-frequency monitors.

The FL6605, HL6605, and HL6905 Diamond Scan monitors give you a broad slice of the higherresolution-display pie, adjusting to the scanning frequency of various color/graphics boards. You start at VGA (640 by 480), go to 800 by 560, and end up at 1280 by 1024. This means you can use high-frequency, highresolution controllers with applications that have the appropriate display drivers. For example, you can use a 48-kHz or 64-kHz Imagraph card with AutoCAD.

If you've worked at high resolutions before, you probably purchased a fixed-frequency monitor matching your controller and had a technician adjust it to provide the least distorted, most accurate picture. But with Mitsubishi's monitors you get the accuracy of a fixed-frequency display without the technician, since Diamond Scan monitors let you work even with the new multiple-frequency controllers.

Front-panel controls let you adjust the horizontal and vertical position of the displays for as many as 20 frequencies. A scanmode memory stores your settings.

All the units offer the same features except for dot pitch and screen size. The HL6605, with a .31mm dot pitch, is \$1945, and the FL6605, with .26mm dot pitch, is \$2145. Both give you a 15-inch display area on a 16-inch screen—appreciably larger than the typical 13-inch

display on a 14-inch screen but still small enough to fit atop PCs with small footprints. The HL6905 has the same dot pitch as the HL6605 but has a 19-inch display on a 20-inch screen; it retails for \$3650. Mitsubishi Electronics America, Computer Peripherals Division, 991 Knox St., Torrance, CA 90502; 213/515-3993.

Mini Modem

#### Data to Go

All too often, life on the road is a series of small annoyances that loom larger the farther you get from home. You can't do much about restaurant food and uncomfortable hotel beds, and you may run out of clean socks. But you'll never be cut off from your data as long as you pack a laptop and QIC Research's Mini Modem.

Once you've downloaded the worksheet you
forgot on your hard disk
or uploaded the report
that must be at the office
tomorrow morning, you
won't ever want to leave
home without QIC's pocket-size communications
companion. It delivers
your electronic mail and
lets you tap into the corporate data base whenever you need to.

The 4-by-2½-by-1-inch device plugs directly into your computer's serial port, runs on either an internal 9-volt battery or an AC adapter, and works with either tone or pulse telephone lines. It plugs into your phone with a standard RJ-11 jack.

Despite its size, Mini Modem offers many features provided by full-size modems, including a built-in speaker with volume control software, status LEDs (indicating low battery, 300- or 1200-bps operation, and carrier detect), and auto-dial/redial and auto-answer capabilities.

If you travel overseas, you can quickly configure Mini Modem to operate under the European 300-or 1200-bps protocol via a DIP switch. For North America, you get Hayescommand-set compatibility, enabling you to run communications software such as Crosstalk XVI and ProComm.

Other switches let you quickly enable or disable the auto-answer capability and set other interface parameters for various hardware and protocols. But you don't have to be a communications techie to use Mini Modem—it comes from the factory preconfigured for operation on a standard PC or compatible.

Best of all, Mini Modem carries a mini price tag of \$139, which includes the modem, a 7-foot phone cable, a battery, an AC adapter, and Bitcom communications software. QIC Research, 1961 Concourse Dr., Ste. C, North San Jose, CA 95131; 800/843-0806.

Linus Write-top

#### The Write Stuff

You can work on your computer as long as you can find a place to park your keyboard. But what if you're standing up or



The Linus Write-top's 3-pound electronic notepad lets you move around while you jot notes directly on its 80-column-by-25-line display. Its handwriting recognition algorithm translates your notes to ASCII text.

moving around? And what if you don't like typing on a keyboard, period? If you're a manager on the move, a doctor on rounds, or just someone who hates to type, the Write-top from Linus Technologies will give you the equivalent of an electronic clipboard.

The Linus Write-top is essentially a laptop without a keyboard based on a 7.16-MHz 8088 processor and fitted out with an 80-column-by-25-line display sensitive to a stylus. You write directly on the screen, and a handwriting recognition algorithm stores your notes in ASCII format.

Configured with a 3½-inch internal floppy drive and an optional modem, the Write-top weighs just 9 pounds. But you need to hold only the detachable 3-pound display that connects to the rest of the unit with a 3-foot cord.

Linus has taken pains to make the stylus on the display feel like a pen on paper; the display's electrosensitive glass is lightly etched so that the stylus won't slip around when you write. The portable is equipped with the Your-Write program, with which you teach the system to recognize your handwriting. It should take you only 30 minutes of writing the alphabet several times to teach the system the way that you write letters, according to Linus Technologies. The recognition software takes 40K of the laptop's 640K memory.

You create your notes or memos with the Just-Write text editor, entering and editing text with the stylus; drawing a line through a word deletes it. Since the Write-top comes with a connection for a standard XT-compatible keyboard, you can also key text into Just-Write and then edit it with the stylus. And you can buy Just-Write with a file transfer program that runs on a standard PC and converts word processing files into Just-Write's format.

The Write-top runs for up to 7 hours off a camcorder battery that lasts as long as five years. The battery recharges whenever the AC adapter is used.

The basic Write-top system-which includes Your-Write and Just-Write software, DOS 3.30, a battery, an AC adapter, serial and parallel ports, and the backlit LCD display-costs \$3145. Writetop also comes with a slot for a credit-card-size memory card containing 512K of CMOS RAM for \$500. You can add a 300/1200-bps internal modem for \$245. Any PCcompatible, separately



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Best of all, with speeds of up to 15 pages per minute and a duty cycle of 25,000 pages per month, it can satisfy the needs of even the busiest group of professionals.

You can connect an OmniLaser to virtually any computer or network. It features multiple standard interfaces for IBM\*, DEC\*, Apple\*, even specialized hardware like CAD/CAM workstations.

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With the OmniLaser 2115, you have the flexibility you need for today's sophisticated printing applications. You also have the confidence of knowing that your OmniLaser offers a safe path to the applications of the future.

The OmniLaser family also includes the 2106 workstation printer and the 2108 small-cluster printer. So whatever the demand of your application, there's a multipurpose OmniLaser that's right for you

To find out more, call Texas Instruments toll-free 1-800-527-3500.



powered external disk drive can be attached through the parallel port. A file transfer program for *Just-Write* is \$125, and a shoulder bag is \$99. Linus Technologies, 1889 Preston White Dr., Reston, VA 22091; 703/476-1500.

IntelliPort PS8

#### PS/2 Plus PS8 Equals More

Problem: You need to share data and files among a handful of desktops, but you don't want to buy an expensive multiuser system or tangle with the cards, server, and special software of a local area network.

Solution: Take your PS/2 Model 50, 60, or 80 and create a low-cost multiuser system with a Computone add-in board.

Computone's Intelli-Port PS8 adds its own coprocessing technology to the PS/2's 80286 or 80386 processing speed and wide Micro Channel data pathway so that up to eight terminals or PCs can share the PS/2 processor. Adding a terminal costs as little as \$150 per node, and virtually no performance degradation takes place when new terminals are connected.

A ribbon cable connects the board to an expansion box that houses eight serial port connections (if you have the slots, you can add three more PS8 boards and boxes and support as many as 32 terminals). The PS8 incorporates its



Take advantage of the IBM PS/2's excess processing capacity to create a low-cost multiuser system with Computone's IntelliPort PS8.

own 10-MHz 80186 processor, which buffers terminal input/output and minimizes the load on the PS/2 processor. The PS8 processor board also exploits a dual-port communications chip to transfer data at 38.4 kilobits per second, rather than the 9600-bps maximum of the typical serial port. Data also travels faster along the Micro Channel than it does on the typical AT bus.

The PS8 board comes with the drivers you need to use off-the-shelf multiuser operating systems like UNIX and PC-MOS for distributing processing time among the nodes. You also get three ROMbased utilities: Intelli-View, which allows you to run dual applications when you use terminals (each application appears in its own window); IntelliPrint, which lets any node on the system use any printer on the system; and IntelliKey, which allocates function keys on terminals or PCs.

Each of the PS8's eight terminal connections can be configured individually for different bps rates, buffer sizes, and handshake signals. The PS8 multiuser board—including the board drivers, the expansion box, the ROM-based software, and a manual—sells for \$1295. Computone Systems, Multi-User Products Division, 5555 Oakbrook Pkwy. #280, Norcross, GA 30093; 404/475-2725.

Telepower +

#### Max the Fax

Direct marketing for 10 cents a letter may sound too good to be true, but Lantor can make it happen with Telepower + , a ten-module program that trims time as well as phone and mail charges from direct marketing campaigns. Telepower+ merges a data base with a mass mailing list to help you fax as many as forty 200-word letters an hour to any list you identify. What's more, you can program the Mass-Fax module in Telepower + to send your messages after hours when telephone rates are low. Charges are as low as 10 cents a letter when you use a WATS line or similar business phone service.

To write those letters, you can use *Telepower +* 's word processing module or import copy from programs like *WordStar* and *Microsoft Word*. You do need *Telepower +* 's data base manager, *Profile*, but that isn't as limiting as it sounds.

Profile, which is included, also lets you set up an unlimited number of calling groups using an unlimited number of fax phone numbers. If a cus-

tomer wants to know where your closest retail outlet is, simply type in the customer's ZIP code and *Profile* will locate the six nearest dealers.

That aside, the real coup is the Mass-Fax module, which eliminates all envelope stuffing and postage metering. You also can use it to send telex/TWX, EZ-Link, and E-mail messages.

Telepower + works with most major brands of PC fax boards, including ADT's SmartFax, Panasonic's FaxPartner, and Datacopy's MicroFax. It requires 460K of memory on an IBM AT or compatible equipped with 640K, a 20MB hard drive, and DOS 3.00 or a later version. A single copy retails for \$495: the LAN version goes for \$1495. Lantor, Inc., 13650 Gramercy Pl., Gardena, CA 90249; 213/324-7070.

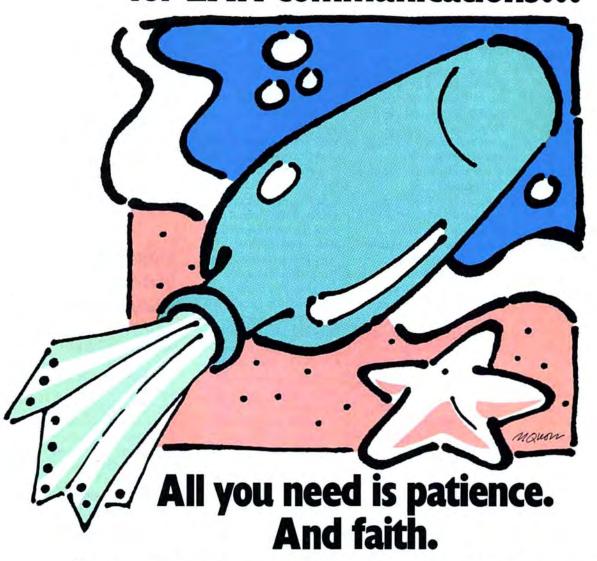


#### **IntelliForm**

Mind Path Technologies has introduced a form generator that relies on artificial intelligence techniques to make form creation and form usage quicker and easier.

Like many products in the form-generation genre, *IntelliForm* lets you lay out a form on your screen so that what you see is what you get, and it also lets you specify

# You can rely on your file server for LAN communications...



You're getting the drift of this message already. File servers aren't designed to solve the PC user's communications problem. But now there's a system that is.

#### Now there's COMMIX™32.

It's a general purpose local area network for PCs and minicomputer hosts. It connects you with the host, other PCs, and peripherals such as printers, plotters, or modems through simple, pop-up menu commands.

For file transfer and E-mail as a background task. For printer spooling and sharing directly from your applications programs. For terminal emulation that's automatic. COMMIX 32 will let anyone perform common LAN tasks—without the need for expert assistance.

#### Install it quickly. Expand it easily.

Almost any PC user can install and connect with COMMIX. With each connection, you're saving time and money. Because each COMMIX connection costs as little as \$125.

Then take advantage of expansion possibilities. With our optional Ethernet<sup>®</sup> Link Module, you can create larger LANs with thousands of users. And through our optional Wide Area Network Module, distant COMMIX LANs can appear as one network.

#### If you're lost at sea.

And looking for solid LAN. The COMMIX 32 is available now. Send us a message: ITRON, a Division of Infotron Systems Corporation, 130 Gaither Drive, Suite 116, Mount Laurel, NJ 08054.

TEL: (609) 722-5575 FAX: (609) 234-0451

1-800-423-8044





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prompts and help messages for the fields (blanks) on the form.

You can give data entry personnel even more guidance by defining rules for filling out each blank. For example, you can set up rules allowing only certain data to be entered in a blank, and guide your employee to correct entries via menus and other aids. You can define a mathematical formula and prompt your employee for the values the formula needs, with the result of the calculation automatically appearing in the blank. And you can set up rules that pass the data entered in one blank to dependent blanks.

IntelliForm prints finished forms on any character printer. If you want fancy forms with logos and other graphics, you can buy IntelliForm with FormMaker Software's FormMaker II design package for printing on a LaserJet-compatible or PostScript laser printer.

IntelliForm includes a screen editor, for designing forms and specifying rules, and a screen processor that employees use to execute forms. The program requires DOS 2.10 or a later version and 512K; it retails for \$495 for a single machine license and \$95 for each additional copy of the screen processor. IntelliForm bundled with FormMaker II is \$990. Mind Path Technologies, 12700 Park Central Dr. #1801, Dallas, TX 75251; 214/233-9296.

#### WordStar Professional 5.0

With the goal of providing full word processing capability even on floppy-based PCs, MicroPro International has bolstered its long-time best-seller, WordStar, with more than 300 features.

Changes to WordStar Professional 5.0 start with a new interface. which MicroPro has made compatible with IBM's System Application Architecture so that it will continue to evolve within industry standards, protecting your investment in learning. Version 5.0 has pulldown menus plus page-preview capabilities that let you see on screen how all the typefaces and sizes in a document as long as 144 pages will appear in print. You can also split the screen into two resizable horizontal windows to edit two documents at once.

WordStar Professional 5.0 contains the same ease-of-use features available in version 4.0, including advanced footnoting capabilities, automatic reformatting, macros, and an undo command. Moreover, you can make outlines or create up to eight newspaper-style snaking columns. For safety, you can set the program to save your files automatically at regular intervals of less than a minute.

Also new is a data entry screen for creating a data base of mailing labels on which you can perform sorts and retrievals. A new telecommunications module, accessed in the opening menu, lets you go on line to upload or download files. Version 5.0 automatically converts WordStar files to ASCII for transmission to mail services like MCI Mail. It also converts incoming ASCII files to the Word-Star format.

Finally, the word processor supports a wider variety of printers, including PostScript-compatible laser printers, and offers proportional spacing for simple desktop publishing applications. A 100,000-word spelling checker and a thesaurus

containing more than 200,000 synonyms are included.

WordStar Professional 5.0 requires 320K of memory without the page preview function, 512K with it, and DOS 2.00 or a later version. It retails for \$495. Upgrades are available to registered owners for \$119. MicroPro Int'l, 33 San Pablo Ave., San Rafael, CA 94903; 415/499-1200.

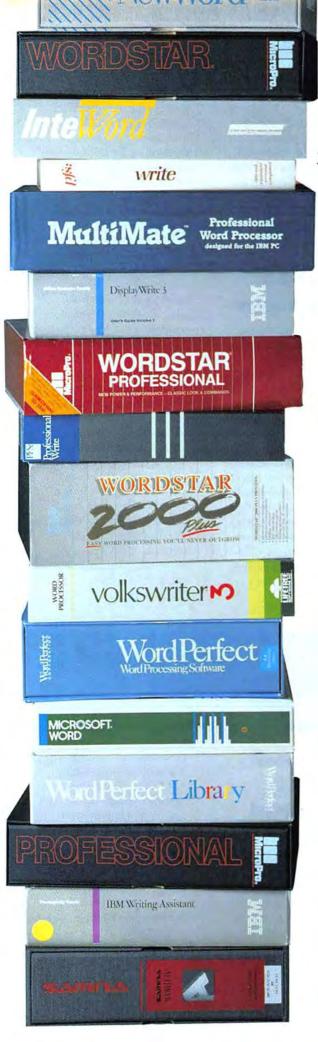
#### Project Calc, Decision Analyst

Frontline Systems has unveiled two tools to help your 1-2-3-based project planning or decision analysis. Project Calc lets you use 1-2-3 to plan project schedules and budgets. You express task durations, interrelationships, and cost assignments in the rows and columns of a worksheet, guided by 1-2-3-style menus and prompts. You also get a library of 30 @ functions tailored to project management. With these tools, you can play "what if" with deadlines, durations, and costs, just as you would with other variables in any other worksheet.

Project Calc determines the critical path for a project and computes early and late start and finish dates for each task involved, as well as slack time for noncritical activities. It can depict a project's schedule in Gantt and PERT charts and produce tables showing deadlines and costs.



WordStar Professional 5.0 includes more than 300 new features, such as pulldown menus and desktop publishing page-formatting features. You can split the screen into two resizable horizontal windows to edit two documents at once.



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- •Comprehensive user's manual detailing the functions is included.
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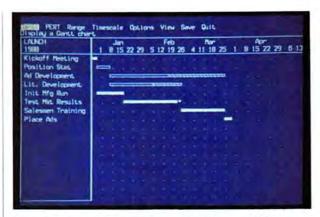
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Project Calc (shown here) and Decision Analyst let you use PERT and Gantt charts within your Lotus 1-2-3 worksheets to create alternate project scenarios.

Decision Analyst lets you draw a decision tree linked to your spreadsheet so that you can graphically analyze alternatives in a model, thus automating a helpful but often cumbersome decision analysis technique.

You use a built-in graphics editor to construct your tree on the screen. You can specify a value for each branch, or alternative, and supply that value to any cell in your spreadsheet. You can then recalculate the spreadsheet to obtain the outcome you can expect from choosing a particular alternative. During this process, you can flip back and forth between the tree and your spreadsheet.

Project Calc and Decision Analyst require 1-2-3 release 2, since only that version has the 1-2-3 Addin Manager. They also need 140K and 55K, respectively, in addition to the 21K the Add-in Manager requires. Project Calc is \$149.95; Decision Analyst is \$99.95.

Frontline Systems, P.O. Box 7408-P1, San Francisco, CA 94120; 800/451-0303 ext. 55, 916/677-7171.

#### PC Password

Software file encryption schemes generally can be defeated by a good programmer using common programming utilities. For the ultimate in security, Computer Commodities offers its PC Password add-on board. PC Password keeps its encryption algorithm in an EPROM chip on a \$149.95 half-card that fits in any 8-bit slot with a one-way screw. PC Password takes over at the BIOS stage; it doesn't let the computer boot until you enter the password. In order to defeat it, the board must be removed with a special screwdriver. A sticker affixed to the cabinet will be destroyed if the board is removed, alerting you to the break-in.

Each board comes with a unique password and software to set up a new password as often as you wish. Files and directories can be locked one by one. You also can disable your computer while it's still running and unlock it again with the password. Computer Commodities USA, 7127 Shady Oak Rd., Minneapolis, MN 55344; 612/942-0992.

#### Lotus 1-2-3 Video Training

With its installed base growing by a million copies each year, 1-2-3 is gaining followers faster than a television ministry. Many of these converts need extensive training in the discipline, and what better medium for the purpose than television?

SoftVision has tapped the talents of scriptwriters and video education specialists to develop a 1-2-3 training program that entertains as it instructs. The 60-minute program simulates a realworld business situation in which the protagonist must quickly produce a spreadsheet for his boss. He accomplishes the task with the help of a teacher, who performs magical feats in the form of 1-2-3 @ functions.

Along with the cassette, SoftVision supplies a workbook and a diskbased training program to let viewers implement what they are learning at their own pace. The Soft-Vision curriculum doesn't cover every 1-2-3 function but rather focuses on developing a basic comprehension of spreadsheets and the necessary skills to complete an expense budget. Available in both VHS and Beta formats. the cassette sells for \$449 and is accompanied by a 51/4- or 31/2-inch disk. Additional student kits with workbook and disk cost \$39 each. Soft Vision, 140 Wood Rd., Braintree, MA 02184; 617/849-3551.



#### Professional Write 2.0, Professional File 2.0

Software Publishing has improved the file compatibility features of two members of its *Professional* series. *Professional File 2.0* reads the native .DBF data files and .DBT memo files of Ashton-Tate's *dBASE* as well

as reading and writing delimited and fixed-width ASCII files. The package now also includes file indexing, plus improved formula and calculation abilities. Although you can't keep more than one file open at a time, you do gain quasi-relational capabilities because you can search across multiple closed files.



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Hardware Specifications: Requires PC/MS-DOS version 2.0 or higher with 584K of usable memory and a minimum 10 MB hard disk. For use with the IBM® PC, PCXT, PCAT, Personal System/27M and compatibles. 3½° media optionally available. Not copy protected.

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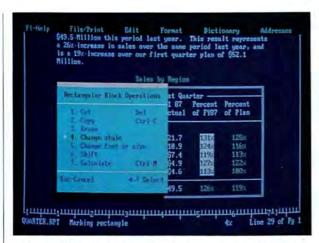


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Software Publishing's Professional Write 2.0 lets you use multiple fonts selected from a menu of popular fonts, including those for Hewlett-Packard LaserJet and PostScript printers.

Professional File 2.0 now supports conditional statements as well as time and date calculations and incorporates a menu-driven applications generator for creating executable files complete with custom menus. The program retails for \$299; upgrades cost \$75.

Professional Write 2.0 also has enriched import/ export facilities. It automatically imports files from WordPerfect 4.2, MultiMate Advantage II. Microsoft Word 3.0, and WordStar Professional 4.0, among others, and can save its own files in those formats. It reads the .WK1 and .WKS files of 1-2-3 and can do a direct mail merge with dBASE III files at print time.

Professional Write 2.0 lets you use multiple fonts in a document. Simply mark your text and select the appropriate typeface from a menu of popular fonts, including those for the Hewlett-Packard LaserJet series and Post-Script printers. Moreover, *Professional Write 2.0* provides extensive file sorting and searching, including the ability to search within the files on a subdirectory for a specific text string.

Professional Write 2.0 sells for \$199, with upgrades available for \$50. Both programs require 512K of memory and DOS 2.00 or a later version. Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94039; 415/962-8910.

#### Framework III

Ashton-Tate's Framework integrated productivity software has added electronic mail capability, enhanced its outliner, and boosted import/export functions. Framework III automatically imports and exports files to 1-2-3 release 2.01 and WordPer-

fect, among other popular packages. It provides closer compatibility with dBASE, is compatible with the Lotus/Intel/Microsoft (LIM) 4.0 Expanded Memory Specification (EMS), and has sped up the recalculation of spreadsheets by letting you recalculate selected regions.

Framework III has a built-in E-mail system based on the Message Handling Service file transfer paradigm from Action Technologies, which is also supported by Novell's Netware. Other improvements include point-and-shoot selection of screen colors and word processing enhancements, including a capacity for multiple columns with automatic snaking of copy and a thesaurus containing 40,000 root words. Moreover, you can run other applications or issue DOS commands from within the program, and

Framework III saves memory space by "rolling out of memory," except for a 10K kernel. Framework III sells for \$695 and requires 640K and DOS 2.10 or a later version. A five-user network pack sells for \$995 and can be expanded with single-user copies. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319; 213/329-8000.

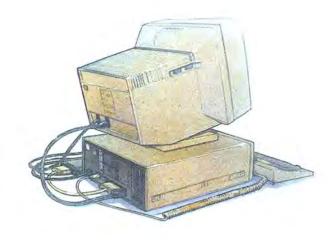
#### Epson Equity II+

Epson America has upgraded its small-footprint IBM AT compatible with a faster 80286 microprocessor offering switchable clock speeds of 8 MHz and 12 MHz in a compact 15.7-by-16.3-by-6-inch cabinet.

The Equity II+ comes standard with 640K of memory expandable to



The AT-compatible Epson Equity II + has a small footprint and adds a faster 80286 microprocessor with switchable clock speeds of 8 MHz and 12 MHz.



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15.5MB; a 1.2MB, 51/4-inch floppy drive; and six fullsize expansion slots, including three 16-bit and three 8-bit slots. The Equity II + also features a battery-backed built-in clock/calendar, a parallel and a serial port, a 101key, AT-style keyboard, and a 110-watt power supply. Epson bundles in DOS 3.30, GW BASIC, and Epson utility software with a hard disk cache.

The Equity II + sells for \$1899 in a single-floppy configuration or \$2999 with the addition of a 40MB hard disk. Video choices include a \$149 MGA or a \$299 EGA board and either a \$149 monochrome, \$449 RGB, or \$599 EGA monitor. Epson America, 2780 Lomita Blvd., Torrance, CA 90505; 213/539-9140.

## EasyCAD2

**Evolution Computing has** doubled the number of features in its low-cost CAD package, EasyCAD, adding pattern fill even for stretched polygons and making it possible to select line styles from pop-up dialog boxes. EasyCAD2 has been completely rewritten in assembly language for enhanced performance and faster regeneration of complex drawings. You can select colors for shapes and lines from an on-screen palette at any

time the program is in use and use as many as 16 colors simultaneously from a palette of 256. Up to 256 design layers—say, for circuit board design—can be hidden or shown and locked or unlocked.

EasyCAD2's macro language has been enhanced to better automate complex or repetitive tasks, and its menus can be defined by the user. Output is read/write compatible with AutoCAD, VersaCAD, and other CAD packages. Easy-CAD2 is compatible with the LIM 4.0 EMS, runs in a Microsoft Windows window, and requires 512K of memory and two floppies, although a hard disk is recommended. It sells for \$169.95. Evolution Computing, 437 S. 48th St. #106, Tempe, AZ 85281; 602/967-8633.

## Page Reader 2.0

Saba Technologies has improved the throughput of Page Reader, its handheld optical character recognition (OCR) scanner. Version 2.0 of Page Reader handles about 40 percent more draft dot matrix fonts, and its data entry is 25 percent faster than the original version. Page Reader 2.0 can take in about a page per minute, the equivalent of 400 words per minute. It has a more intuitive user interface, can deal with more complex document layouts, and is compatible



Brown Bag's MindReader version 2.0 gains a new interface. This word processor with an artificial intelligence engine suggests appropriate words and phrases as you type.

with TIFF, the graphics file format used by Aldus PageMaker and other Windows desktop publishing programs.

Page Reader 2.0 can read multicolumn text, outlines, tables, and lists. The device, which requires 640K of memory, DOS 2.10 or a later version, and a hard disk, retails for \$1299. Current registered owners will receive the software update for a \$7.50 handling fee. Saba Technologies, 9300 W. Gemini Dr., Beaverton, OR 97005; 503/626-7050.

## **MindReader**

Brown Bag Software has added a bar interface along the top of the screen with pulldown command menus and context-sensitive help to version 2.0 of its *MindReader* word processor. *MindReader*, which includes an artificial intelligence engine to suggest appropriate words and phrases as you type, employs *WordStar-*

like editing commands and an interface that Brown Bag compares to its *PC-Outline*. Menus can be bypassed altogether for faster editing. The more you use the program, the more of your often-used words and phrases *MindReader* adds to its lexicon.

MindReader 2.0 also gains larger file capacity, user-definable colors, and full DOS path support. The program includes a real-time spelling checker, mail merge features, line drawing capability, a name and address data base, and a calculator. A shareware product, Mind-Reader 2.0 is distributed free of charge to those who wish to try it, but a \$54.95 registration fee is asked of those who continue to use it. The vendor will send a trial copy for a \$10 postage/handling charge. Brown Bag Software, 2155 S. Bascom Ave. #114, Campbell, CA 95008; 800/523-0764, 



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## **Business-Class ATs**

With prices dropping and performance rising, AT-clone buyers can be choosers, not beggars.

PC World evaluates five highspeed, low-end 80286 systems.



TJ Byers Sometimes (usually around 4:30 on a bad Monday afternoon), you get the impression that the quality of life is on a relentless downhill slide. Happily, one area where optimism is definitely appropriate is bargain-basement computing. Month by month, reliable systems like 80286-based AT clones seem to get faster and cheaper.

In fact, high-speed 80286 machines using fast RAM and running without wait states are rapidly approaching the performance of low-end 80386 systems. Assuming you don't need Windows/386 or other 80386-specific software, one of the new AT clones can handle all your business computing with amazing speed.

How much 286 can you get for the buck? To find out, *PC World* collected five high-performance AT clones, all with clock speeds of at least 10 MHz, all priced under \$2000. The systems were ordered in a minimal, moneysaving configuration: 1MB RAM, a 1.2MB floppy drive, a 40MB or higher-capacity hard disk, one parallel and one serial port, a 101-key keyboard, and a monochrome video adapter and monitor. Each manufacturer put together the best package it could for the price. The contest included the Blackship 286, the Micro 1 286, the TBS International 286 Turbo Plus, the Fivestar 286, and the Clone Technologies AT-1.

The systems had many features in common. All five were housed in standard-AT-size boxes; no compact footprints here. All sported front-panel reset buttons, tilt-and-swivel monitor stands, switchable dual-speed CPUs (with front-panel LEDs to indicate the speed), and 80287 math coprocessor sockets, and all could use memory between 640K and 1MB for extended or expanded RAM. Four out of five systems came with two parallel ports, five half-height drive bays, two 8-bit and six 8/16-bit expansion slots, and a front-

panel button to toggle between low-speed and turbo mode.

How did performance compare? While raw clock speed is a factor, throughput is a truer measure of performance—and CPU clock speed is only one of three factors that affect it. The other two are wait states (see the sidebar "Waiting for Performance") and hard disk access speed (see "The Ultimate System Buyers' Guide," *PCW*, January 1988). Nonetheless, it should come as no surprise that in throughput tests conducted by National Software Testing Laboratories (NSTL), the 12-MHz, no-wait-state TBS was the big winner, while the 10-MHz Clone AT-1 came in last.

For this roundup, however, cost was just as important as speed—and when price was factored in with performance, three systems emerged with laurels: The Blackship took top honors, while the Micro 1 and the TBS tied for second place.

## Blackship 286

The \$1755 Blackship 286 runs at 12 MHz (switchable to 6 MHz), but it uses relatively slow, 120ns RAM chips that require the 12-MHz CPU to run at one wait state. As a result, it came in fourth overall in the speed events—but in company this fast, fourth place isn't that bad. In fact, the Blackship delivers more-than-adequate performance, and its price/performance ratio easily justifies *PC World*'s Best Buy recommendation.

The Blackship includes quite a few attractive features, including a fast (28ms), sturdy, 44MB Seagate hard drive and a well-designed Data Bank motherboard. The system comes with two serial ports: a 9-pin type and

The 12-MHz
Blackship 286
(far left) offers
a winning combination of price
and performance. Its latest
version includes
faster RAM
and higher
performance.

## FEATURES EVALUATION

## **Cheap ATs**

Blackship's 286 offers the most impressive price/performance ratio, but the Micro 1 and the TBS are almost as compelling.

1 2 3 3 3 5 0

Micro 1 286			Clone AT-1	1
	1	P	1	1
/ /	/	12	1	
\$1755	\$1950	\$1999	\$1995	\$199
286	286	286	286	286
6/12	8/12	6/12	6/10	6/1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
14	14	14	14	12
1MB	1MB	1MB	1MB	512
1MB	1MB	1MB	1MB	1ME
6	5	6	6	6
2	3	2	2	2
3	4	3	3	3
5	4	5	5	5
•	•	•	•	0
•	•	•	•	•
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
•	•	•	•	•
0	0	0	0	0
	\$1755 286 6/12  O O O 14  IMB IMB S 5 O O O O O O O O O O O O O O O O O O	S1755 S1950  286 286 6/12 8/12  O O O O O O O O O O O O O O O O O O O	\$1755 \$1950 \$1999  286	286   286   286   286   6/12   8/12   6/12   6/10

<sup>&</sup>lt;sup>1</sup> Price based on 1MB RAM, 1.2MB floppy drive, 40MB hard drive, one parallel and one serial port, monochrome video card and monitor.

a conventional 25-pin RS-232C. An enhanced AT-type keyboard from Key Tronic—the best on the market—and a 14-inch amber monitor from Quimax with good, crisp characters round off the Blackship's package of winning accessories.

Even in its one-wait-state configuration, the Blackship is a compelling deal—and the news gets better. Since the review unit was delivered to *PC World*, Blackship has begun shipping this system with 80ns RAM, allowing zero-wait-state operation. This should boost performance right up to the level of the overall speed event winner, the TBS International, making the Blackship 286 impossible to resist.

## **EXECUTIVE SUMMARY**

## Blackship 286

AT-compatible system



This 12-MHz machine with a speedy 42MB hard disk provides the best dollar-for-dollar value of any unit in the roundup. With faster RAM now included at no extra cost, the Blackship

has even more to offer.

Memory capacity	•		
Expandability	•		
Ergonomic design			•
Performance		•	
Overall value			

## Micro 1 286

Micro 1's 286 is something of a speedster, taking second place overall in the performance events. Its throughput was a little slower than the TBS's, and the Micro 1 is less expandable—but it has a faster motherboard and at \$1950 is also slightly cheaper. Go choose! The only fair solution was to declare a tie for second place.

The Micro 1 is an 8/12-MHz system, equipped with a 49MB CTI hard disk. It comes with the same excellent Key Tronic enhanced keyboard as the Blackship and a 14-inch, flat-screen, Packard Bell amber monitor with a nice sharp image and handy controls. An included utility, Softgraph, allows the monochrome monitor to emulate CGA mode.

The Micro 1's expandability leaves some-

<sup>&</sup>lt;sup>2</sup> Price includes only 512K RAM.

MAKK JUHANN

thing to be desired. The motherboard includes the standard eight expansion slots—three 8-bit and five 8/16-bit—but one 8-bit and one 8/16-bit slot are located behind the drive bays, making it impossible to put a full-length board into either. To make matters worse, four slots are already occupied with boards (compared to three in the other systems reviewed) due to separate floppy and hard disk controllers. And unlike the other systems reviewed, which can hold five half-height devices, the Micro 1's system unit can only hold four.

Although the Micro 1 took second place overall in the speed trials, its 12-MHz, zero-

## **EXECUTIVE SUMMARY**

## Micro 1 286

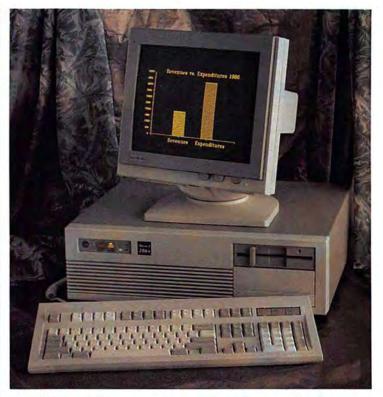
AT-compatible system

This 12-MHz racer is the second-fastest machine in the roundup. Its slow hard disk holds it back a bit, and it is less expandable than the other systems here, but its fast motherboard and relatively low price are impressive enough to tie for second place.

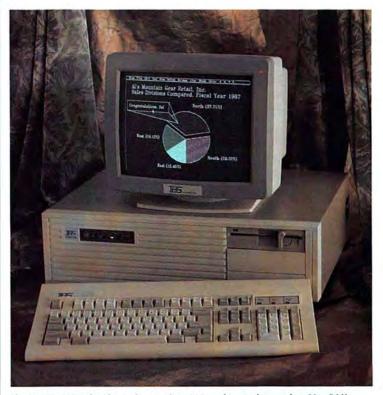
Expandability				
	4.0			
Ergonomic design			•	
Performance		•		
Overall value	•			

wait-state motherboard, with 80ns memory, is the fastest of any system in the roundup (based on NSTL's processor-intensive 1-2-3 tests). What drags down throughput is the 33ms hard disk.

With a faster drive installed (and there's nothing to stop you from putting one in), the Micro 1 would probably lead the pack—although you'd end up paying slightly more than \$2000. Alternately, if you can live with a 20MB, 33ms drive, the price plummets to a remarkably low \$1615. Even without a disk transplant, though, this is a hot machine.



The 12-MHz Micro 1 286 scores a speedy second-place performance rating, despite a relatively slow 49MB hard disk. And while its \$1950 price tag is fairly close to the upper limit of the survey, the system includes an excellent 14-inch flat-screen monitor.



The 12-MHz TBS Turbo Plus is the speediest 286 machine in the roundup. 80ns RAM allows the CPU to run without wait states. Its \$1999 price is high but includes a fast 44MB Seagate hard disk and an outstanding 14-inch paper-white monitor from CTX.

## NSTL TEST REPORT

## **Cheap ATs**

The Micro 1 places first in the processor-intensive 1-2-3 benchmark, but overall performance figures put the TBS in the top slot, followed by the Micro 1.

## **WordStar Professional**

Micro 1 286	83
TBS 286 Turbo Plus	94
Fivestar 286	103
Clone AT-1	107
Blackship 286	110
dBASE III Plus	
TRS 286 Turbo Plus	155

2 2 2 2	
Clone AT-1	220
Blackship 286	173
Micro 1 286	170
Fivestar 286	166
1D3 200 TUIDO FIUS	133

## 1-2-3

Micro 1 286	26
TBS 286 Turbo Plus	27
Fivestar 286	31
Clone AT-1	32
Blackship 286	34

## Lattice C Compiler

came e compiler						
TBS 286 Turbo Plus						80
Micro 1 286						84
Blackship 286						91
Clone AT-1						91
Fivestar 286						92
H	-1-	-	-1	-1-	1.	
seconds O	40	80	120	160	200	

All machines tested had a minimum configuration of 1MB of RAM and a 40MB hard disk, with the exception of the AT-1 from Clone Technologies, which was shipped with 512K of RAM; all machines were tested with a monochrome adapter and without a coprocessor.

## **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 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.

## **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 benchmark 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.

## TBS International 286 Turbo Plus

The 12-MHz TBS 286 Turbo Plus won the speed trials hands down, but fastest isn't always best. Given the Micro 1's faster motherboard and slightly lower price, a dead heat was declared for second place between the \$1999 Turbo Plus and the \$1950 Micro 1.

The system comes with the same fast, 44MB Seagate hard disk used in the Blackship, an excellent Focus Electronics enhanced keyboard with a very nice touch, and a large, 14-inch paper-white monitor from CTX that is a viewing pleasure (see "View-

## EXECUTIVE SUMMARY

## **TBS International 286 Turbo Plus**

AT-compatible system

The TBS International 286 Turbo Plus shares second-place honors with the Micro 1. It scored the top speed rating overall in the roundup. It's virtually identical to the Blackship 286 test unitexcept for faster RAM and a price tag that's \$250 higher. This is an excellent system with a good price, but why pay more than you have to?

	•	
		•

ers' Choice: 13 Monochrome Monitors" in this issue). CPU speed is toggled with a slide switch located, rather inaccessibly, at the rear apron of the cabinet.

This 6/12-MHz system is built around the same Data Bank motherboard as the Blackship 286. While the Blackship review unit used 120ns RAM chips, the Turbo Plus contained 80ns chips that allowed its CPU to run at zero wait states-which is why it sprinted past the Blackship in NSTL's

throughput events. Now that the Blackship comes with 80ns chips too, there should be no difference between them—except the extra \$250 you'll spend for the TBS. Need we say more?

## Fivestar 286

The Fivestar 286 is not cheap; at \$1995 it costs about the same as the much higher performance 12-MHz TBS. What Fivestar sells you is a fairly typical 10-MHz AT clone that mimics an IBM to the letter. It placed third overall in the speed trials—impressive performance for a 10-MHz machine, but in a world with 12-MHz machines for less money, who cares? Furthermore, since it already runs at zero wait states, there's no way to speed it up short of going to a 12-MHz motherboard. What you see is what you get.

The Fivestar comes with a swift (28ms), 44MB Seagate hard drive; a Hercules Graphics Card (note: not the HGC Plus), and a poor-quality, 14-inch paper-white Xtron monitor with a fuzzy image that's noticeably inferior to the monitors of the other clones reviewed (see "Viewers' Choice: 13 Monochrome Monitors" in this issue). The keyboard is the same outstanding Key Tronic

## 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.

unit provided with the Blackship and the Micro 1.

The sturdy PC&C horizontal motherboard is made in Taiwan, uses 120ns memory chips that allow the 10-MHz CPU to run at no wait state, and can be throttled down to 6 MHz if necessary. It includes a rechargeable clock battery; if it runs down, you can simply leave the system on overnight, and the battery will replenish itself.

The Fivestar 286 is a less-than-overwhelming value: a 10-MHz system that runs slower (and costs more) than the 12-MHz Mi-

## WAITING FOR PERFORMANCE

What is a wait state? What is the CPU waiting for? What impact does a wait state have on performance?

At the heart of a personal computer is the system clock, a set of integrated circuits that produces a steady clock tick. The system clock determines the "speed" of your computer: 8 MHz, 12 MHz, and so on. With every click of the system clock, the CPU can execute one step of an instruction. The faster the CPU, the more steps it can perform in a given amount of time. RAM chips are also rated for speed—the time they require to respond correctly to a read-data request.

If a PC uses a fast system clock and slow (read cheap) RAM, the CPU can execute an instruction before the result of a previous read-data instruction is available. This is clearly a disaster. A wait state—a momentary pause, equal to one clock tick, in the execution of instructions—inserted by the system hardware just before each read-data instruction, keeps fast processors from outrunning slow memory.

RAM access time is rated in billionths of a second, or nanoseconds (ns). A chip rated at 150ns, for instance, takes longer to stabilize than one rated at 100ns. (RAM chips that stabilize faster are generally more expensive.) For the CPU to run at 10 MHz with no wait

states, RAM chips must be 120ns or faster; slower RAM will require the introduction of one wait state. At 12 MHz, memory must be rated at 100ns or faster for no-wait-state operation.

Predictably, wait states also slow processing throughput. Introducing a wait state drops throughput by about 25 percent. So if you're shopping for a fast computer, you're really in the market for throughput—the time it takes the CPU to process a given amount of data—and that depends as much on wait states as it does on clock speed.

—TJB



The 10-MHz Fivestar 286 costs \$1995 but fails to deliver performance to match the similarly priced 12-MHz TBS Turbo Plus. The system includes a rechargeable clock battery, a Hercules Graphics Card, and an unimpressive 14-inch paper-white monitor from Xtron.



The Clone Technologies AT-1 took last place in the speed trials, comes with only 512K of RAM, and costs no less than \$1995. A 40MB Miniscribe hard disk, a plain-vanilla 12-inch monitor, and a flaky Chicony keyboard are part of this dubious package.

cro 1—and has a shoddy monitor. (Beware: Fivestar sells another AT clone, the FS-286, that uses a backplane instead of a horizontal motherboard. Not only is the FS-286 slower, it's more expensive—so be sure you know which machine you're buying.)

## Clone Technologies AT-1

This is not an impressive system. In addition to a high price and a last-place overall showing in the speed event, the 10-MHz AT-1 came with a malfunctioning keyboard and a skimpy helping of RAM. Although the 10-MHz, zero-wait-state VIP motherboard holds 1MB of RAM, the system was shipped with only 512K.

## **EXECUTIVE SUMMARY**

## Fivestar 286

AT-compatible system

The Fivestar 286 is very fast—for a 10-MHz machine—and it has many good features. Nonetheless, you can get higher performance for less money with the 12-MHz Micro 1.

Memory capacity			
Expandability	•		
Ergonomic design		•	
Performance			
Overall value			
	12/2/	//	/
/	ACCULATE ON AND	00°	

The \$1995 Clone AT-1 includes a 40MB MiniScribe hard disk that claims 40ms access time; it proved to be a slow-motion clunker that sounded like a transmission looking for an AAMCO garage. You also get a flaky enhanced AT keyboard from Chicony that prevented the system from booting at 6 MHz. (When the Key Tronic keyboard was substituted, there was no problem.) The monitor is a plain-vanilla, 12-inch amber unit from Packard Bell.

## **EXECUTIVE SUMMARY**

## Clone Technologies AT-1

AT-compatible system

Offering only 512K RAM, a keyboard that refused to let the system boot at 6 MHz, and a cheap 12-inch monitor, this poor excuse for an AT is a must to avoid—at any price.

Memory capacity				•
Expandability		•		
Ergonomic design			•	
Performance			•	
Overall value				
Overall value	10/	,	-	

There is one nice touch. Instead of a rechargeable clock battery, the Clone AT-1 uses a large capacitor that holds a charge for up to a month. If it runs down, you can recharge it by leaving the system on overnight—and unlike a rechargeable battery, the capacitor never wears out. Clone Technologies expects you to fork over top dollar for this dubious system. Fortunately, you can do a lot better.

## Heroes of the AT Olympiad

When the dust settles, three systems emerge as true heroes: the top-rated Blackship 286 (\$1755) and the second-place tie-winners Micro 1 286 (\$1950) and TBS International 286 Turbo Plus (\$1999). You won't go wrong with any of these systems.

The Fivestar 286 fails to make the winner's circle; there is nothing wrong with it, except that you can get faster performance for less money. Last and definitely least is Clone Technologies' AT-1, checking in with short memory, a bum keyboard, and a hard disk that wheezes while it works.

With performance that would have pinched your pocketbook only a few years ago, the best of these bargain-priced machines provide real cause for celebration. The work time they'll save you will turn even a blue Monday into a good-news day. ●

TJ Byers is a contributing editor for PC World.

## WHERE TO BUY

## Blackship 286

Blackship Trading Co. 385 Oyster Point Blvd. #110 South San Francisco, CA 94080 800/654-7955 List price: with 1MB zero-wait-state 80ns RAM, 101-key keyboard, two parallel and two serial ports, 1.2MB floppy disk drive, 44MB hard disk drive, Herculescompatible video board. 14-inch amber monochrome graphics monitor \$1755

Warranty: one year parts and labor Extended warranty: \$210, available through Data Bank Technical support: no toll-free number, 9–5

## Clone Technologies

AT-1 Clone Technologies 13522 W. 107th St. Lenexa, KS 66215 913/469-0400 List price: with 512K zero-wait-state 120ns RAM, 101-key keyboard, two parallel ports and one serial port, 1.2MB floppy disk drive, 40MB hard disk drive, Hercules-compatible video board, 12-inch amber monochrome graphics monitor \$1995 Warranty: one year

parts and labor
Extended warranty: \$199 per year
Technical support:
no toll-free number (collect calls accepted), 9–5

## Fivestar 286

Fivestar Computers
1621 W. Crosby #112
Carrollton, TX 75006
214/242-7000
List price: with 1MB
zero-wait-state 120ns
RAM, 101-key keyboard,
two parallel ports and
one serial port, 1.2MB
floppy disk drive, 42MB
hard disk drive, Hercules
Graphics Card, 14-inch
paper-white monochrome graphics monitor
\$1995

Warranty: one year parts and labor Extended warranty: none Technical support: toll-free number, 9–5

## Micro 1 286

Micro 1

557 Howard St.
San Francisco, CA
94105
415/974-5439
List price: with 1MB
zero-wait-state 80ns
RAM, 101-key keyboard,
one parallel and one serial port, 1.2MB floppy
disk drive, 49MB hard
disk drive, Herculescompatible video board,
14-inch amber monochrome graphics monitor
\$1950

Warranty: one year parts and labor Extended warranty: \$200 per year from National Computer Systems Technical support:

no toll-free number, 9-5

## TBS International 286 Turbo Plus

TBS Int'l

20 Main St.
Ashland, MA 01721
617/881-7322
List price: with 1MB
zero-wait-state 80ns
RAM, 101-key keyboard,
two parallel ports and
one serial port, 1.2MB
floppy disk drive, 42MB
hard disk drive, Hercules-compatible video
board, 14-inch white
monochrome graphics
monitor \$1999

Warranty: one year parts and labor Extended warranty: \$300 for two years, \$500 for four years Technical support: no toll-free number, 9–5

For more information, see Products Featured in This Issue.

## XTs for Bargain Hunters

Five XT clones set out to prove that you can still find happiness with an 8088.

Unexpectedly, the cheapest units deliver the best performance.

Ithough speedy 80286 and 80386 systems tempt buyers with 16- and 20-MHz speeds, most users have yet to push their 8088 systems to the limit. Many companies waste money buying ATs when less expensive XT compatibles would do just as well. XT clones are faster than ever, yielding 8-MHz to 10-MHz clock rates, and plenty of inexpensive expansion products can boost performance even further.

This review examines five XT clones ranging in price from \$1077 to \$1273.95: the Maxum Turbo XE from 47th Street Computer, the Plain Vanilla PC from PC Designs, the Standard Turbo/10 from CompuAdd, THE PC/10 from PC Network, and the Whole Earth Turbo System from Whole Earth Electronics.

## **Look-Alike Clones**

The five PC XT clones tested are clearly commodity products—while price, performance, and ergonomic extras vary, components are often identical. For the sake of comparison, *PC World* requested similar configurations from all vendors, representing inexpensive yet complete computer systems. However, all the vendors offer numerous op-

tions for customizing your system. Prices for the most common items appear in the Where to Buy section at the end of this article. (Due to the rising cost of RAM at press time, prices are subject to change.)

For each unit tested, the sticker price includes 640K of RAM, a 360K half-height floppy drive, and an 85ms Seagate ST-225 20MB hard drive. The only exception is the Maxum Turbo XE, which came with a 65ms 40MB MiniScribe 3650 hard drive and 768K RAM. Also included are an amber monochrome monitor, a Hercules-compatible video adapter, DOS 3.20 or 3.30, an AT-style keyboard, a clock/calendar, one serial port, and at least one parallel port. Note, however, that manufacturers often substitute one brand of component for another—which may affect performance.

All the units except the Maxum offer Datatech DTK motherboards and use the ERSO BIOS. All provide eight expansion slots (six long and two short), and all but the Maxum leave five slots free (the Maxum leaves only four). Each system has an 8088

Lewis Perdue





CPU switchable between 4.77 MHz and either 8 or 10 MHz, and each offers a socket for an 8087 math coprocessor. All have 135-watt power supplies and two empty half-height disk drive bays.

## The Speed Gap

Performance tests by National Software Testing Laboratories (NSTL) show wide variations in the clones' performance. Overall, the Whole Earth Turbo and Standard Turbo/10 took the top two prizes, THE PC/10 was third, the Maxum Turbo XE fourth, and the Plain Vanilla PC lagged far behind.

Not surprisingly, the two slowest models lack 10-MHz operation, but other variations

come into play. The sluggardly Plain Vanilla PC depends on the older revision 5 DTK motherboard, while the others use revision 9. The faster units are equipped with version 2.40 of the ERSO BIOS (a public-domain BIOS distributed by the Taiwanese government); the slower PCs rely on earlier versions. All but THE PC/10 use Western Digital disk controllers, but data transfer tests reveal that the WX-1 version used by the Whole Earth is the fastest.

NSTL tests uncovered no software compatibility problems except with THE PC/10, The Whole Earth Turbo System delivers fast performance and good ergonomics at a moderate price.



The Standard Turbo/10 is the least expensive machine in this group. Considering its speedy performance, the system is hard to beat.



The Maxum Turbo XE runs at a maximum clock speed of 8 MHz and, unlike the other clones, allows you to install up to 1MB of RAM on the motherboard.

and *PC World* discovered only a few gaffes in hardware compatibility. The Plain Vanilla had trouble with the AST Hot Shot accelerator board, and none of the systems ran with either the Intel or Quadram 80386 accelerator boards.

## **Whole Earth Turbo System**

At \$1153, the 10-MHz Whole Earth Turbo System is not only one of the least expensive systems tested but also one of the fastest, performing about 42 percent faster than an IBM PC XT. The Whole Earth's flawless operation and extensive panel controls mark it as a Best Buy.

The system arrived fully configured, and installation was easy. The unit's excellent panel controls add to the illusion that you're riding an AT. The cabinet contains a keylock, a reset button, and a speed indicator light, and it's the only unit with a convenient switch for toggling clock rates. The system

## **EXECUTIVE SUMMARY**

## **Whole Earth Turbo System**

XT compatible



As one of the top performers and the second least expensive unit evaluated, the Whole Earth Turbo deserves a firm thumbs-up.

Expandability Ergonomic design Performance	•		
-	•		
Performance			
Overall value			
\\ \delta \\ \de	/	/	/

came with a Samsung monochrome monitor; however, the 84-key BTC 5060 keyboard was somewhat mushy. The package included a disk of DOS utilities and special display drivers, as well as the *PC-Write* shareware word processor.

The combination of top performance, reasonable price, and easy setup are hard to beat. Despite the mushy keyboard, the Whole Earth Turbo is one of two highly recommended systems in this group.

## Standard Turbo/10

At \$1077, CompuAdd's 10-MHz Standard Turbo/10 is the cheapest of the systems reviewed. Only a shade slower than the Whole Earth (and 42 percent faster than an IBM PC XT), the Turbo/10 finishes in a dead heat with the Whole Earth for first place in overall value.

Like the Whole Earth Turbo, the Turbo/10 is housed in an AT-style cabinet with a key-

## **EXECUTIVE SUMMARY**

## Standard Turbo/10

XT compatible



The Turbo/10 offers the lowest price and nipped at the Whole Earth's heels in performance. Although our review unit's floppy drive problems had to be fixed, the system is a good deal.

			1000
	•		
1	/	/	/
6/8	0	8	
	-	•	•

lock, reset button, and speed indicator light, but you have to toggle clock rates with a hot key. The 101-key, AT-style Key Tronic keyboard, with its crisp touch, was the best tested. The Turbo/10 came with a Samsung monochrome monitor and several hard disk utilities, including *PC Fullbak*.

Unfortunately, the first Turbo/10 test unit was plagued with a floppy drive problem. Even after the drive, controller, and cable were replaced, the new drive still wouldn't work right. Replacing the CPU finally fixed matters.

While its floppy drive mishaps could prove significant, the Turbo/10 is nonetheless recommended. Its fast performance, low price, and superior keyboard make it a solid value.

## FEATURES EVALUATION

## **XT Features Compared**

Welcome to the me-too generation of XT clones. With so much in common, price and performance are paramount.

Yes O No	5	Maxum 1	plain Vo.	THE PC	\
• 40	Made	1 AL	1	THE PC	.\
Yes	E .	1	4 9	1	6
No \	=	arb	8	5	-
\	1	3	*	2	1
standard features	1	0	1	1	,
Price 1	\$1153	\$1077	\$12742	\$1208	\$1179
CPU	8088-1-p	8088-1-p	8088-2	8088-2	8088-1-
Maximum clock speed	10 MHz	10 MHz	8 MHz	8 MHz	10 MHz
Parallel ports <sup>3</sup>	2	2	1	2	2
Serial ports <sup>3</sup>	1	1	1	1	1
Monitor	12 inch	12 inch	12 inch	12 inch	12 inch
Coprocessor support	8087	8087	8087	8087	8087
Memory capacity					
Amount shipped with unit	640K	640K	768K	640K	640K
Maximum installable on motherboard	640K	640K	1MB	640K	640K
xpandability					
8-bit expansion slots	8	8	8	8	8
Slots occupied	3	3	4	3	3
Maximum number of half-height drives	4	4	4	4	4
rgonomic design					
Front-panel reset button	•	•	0	0	•
Front-panel on/off switch	0	0	0	0	0
Key lock	•	•	•	0	•
Speed indicator		•	•	0	•
Speed toggle	•	0	0	0	0
Tilt-and-swivel monitor	•	•	•	•	0
Compact footprint	0	0	0	0	0
Complete documentation		•	•	•	•

<sup>&</sup>lt;sup>1</sup> Price based on a 640K XT with a 20MB hard disk, a monochrome graphics monitor, and at least one serial and one parallel port—except for the Maxum Turbo XE, which came with 768K and a 40MB hard disk.

## Maxum Turbo XE

The Maxum Turbo XE tested second to last in performance, registering just 37 percent faster than an IBM PC XT. The unit performed weakly despite its advanced compo-

<sup>2\$1189.95</sup> with 20MB hard disk.

<sup>2</sup> Not built into the motherboard.



The Plain Vanilla comes with an excellent keyboard, but its front panel is rather bare, and its price and performance aren't on a par with the other units'.



Priced about average for this group of clones, THE PC/10's keyboard has a rubbery feel, and the review units' components were problematic.

nents, including 128K of extended memory, a PC-II ADvance motherboard, and an Award BIOS. In addition, only a 65ms MiniScribe 40MB hard drive was available for evaluation with the unit, thus skewing the price (and perhaps performance scores on disk-intensive tests) slightly upward. For comparison's sake, with the 20MB Seagate drive, the Maxum would cost \$1189.95 rather than \$1273.95—the price of the 40MB system received.

The Turbo XE dwells in an AT-style cabinet with a keylock and turbo indicator lights. Toggling from 4.77 MHz to 8 MHz requires a

## **EXECUTIVE SUMMARY**

## **Maxum Turbo XE**

XT compatible

In spite of more advanced components, the Maxum was the second slowest unit evaluated. With its tired performance and inefficient slot configuration, it takes third place in this evaluation.

Memory capacity	•			
Expandability			•	
Ergonomic design		•		
Performance			•	
Overall value			•	
/«	gilet 00/	ALP .	04/	/

keystroke combination. The unit's Vendex monitor is a dressed-up version of a basic Samsung unit, and the keyboard is the mushy BTC 5060.

The Maxum has eight expansion slots, but only four are open for use because the serial port requires its own expansion board, separate from the floppy controller. Worse yet, the serial board did not function at all and the hard disk crashed during tests. However, the second review unit's serial port worked just fine. In addition, the Maxum is the only unit tested that lets you upgrade to 1MB of RAM on the motherboard.

Despite its edge in memory expansion, the Maxum Turbo XE's mediocre 8-MHz perfor-

mance places it third in overall value. The unit's slot-wasting hardware design further prevents it from winning a strong recommendation.

## Plain Vanilla PC

PC Designs' Plain Vanilla PC clearly lives up to its self-effacing moniker. Although it has a responsive keyboard, it was the slowest machine evaluated, straggling in last in every test. In its fastest mode (8 MHz), the Plain Vanilla was only 29 percent faster than the IBM PC XT, compared to 37 percent for the second lowest competitor. At \$1208, it was also one of the most expensive units tested.

The Plain Vanilla's panel is strictly plain vanilla; bereft of locks, controls, and lights, it's the only unit tested without a reset button. The 101-key, enhanced AT-style Maxi-

## **EXECUTIVE SUMMARY**

## Plain Vanilla PC

XT compatible

The Plain Vanilla was not only one of the most expensive units evaluated but the slowest by a long shot. Despite its responsive keyboard, it doesn't win our stamp of approval.

-	-		
	•		
		•	
			•
			•
4/	/	/	/
8	1	8	
	2/00/	2/0/3/	0/4/0/

Switch keyboard is a plus, offering a firm touch. The system came with a Samsung monochrome monitor.

Installing the Plain Vanilla required a battery of hard disk utilities and plenty of experience. On the unit received, the hard disk refused to load due to the presence of a non-

## NSTL TEST REPORT

## Cheap XTs

The Whole Earth Turbo System and the Standard Turbo/10 pulled out ahead.

## **WordStar Professional**

Standard Turbo/10	253
Whole Earth Turbo System	253
THE PC/10	261
Maxum Turbo XE	292
Plain Vanilla PC	321
IBM PC XT	497

## dBASE III Plus

Maxum Turbo XE	368
Standard Turbo/10	375
Whole Earth Turbo System	377
THE PC/10	387
Plain Vanilla PC	437
IBM PC XT	541

1-2-3	
Standard Turbo/10	98
THE PC/10	98
Whole Earth Turbo System	98
Maxum Turbo XE	109
Plain Vanilla PC	126
IBM PC XT	205

Whole Earth Turbo System	217
Standard Turbo/10	231
THE PC/10	238
Maxum Turbo XE	268
Plain Vanilla PC	276
IBM PC XT	412

All machines were tested with 640K of RAM and a 20MB hard drive, except for the Maxum Turbo XE, which had 768K of RAM and a 40MB hard drive; all machines were also tested with a monochrome adapter and without a coprocessor.

## **WordStar Professional**

Although disk access plays a small part in this benchmark, processing and memory 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 to produce a report based on a three-file join, select, and sort.

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.

## Lattice C Compiler

In this benchmark, the sequential disk access rate is the most important factor. The benchmark 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.

DOS partition. After several hours of running diagnostics and other utilities, however, the hard disk worked fine.

Although the Plain Vanilla offers a respectable keyboard, the unit cannot be recommended. Sluggish performance, a high price, and tricky installation conspire against it.

## THE PC/10

Despite its 10-MHz operation, PC Network's THE PC/10 sits squarely in the middle on performance tests, running a hair slower than the Standard Turbo/10 and about 40 percent faster than an IBM PC XT. Priced about average at \$1179, it earns the lowest overall ranking, thanks to a rubbery keyboard and severe hard disk and display problems.

THE PC/10's cabinet has a reset button and a keylock. The 101-key, AT-style keyboard from Chicony Electronics has the worst touch of the models tested. The keys feel as if they were mounted with wads of chewing gum.

THE PC/10 was given two chances to pass muster and failed both times. The first unit received by NSTL had serious floppy disk problems, and the second was barely breathing. The original Cardinal MM1215A monitor would not hold a steady image. (At press time PC Network said it was no longer using the Cardinal.)

## **POWER TIP NO. 3**

## Searching dBASE III Plus Logical Fields

In dBASE III Plus, you can define logical fields whose values are either true or false (actually T or F). Since it's searching for only two characters, dBASE III Plus can search logical fields faster than it can search alphanumeric fields. Here's the proper syntax for searching on a logical field:

List for logical\_field

or

List for .Not. logical\_field.

Roy Moore

Director of Technical Support, Ashton-Tate

Torrance, California

## **EXECUTIVE SUMMARY**

## THE PC/10

XT compatible

THE PC/10 takes third place in performance, making it the slowest of the three 10-MHz systems. Severe hard disk and monitor problems in the review unit, along with a chintzy keyboard, combine to earn it the worst rating of the XTs tested.

Expandability  Ergonomic design  Performance			Memory capacity
Performance			Expandability
			Ergonomic design
			Performance
Overall value			Overall value

The second system refused to recognize the Seagate hard disk, and further tests indicated that half the drive's sectors were bad. After a low-level format, the drive operated, but very slowly. Whether these problems were due to poor components or slipshod packing, it's enough to give one pause. Moreover, in NSTL software compatibility tests, THE PC/10's hard disk wouldn't boot when formatted with IBM PC-DOS 3.30, nor would it install that version's VDISK.SYS. Clearly, THE PC/10's disastrous performance disqualifies it from recommendation.

## Low Cost, High Quality

If this crop of XT compatibles is any indication, price has little to do with performance. The Whole Earth Turbo is highly recommended because of its top-notch performance and reasonable price. The Standard Turbo/10 is less expensive than the Whole Earth system and is equally recommended, despite floppy drive problems with our review unit. The Maxum Turbo XE's extra RAM helps to place it third, but buyers should note that it leaves only four slots open for expansion. The Plain Vanilla PC is simply

too slow and limited for serious consideration, and THE PC/10 merits the lowest ranking due to its poor keyboard and damaged components.

Despite the remarkable similarity among XT clones, subtle differences can produce significant variations in performance. The faster of the reviewed models represent

sound values and give new life to the ever-expandable 8088-based XT. ●

Lewis Perdue is the editor and publisher of PC Management Letter and the author of Supercharging Your PC (Osborne/McGraw Hill, Berkeley, California, 1987).

## WHERE TO BUY

## Maxum Turbo XE

47th Street Computer 36 E. 19th St. New York, NY 10003 800/221-7774

List price: with 768K, 360K floppy disk drive, MiniScribe 3650 40MB hard disk, DOS 3.20, Vendex (Samsung) monochrome monitor, game port, one serial and one parallel port, BTC 5060 keyboard \$1273.95

Accessories: Seagate ST-225 20MB hard drive \$289.95, Toshiba 720K 31/2-inch floppy drive \$109.95, Toshiba 1.44MB 31/2-inch floppy drive \$139.95, CGA adapter \$89.95, Thomson CGA monitor \$229.95, Paradise AutoSwitch EGA adapter \$149.95, Quadram EGA monitor \$469, Paradise VGA graphics adapter \$259, NEC MultiSync II (VGA) monitor \$579, Irwin 20MB tape backup \$409.95, Mountain 40MB tape backup \$379.95, Intel Above-Board with 512K \$389.95

**Warranty:** one year parts and labor, carry in or ship in

**Extended warran- ty:** one additional year only, costs 18 percent of system price

**Technical support:** unlimited phone support, no toll-free number, M–Th 9:30–5, F 9–2, Sun 10–5

Other support services: buyer discounts on computer classes in New York City

## Plain Vanilla PC

PC Designs 2500 N. Hemlock Circle Broken Arrow, OK 74012 800/322-4872

List price: with 640K, 360K floppy disk drive, Seagate ST-225 20MB hard disk, Samsung

nara disk, Samsung monochrome monitor, one serial and two parallel ports, DOS 3.30, Maxi-Switch 101-key keyboard \$1208 Accessories: Seagate

ST-225 20MB hard drive \$295, Seagate ST-238 30MB hard drive \$329, Seagate ST-251 40MB hard drive \$495, 360K floppy drive \$99, 720K 31/2-inch floppy drive \$115, Hercules CGA adapter \$150, Samsung CGA monitor \$409, NEC GB1 EGA/CGA adapter \$335, Vega Video-7 Deluxe adapter \$215, Samsung EGA monitor \$409, Vega Video-7 VGA adapter \$319, Orchid Designer VGA adapter \$319, NEC MultiSync II monitor \$629, TEAC 40MB internal cassette tape backup \$545, TEAC 60MB internal cassette tape backup \$619, Wangtech 125MB internal cartridge tape backup \$969

Warranty: one year parts and labor, carry in or ship in

Extended warranty: none Technical support: unlimited toll-free phone

support, M-F 8-6
Other support services: user BBS
(918/252-9137)

## Standard Turbo/10

CompuAdd Corp. 12303G Technology Blvd. Austin, TX 78727 800/531-5475

List price: with 640K, 360K floppy disk drive, Seagate ST-225 20MB hard disk, 12-inch Samsung monochrome monitor, one serial and two parallel ports, DOS 3.30, Key Tronic 101-key keyboard, PC Fullbak backup utility \$1077

Accessories: Mini-Scribe 3650 40MB hard drive \$395, 360K floppy drive \$99, 1.2MB floppy drive \$109, 720K 31/2inch floppy drive \$109; CGA monitor and adapter \$289; EGA monitor and adapter \$469; Vega Video-7 Deluxe adapter plus NEC MultiSync II monitor \$869; Paradise VGA adapter \$269; Vega Video-7 adapter \$299; NEC MultiSync II monitor \$679; Mountain 40MB internal tape backup \$389; Intel AboveBoard

(with 512K) \$349 **Warranty:** one year parts and labor, carry in or ship in

Extended warranty: none Technical support: one year toll-free phone

support, M-F 8-7
Other support services: none

## THE PC/10

PC Network 320 W. Ohio St. Chicago, IL 60610-9934 800/621-SAVE, 312/280-0002

List price: with 640K, 360K floppy disk drive, Seagate ST-225 20MB hard disk, Cardinal monochrome monitor, DOS 3.20, one serial and two parallel ports, Chicony keyboard \$1179

Accessories: Mini-Scribe 3650 40MB hard disk drive with controller \$386, 1.2MB Mitsubishi floppy disk drive \$103, 360K floppy disk drive \$81, 720K 31/2-inch floppy disk drive \$86, 1.44MB 3½-inch floppy disk drive \$103, color video adapter \$53.90, color monitor \$269, EGA board \$140, EGA monitor \$345, Orchid VGA board \$259, Princeton Ultrasync VGA monitor \$513, Intel AboveBoard 286 with 512K \$323, Irwin 20MB internal tape backup \$351

**Warranty:** one year parts and labor, carry in or ship in

Extended warranty: none Technical support: unlimited, no toll-free

number, M—F 9:30—4:30 Other support services: 15-day moneyback guarantee, user BBS

## Whole Earth Turbo System

Whole Earth Electronics 2990 Seventh St. Berkeley, CA 94710 800/323-8080 outside California, 415/653-7758

List price: with 640K, 360K floppy disk drive, Seagate ST-225 20MB hard disk, Samsung monochrome monitor, one serial and two parallel ports, DOS 3.30, BTC 5060 keyboard \$1153

Accessories: Mini-Scribe 3650 40MB hard drive \$170, Seagate FT-251-1 40MB hard drive \$370, 1.2MB floppy drive \$159, 720K 31/2inch floppy drive \$119, 1.44MB 31/2-inch floppy drive \$149, CGA board and monitor \$200, EGA board and monitor \$400, VGA board and monitor \$600, 40MB internal tape backup \$399, Intel AboveBoard (without memory) \$129 Warranty: one year parts and labor, carry in

or ship in

Extended warranty: second year costs 7
percent of system price,
third year costs 25

percent
Technical support:
unlimited toll-free phone
support, M–F 8–5
Additional support
services: 30-day money-back guarantee

For more information, see Products Featured in This Issue.

## **Five Flat-File Favorites**

Five flat-file data managers show their colors.

The spectrum ranges from simple file management to complex data analysis.

he first file managers were crude electronic bins with clunky user interfaces and a couple of ways to print lists and labels. Today many feature colorful, informative menus and a surprising array of search, sort, view, and report options. Some even borrow multifile powers usually associated with relational data managers like *Paradox* and *dBASE*.

Last month *PC World* reviewed Symantec's *Q&A 3.0*, a genial, multitalented program widely considered the best general-purpose file manager around. In this review, we round up five more entries—some addressing more specialized needs, others after a piece of *Q&A*'s extensive turf.

Each of the programs offers a menu-driven system for creating files, searching data, sorting records, and producing simple reports. Beyond these commonalities, the packages accommodate an intriguingly diverse set of users and applications—but there are limitations buyers should know about.

Ellen J. Sander and Marlene Nesary

## PFS: Professional File 1.01

PFS: Professional File doesn't pretend to be other than what it is—a capable flat-file manager. A mature, popular product, its interface is attractive and consistent. It supplies the basics most beginners need: good tools for data entry and editing, quick searches, and simple columnar reports. The latest version offers memory caching for faster searches and sorts, and supports up to 64 sort keys in reporting mode.

Professional File's \$249 price is midrange, and its system requirements are modest: two disk drives and 256K of RAM. A simple installation procedure and lucid documentation simplify setup, and navigating the overlapping menus is a breeze. When you pull down a menu, you're confronted with just a few explicitly defined choices, and hot keys let you bypass menus altogether. If this isn't enough, PFS's on-line help is superb.

Building a file is straightforward. Professional File automatically assigns field type and length according to data you key in. A useful set of editing features lets you insert blank lines and duplicate fields, pages, and entire forms. Field versatility is somewhat limited, though. The program provides automatic date stamping, but you're stuck with ANSI year-first format.

The program's error messages are precise and action oriented, and data can't easily be destroyed. However, data validation is limited; you can't restrict entries to a proper range, date, or time, nor can you require an entry. Quick searches, sorts, and reports are Professional File's forte. To select a group of records, you type the match criteria in a blank record and establish field priorities by number for sorts. Macros further speed these (and other) operations. You can't edit macros, but you can have them pause for user input.

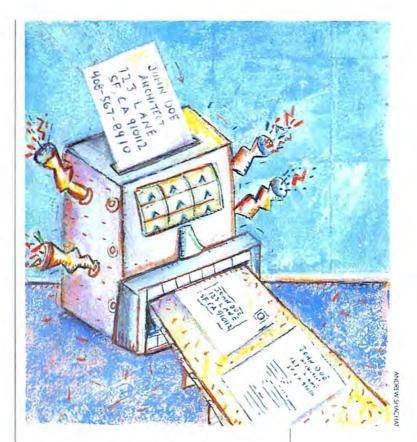
Professional File's reporting powers are limited but well designed, offering list, mailing label, and cross-tabulation formats. The easy-to-use cross-tab report accommodates five kinds of summary fields: total, count, average, maximum, and minimum values. But Professional File can't accommodate or adjust to custom formatting.

Despite these limitations, *Professional File* is all the data base many users need. Quick reports and speedy performance make the program a pleasure to use. For the silent majority who use file management programs, *Professional File* is the best buy around.

## PowerBase 2.3

If you're willing to part with \$349, Power-Base will take you closer to relational style and capability than any other program reviewed here. The program's multifile features are well implemented, and a first-rate zoom option lets you move quickly from file to file for viewing and reporting. However, to take advantage of these features, you'll have to think like a relational data base designer. You'll also need the patience of one as you wait for its slower-than-dBASE report generator to do its stuff.

Clear documentation, a tutorial disk, and a capable installation program make setup easy. The program requires 384K of RAM and two disk drives. *PowerBase* strings its



menus across the bottom of the screen, a status line along the top tells what file and mode you're in, and a help line provides orientation. Menu format is consistent, but keystroke routines are cumbersome. However, you can override keystroke choices with a command mode, which is smoother.

PowerBase is the only program of the five that requires you to declare field lengths, and you have to choose from the four field types provided. To take advantage of the multifile capabilities, you'll have to build the links as you create or modify fields—a far cry from Professional File's hand-holding. Fortunately, PowerBase supplies sensible default values as you design your data base.

Flexible multifile action is the reward for those who conquer *PowerBase*'s steep learn-

## **EXECUTIVE SUMMARY**

## PFS: Professional File 1.01

Flat-file manager



The epitome of user-friendliness, PFS: Professional File combines an attractive and logical interface with excellent list-handling capability. It easily produces several kinds of reports but cannot

accommodate more than one custom form. Add great on-line help and smooth data exchange, and Professional File becomes a Best Buy.

User interface	•		
Data base setup	•		
Data entry and validation		•	
Querying and reporting		•	
File import/export	•		
Overall value			

ing curve. You can fill in data from outside fields and even edit a look-up field and send the changes back to the file of origin. Once established, the program's system of lookups and zoom functions allows you to move easily through multiple files. These links provide ammunition for bull's-eye reporting too, since data along a zoom path can be sorted, subtotaled, and printed in a highly flexible format.

PowerBase's report generator also supports ad hoc calculations for report fields, a valuable tool for data manipulation and analysis. The more links you assign. however, the slower the report generation. Searches or reports involving too many lookups may run out of memory.

Though generally well executed *Power-Base* is a bit of an orphan. It's a good way to learn relational concepts, and it provides some powerful, flexible data handling, but most people don't buy software to learn a concept—they buy to get the job done. If you

really need relational capability, you're probably better off buying one of the big guns in the first place.

## Reflex: The Analyst 1.0

File managers don't have to be relational to be high-tech. Borland's *Reflex: The Analyst* offers statistical functions that easily beat *dBASE*'s lineup, and its formula language is more powerful than 1-2-3's. Add built-in graphs and quick, powerful tools for viewing and outputting data, and you can see why *Reflex* has generated a loyal following among users who do trend analysis, asset planning, and the like.

Reflex costs a mere \$150, but hardware requirements can be steep. The specs say you need only 384K of RAM, but to massage data files larger than, say, 5000 records, you'll need LIM expanded memory. You'll also need a graphics adapter. Installation depends on the DOS COPY command.

Function keys and <Shift>-function key combos operate a 1-2-3-like menu bar. Reflex's terminology is also reminiscent of a spreadsheet; you select cell ranges when retrieving a data base subset. A far cry from Professional File or Q&A's pretty color-cod-

## **EXECUTIVE SUMMARY**

## PowerBase 2.3

Flat-file manager

Excellent lookup features allow you to move easily between files for querying, reporting, and data validation. *PowerBase's* multifile powers, however, make it the most complex of the five to set up and use. This program is too complicated for most flat-file users, yet not powerful enough for real relational applications.

Data base setup			•	
Data entry and validation	•			
Querying and reporting		•		
File import/export		•		
Overall value				•

## FEATURES EVALUATION

## **Versatile Flat-File Managers**

For a blend of power and usability, try PFS: Professional File or RapidFile—they rival top-notch Q&A.

Professional Fig.	Rapidrii 2.3	Referen.	Reflex 1.0	ORA	1	
\ lessi	202	3	=	0	1	
onal	10	1	13	1	1	\
\ 7		1	1	1	1	1
a entry, editing,	50	1	1	1	1	1
I validation	-	1				-
Variable-length fields	•	0	•	•	•	•
Currency fields	0	•	0	•	•	•
Calculated fields	•	•	•	0	•	•
Date fields	0	•	•	•	•	•
Time fields	0	0	0	0	0	•
User-customized screens	•	•	•	• 1	•	•
Global record updates	•	•	•	0	•	•
Global record deletions	•	•	•	0	•	•
Validates via lookup table	0	•	0	0	0	•
Checks for valid data range	0	•	•	0	0	•
Checks for duplicate index keys	0	•	0	•	0	•
Requires entry on all fields	0	•	0	0	0	•
Number of data entry screens allowed	1	1	102	1	2	10
rch and sort parameters						
Search on nonindexed field		•	•	•	•	•
Sort on nonindexed field	•	0	•	0	•	•
Search on multiple fields	•	•	•	•	•	•
Sort on multiple fields	•	0	•	•	•	•
Search/sort macros	•	0	•	0	0	•
Wild-card search allowed	•	•	•	•	•	•
Substring search allowed	•	•	•	•	•	•
Case-sensitive searches	0	0	0		0	0
Boolean searches	•	•	•	•	•	•
Compound Boolean		•	•	•	•	

Profes	apidri.	eteren.	Mex File 1.0	1.0	/	
Sional	12	احز	101.0	1	1	\
porting capability	1.01	/	1	1	1	1
Saves report formats	•	•	•	•	•	•
Send reports to screen	•	•	•	•	•	•
Send reports to disk	•	•	•	•	•	
Date stamping	•	•	•	•	•	•
Mailing label formats provided	•	•	•	•	0	(
Headers allowed	•	•	•	•	•	
Footers allowed	•	•	•	•	•	•
Forced page breaks	•	0	•	•	•	(
Torcea page breaks	-		-	-	-	-
User-defined formats	•	•				

12 2 2 2 2 2 2

Capacity						
RAM requirements	256K	384K	256K	140K	384K	512K
Maximum file size (in records)	29,500	65,530	64,000	Δ	32,500	16 million
Maximum file size	4MB	Δ	10MB	64K	Δ	256MB
Maximum fields per record	3200	64	254	64	250	2182
Maximum record size	4MB	1.6K	7.5K	64K	16K	64K3
Maximum text field size	1.95K	0.08K	64K	64K	0.254K	64K3
Reads/writes DIF	0	•	0	O4	O4	•
Reads/writes ASCII	•	•	•	•	•	•

● Yes ○ No ● Deficient △ Unlimited

With Rererence File, you can change field names and window size, but you can't "paint" the screen or move fields from one side to the other.

250 lines total.

<sup>3</sup> Q&A's word processing module allows text documents—basically one of up to 64K.

4 Reads but cannot write DIF files.

ed menus, *Reflex*'s graphics mode sometimes produces offbeat visual effects. When you pull down a menu, for instance, inactive items are blurred almost beyond recognition.

Reflex provides up to 45 screens per form and a fair number of editing and scrolling features. However, data validation is limited to date checking. Fields are variable length, and you can choose from the usual text, date, and numeric field types, as well as specify a repeating text field and an integer field. Re-

flex really shines at calculated fields. Applying its extensive formula language to a calculated field, for instance, you could, using a quantity conditional discount for a named range, return values based on the net cost of an order. You could then take that field and use it as a basis for projection formulas.

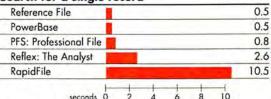
Reflex's unique strength is its ability to view relationships via graphs and formulas. You can look at data via the forms, list, graph, or cross-tab views or in formatted reports. Forms view displays one record at a time. The list view offers a simple row and

## NSTL TEST REPORT

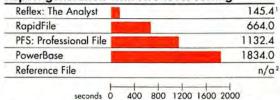
## Flat-File Favorites

RapidFile lives up to its name in speed tests except for single-record searches. PFS: Professional File also delivers consistent performance.

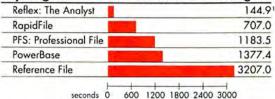
Search for a single record



Report generation with two-level sorting



Report generation with selection and sorting



Reflex requires 2MB of memory to execute these tests, which gives it a performance

The following versions were tested: Reflex: The Analyst 1.0, RapidFile 1.2, Reference File 1.0, PFS: Professional File 1.01, and PowerBase 2.3.

All benchmarks except for the Reflex tests were performed on an 8-MHz IBM PC AT with 640K and a 30MB hard disk. An AST expanded memory card with 2MB of RAM was required to run the tests for Reflex, which can use only data base files the same size as or smaller than the computer's available system memory. Testing was timed from the last keystroke of the command sequence until program control was returned to the user.

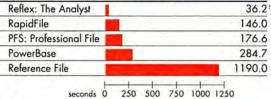
## Search for a single record

This test measures the time required to search for a single record in a 5000record inventory file, using the fastest type of search the program allowed.

## Report generation with two-level sorting

This test measures the time required to sort the inventory file using the price field as the primary key and the part number field as the secondary key, and to print the report consisting of 4 fields to a null printer (a device that simulates an infinitely fast printer, one not slowed by paper or printhead movement).

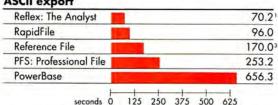
Report generation with selection



Print one-across mailing labels

Reflex: The Analyst	30.4
RapidFile	165.0
PFS: Professional File	188.2
PowerBase	235.4
Reference File	448.0

**ASCII** export



## Report generation with selection and sorting

This test measures the time required to sort the inventory file on the price field, select 818 records with price > 150, and print the report consisting of 10 fields to a null printer

## Report generation with selection

This test measures the time required to sort the inventory file on the price field, select 526 records with price > 5105.00 and part # > 104000, and print the report consisting of 10 fields to a null printer.

## Print one-across mailing labels

This test measures the time required to print to a null printer mailing labels consisting of three fields. The fields were taken from 1000 records that were ordered by part number.

## ASCII export

This test measures the time required to select 1000 records from a 5000record data base and export them into a standard ASCII text file.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

column format. With the graph view you can display, edit, and plot scatter graphs and bar charts. Moreover, you can move the cursor to a point on a graph and have Reflex summon

the record that produced the highlighted value. You can even utilize a powerful For Each option that allows you to treat fields as multivalued—sorting on different state names within the same field, for instance. The For

<sup>&</sup>lt;sup>2</sup> A bug discovered in the Reference File quick-sort routine made it impossible to complete

<sup>3</sup> The test called for ten fields to be exported, but Reference File allows either eight selected fields or the entire file. This time is for the entire file.

Each command extends to the cross-tab view, where you can also use any *Reflex* formula for quick exploration of "what if" scenarios. A split-screen feature allows you to display up to three views at once.

The fifth view, a formatted report, is powerful but inconvenient; you must exit *Reflex* and call up the separate report program to define a printout with headers, footers, and the like. This could be a fatal flaw if the program's viewing and quick report functions weren't already so powerful and flexible.

Unless you're an experienced user of data management or spreadsheet programs, *Reflex* will present a steep learning curve. The interface offers little comfort, and custom reports are a hassle. But if you're consistently data deep in statistical, periodic, financial, or other numerically dependent evaluations, *Reflex* can be a uniquely capable ally.

## Reference File 1.0

And now for something completely different: a memory-resident file manager. Reference File waits behind your application, ready with unparalleled talents for searching heavily textual or technical data. One volume in a library of on-line reference products, Reference File is designed to cut and paste information to and from outside applications. At \$89, it's a bargain for that purpose. Limited forms creation and reporting, however, suggest that Reference File works better as a utility than as a full-featured file manager.

Reference File requires a hefty 512K of RAM. A longish install program prompts you to create directories, set up hot keys, and choose from screen attributes. If you use Reference File with several applications and need to change hot keys, you must redo that part of the installation.

Consistent commands, context-sensitive help, and pulldown menus make learning easy. However, screens are cluttered with overlapping messages that inhibit work space.

Reference File is perfect for searching large, unstructured, and technical data bases. You can search the whole data base

## **EXECUTIVE SUMMARY**

## Reflex: The Analyst 1.0

Flat-file manager

A great formula language and built-in graphics add up to a dynamite tool for analyzing financial, statistical, and other numeric data. But it's difficult to master, and formatted reports are a hassle to produce. Reflex requires LIM memory when handling files of significant size. At \$150, however, you'll get amozing software power.

User interface			•	
Data base setup		•		
Data entry and validation			•	
Querying and reporting		•		
File import/export	•			
Overall value		•		

for any word, phrase, number, or index key. Such specific string searches outperform anything dBASE can accomplish with its Locate command. And Reference File's ability to construct nested conditional search parameters bests all the other file managers tested here.

Reference File also lets you search for both upper and lower ASCII characters. A handy pop-up ASCII table helps if you forget which symbols are tied to what key. And if you're working with scientific notation, you don't have to switch to a gnarly UNIX system running LaTeX to preserve the proper symbols.

Although Reference File's search tools are great, the fundamentals suffer. For instance, to build a new data base, you must exit to DOS and load a separate program. The program supplies default data entry forms for a number of applications (customer tracking, contact lists, bibliographies), but customization is limited. You can resize and move fields and edit field names, but you can't paint the screen. Moreover, data validation is limited to checking for duplicate index keys.

Reference File's reporting is also inflexible, restricting you to choosing and moving the fields. Although the program supports

several types of numerical fields, summarizing numerical data in reports is limited to ranking them in ascending or descending order. You can't produce totals or subtotals, a basic requirement of most applications.

With its weak reporting and validation features, *Reference File* fails as a well-balanced file management package. But for collecting research, building a bibliography (it supports Dewey decimal fields), or organizing notes or lab work, it's a bargain.

## RapidFile 1.2

Sporting a comprehensive feature set and swift performance, Ashton-Tate's *RapidFile* is well named. The latest version improves integration with *dBASE*, adds new user-definable fields and print options, and beefs up mail merge functions. In addition, the program now includes word processing powers comparable to *Q&A*'s (see "RapidFile: A Distant Relation," *PCW*, June 1987).

At \$295, RapidFile is the second most expensive product reviewed. It eats up 256K of RAM and needs at least two disk drives—or a hard disk if you use the new 80,000-word

## **EXECUTIVE SUMMARY**

## Reference File 1.0

Flat-file manager

As a file manager, RAM-resident Reference File is compromised by a cluttered interface and weak reporting. As an \$89 tool for searching large, diverse, or technical data bases and minimally massaging the resultant data subsets, it's great.

User interface		
Data base setup		•
Data entry and validation	TITO	•
Querying and reporting	•	
File import/export	•	
Overall value		

spelling checker and thesaurus. Installation is smooth and menu driven.

RapidFile's generous interface lets you choose between a 1-2-3-style menu bar and pulldown menus. Basic tasks such as file building are easy. RapidFile automatically sizes fields during file creation, and the new version adds several field options, including user-defined currency formats. Except for lookups to other files, RapidFile's data validation features are as complete as those in PowerBase, and its error messages are more precise.

Because it does not index, RapidFile is slow at searching for individual records. However, it lives up to its name in every other respect. It responds quickly to all Boolean criteria and does wild-card and string searches. Moreover, you can nest calculated expressions up to a limit of 254 characters each, thereby gaining impressive data-analysis tools that are easier to use than Reflex's, though not as powerful. The program also provides three types of fully editable macros.

RapidFile provides a flexible array of word processing and mail merge features. You can do block moves and center and underline text, for instance. You can also perform mail merges with an imported file (as long as it's in ASCII format) and link form letters to a selection of records—though not as directly as with Q&A. Incorporating fields in a RapidFile form letter is as easy as picking them from a menu. In addition, you can insert a document of up to 64K in a single field.

RapidFile's reporting functions aren't as simple to use as Professional File's, but they're more flexible and more powerful. The Quick Report option provides a columnar format of all or selected data in chosen fields. It can even use the formula language for easy "what if" evaluations of calculated data. Custom reports can be completely user designed, with up to 15 nested control breaks (or subtotaled sections), and a handy new function removes unwanted blanks.

With a usable interface, powerful querying capabilities, and a full set of word processing features, *RapidFile* offers considerable power without drowning in its own features.

Take into account its brisk performance, and

RapidFile is your best bet for advanced flatfile handling or mail merge-intensive applications.

## Flat File Face-Off

For application needs that are evenly balanced between usability and capability, you have only two choices—*Professional File* and *RapidFile*. The former works well for absolute beginners, and the latter is excellent for more complex file management.

The other three packages can be recommended only for special needs. PowerBase scores well on data validation and zooms smoothly among numerous files. However, slow performance and demanding data-structure planning make it a file-management dinosaur. On the other hand, Reflex clearly owns a market niche with its ability to analyze data using statistical functions. Perhaps a rumored upgrade will improve its interface and reporting capability. And Reference File will no doubt find an enthusiastic audience among researchers who cull data from a variety of sources; but don't count on it for overall file-handling functionality.

As you can see, many capabilities and styles dwell under the rubric of menu-driven

## EXECUTIVE SUMMARY

## RapidFile 1.2

Flat-file manager

Not quite as easy to use as PFS: Professional File, RapidFile's interface is still well done, with especially helpful error messages. It's skillful at querying and custom reporting, too. New word processing features make it the best single-product solution for mail merge applications.

User interface		•	
Data base setup	•		
Data entry and validation		•	
Querying and reporting	•		
File import/export		•	
Overall value	•		

Ellen J. Sander is a Los Angeles consultant specializing in data base and word processing applications. Marlene Nesary is an assistant editor for PC World.

## WHERE TO BUY

## PFS: Professional File 1.01

Software Publishing Corp. P.O. Box 7210 1901 Landings Dr. Mountain View, CA 94039-7210 408/848-4391, 415/ 962-0191 (technical support)

List price: \$249 Requirements: 256K, DOS 2.00 or later version

Not copy protected **Technical support:** free to registered users, no toll-free number,

M-F 8-5
Other support services: none

## PowerBase 2.3

PowerBase Systems 32100 Telegraph Rd. Birmingham, MI 48010 313/540-2398, 313/ 540-3706 (technical support)

List price: \$349 Requirements: 384K, two disk drives, DOS 2.00 or later version Not copy protected

Technical support: unlimited free support to registered users, no tollfree number, M-F 9-6

Other support services: registered users may purchase additional business application templates for \$29.95; free 24-hour BBS for 1200-bps modems

## RapidFile 1.2

Ashton-Tate 20101 Hamilton Ave. Torrance, CA 90502-1319 800/437-4329 ext. 274, 303/799-4900 ext. 274 Colorado, 213/329-9989 (technical support) List price: S295

Requirements: 256K, two disk drives (one a hard disk drive if spelling checker is used), DOS 2.00 or later version

Not copy protected

Technical support:

free for 90 days after registration, after 90 days \$50 per year per product for 10 calls, \$80 per year per product for 20 calls

Other support services: free support forums on CompuServe, The Source, and 24-hour Ashton-Tate BBS

## Reference File 1.0

Reference Software 330 Townsend St. #131 San Francisco, CA 94017 415/541-0222 List price: \$89 Requirements: 512K, hard disk, DOS 2.00 or later version

Not copy protected **Technical support:** no toll-free number, M-F 9-5

Other support services: none

## Reflex: The Analyst

Borland Int'l 4585 Scotts Valley Dr. Scotts Valley, CA 95066 408/438-8400, 408/ 438-8000 (technical support)

List price: \$149.95 Requirements: 384K, DOS 2.00 or later version, graphics card, LIM expanded memory for data files larger than system memory, mouse optional Not copy protected

Technical support: no toll-free number, M-F 10-5

Other support services: Borland forum on CompuServe

For more information, see Products Featured in This Issue.

## Viewers' Choice: 13 Monochrome Monitors



It's still hard to beat the razorsharp text produced by that old workhorse, the monochrome monitor.

> PC World reviews a baker's dozen of cheap monochrome displays and comes up with some clear favorites.

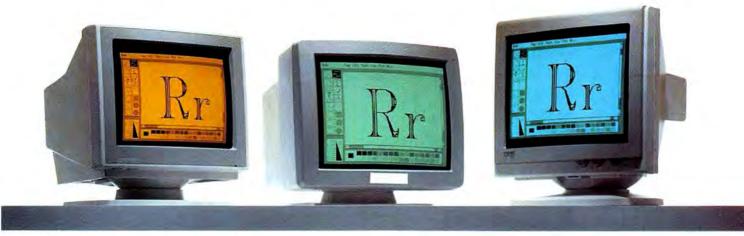
t may come as a surprise, but the PC's original monochrome monitor (and its compatibles) still offers the best resolution of any standard-mode display. To get text with as many dots per character in color, you'd have to have a PS/2 or VGA video adapter and buy a compatible color monitor—at \$300 to \$500 more. Moreover, analog monitors such as those for PS/2s can't match the digital crispness of a monochrome unit.

Sharp text is the reason a number of mossbacks (including at least one *PC World* editor) still prefer monochrome monitors for word processing. Now that low-cost, standard paper-white displays are available along

with conventional green and amber units, the monochrome option is even more attractive. Drive one of these babies with a Hercules Graphics Card (HGC), which provides a graphics resolution of 720 by 348 pixels, and you've got a low-end desktop publishing solution. (Ventura Publisher, PageMaker, and Microsoft Windows all have drivers for the HGC.)

Few people actually shop for a monochrome monitor; they just get one along with a PC. Next to no display at all, a PC's least expensive configuration includes a monochrome unit, so you simply take whatever the manufacturer stocks. They're all the same anyway, right? Wrong. In fact, monochrome monitors vary in quality from manufacturer to manufacturer more than color displays do.

TJ Byers



Take bandwidth, for example. Some monochrome monitors have a bandwidth rating lower than the 20-MHz industry standard and are consequently less sharp than the original PC's monochrome display. On the other hand, those with bandwidths higher than 20 MHz can be driven by high-resolution monochrome boards with no fall-off in image sharpness. For example, boards such as STB's Chauffeur HT or Everex's The Edge—both of which have higher resolutions than the HGC or the Monochrome Display Adapter (the monochrome board that came with the original PC)—work best driving a monitor with at least a 25-MHz bandwidth.

Another important variation is in the shape of the screen. The flatter the screen, the less glare caused by reflected ambient light. Flat screens also minimize geometric distortion; curved screens (such as the one found on IBM's original monochrome monitor) bend straight lines, especially at the image's edge.

To help you decide whether you should accept a PC vendor's off-the-shelf monitor—
or to guide you in replacing one that doesn't make the grade—PC World has rounded up 13 amber and paper-white displays, each of which sells for less than \$200. Whenever a manufacturer offers green, amber, and white versions of the same monitor, we've reviewed soothing paper white. And given the choice of green or amber, we've gone with amber, because we think it's a bit easier on the eyes.

## Amdek 210

PROS: None

CONS: Curved screen, no tilt-andswivel base, high price

Looking every bit like the PC's original monochrome display, the Amdek 210 is one of the least desirable monitors in this roundup. The display leans back at an angle and reflects every bit of light in the room; there's no tilt-and swivel base, so propping up the monitor is the only way to correct this problem. The curved screen's antiglare treatment helps somewhat, but it also reduces image quality. Priced at a whopping \$199 and carrying only a six-month warranty, the Amdek 210 has to be the worst deal of the century.

## AST Premium Display/ Monochrome

PROS: White phosphor, flat screen

CONS: Slight flicker

A paper-white monitor with an almost-flat surface, the Premium Display boasts a 14-inch screen, a size matched in this roundup only by the CTX 2400 and the Xtron MF147. However, the relatively large screen produces noticeable spaces between the scan lines. In addition, the kind of white phosphor used causes a slight flicker when you scroll text. The Premium Display is one of the most expensive monitors reviewed, but \$195

From left to right: the Amdek 210; the Casper GM-1266; and the best paper-white monitors in the roundup, the CTX 2400 and the AST Premium Display/ Monochrome



The imTEC 1252 (left), the Magnavox Professional PC Monitor 80 (middle), and the Datafox SM-12SFA7 isn't bad for a paper-white unit, especially one with a nearly flat screen. Unfortunately for AST, the CTX 2400 beats the Premium Display's price and performance hands down.

## Casper GM-1266

PROS: Low price, tilt-and swivel base

CONS: Curved screen

The GM-1266 12-inch monitor is a great buy at only \$99, but it can't beat the value of the comparably priced Samsung MD-1278. The problem is that the Casper GM-1266 has a curved screen surface, which produces glare and geometric distortion. Otherwise, the screen quality is good, the tilt-and-swivel base helps defeat the glare, and the controls are conveniently located. All in all, the Casper has to be rated the third-best deal in this roundup.

## **CTX 2400**



**PROS:** Dual frequency, high bandwidth, white phosphor, inverse-video switch, flat screen, low price

CONS: None

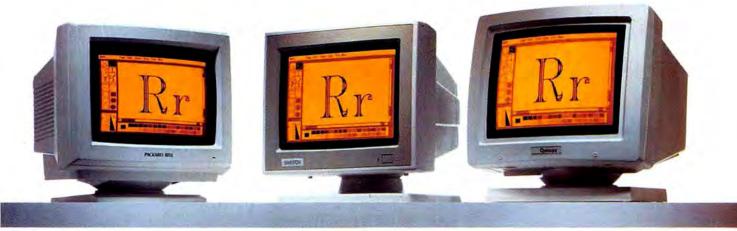
AST may have the high profile, but the CTX 2400 is the low-cost paper-white monitor of choice. At \$168, the price is \$27 less than the Premium Display's, and the type of white phosphor used produces no noticeable flicker when you scroll text. Even better, this monitor offers a high-performance 25-MHz bandwidth—enough to handle the high resolution of the STB Chauffeur or Everex's The Edge. Now the clincher: The CTX 2400 is the only dual-frequency monitor in the roundup, and thus the only one capable of working with a CGA card. Top it off with a two-year warranty and an inverse-video toggle for black-on-white viewing, and you know why we selected this monitor as a Best Buy.

## **Datafox SM-12SFA7**

PROS: Flat screen, tilt-and-swivel base

CONS: Relatively high price

The Datafox SM-12SFA7 amber monitor is identical to the Samsung MD-1278—and for good reason: Samsung makes the monitor for Datafox. The only discernible difference is the name on the logo; the warranty card even bears Samsung's name and mailing address. Although this is a great monitor, it does have one flaw: Samsung sells the same display for one-fourth less! Save your cash and go straight to the horse's mouth on this one.



## **imTEC 1252**

PROS: Tilt-and-swivel base

CONS: Curved screen, short power cord

The imTEC 1252 comes from Leading Technology, one of the better-known PC clone suppliers. There's not a lot to be said about this plain-vanilla monitor—it comes with a tilt-and-swivel stand, but its screen is as curved as IBM's old standby. Another problem is the short power cord, though that won't bother you unless your system unit lives under the desk. You'd be safe accepting this monitor with a Leading Edge PC, but three monitors in this roundup beat the imTEC 1252's \$139 retail price.

# Magnavox Professional PC Monitor 80

PROS: Two-year warranty

CONS: Curved screen, no tilt-andswivel base, plug-in video cable

You may find that the Professional PC Monitor 80 has a bit of a glare problem, due to its curved screen and lack of a tilt-and-swivel base. A lesser annoyance is a video cable that isn't hardwired into the monitor. You must plug the supplied cable into a connector on the monitor and into the video board, dou-

bling the chances of a loose connection. In addition, although the second unit we received worked fine, the first Professional PC Monitor 80 was defective: The display jittered nervously, one line up and one line down. Unless you find this \$189 monitor at a fabulous street price (Magnavox is typically heavily discounted), pass on it.

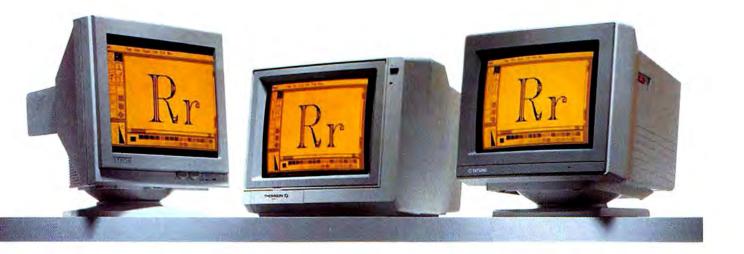
## Packard Bell PB 1272

**PROS:** Side-mounted controls, tilt-andswivel base

CONS: Curved screen

The PB 1272's screen image is good and crisp, and the tilt-and-swivel base can compensate for the curved screen. The brightness and on/off controls are side-mounted and recessed, lending the monitor a trimmer look than most. The former list price was \$189, but at press time Packard Bell was revising the price structure of its product line, so no list price was available. A Packard Bell spokesperson told us the street price is about \$70—a claim we were able to verify. The prize-winning Samsung MD-1278 retails for \$25 more, and its street price may well be less; even if it isn't, the Samsung's flat screen is worth the extra bucks.

The Packard Bell PB 1272 (left), the winning Samsung MD-1278 (middle), and the Quimax DM-12



The paper-white Xtron MF147 (left), the Thomson 230 (middle), and the Tatung MM-1255

## **Quimax DM-12**

PROS: Tilt-and-swivel base

**CONS:** Few externally accessible controls, curved screen, moderately high price

Quimax monitors are very popular with system distributors because they're so simple. In fact, only top-of-the-line Quimax models have an on/off switch (the DM-12 doesn't), and none venture beyond the DM-12's user-accessible brightness and contrast controls. As a result, there's virtually nothing you can do to screw up one of these monitors short of a using a chain saw on it. Of course, that assumes the factory has adjusted the monitor correctly.

## Samsung MD-1278



PROS: Low price, flat screen, tilt-andswivel base

CONS: Rear-mounted controls

Of all the monitors reviewed, the Samsung MD-1278 (or SM-12SFA7, depending on which manual you receive) gives you the most bang for the buck (the paper-white version was not available in time for review). At \$97 list, it has the lowest retail price tag of any monitor in this roundup—a potent criterion in its Best Buy ranking. When you con-

sider that the screen is almost perfectly flat, how can you go wrong? The MD-1278's only bad point is that the brightness and contrast controls are in the rear and require a gorilla stretch to reach. But what the heck—considering the number of times you access these items (once set, usually forgotten), the MD-1278 is just too good a buy to pass up.

## Tatung MM-1255

**PROS:** Bandwidth slightly higher than average, tilt-and-swivel base

**CONS:** Curved screen, moderately high price

The Tatung MM-1255 falls into the same class as the Casper GM-1266, the imTEC 1252, the Packard Bell PB 1272, and the Quimax DM-12: curved screen, tilt-and-swivel base. As with the Packard Bell unit, the contrast and brightness controls are side mounted, out of the way but accessible. The MM-1255's standout feature is a bandwidth of 22 MHz, which should give the unit slightly better sharpness than standard 20-MHz monitors when used with high-resolution boards. Quimax, Samsung, and Tatung provide the monitors most popular with Taiwanese clone makers, so the MM-1255 is like-

## FEATURES EVALUATION

## **Monochrome Monitors**

Less than \$200 will get you a perfectly acceptable monochrome display. In this roundup, the CTX 2400 and the Samsung MD-1278 are the best values.

\ \ \	2.5	81	31	0	ã.\	24	2	2	5	1	#1	#1	
Yes O No	AST Premior.	Casper Gm	CIX 2400	Datalox Sm.	Im186 1256	PC Monitor 80	thard Bendersional	Quimax Dm 1272	Samsung m.	Talung Mm	Thomson Ave	XIron MEIN	É
Diagonal measurement (inches)	12	14	12	14	12	12	12	12	12	12	12	12	14
Bandwidth (MHz)	20	20	20	25	20	20	20	20	20	20	22	25	17
Flat screen	0	•	0	•	•	0	0	0	0	•	0	0	•
Tilt-and-swivel base	0	•	•	•	•	•	0	•	•	•	•	0	•
Screen colors available													
White	0	•	0	•	0	0	0	0	0	•	0	0	•
Amber	•	0	•	•	•	•	•	•	•	•	•	•	•
Green	•	0	•	•	•	•	•	•	•	•	•	•	•
Externally accessible controls 1										,			
Horizontal hold	O <sup>2</sup>	0	0	0	0	•	• 2	•	0	0	•	0	0
Vertical hold		0	•	0	•	•	•	•	0	•	•	•	0
Vertical size		0	•	•	•	•	•	0	0	•	•	•	0
Focus	0	•	0	0	0	0	0	0	0	0	0	0	•

<sup>&</sup>lt;sup>1</sup> All monitors reviewed have externally accessible contrast and brightness controls.

ly to turn up with many a plain-vanilla box. Off the shelf, however, \$165 is a bit much to pay for a monitor of only adequate quality.

## Thomson 230

PROS: High bandwidth

CONS: Curved screen, no tilt-andswivel base, minor sync problem

Were it not for the CTX 2400, the Thomson 230 would be the monitor of choice for handling high-resolution boards like the STB Chauffeur or the Everex Edge. The Thomson 230 isn't available in paper white, however, and it has no tilt-and-swivel base to make up for the curved screen. And every once in a while it locks on to a sync signal that squashes the image to half its normal height;

a simple vertical hold adjustment always cures the problem. If you plan to push your resolution, this \$159 high-octane monitor is viable only as a second choice.

## Xtron MFI47

**PROS:** Flat screen, white phosphor, tiltand-swivel base

CONS: Low bandwidth, poor focus

The Xtron MF147 14-inch paper-white display is made by the same Korean manufacturer that produces the AST Premium Display/Monochrome. While the two are vir-

<sup>&</sup>lt;sup>2</sup> Horizontal size control is externally accessible.

tually indistinguishable on the outside, the electronics inside are quite different. Whereas the AST offers a full 20-MHz bandwidth, the Xtron MF147 is limited to 17 MHz, which results in a noticeable drop-off in focus from the screen's center to its corners. Xtron has made this trade in performance in exchange for lower manufacturing costs, yet it lists the MF147 at a steep \$199.95. In short, stay away from this one.

## **Pick Your Partner**

If you're in the market for a cut-rate clone, don't just look at the ad. Call the vendor and ask what display the company is shipping that week with the machine you want. If it's an Amdek 210, a Magnavox Professional PC Monitor 80, or especially an Xtron MF147, you'd be better served buying a monitorless

configuration and doing a little shopping.

The conclusion of this roundup is a happy one: Price is not a measure of quality. The two best buys in this roundup, the Samsung MD-1278 and the CTX 2400, happen to be the least expensive in their classes. We've provided only list prices, however, so you'll probably find many of the monitors in this roundup selling for less—in some cases, a lot less, particularly the plain-vanilla, convex-CRT displays. A little price comparison can net you a very good deal. ●

TJ Byers is a contributing editor for PC World.

## WHERE TO BUY

## Amdek 210

Amdek Corp. 1901 Zanker Rd. San Jose, CA 95112 408/436-8570 List price: S199 Warranty: six months parts and labor

## AST Premium Display/ Monochrome

AST Research 2121 Alton Ave. Irvine, CA 92714 714/863-1333 List price: \$195 Warranty: one year parts and labor

## Casper GM-1266

TW Casper Corp. 2153 O'Toole Ave., Ste. E San Jose, CA 95131 408/922-0188

List price: \$99 Warranty: one year parts and labor

## CTX 2400 CTX Int'l

260 Paseo Tesoro Walnut, CA 91789 714/595-6146 **List price:** white \$168, amber or green \$159 **Warranty:** two years

Warranty: Iwo years parts and labor

## Datafox SM-12SFA7

Datafox, Inc. 205 S. 29th St. Phoenix, AZ 85034 800/821-6317 List price: \$129 Warranty: one year parts and labor (excluding labor for CRT)

## **imTEC 1252**

Leading Technology 10430 S.W. Fifth Ave. Beaverton, OR 97005 503/646-3424 List price: \$139 Warranty: one year ports and labor

## Magnavox Professional PC Monitor 80

N.A.P. Consumer Electronics Corp. P.O. Box 6950 Knoxville, TN 37914 615/521-4366 **List price:** amber \$199, green \$189 **Warranty:** two years parts and labor

## Packard Bell PB

1272
Packard Bell Electronics
6045 Variel Ave.
Woodland Hills, CA
91367
818/704-3905
List price: not
available

Warranty: one year parts and labor

## Quimax DM-12

Quimax Systems 844 Del Rey Ave. Sunnyvale, CA 94086 408/773-8282 **List price:** \$159 **Warranty:** one year parts and labor

## Samsung MD-1278

Samsung Electron Devices 16031 S. Carmenita Rd. Cerritos, CA 90701 213/404-1835 **List price:** white and amber \$97, green \$95 **Warranty:** one year parts and labor

## Tatung MM-1255

Tatung Co. of America, Inc. 2850 El Presidio St. Long Beach, CA 90801 213/637-2105 List price: amber S165, green S159 Warranty: one year parts and labor

## Thomson 230

Thomson Consumer
Products Corp.
5731 W. Slauson Ave.
#111
Culver City, CA 90230
213/568-1002
List price: \$159
Warranty: one year
parts and labor (excluding labor for CRT)

## Xtron MF147

Xtron Computer Equipment Corp.
19 Rector St., 35th floor
New York, NY 10006
800/854-4450
List price: white
\$199.95, amber or green
\$189.95
Warranty: one year
parts and labor

For more information, see Products Featured in This Issue.

# Know the limitations. Then exceed them.



## AccountMate.® Integrated accounting software from SourceMate.™

t SourceMate, innovation has been our business right from the start. We didn't become the leader in database accounting technology by matching the competition. In addition to introducing the first true dBASE III® accounting system, we released the first multiuser dBASE® accounting system. Not only are we known for reliability and speed, but for first-rate technical support as well. Now our team of top software engineers has created a system that fits the workplace so precisely, so intuitively, it's practically effortless. The result is AccountMate 1.3, the most streamlined database accounting software you can buy for business.

AccountMate's easy data lookup and up-to-the-minute reports give you instant access to the information you need to make informed decisions. Sophisticated multilevel passwords increase your control over sensitive accounting information. For speed and additional security, you can even set key data fields to be bypassed during regular data entry.

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AccountMate modules are priced from \$295.



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Welcome to the Dell computer store. Where you can get some of the fastest computers in the world. For example, our Dell System 220, which is a 286 computer running at the unbelievable speed of 20 MHz.

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and reliability

Each computer goes through a battery of diagnostic checks, including a comprehensive burn-in

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# THE NEW 20MHz 386 SYSTEM 310.

The top of the line. It's the highest performance 80386 computer available, faster than the IBM+ PS/2+ Model 80 and the Compaq† 386/20. It runs at 20 MHz, with the latest 32bit architecture for maximum performance. And it's completely MS\* OS/2 compatible. Since it also has Intel's† Advanced 82385 Cache Memory Controller, and high performance disk drives, the System 310 is ideal for intensive database management, complex research and development, CAD/ CAM, and desktop publishing. As a network file server the system offers an unbeatable combination of price and performance.

## Standard Features:

Intel<sup>†</sup> 80386 microprocessor running at 20 MHz.

1 MB of 80 ns 32-bit RAM expandable to 16 MB without using an expansion

Advanced Intel 82385 Cache Memory Controller with 32 KB of high speed static RAM.

Socket for 20 MHz 80387 coprocessor. 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.

Dual diskette and hard disk drive controller.

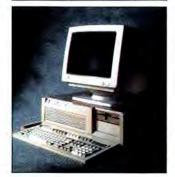
Enhanced 101-key keyboard. 1 parallel and 2 serial ports. 200-watt power supply. Real-time clock.

 8 expansion slots (6 available with hard disk drive controller and video adapter installed).

adapter instaled).
Dell System Analyzer.
MS-DOS\* and MS OS/2 compatible.
Security lock with locking chassis.
12 month on-site service contract
(Available on complete systems).

Options: 1 MB RAM upgrade kit. 20 MHz Intel 80387 math coprocessor. 2 MB or 8 MB memory expansion

SYSTEM 310	With M	With Monetor and Adapter					
Hard Disk Drives	VGA Mono	VGA Color	VGA Color Plus				
40 MB-28 ms	\$4,099	\$4299	\$4399				
90 MB-18 ms ESDI	54,899	55,099	\$5,199				
150 MB-18 ms ESDI	\$5,399	\$5,599	\$5,699				
322 MB-18 ms ESDI	\$7,399	\$7,500	57,090				



# THE NEW 20MHz 286 SYSTEM 220.

As fast as most 386 computers, at less than half the price-more power for the money than any other system. An 80286 system that runs at 20 MHz, with less than one wait state. Completely compatible for both MS-DOS and MS OS/2 applications (it runs OS/2 faster than IBM PS/2 Model 80), and with a remarkably small footprint, the System 220 is the ideal executive workstation for database management, business, or sophisticated connectivity applications. The system uses page-mode interleaved memory; the page-mode RAM operates at less than one wait state, and inter-leaving results in a performance increase of about 15 percent.

## Standard Features:

80286 microprocessor running at 20 MHz.

I MB of RAM expandable to 16 MB (8 MB on system board).

Integrated diskette and VGA video controller on system board. One 3.5" 1.44 MB diskette drive. Integrated high performance hard

disk interface on system board. Enhanced 101-key keyboard. 1 parallel and 2 serial ports. LIM 4.0 support for memory

over I MB. Real-time clock.

Three full-sized AT† compatible expansion slots.
Socket for 80287 coprocessor.
Dell System Analyzer.

Dell System Analyzer. MS-DOS and MS OS/2 compatible.

Security lock with locking chassis. 12 month on-site service contract (Available on complete systems).

Options: 3.5" 1.44 MB diskette drive. Intel 80287 coprocessor. 1 MB RAM upgrade kits.

	With Monitor						
SYSTEM 220	VGA Mono	VGA	VGA Color Plus				
One Diskerte Drive	52,299	52,499	\$2,599				
40 MB-29 ms Hard Disk	\$2,999	\$3,199	53,299				
100 MB-29 ms Hard Disk	\$3,790	53,999	54,099				



## THE NEW 12.5MHz 286 SYSTEM 200.

A great value in a full-featured AT compatible. An 80286 computer running at 12.5 MHz, this system is completely MS OS/2 compatible. It's ideal for general business applications, as well as software development, local area networks, CAD/CAM, and desktop publishing. The System 200 offers high speed drive options, industry standard compatible BIOS, and on-site service. At these low prices, the System 200 is the best value in the 80286 marketplace. As Executive Computing said of this computer's predecessor, "If faster processing speed and low cost are two key issues affecting your purchase decision, this machine might be the ideal choice for your office."

#### Standard Features:

Intel 80286 microprocessor running at 12.5 MHz.

640 KB of RAM, expandable to 16 MB (4.6 MB on system board.) 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.

Dual diskette and hard disk drive controller.

Enhanced 101-key keyboard. 1 parallel and 2 serial ports. 200-warr power supply. Real-time clock.

6 expansion slots. (4 available with hard disk drive controller and video adapter installed).

Socket for 8 MHz 80287 coprocessor. Dell System Analyzer. MS-DOS & MS OS/2 compatible. Security lock with locking chassis. 12-month on-site service contract (Available on complete systems).

Options: 512 KB RAM upgrade kit. 8 MHz Intel 80287 coprocessor.

SYSTEM 200	W	ipter		
Hard Disk, Drives	Morar	VGA Mono	Color	VGA Color Plus
20 MB	\$2,099	\$2,299	52,499	\$2,599
40 MB-40 ms	\$2,299	52,499	\$2,699	\$2799
49 MB-28 ms	\$2,499	\$2,699	52,899	52999
90 MB-18 ms ESD1	\$3,299	\$3,499	\$3,699	53799
150 MB 18 ms ESDI	\$3,799	\$3,999	\$4,199	54299
322 MB 18 ms ESDI	\$5,799	\$5,999	\$6,199	56,299



## THE NEW 8088 SYSTEM 100.

A full-featured, vet economical one-piece computer for office, school, or home. This system is fast, easy to use, and ready to run with Dell Enhanced MS-DOS 3.3, Microsoft® DOS Manager, and Microsoft Works software-more than a \$400 value, included at no extra charge. Complete MS-DOS compatibility means you can run thousands of programs for business, personal finance, education, and entertainment. And the System 100 can grow, with the high quality options listed below. A price leader in 8088 technology, the System 100 boasts an innovative design that allows for more power, speed and convenience than most of its competitors.

#### Standard Features:

Intel 8088 microprocessor running at 9.54 MHz selectable to 4.77.

to 4.77.
640 KB of RAM.
3.5" 720 KB diskette drive.
Diskette drive controller integrated on system board.
Integrated high-quality 84-key keyboard.

I serial and I parallel port. Two full-sized expansion slots available when video adapter is installed.

One half-sized expansion slot used for video adapter.

Socket for 8 MHz 8087 coprocessor.

Internal speaker with earphone jack and volume control. Security Tie-Down bracket. Dell Enhanced MS-DOS 3.3 Microsoft DOS Manager, Microsoft Works.

Options: 3.5"720 KB diskette drive. 8 MHz Intel 8087.

	With Montter and Adapter					
SYSTEM 100	Mono	CGA Color	VGA Mores	VGA Color		
720 KB Dakette Drive	\$1,099	51.199	\$1.200	\$1,499		
Two 720 KB Diskette Drives	\$1,249	\$1,349	\$1,449	\$1,649		
20 MB Hard Disk	51,599	\$1.699	51,799	\$1,999		



PRINTERS. We now offer a full line of PC-compatible dot matrix and laser printers. Our dot matrix printers range from inexpensive near-letter quality printers to the highest resolution printers available. Our laser printers include some of the fastest, most reliable printers ever made. All are 300 dots per inch, and all support serial and parallel interfaces. And all printers come with our 30-day money-back guarantee and a one year warranty.

LASER PRINTERS

Laser System 150 \$5,995

15 pages per minute, text and graphics 1.5 MB standard memory, expandable to 2.0 MB

Dual 250-sheet input trays

Laser System 80 \$3,195 8 pages per minute text and graphics 15 MB standard memory, expandable to 2.0 MB

Laser System 60 \$2,195 6 pages per minute, text and graphics 1.5 MB standard memory, expandable to 2.0 MB

DOT MATRIX PRINTERS

Printer System 800 \$699.95 Highest resolution text and graphics from a 24-wire dot matrix printer Draft quality at 200 cps Correspondence quality at 132 cps Letter quality at 66 cps Standard parallel and serial interfaces Wide carriage

Printer System 600 \$499.95 9-wire dot matrix Draft quality at 240 cps Near-letter quality at 60 cps Standard parallel interface 12.6 KB Buffer (expandable to 28.6 KB) Wide carriage

Printer System 300 \$199.95 9-wire dot matrix Draft quality at 144 cps Near-letter quality at 36 cps Four standard fonts Paper parking 4 KB buffer Standard Parallel interface

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utilities \$119.95.
Dell MS OS/2 Standard Edition 1.0 \$324.95

SOFTWARE. Complete your system with software: accounting, communications, desktop publishing, graphics, home, spreadsheet, training, word processing, and integrated packages. Call for more information.



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#### THE HARDWARE SHELF

#### 134 AST Premium/386, IBM PS/2 Model 80-111

Power users: Do you want immediate gratification, or a platform for the future? Two 20-MHz 386 systems give you a choice.

#### 142 Tandon PAC 286 Plus

Popping hard disks in and out of this AT clone at the touch of a button may be convenient, but is it more than a gimmick?

#### 150 Epson LQ-1050

An inspired combination of speed, print quality, paper handling, and price—possibly the perfect 24-pin dot matrix printer.

#### 156 Micronics 1616-01, 2016-01, 2020-01

A trio of motherboards for upgrading ATs. If your time is expensive, they may be worth their considerable price.

#### AST Premium/386

20-MHz 80386 computer

**PROS:** Fast performance, multimaster capability, accommodates AT boards, ESDI controller

CONS: Expensive RAM modules

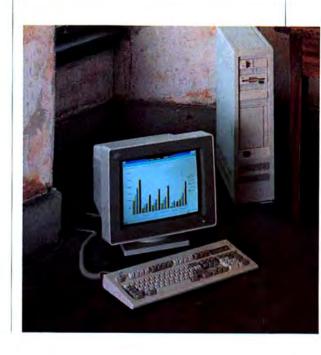
#### IBM PS/2 Model 80-111

20-MHz 80386 computer

**PROS:** Fast performance, multimaster capability, ESDI controller

**CONS:** Pricey, won't accommodate AT boards, no 51/4-inch floppy option

Now that 20 MHz is the going clock rate for 80386 machines, users desperate for high-performance network servers, CAD workstations, or nonstop multitasking are puzzling over which speedster to buy. Should they get a low-end 20-MHz system, or a high-class, pricey machine like the new 20-MHz PS/2 Model 80-111 (officially termed the 8580-111), with its tantalizing—but AT-incompatible—Micro Channel features? Now, AST Research has raised yet another option with the Premium/386—one that seems to offer the best



of both worlds: 20-MHz 80386 speed, namebrand reliability, low price (at least compared to an IBM), plus Micro Channel-like Smartslot architecture that maintains complete compatibility with AT boards.

The key similarity between AST's Smart-slot bus and IBM's Micro Channel is the ability to accommodate multiple *bus masters*, microprocessor-equipped expansion boards that can perform functions independent of the CPU (see "A Model for the '80s," *PCW*, December 1987).

This multimastering capability is the hardware side of multitasking. Rather than having a multitasking operating system like OS/2 slice up CPU time and slow things down, the Model 80 and the Premium/386 will (once the boards and software arrive) be able to dedicate a microprocessor to each application. Thus, you might have one bus master running a micro-to-mainframe application, another sending ultra-high-resolution graphics to the screen, and another accelerating disk I/O, yielding a powerhouse architecture that would make even the fastest single-80386 system look sick.

And guess what? AST delivers multimaster functionality for less. Configure both units with 2MB of RAM, one floppy drive, a VGA adapter, one parallel and one serial port (AST throws in an extra serial port), a 101-key keyboard, and an ESDI hard disk/ controller combo, and the AST weighs in at \$9535, while the 20-MHz IBM tips the scales at \$10,995. (You'll have to add the price of a monitor to each system.) This is not a perfect comparison, because the standard configuration for the 20-MHz Model 80 includes a 115MB hard disk instead of the Premium/ 386's 90MB unit, but few would argue that an extra 25MB of mass storage is worth \$1500.

Nonetheless, other price/performance comparisons are worth making. First of all, the Premium/386 is slightly faster. More important than the machines' relative speeds, though, is how they will perform with bus masters. After all, that's the added value you're paying for; otherwise you might as well get a cheap, generic 20-MHz box and save yourself a few thousand bucks.

Although it's tough to imagine such a scenario, all eight slots on the Model 80's I/O bus (three 32-bit and five 16-bit) can handle bus masters. By contrast, only three of the Premium/386's slots are Smartslots (which, although slightly longer than standard 8/16-bit slots, accommodate 16-bit AT boards). Furthermore, all things being equal, a bus master in one of the Model 80's 32-bit slots would presumably have twice the throughput of one located in a Premium/386 8/16-bit Smartslot. But all things aren't equal. The Premium/386's I/O bus runs at 8 MHz, while the Model 80's runs at 10 MHz, giving IBM's entry another 20 percent edge.

Another important difference between the two architectures is the way they arbitrate requests from intelligent devices on the bus. With multiple processors moving data around without the CPU paying any mind, the possibilities for conflict are obvious. Traffic management needs to be built into the bus—hence the name for AST's Smartslot. However, the Micro Channel (or its

The IBM PS/2
Model 80-111
(left) and the
AST Premium/386 (below)
share a 20-MHz
clock speed and
multimaster capability—but
the Model 80 is
a smarter buy.



#### FEATURES EVALUATION

#### 20-MHz 80386 Computer Systems

AST's Premium/386 costs about \$1500 less than IBM's PS/2 Model 80-111, but Big Blue's machine offers more memory, greater memory capacity, and the potentially more powerful Micro Channel.

•	Model 7386	18M PS/2.111
Yes	91	25
O No	in in	3 /
No	1 2	-
Standard features	1 2	
Price !	\$9535	\$10,995
CPU	80386	80386
Clock speed	20 MHz	20 MHz
Built into motherboard		
Parallel port	•	•
Serial port	●2	•
Floppy disk controller	0	•
Video adapter	0	•
Coprocessor support	80387	80387
32-bit memory capacity  Amount shipped with basic unit	1MB	2MB
Maximum installable	13MB	22MB
xpandability	10,110	LLING
8/16-bit expansion slots/number free	43/3	54/4
8-bit expansion slots/number free	2/1	0/0
Half-/full-height storage device bays	5/0	25/2
120MB or larger hard disk available from manufacturer	•	•
rgonomic design		
Front-panel reset button	•	0
Front-panel on/off switch	0	•
Front-panel keyboard socket	0	0
ROM-based setup software	0	0
Tilt-and-swivel monitor	•	•
Compact foolprint	•	• *
Complete documentation	•	•

Price based on 2MB RAM, one floppy drive, one 115MB (IBM) or one 90MB ESDI (AST) hard disk and controller, VGA (monitor not included), one parallel port, one serial port, and a 101-key keyboard.

manufacturer, perhaps) is even smarter. IBM's specifications require manufacturers to assign an arbitration level to every Micro Channel board, whether it's a bus master or not—giving each device a priority in the queue for memory and other system resources. Smartslot boards have similar specifications, but since part of the whole Smartslot idea is backward-compatibility with dumb AT boards, these older devices will be cut out of the arbitration scheme.

Of course, all the fuss over bus masters is still somewhat theoretical, since as yet no bus master boards are for sale. On the other hand, one step ahead of IBM, AST has recently announced its first intelligent board, the Advanced Disk Controller (ADC), which should be available this fall. AST's Smartslot controller will use its own 10-MHz 80186 microprocessor and a 64K track buffer to achieve a transfer rate of up to 15 megabits per second—one third faster than standard ESDI controllers. An optional enhancement for the ADC will provide 512K (expandable to 4MB) of read-ahead caching.

Future devices aside, a more immediate consideration is memory expansion. At first glance, the Premium/386's future looks bright. Not only can it hold up to 13MB of 32bit RAM (on a board that fits in a special 32bit memory slot), but all that memory can be accessed at a full 20 MHz; a static-column RAM scheme alternates wait states between zero and one. The Model 80 uses a paging scheme to keep its memory access speed hovering in the same zone, but the maximum amount of 32-bit RAM it can access at 20 MHz is only 4MB. With one of IBM's 6MB memory expansion boards plugged into each of the I/O bus's 32-bit expansion slots, the 32-bit RAM total can rise to a generous 22MB, but 18MB of that will be accessed at half speed.

The problem for AST is the price of its RAM. Adding 4MB of 32-bit RAM to the Model 80 will cost you \$2890; adding the same amount to the Premium/386 Model 390 runs a staggering \$7995—more than the base price of the machine! Clearly, AST is suffering from today's inflated open-market RAM prices, while IBM enjoys the ability to manufacture its own chips.

<sup>&</sup>lt;sup>2</sup> Includes two RS-232C 25-pin serial ports.

<sup>&</sup>lt;sup>3</sup> All slots accept AT-compatible boards. Three of the four are Smartslots.

All slots accept MCA-compatible boards. The I/O bus also has three 32-bit slots.

<sup>5</sup> Half-height bays accept only 31/2-inch devices.

<sup>&</sup>lt;sup>6</sup> Floor-standing model.

## 'len plugs for lettingeveryone use

the laser printer, the dot matrix, the daisywheel, the plotter or the modem anytime they want. Automatically! For 1/4 the cost of a new laser.

#### Spend \$525, save thousands

Laser printers are expensive, but everybody wants one. Answer: let them all share the same laser. The same goes for other peripherals. The Buffalo\* SX\* does it all, and costs far less than the extra printer you won't have to buy!

#### Saves time like a LAN

Day in, day out, the Buffalo SX turns wasted hours into productive hours. No more plugging and unplugging cables, swapping disks, throwing switches. No waiting. People just choose the peripheral they need and get on with the next job. Input and output are handled simultaneously, "on demand" at all ports.

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Buffalo boxes do more than other sharing devices that cost 40% more per port. Just look at this

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comparison:



Just select the printer from a pop-up menu, using printer names you've chosen. Move the cursor to the one you want and hit Enter. Nothing could be simpler. RAM-resident software takes just 11K and works with text and VGA graphics displays like Ventura Publisher.\*

#### Hook almost anything to anything

PCs, Macs, minis and mainframes can share printers and exchange data with communications software.

stored in order, and computers are freed up. People can go on to another job as the box spoon-feeds



#### A 1,200 CPS printer?



That's what a computer thinks it's hooked to when it downloads data into the big buffer. Print jobs are

**BUFFALO SX** BOX X Price: \$595 Total Ports: 10 Cost/Port: \$52.50 \$74.38 Max. Output Ports: 8 6 Max. Input Ports: 6 Max. Serial Ports: 5 (4 In or Out) 4 (In or Out) 4 (2 In, 2 Out) Max. Parallel Ports: 5 (3 In or Out) Max. Buffer: 1 Mb 512K FREE user installable \$50 factory installed Software Upgrades: Unitd. Toll-Free Support? Yes

45 days

data to the printers. Capacities range from 256K to 1 Mb-plenty for desktop publishing and big CAD drawings.

#### Instant installation



and run the menu-driven installation software. The SX has ten ports - 5 serial and 5 parallel. Conversion is automatic. Connect 7 computers to 3 peripherals. Or 2 computers to 8 peripherals. Or any combination between. Printers can be 400 feet

Just plug in the cables

#### Expands as you grow

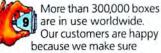


or more away.

SXs work together to make a large network. Reconfigure the ports or plug in more memory later if you change

your equipment. For fewer machines, use smaller Buffalo boxes, starting around \$200. They all work together, so you'll never outgrow your investment.

#### Proven customer satisfaction



they're satisfied. Question? We answer it on our unlimited toll-free support line. Problem? We fix it free under a generous one-year limited warranty. Want to send it back? Within 45 days you can, for a full refund.

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With your order, we'll send 10 free programs to speed up your system: HyperDisk™ disk caching; HyperKey\* keyboard enhancer, and PrintBooster\*

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Circle 215 on reader service card

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MultiSync XL

Breakthrough

MultiSync technology

for CAD.

Whether your big ideas take the shape of skyscrapers or screw threads, you'll find the new MultiSync® XL the perfect monitor to display them. Especially when it's used with the graphics board that was designed to make the most of it: the MVA 1024 from NEC. Together, they give you the brilliant resolution and CAD capabilities your ideas deserve.

The XL gives you a reduced-glare 20" diagonal CRT on a tilt-swivel base, for a larger viewing area and greater comfort.

And it works with a wide variety of systems from PC/XT/AT/386 to PS/2 to Mac II. The MultiSync XL automatically adjusts its scanning frequency from EGA to VGA, and on up to even higher standards with our MVA 1024 in AT/386 based machines.

So, to create brilliant CAD ideas, get the MultiSync XL and the MVA 1024. Two big ideas in themselves. For literature or a dealer of the control of the cont





#### NSTL TEST REPORT

#### IBM PS/2 Model 80-111 and AST Premium/386

The AST and IBM trade places but fail to match the Compaq's speed.

Compaq Deskpro 386/20						48
AST Premium/386						53
IBM PS/2 Model 80-111		_ 4				60
dBASE III Plus						
Compaq Deskpro 386/20		- 33				36
IBM PS/2 Model 80-111						38
AST Premium/386						41
1-2-3						
Compaq Deskpro 386/20						14
AST Premium/386						18
IBM PS/2 Model 80-111						19
AutoCAD						
Compaq Deskpro 386/20						61
IBM PS/2 Model 80-111				33		70
AST Premium/386						71
Lattice C Compiler						
Compaq Deskpro 386/20						37
AST Premium/386						38
IBM PS/2 Model 80-111						48
seconds 0	15	30	45	60	75	

The IBM PS/2 Model 80-111 and the AST Premium/386 were both tested using a 192K disk cache in extended memory. The AST Premium/386 had 1MB of RAM, an EGA, a 1.2MB floppy drive, and a 90MB hard disk. The IBM PS/2 Model 80-111 had 2MB of RAM, a 1.44MB floppy drive, and a 115MB 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 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 containing six two-dimensional and seven three-dimensional views.

#### 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 On the outside, the two computers couldn't be more different. The Model 80 is a free-standing tower with two externally accessible 3½-inch drive bays and a knockout panel for a full-height drive. The small-footprint Premium/386 offers external access for three half-height devices—perfect lodgings for a 5¼-inch floppy drive, a 3½-inch floppy, and an internal tape backup. For mass storage, the Premium/386 has enough room inside for two half-height devices, while the capacious Model 80 can hold two full-height hard disks.

AST provides several utility programs with the Premium/386, including a disk-caching program, a RAM disk, a print spooler, and an expanded memory driver (LIM 4.0). GW BASIC and DOS 3.30 are also included. IBM provides disk caching too, of course, but also some of the slickest setup, diagnostics, and system-tutorial software in the business—plus a facility for checking and adjusting arbitration levels.

Which 20-MHz machine you buy depends largely on what you anticipate your performance needs will be-and how far you peer into the future. If you're simply looking for today's top performer, get the Compaq Deskpro 386/20, which is 15 to 20 percent faster than either the Premium/386 or the Model 80. If you want limited bus-master capability, 20-MHz access to a full 13MB of RAM, and backward-compatibility with your AT boards, the Premium/386 is a perfectly viable option. But despite its high price, its low ceiling on high-speed RAM, and the current dearth of bus-master boards for the Micro Channel, the Model 80 remains the most promising platform for heavy-duty servers, workstations, and LAN gateways of the future. -Eric Knorr

#### WHERE TO BUY

#### Premium/386

AST Research 2121 Alton Ave. Irvine, CA 92714 714/863-1333

List price: Model 300 with 1MB RAM,

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The Tandon
PAC 286 Plus
offers removable
hard drives, but its
performance is
less than
dazzling.



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#### **Tandon PAC 286 Plus**

AT-compatible system

**PROS:** Removable hard drives, compact design

CONS: Unimpressive speed, high price

High-density, removable-media drives like the Bernoulli Box—and even removable hard drives like the Remedy Removable—have been available as add-on PC peripherals for some time, but Tandon's \$4846 PAC 286 Plus is the first system with removable hard drives built in. Press <Alt>-1 on the keyboard, and the computer hums, whirs, and ejects its entire 30MB Personal Data Pac (PDP), to the guaranteed "oohs" and "ahs" of the office staff.

Popping hard disks in and out of the PAC 286 like VCR tapes is fun, but is it more than a gimmick? Tandon's 10.7-MHz, one-wait-

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#### FEATURES EVALUATION

#### Tandon PAC 286 Plus

With the 10.7-MHz Tandon PAC 286 Plus's two plug-in hard drives, users can take their data home for the weekend.

				res

CPU	80286
Clock speed	8/10.7 MH
Built into motherboard	
Parallel port	•
Serial port	
Floppy disk controller	•
Video adapter	0
Mouse port	0
Coprocessor support	80287

#### Memory capacity

Amount shipped with basic unit	1MB
Maximum installable on motherboard	1MB
Amount installable on special memory boards	4MB

#### Expandability

8/16-bit expansion slots/number free	4/3
8-bit expansion slots/number free	1/1
Half-/full-height storage device bays	1/2
120MB or larger hard disk available from manufacturer	0

#### Ergonomic design

Front-panel reset button	
Front-panel on/off switch	•
Front-panel keyboard socket	0
ROM-based setup software	•
Tilt-and-swivel monitor	•
Compact footprint	•
Complete documentation	•

Yes O No

state, removable-media system may seem like a tempting choice for offices where users need to transfer 25 high-density floppies' worth of data to another computer quickly and easily or lock the hard disk in a safe overnight for higher data security. Neverthe-

less, it's a bit slow and a bit expensive; buying a removable drive and installing it in a faster, cheaper AT clone may be a more costeffective solution.

Fully configured with 1MB of RAM, a 1.2MB 51/4-inch floppy drive, parallel and serial ports, a 101-key keyboard, two PDPs (so the machine won't be useless while one PDP is elsewhere), and an EGA and monitor, the PAC 286 costs \$4846. This is not cheap, especially compared with stand-alone upgrade alternatives. For instance, you could install two 30MB Remedy Removable Winchesters (see "Removable Resources," PCW, December 1987) in a fast, inexpensive 286 machine like the 12.5-MHz Dell Model 200, with EGA and color monitor, for about \$1000 less than the Tandon-if you were willing to brave tricky installation and possible maintenance problems.

The PAC 286 is an attractive, slender, vertical-standing system. It has no internal drive bays (except for its two PDP receptacles); a 1.2MB floppy drive is mounted at the top of the system unit.

The motherboard holds 1MB of memory, an 80287 math coprocessor socket, four 8/16-bit slots, and one 8-bit slot. A high-performance RLL controller for both PDPs, with 128K of cache memory, takes up one of the 8/16s. A proprietary sixth slot is designed to hold Tandon's 1MB RAM expansion board (expandable to 4MB), allowing a system maximum of 5MB without your having to use up an 8/16 slot. A serial port, a parallel port, and a floppy disk controller are built into the motherboard. While all of this is nice in terms of increased throughput and plenty of free slots, none of it is big news.

What makes the PAC 286 newsworthy is its removable drives. Each bootable, 2½-pound PDP is the size of a fat paperback novel and stores 30MB of data. The unit is a conventional two-platter, four-head, 40ms Winchester with a 2:1 interleave, secured by

<sup>&</sup>lt;sup>1</sup> Floor-standing model



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#### NSTL TEST REPORT

#### Tandon Pac 286 Plus

First place evades Tandon's PAC 286 Plus, which places second or last in each test.

#### WordStar Professional AST Premium/286 106 Tandon PAC 286 123 IBM Model 50-021 125 **dBASE III Plus** 84 IBM Model 50-021 Tandon PAC 286 114 146 AST Premium/286 1-2-3 32 AST Premium/286 Tandon PAC 286 38 41 IBM Model 50-021 **AutoCAD** 171 IBM Model 50-021 179 AST Premium/286 Tandon PAC 286 211 Lattice C Compiler 91 AST Premium/286 95 IBM Model 50-021 Tandon PAC 286 100 seconds 0 200 40 80 120 160

All systems compared had processors running at 10 MHz. The Tandon PAC 286 had two removable 30MB hard drives and an RLL controller with 128K on-board cache. The IBM Model 50-021 had a single 20MB hard drive and a disk cache of 192K. The AST Premium/286 had a single 40MB hard drive and used no disk cache.

#### **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 efficiency of disk caching, if present, will dramatically affect apparent disk access speed. The test measures the time 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.

#### AutoCAL

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 containing six two-dimensional and seven three-dimensional views.

#### 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 benchmark measures the time required to compile and link two 1000-line programs. The test is performed automatically using a DOS batch file.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

rubber shock absorbers inside a plastic shell; a connector mates with an input/output/power socket in the receptacle.

While playing racquetball with your PDPs is not recommended, Tandon claims the removable drives can withstand shocks of 250 g's—not to mention normal buffeting in your briefcase. The ejection process lifts and locks the read/write heads away from the media instead of merely parking them on areas that don't have data. During our evaluation, a PDP was accidentally knocked off a desk. It landed hard, but when it was reinserted, it booted with no ill effects; all the data was intact.

Each PDP comes preformatted and loaded with Tandon DOS 3.30, GW BASIC, *Microsoft Windows 2.03*, and a LIM 4.0 driver for EMS memory. If you prefer standard DOS, Tandon provides a separate device driver for the PDP's ejection mechanism.

Thanks to its fast controller and memory cache, the PAC 286's PDPs seem to load programs about twice as fast as an XT hard disk. Once applications are loaded, however, the machine delivers only moderate performance. In NSTL tests, it outran the PS/2 Model 50 in the processor-intensive 1-2-3 and WordStar benchmarks but lost to the AST Premium/286; in the AutoCAD and Lattice C tests, it ran dead last.

Accessories and peripherals are no better than OK. The system's 101-key keyboard rates very well—neither too stiff nor too mushy. The monochrome monitor is acceptably sharp, but the controls are placed awkwardly at the rear. Documentation is merely adequate.

The PAC 286 would make a better impression with a lower price and higher performance. Still, its drive-swapping capability is undeniably alluring, and the rugged and convenient PDPs are a pleasure to use. The PAC 286 offers brand-name reliability, one-stop shopping, and simple setup (especially compared to the installation headaches that come with stand-alone units like the Remedy). For

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business users who need removable drives but hate going under the hood, its convenience may be irresistible. — *Eric Grevstad* 

#### WHERE TO BUY

#### Tandon PAC 286 Plus

Tandon Corp. 405 Science Dr. Moorpark, CA 93021 805/523-0340

List price: 10.7-MHz PAC 286 with 1MB RAM, 1.2MB 51/4-inch floppy drive, 101-key keyboard, one serial and one parallel port, two Personal Data Pac receptacles (no PDPs, video board, or monitor) \$3199

Accessories: 30MB Personal Data Pac hard disk drive \$399; EGA adapter \$250; monochrome monitor \$190, EGA monitor \$599; 1MB memory expansion board \$400, 4MB memory expansion board \$1900

Warranty: one year parts and labor Extended warranty: none Technical support: handled through dealers

Other support services: none
For more information, see Products
Featured in This Issue.

#### Epson LQ-1050

24-pin dot matrix printer



PROS: High speed, advanced paper handling

**CONS:** Unreliable sheet feeder, occasional paper jams

By now, most people have encountered TANSTAAFL, the acronym for There ain't no such thing as a free lunch. But how about TANSTAAPDMP—There ain't no such thing as a perfect dot matrix printer? Setting aside specialized requirements like color and desktop publishing capabilities, such a dream machine would have to provide high speed, exemplary print quality, state-of-the-art paper handling, easy envelope printing, convenient operation, and low cost. Impossible, right?

Maybe, but Epson's new 24-pin printer, the \$1199 LQ-1050 (the LQ-850, a narrowcarriage version, costs \$849) comes astonishingly close. If not for an unfortunate tendency toward paper jams, the LQ-1050 would rate as the best dot matrix printer this reviewer has ever used.

When it comes to meat-and-potatoes issues like speed and print quality, the LQ-1050 is unassailable. In draft mode it blasts out a 250-word, 24-line page in 13 seconds flat; the same page takes only 28 seconds in near letter quality mode (NLQ). Two fonts are built in—a stylish roman and a clean, elegant sans serif. Draft output (always sans serif) is easily readable; in NLQ mode both fonts are almost indistinguishable from typed copy.

Print flexibility and ease of use are exemplary. The printer delivers 5-, 6-, 7-, 10-, 12-, 15-, 17.5-, and 20-pitch type (if your word processor knows how to ask for them) and gives you a choice of 6 or 8 lines per inch. You can select 10, 12, and 15 pitch and proportional spacing from the easy-to-use pushbutton control panel as well. Likewise, form-feed, linefeed, and paper loading are simple push-button operations.

The LQ-1050 offers a remarkable set of paper-handling features. The most impressive is its automatic paper roll-up: When a print job is done, the printer advances the fanfold paper about a quarter of a page for easy tear-off. When the next print job starts, the paper rolls back into printing position. You'll never waste another sheet.

Paper parking is reliable and easy. Three button-pushes and one pull on a lever roll out the fanfold paper and load a cut sheet or envelope. Paper positioning is fully automatic and—unlike most auto-feed printers, which load paper an inch above the printhead—the LQ-1050 places the top edge of the paper precisely where it should go: at the printhead.

The LQ-1050 prints envelopes perfectly; all you need to do is adjust the paper-thickness dial. So much for printer manufacturers who claim that 24-pin printers are incapable of this essential office task.

## COOL, QUIET POWER

#### SILENCER 150



- PC/XT compatible
- 150 watts of power
- system runs 5°-15° cooler
- 84% noise reduction

\$129

#### TURBO-COOL 150



- PC/XT compatible
- 155 watts of power
  system runs 25°-40° cooler
- 50% noise reduction

\$149

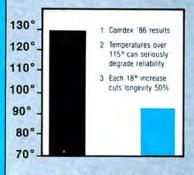
#### TURBO-COOL 200



- PC/XT/Mini AT compatible
- 200 watts of power
- system runs 30°-45° cooler
- standard noise level

\$189

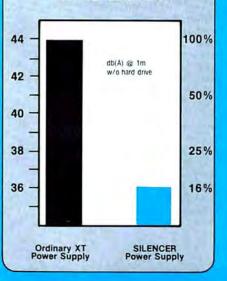
#### **EXPANSION CARDS TEMPERATURE TEST**



Ordinary XT Power Supply

TURBO-COOL Power Supply

#### **NOISE LEVELS**



**VISA/MC/COD/PO** 

#### **TURBO-COOL AND SILENCER POWER SUPPLIES:** POWER PACKED AND BUILT TO LAST

- · full rated power
- · low ripple; tight reg.
- · heavy duty components
- FCC-B compliance
- UL (#E114179:TC150/200)
- · OV, OC, SC protection
- · patented twin fan slope-cover design for max. cooling vs noise (TC150/200)
- · high capacity West German cooling fan w/adjustable speed control (TC250)
- installation instructions; 4 drive plugs
- · rigorously tested; 1 yr. warranty

#### SILENCER 200



- AT compatible
- . 200 watts of power
- adjustable cooling (1.0X-1.3X)
- 69% noise reduction @ 1.0X

\$169

#### TURBO-COOL 250



- AT compatible
- · 250 watts of power
- adjustable cooling (1.3X-1.8X)
- · 386 boards and hard drives run up to 35° cooler

\$189

#### **ALSO AVAILABLE**

Computer Replacement Fans (West German & Japanese) \$29
Turbo-Cool PC/XT Auxiliary Cooling Unit (system runs 15°-30° cooler) \$59
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For XT, AT, PS/2, and compatibles (requires 512k, 1 floppy & 1 hard drive;  $3^{1}/2^{"}$  available) . . . . . . . . . . . . . \$119.

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Wanna get high? (Or, how we dig our roots.)

ach year the local color gathers on the green of memorable Marlow, NH (pop. 554) to pay their respects to our furry founder. We wave our flags, doff our hats, toot our own horns, and gather renewed strength for another year of lofty service. For it was he (or was it she?) who had the voluminous vision and towering talent to lead Marlow onto the cutting edge of micro mail order.

#### Giving us credit where credit is due.

But, if the truth be known, it is our customers whom we put on a pedestal. From day one, we have striven valiantly, to follow

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Remember when computers were going to make paper obsolete? Instead, they churn out unmanageable quantities with reckless abandon. That's why you need an official PC Connection Founder's Statue which can also

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Xerox NCP  Note: National Publisher 1.1	540
A Veritura Fublisher 1.1	J45.
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Barron's CP	
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Computer SAT	d.)
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Accolade CP (reqs. graphics brd.)	
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The only problem with the LQ-1050 is that the emerging sheet of paper tends to catch on the front edge of the single-sheet paper guide, causing a jam that requires you to clear and rethread the entire paper path. One solution is to remove the paper guide completely; replacing it takes only a few seconds when you need to print on cut sheets. A more elegant solution is to spend \$249 for Epson's sheet feeder (the narrow-carriage version is \$199). With the sheet feeder installed, you can remove the paper guide permanently. Unfortunately, the sheet feeder adds about 9 seconds per page to the printing time and does not always feed sheets reliably.

Still, despite its paper jam problems, the Epson LQ-1050 delivers an extremely attractive combination of speed, print quality, envelope printing, advanced paper-handling, and price. IBM's Proprinter XL24 offers comparable speed and price but lacks envelope capability and sophisticated paper handling. Toshiba's P341SL is a bit cheaper, but it won't print envelopes, and it's significantly slower. So, TIAAPDMP (There is an almost perfect dot matrix printer). The LQ-1050 may not be flawless, but in an imperfect world it comes closer than any other printer in its price range. —M. G.

#### WHERE TO BUY

#### Epson America

2780 Lomita Blvd. Torrance, CA 90505 213/539-9140

labor

List price: LQ-1050 with 6K buffer, push tractor, battery backup \$1199; LQ-850 (narrow-carriage) \$849

Accessories: font modules \$59; wide-carriage sheet feeder \$249, narrow-carriage sheet feeder \$199; wide-carriage pull tractor \$74, narrow-carriage pull tractor \$59; wide-carriage ribbon \$15, narrow-carriage ribbon \$9

Extended warranty: \$79.95 per year, renewable

Warranty: one year limited parts and

Technical support: dealer only For more information, see Products Featured in This Issue.

### Micronics 1616-01, 2016-01, 2020-01

80386 motherboards

PROS: 20-MHz board is very fast

**CONS:** Expensive, limited memory expansion with 20-MHz board

f you use an AT for CPU-intensive applications like desktop publishing, computerassisted design, or updating megabyte-size 1-2-3 worksheets, you probably spend aeons of waiting time staring at your screen and dreaming of an 80386 machine. But there's an alternative: Replace the soul of your machine with an 80386 accelerator board or a new 80386 motherboard. Either upgrade will deliver faster performance and at least the possibility of running OS/2, Windows/386, or Xenix. The motherboard option costs about \$1000 to \$1500 more, and installation takes a bit more trouble, but a 386 motherboard provides a 32-bit data bus for faster throughput, greater memory expandability, and expanded software compatibility. Furthermore, transplanting a 386 motherboard into an AT requires only a screwdriver, a pair of needlenose pliers, and 45 minutes of the time you'll save later on.

Micronics makes three 80386 motherboards designed specifically for upgrading the IBM AT (and machines with the same form factor)—and if your time is expensive, they are worth every penny. The 1616-01 (\$1995) runs at 16 MHz; both the 2016-01 (\$2250) and 2020-01 (\$2550) run at 20 MHz. The more expensive 20-MHz board comes with an 80386 CPU certified by Intel to run at 20 MHz; the cheaper one uses an 80386 certified by Micronics to run at 20 MHz. Other than that, the two are identical; we experienced no difficulties with the 2016-01. All three can be toggled down to a lower speed for older software and games, come with 1MB of 32-bit RAM, offer zero-wait-state operation, five 8/16-bit slots, two 8-bit slots, and one 32-bit expansion slot-and run IBM OS/2. They are socketed for the 80287 math coprocessor but require a separate (and expensive) daughterboard to use the faster 80387.

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#### By James Lewis

Are you ready to discover one of the most exciting software developments in years?

It's called Tornado – but the name hardly explains what it can do for you.

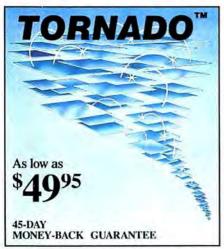
Tornado is like having a 'photographic memory' that gives you perfect recall of up to 25,000 items of information. And the result is not access to mere facts; you actually boost your thinking power because you have more "conscious" information.

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Tornado has been reviewed by numerous publications. Patrick Marshall of PC World gave Tornado their highest rating: "Excellent, Excellent, Ex

Tornado is one of the most versatile—and most personal software packages ever created. Some people use it for brainstorming. Other people use it for random notes...decision-making...freeform reference information... unstructured databases... and much more. "The applications are endless," writes Richard Rothchild. "It is the best written, best documented, most thought out program I own."

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All three versions run on the IBM-PC, XT, AT, PS/2, and compatibles in as little as 60K. Tornado runs on floppy and hard disk systems and can run memory resident or as a standard program.

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#### FEATURES EVALUATION

#### Micronics 80386 Motherboards

Micronics' 16-MHz 80386 motherboard offers greater memory expansion capability than the company's 20-MHz boards—and a price hundreds of dollars lower. Of course, if performance is the issue, either 20-MHz board is more desirable.

	5	18	8
Standard features	1616.01	2016-01	2020-01
Price	\$1995	\$2250	\$2550
CPU	80386	80386-16	80386-20
Clock speed	16 MHz	20 MHz	20 MHz
Built into motherboard			
Parallel port	0	0	0
Serial port	0	0	0
Floppy disk controller	0	0	0
Video adapter	0	0	0
Coprocessor support	80287/ 80387	80287/ 80387	80287/ 80387
Complete documentation	•	•	•
2-bit memory capacity			
Amount shipped with basic unit	1MB	1MB	1MB
Maximum installable	10MB	4MB	4MB
xpandability			
32-bit expansion slots	ľ	11	11
8/16-bit expansion slots	5	5	5
8-bit expansion slots	2	2	2
Number of slots occupied	1 (32 bit)	1 (32 bit)	1 (32 bit)

<sup>•</sup> Yes O No

These motherboards are fast. In a recent NSTL survey of four 80386 motherboards, the Micronics 20 MHz took first place in every event. The 16-MHz board held third place in every test except AutoCAD—where it came in second.

Like most 386 motherboards, the Micronics boards have separate 32-bit memory and I/O buses; this division of labor allows the memory bus to run at full CPU clock speed while the expansion bus ticks along slowly enough to suit peripherals. Expansion I/O slots on the 16-MHz board run at 8 MHz; those on the 20-MHz models run at 10 MHz. While 10 MHz is pretty speedy, Micronics says its clients have encountered few compat-

ibility problems. A few older XT boards—notably cheap monochrome video adapters—have problems at 10 MHz, but I/O boards and disk controllers seem to do just fine.

Micronics offers a choice between the Award BIOS and the Phoenix BIOS—or both! These motherboards offer an unusual capability: socketing two BIOS's simultaneously and switching between them with a software utility. Most users will never need this feature, but if you want to run two applications that require different BIOS's, it might save your skin.

The boards are less impressive in the memory-expansion department. All three come with a 32-bit memory board that holds 1MB of static column RAM, plus sockets for an additional 1MB. The memory board for the 16-MHz motherboard accommodates up to 8MB of additional 32-bit RAM on piggyback boards; unfortunately, the 20-MHz memory board permits only 2MB of piggyback 32-bit RAM, for a miserly 4MB ceiling.

Setting up the boards is simplicity itself, thanks to well-written documentation with clear illustrations. You must set a jumper on the memory board to indicate how much memory is installed; all additional settings can be made with one easy-to-reach DIP switch block. The boards come with a setup utility, software that lets the user select simulated clock rates of 4.77-, 6-, 8-, and 16-MHz from the keyboard, and a driver for Lotus/Intel/Microsoft LIM 4.0 expanded memory.

If you're looking for performance, the 20-MHz motherboards will change the way your AT does business, and even the slower 16-MHz model will make a big difference in computation-intensive applications. None of the boards is cheap, but when time is money, any one of them can save you a bundle.

-Lewis Perdue

#### WHERE TO BUY

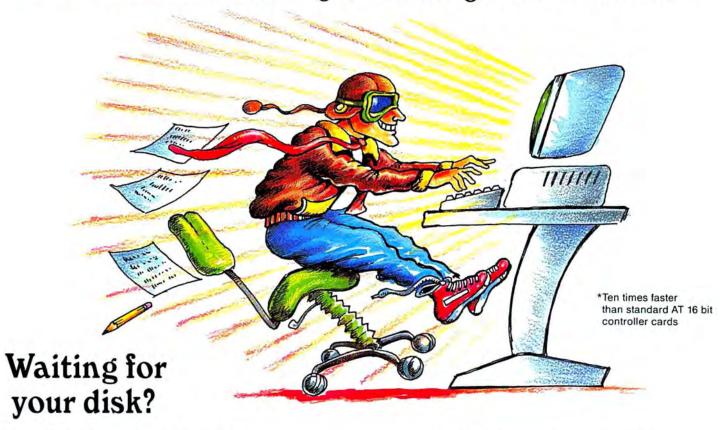
Micronics 1616-01, 2016-01, 2020-01

Micronics, Inc. 935 Benicia Ave. Sunnyvale, CA 94086

For memory expansion only.

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\*data transfer from controller to PC

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Toshiba 51/4" 1.2 mb int1	10
Micropolis 70 mb69	05
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BEKINOULI BOX II 51/4"	
20 mb internal9!	55
20 mb external w/card11	95 I
dual 20 mb external w/card179	95
SYSGEN Duranack single	25
SYSGEN Durapack single	05
Disa Liand Cand 40	70
Plus Hard Card 4067	19
Plus Hard Card 205	25
Priam 60 mb AT70	69
Priam 43 mb AT64	49
MODEMC	
MODEMS  Everex 1200 int./ext79/11	
Everex 1200 int./ext <b>79/1</b> 1	15
Everex 2400 int./ext139/24	19
Hayes 1200/2400	íó
Migest Peaket Modern	25
Migent Pocket Modem	25
Practical Peripherals half card	
2400 w/Procomm15	59
US Robotics 2400 direct internal	
11 . 111 1/0 11000 /0 . " 0	59
venter Half Card 1200 w/Crosstalk 25	59
Ventel Half Card 1200 w/Crosstalk 25 Vental Half Card 2400 w/Crosstalk 35	59 59
Vental Half Card 2400 w/Crosstalk 35	59 59
Vental Half Card 2400 w/Crosstalk35 Ventel 1200/2400 Plus239/35	59 59
Vental Half Card 2400 w/Crosstalk35 Ventel 1200/2400 Plus239/35 MONITORS	59 59
Vental Half Card 2400 w/Crosstalk3s Ventel 1200/2400 Plus239/3s MONITORS	59 59 59
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#### NSTL TEST REPORT

#### 386 Motherboards

The 20-MHz Micronics 2016 and 2020 snap up the speed crown, while the 16-MHz 1616 comes in a respectable third.

**AutoCAD** 



All motherboards were tested on an IBM PC AT model 339 with a 30MB hard disk and an IBM EGA board with 256K of video RAM.

#### **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.

#### Micronics 2016/2020 Micronics 1616 Fortron

seconds 0 30 60



95

113

122

120

#### 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 containing six two-dimensional and seven three-dimensional views 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. All of the views are then displayed in the last step of the benchmark.

#### 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 benchmark measures the time required to compile and link two 1000-line programs. The test is performed automatically using a DOS batch file.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL). All rights reserved.

800/234-4386, 408/732-0940 **List price:** model 1616-01 (16-MHz board) with 1MB RAM \$1995, model 2016-01 (20-MHz board—Micronics certified) with 1MB RAM \$2250, model

2020-01 (20-MHz board—Intel certified) with 1MB RAM \$2550

Accessories: 2MB piggyback memory board with RAM \$1195; for 16-MHz motherboard only, 4MB piggyback memory board with RAM \$2495, 8MB piggyback memory board with RAM \$4995; 80387-16 math coprocessor and adapter board \$895

Warranty: one year parts and labor Extended warranty: none Technical support: toll-free number for registered users, M—F 8:30—5:30 Other support services: free monthly newsletter For more information, see Products Featured in This Issue.

Eric Knorr is a senior editor for PC World.

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#### THE SOFTWARE SHELF

#### 164 SideKick Plus

An early love of busy PC users, *SideKick* has developed new notepad and communications features as it evolves into a multitasking environment.

#### 168 Info-XL 1.0

Cresting the new wave of information management programs, Info-XL is a handy tool for keeping track of notes about people and projects.

#### 174 Turbo Pascal 4.0

Borland's new Pascal compiler features a comfortable programming environment, good performance, and excellent graphics support.

#### 180 Show Partner F/X 3.0, IBM Storyboard Plus 1.0

If you want to create sharp-looking desktop presentations, *Show Partner F/X* offers high-powered scripting and animation modules but requires time and diligence. While *Storyboard Plus* isn't as powerful, it lets you crank out a snazzy show with much less effort.

#### SideKick Plus

Desktop utilities package

PROS: Multiple notepads; handy file manager, time planner, and outliner; expanded phone book; background communications; excellent manual

**CONS:** Requires a hard disk, expanded memory or RAM drive necessary for fastest performance

Borland's SideKick Plus is like a shopping mall: an environment with so many tempting goodies you have to guard your credit card. With this long-awaited upgrade, SideKick has gained an outliner and a first-class file manager, and the phone book, calendar, and calculator have been greatly expanded and improved. The program even supports lowend multitasking. SideKick Plus is still RAM resident, but it consumes about 1.5MB of disk space, needs a RAM disk or expanded memory to really fly, and at \$199.95 costs a lot more than the original.

SideKick Plus installs easily and requires a minimum of only 72K RAM, though a typical configuration will need about 150K. A menu displays changing memory use as you load different modules or swap them to expanded memory or a RAM disk for faster access. You can also remove SideKick Plus from memory, but only if it's the last resident application loaded.

Anyone familiar with SideKick will welcome SideKick Plus's new File Manager, a disk manager that lets you copy and delete files, view text files, format disks, and perform other related functions. No more quitting SideKick to change directories or hunt for a file name. When you type \*.\* at a file name prompt in other modules, the File Manager pops up to help you locate it.

The second major addition is the flexible Outlook Outliner, which lets you attach a separate note window to any line; expand, contract, and rearrange sections in as many as nine windows; and print outlines with leading numbers or letters in various formats. Outlook also creates organization charts complete with boxes and connecting lines.

SideKick veterans accustomed to a single note file will appreciate the greatly enlarged Notepad module: Nine separate notepads are now available, each holding up to 54K of text. You'll never see another DOS prompt when shuttling between a to-do list, a telephone log, and research notes; just load them in SideKick Plus and switch between them at will.

In the Notepad editor, WordStar-like dot commands and control codes specify page breaks, headers and footers, and bold, italic, and underlined output; unfortunately, styled text doesn't appear as such on screen. For the time conscious, typing .LOG at the top of a notepad will automatically insert the date and time whenever this window comes into view.

To its legion of devotees, *SideKick*'s cardinal virtue has always been its skill at cutting and pasting text between applications; here again, *SideKick Plus* is a big improvement. The 4K Clipboard can now be edited, and you can cut and paste between applications without bringing up *SideKick Plus* itself.

As before, the PhoneBook is the repository for names, addresses, and related information; you can still dial numbers directly from the screen. The new PhoneBook's main advantage is faster searching. Its main drawback is its list of fixed data-entry forms. If you're a free-form kind of person, you may find this aspect of the upgrade painful: A utility will convert your old SideKick phone files to the new format, but only if you entered numbers in the standard configuration.

The PhoneBook has grown into a minitelecommunications system that includes scripts for automatically logging on to such systems as MCI Mail, BIX, and Compu-Serve. For other services, you can write custom scripts and use a learning feature to teach the PhoneBook log-on sequences. Communications can run in the background, but this requires an extra 25K of memory.

Trying to organize your life? SideKick's calendar has evolved into a Time Planner



#### FEATURES EVALUATION

#### SideKick Plus Bests Its Predecessor

The RAM-resident utility package is so crammed with goodies, it's become a full-service environment.

	2	edekick	1
Standard features	SideMid Plus	\	
Price	\$199.95	\$85.95	\$85
Minimum RAM required	72K	64K	64K
ile Manager			
Complete DOS functions	•	n/o	•
Print functions	•	n/o	•
Shows/modifies attributes	•	n/a	0
Displays file statistics	•	n/a	•
Search function	•	n/a	0
Notepad			
Maximum number of windows	9	1	Δ
Repeat last find	•	•	•
Search and replace	•	•	0
View files/directory	•	•	•
Automatic backup	•	0	0
Automatic save	•	0	0
Print formatting commands	•	0	0
Calculator types			
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Programmer	•	•	0
Statistical/scientific	•	0	0
Formula	•	0	0
Memory	•	•	•
Displays/prints tape	•	0	0

	156 Plus		
Displays calendar	•	-	
Shows conflicts in appointments	•	0	
Deletes appointments by category	•	0	(
Searches for free time automatically	•	0	(
Alarms	•	0	
Repeating appointments	•	0	_
utliner			
Number of windows	9	n/a	
To-do list	•	n/a	(
Attaches notes	•	n/a	
Sort	•	n/a	
mmunications			
Multiple phone books	•	•	n
RAM resident	•	•	п
Dials displayed number	•	•	η
Auto-log-on scripts	•	0	n
Script language	•	0	n
Background communications	•	0	п
Capture mode	•	0	n
Built-in text editor	•	0	п
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<sup>1</sup> Via File Manager.

that displays daily, weekly, and monthly schedules. You can now search for blocks of free time in a busy appointment schedule and set alarms—even a snooze alarm—to get you to the church on time. SideKick Plus can link alarms to PhoneBook entries and automatically call remote services, perhaps to retrieve MCI Mail every day at a certain time.

In a bit of numerical overkill, SideKick Plus adds scientific and formula calculators to SideKick's business and programmer calculators. They incorporate memory functions as well as an electronic tape—actually a special notepad that stores entries and calculations. You can save the tape to disk and print, edit, and modify calculations. Having this kind of record available makes the calculator much more practical for accounting jobs than the original tapeless version is.

Although fully explained in the manual, *SideKick Plus*'s calculator entry style is somewhat unusual. To subtract 3 from 2, for



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When in SideKick Plus, typing "." brings up the new File Manager. example, you must type  $2+3-\langle Enter \rangle$  instead of the more natural  $2-3\langle Enter \rangle$ . You get used to it, but it still feels like Reverse Slobovian Notation.

In addition to numeric calculations and conversions in hex, binary, and decimal values, the programming calculator now understands logical functions such as AND, OR, and XOR; this capacity is helpful for computing the result of a logical combination in a programming statement. The scientific calculator has statistical and trigonometric functions and understands exponential notation. Although the formula calculator is no substitute for a spreadsheet, it comes with several built-in financial formulas.

Well-designed menus, an intelligent keyboard layout, and excellent documentation make SideKick Plus an attractive package. Background communications, the Time Planner, and the Outlook Outliner rival standalone products, while the other features make SideKick Plus one of the most versatile software packages you can own. Finally, a new Module Manager will accommodate third-party applications, automatically bringing them up with the main menu. If and when those applications appear, SideKick Plus could move from a handy package of

desktop utilities to an operating environment with consistent commands and menus throughout. If you lack disk space or RAM, stick with the original program, which Borland will continue to support and sell. But if you want a multipurpose command post on your PC, SideKick Plus will put you in charge. —Tom Swan

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#### Info-XL 1.0

Information manager

**PROS:** Allows cross-linking of text data; good scheduling ability; fast, convenient search utility

**CONS:** Limited import and export capabilities, no exit to DOS, lacks autodialer

For months, managers, researchers, and journalists have eagerly awaited the revolutionary information managers that would help them put their scattered project notes in order. Programs like Lotus's Agenda, Persoft's Ize, and Symantec's GrandView promise to link or index unstructured bits of text—anything from quick notes and memos to corporate reports—into impromptu information bases without the constraints of traditional data base field formats.

While others waited for the revolution, Valor Software introduced *Info-XL*, an interesting personal planner that incorporates many of the linking and search features promised by its better-known competitors.



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The main functions Info-XL performs are reflected in its five primary windows: the Manager, Records, Comments, Daily Schedule, and Calendar windows. A sixth, the Search window, pops up when you need to locate a piece of information.

The program isn't cheap, in dollars (\$295) or in RAM (384K minimum), nor is it memory resident. But *Info-XL*, which stands for information excellence, is a useful tool designed to let you input bits of information about people and projects quickly—and find them when you need to.

Each of *Info-XL*'s active windows has special functions and requirements, and navigating them takes some getting used to. The Manager is home base for the entire program and works much like an outliner. This is where you list all the contacts, projects, and other information you want to track, grouped by headings and subheadings. The Records window accepts information organized into fields, which makes reporting easy later on. The Comments window is a miniature word processor that accepts as much as 7K of text per entry. The Calendar, Daily Schedule, and pop-up Search windows round out the set.

What makes *Info-XL* special is that unlike an integrated package that merely lets you move data between modules, the program offers bona fide interconnection. Suppose your to-do list in the Manager includes a meeting with landscape designer Jeff Gillman on September 4. If you highlight the meeting heading, you'll see the date noted on your daily schedule, Gillman's address and phone number in Records, and perhaps a few notes

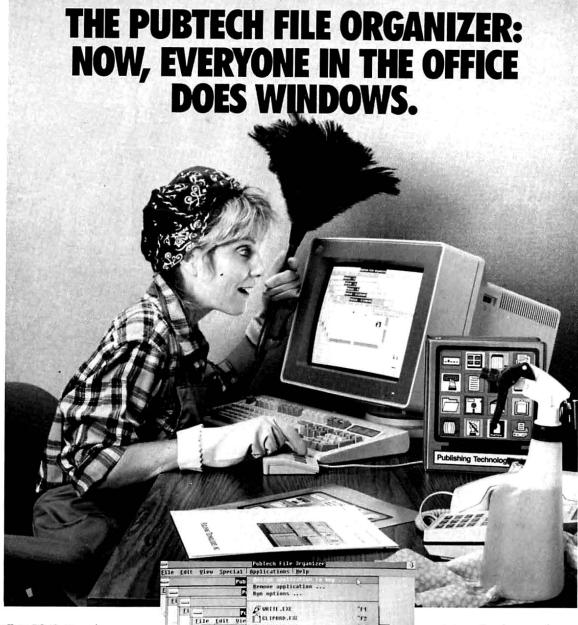
about landscaping in the Comments window. Now suppose Gillman is also a member of a committee you head. With a few keystrokes you can create a link that will bring up the same data when you go to the committee heading. The data is entered once but can be referenced from many different places.

Putting data into Info-XL by creating headers in the Manager is a bit tedious, but finding it later is a cinch. The program's speedy search utility uses a "fuzzy" matching technique that avoids the restrictive parameters of Boolean-type AND/OR searches. Info-XL accepts combinations of words—even misspelled ones—and finds the closest matches. The program will retrieve matches and their related headings in the Manager window and automatically display any related Records and Comments data.

Although the idea behind *Info-XL* is admirable, the program itself has a number of annoying shortcomings. You can import text in ASCII or *WordStar* format only, and all imported files must be run through the Comments window, whose 7K limit can suddenly seem rather confining. Given *Info-XL*'s emphasis on flexibility, it should let you enter items directly into the Daily Schedule; as it is, everything that goes into the schedule has to be tied to a heading in the Manager. *Info-XL* excels at displaying information on screen, but it exports data only in commadelimited format.

Other flaws, at least, are fixable. The program lacks a phone dialer, for example, but works well with General Information's *Hotline*. And although *Info-XL* isn't RAM resident, Valor claims it can be used concurrently with other applications in Quarterdeck's *Desqview*.

Info-XL is the kind of product some people will rave about while others will shrug their shoulders. It takes time to master, and if you've survived so far with a Rolodex and a desktop calendar, it probably isn't worth



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buying. But if your business brings you into contact with many people in different settings, *Info-XL* is a very attractive tool. — *Patrick Marshall* 

### WHERE TO BUY

### Info-XL 1.0

Valor Software 20005 Hamilton Ave. San Jose, CA 95125 800/648-2567, 408/978-3044

List price: \$295

Requirements: 384K, DOS 2.00 or

later version Not copy protected

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Featured in This Issue.

### **Turbo Pascal 4.0**

Pascal compiler



PROS: Extremely fast, easy to use, generates compact .EXE files that overcome the former 64K limit, excellent graphics support

CONS: Linker is not compatible with Microsoft .OBJ format

Turbo Pascal has finally come of age. Version 4.0 features a true linker, better ties to DOS, excellent graphics support, and performance that rivals that of the best C compilers. Its linker isn't compatible with Microsoft .OBJ format, however, and programmers must await the next upgrade for an integrated debugger.

When Turbo Pascal came out in 1983, it revolutionized the way programmers worked.

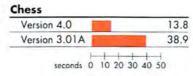
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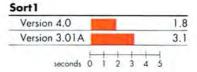
### Turbo Pascal

Version 4.0 cuts Turbo Pascal's compilation time in half, but the resulting .EXE programs run no faster than those created with version 3.0.

### Compilation







### Execution



Benchmarks were performed on an 8-MHz IBM AT Model 339 with a 30MB hard disk and a monochrome video adapter. Three programs, Btree and Sort1 from the Turbo Pascal 3.01 Database toolbox and Chess from the 3.0 Gameworks toolbox, were used to compare 3.0 to 4.0. Because Turbo Pascal 4.0 uses different syntax from version 3.0, the Upgrade program provided with 4.0 was used to convert the test programs for use with 4.0.

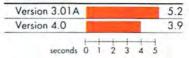
The Btree benchmark sent all 1000 records of randomly generated data—indexed by customer

### Chess



code and customer name—to a null printer (a device that simulates an infinitely fast printer, one not slowed by paper or printhead movement). The Sort1 benchmark read from disk the sample customer file provided with the Database toolbox, sorted the data in memory, and then displayed the records on the screen. Almost all the difference in execution speeds is due to the difference in execution speeds is due to the difference in execution speeds is due to the difference in occupant provides the difference of the control of the program took to respond to a particular move in a specific situation, with the program's "performance level" set to five.

### Sort1



### Compilation

The compilation benchmarks compared the time each version took to compile the test programs' ASCII source code files into .EXEs.

### Execution

The execution benchmarks compared the execution speeds of 3.0-compiled .EXEs versus 4.0-compiled .EXEs.

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Turbo Pascal
4.0's user interface presents a
dramatic improvement over
previous versions. You can
edit in 43- or
50-line mode on
the EGA or VGA,
respectively, and
windows can be
zoomed to fill
the whole
screen.

Where they once had to edit and recompile programs endlessly, they could now compile them in seconds and quickly locate errors with a full-screen editor. But Turbo Pascal versions 1.0 through 3.0 generated CP/M-like .COM files with a 64K limit on the size of the executable code (unless you used overlays) and offered no easy way to maintain libraries of precompiled subroutines. Version 4.0 now produces .EXE files and overcomes the 64K size limit. Programs compile about 50 percent faster than they did before, though they run no faster than under 3.0.

The biggest improvement in version 4.0 is the addition of a true linker. Previous versions incorporated the entire 10K run-time library into every compiled program; version 4.0 brings in only the library routines that are actually needed. So the run-time library can be much larger than before, and users can add to it themselves.

Turbo Pascal even has a C-like "make" utility to manage compilation of multiple source files, and it supports conditional compilation of sections of code based on directives given at the beginning. Linker maps can be used with *Periscope* and similar symbolic debuggers (but not *Codeview*) and can be printed out as text files like those produced by the Microsoft linker.

Turbo Pascal 4.0's real forte, however, is graphics. The supported devices include the IBM CGA, EGA, VGA, MCGA, and 3270 PC; the Hercules Graphics Card; and the AT&T 6300 card. An impressive array of built-in routines makes possible not only lines and circles but bar and pie charts, pattern-filled polygons, and lettering in a variety of fonts.

Turbo Pascal has changed in other ways, too. The language has moved closer to ISO Standard Pascal, the user interface has been revamped, and Turbo Pascal is more at home with DOS than it was before. A procedure to run DOS subtasks, like SHELL in BASIC, is now built in. If your program does not use the screen control package, screen I/O is handled through DOS and is therefore redirectable.

Pascal is an orderly language, simpler than BASIC and thus ideal for beginning programmers, but, like C, it also lets you design your own data structures for professional-level programming. Turbo Pascal has always been a good compiler; now it's an excellent one. —Michael Covington

### WHERE TO BUY

### Turbo Pascal 4.0

Borland Int'l 4585 Scotts Valley Dr. Scotts Valley, CA 95066 800/543-7543

List price: \$99.95

**Requirements:** 384K (256K for command-line version), DOS 2.00 or later version

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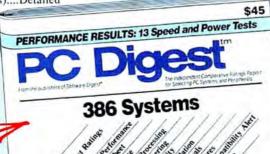
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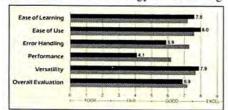
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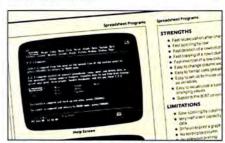
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### Show Partner F/X 3.0

Presentation graphics package

PROS: Powerful scripting and animation modules

CONS: Hard to learn, limited paint capabilities

### IBM Storyboard Plus 1.0

Presentation graphics package

PROS: Easy to learn and use; excellent font, graphing, and image library features

**CONS:** Limited to short, simple scripts; weak on animation

Any teacher knows how effectively a showand-tell session can get a message across. You can do the same thing with a desktop presentation—a disk-based graphics show displayed on your monitor. With either of two recently revamped software packages, Brightbill-Roberts' Show Partner F/X 3.0 and IBM's own Storyboard Plus, you can put a sales pitch, tutorial, or interactive training session on your audience's desk, and let your pictures do the talking.

Of the two programs,  $Show\ Partner\ F/X$  is the more technically demanding, but its

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powerful scripting and sophisticated animation produce spectacular results. Storyboard Plus is easier to learn and use, excels at creating graphs and scripts, and features an exceptional paint module. Both programs cost \$350, require a minimum of 320K, and install easily. You can run them from the keyboard, but a mouse is recommended—especially for the programs' paint modules.

The first step in creating a presentation is to create a series of screens—or grab them from other applications with the programs' memory-resident screen-capture utilities. Show Partner F/X and Storyboard Plus store images in a bin of successively numbered files; the images are retrieved later with the paint or script modules. Show Partner F/X has a second module to capture images created in the Microsoft Windows environment.

Next, you modify captured screens—or create new ones—using the programs' paint modules. These modules allow you to draw, paint, copy, move, mirror, or scale images. You can also design custom colors or patterns, add text, or even scissor out portions of other images.

Show Partner F/X's paint module is clumsy, and its menus are awkwardly designed: Changing brush size and color requires eight separate keystrokes, for instance, as opposed to just three with Storyboard Plus. Show Partner F/X includes few graphing capabilities but makes amends by incorporating a dandy font editor. The program includes two disks of clip-art images; more can be downloaded from the company's bulletin board.

Compared to its rival, Storyboard Plus has an excellent paint module; it resembles PC Paintbrush or GEM Paint, with a familiar color palette, icon tools, and pulldown menu bar. Loading and saving files is a snap, and you can display and manipulate up to eight font styles before placing them on the screen. A basic graphing utility creates four varieties of graphs from scratch, and the program comes with six image libraries that incorporate hundreds of clip-art images.

StoryBoard
Plus's script editor is a marvel
of clarity. You
select commands from a
drop-down
menu and preview the show
in the window
at lower right.

Hemory Used:

1 %

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Invoice Date: June 12, 1988 Order Number: 32212 Date of Order: 10-Jun-58 Ship Yio: U.F.5. Payment Terms: Net 30

Unit Price

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comfortable and informative user interface, supremely easy access to multiple related files, and extensive report design and enhancement tools. Usable by novice and expert alike, it is superb for generating either straight-forward or complex report output . .

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**Editor's Choice** PC Magazine, 12/8/87

"The [time] savings we gained with R&R were remarkable."

InfoWorld, 5/25/87

"The consummate dBASE report writer."

PC World, 3/87

"... run, don't walk ... and place your order . . . . "

PC Week, 11/11/86



Concentric Data Systems, Inc. 18 Lyman Street, PO Box 4063, Westboro, MA 01581

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TXT INTR1 . GX1	Box	In	Full	Picture	Sane	Fast	Key
clear	Box	Out	Full	Picture	Same	Fast	0
TXTINTR2.GX1	Box	In	Full	Picture	Sane	Fast	Key

Show Partner
F/X has so many
scripting options, its screen
looks like a
1-2-3 tax
template.

Once created, the screens are assembled in a script. Both programs' scripting modules appear as spreadsheets. Screens are listed in rows; commands that determine how they appear on screen are stored in columns. Show Partner F/X really flexes its muscles here, offering more than a dozen transitions and a staggering number of display options. Storyboard Plus's script program is simpler but offers far fewer options. Both programs let you preview the results of your handiwork.

Nothing adds sparkle to a desktop presentation like moving images and animation. With *Show Partner F/X* you can create individual objects in a separate animation module, save them as a series of frames, and then recall them by means of the script. You can herd nine animated objects at once, each with its own predetermined path and rate of movement. *Storyboard Plus*'s animation features are much more modest. You can animate and choreograph multiple objects, but their number is limited by system memory. Both programs let you add sound effects to the final show.

Show Partner F/X and Storyboard Plus can both create dazzling desktop presentations, but they are aimed at distinctly different audiences. If you want advanced scripting and animation, buy Show Partner F/X. Otherwise, Storyboard Plus is much easier to use, and its superior paint module can help make your message shine. —Paul Meyers

### WHERE TO BUY

### Show Partner F/X 3.0

Brightbill-Roberts 120 E. Washington St. #421 Syracuse, NY 13202

315/474-3400 List price: \$350

Requirements: 320K (640K recommended for VGA), two disk drives, DOS 2.00 or later version

Not copy protected

**Technical support:** free unlimited phone support, no toll-free number, M–F 9–5

Other support: 30-day money-back guarantee, training available For more information, see Products

Featured in This Issue.

### WHERE TO BUY

### IBM Storyboard Plus 1.0

IBM

Information Systems Group Dept. CCB

900 King St. Rye Brook, NY 10573 800/IBM-2266

List price: \$350

Requirements: 320K, two disk drives, DOS 2.00 or later version

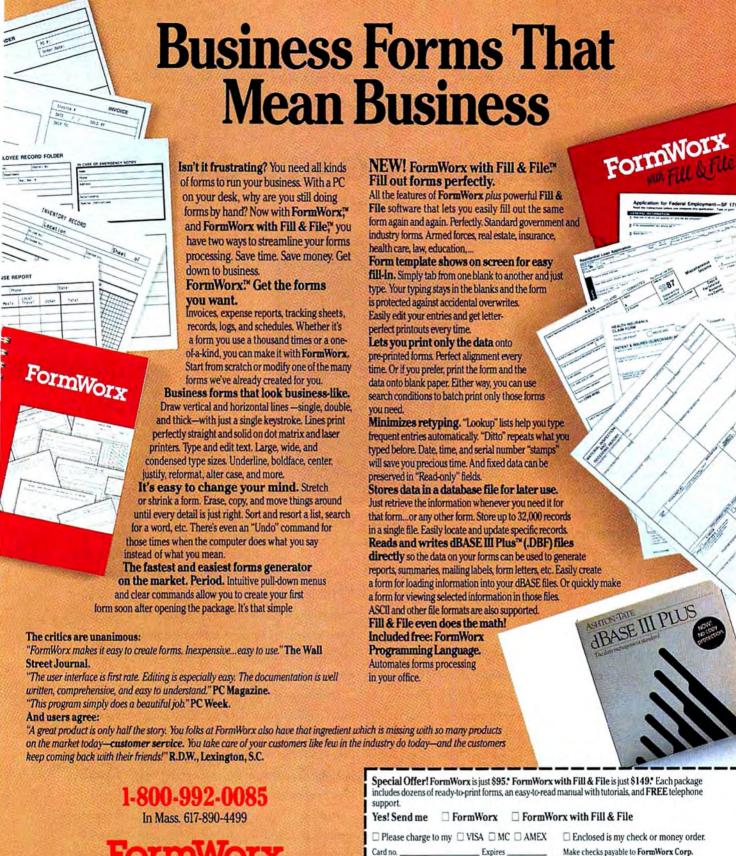
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**Technical support:** 90 days free support (including defect reporting by mail or phone), M–F 10–6, free upgrade for registered users, extended support \$395 per year or \$75 per incident, toll-free number

Other support: quarterly IBM software newsletter

For more information, see Products

Michael Covington is a researcher with the Advanced Computational Methods Center at the University of Georgia in Athens, Georgia, and a coauthor of Prolog Programming in Depth (Scott, Foresman, Glenview, Illinois, 1988). Patrick Marshall edits the Commentary Page of the Oakland Tribune. Paul Meyers is a San Francisco−based video producer and freelance writer specializing in science and technology. Tom Swan is the author of Mastering Turbo Pascal 4.0 (Howard Sams, Indianapolis, 1988) and is PC World's Star-Dot-Star editor. ●



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Hardware requirements: Over 125 printers supported. Requires IBM PC, PS/2, or compatible with DOS 2.0 or higher. FormWorx—320 KB, FormWorx with Fill & File—512 KB. Works with or without a graphics board. Color is displayed on color systems. Available on 3.5° disks when specified. Not

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AND FOR THE AUTHORS

### SHAREWARE COMES OF AGE

JUDY GETTS



MARSHALL MAGEE

"MR. IMAGE"

Many students work their way through college by busing tables. Justin Boyan found something a little more lucrative. In the past year his *Boyan D3* communications software, a shareware program he started hacking out at the

tender age of 15, grossed \$30,000. The 18-year-old University of Chicago sophomore is inexplicably cool about success; talk to him and you'll think all shareware authors find their way to riches.

Bruce Barkelew started writing *ProComm* as a programming exercise and was eventually joined by fellow computer-science student Tom Smith. Two and a half years after they uploaded their communications program to on-line services and bulletin boards (BBS's), they were grossing a half million dollars a quarter: "Even in our fantasies, we never imagined it would take off like this," says Smith.

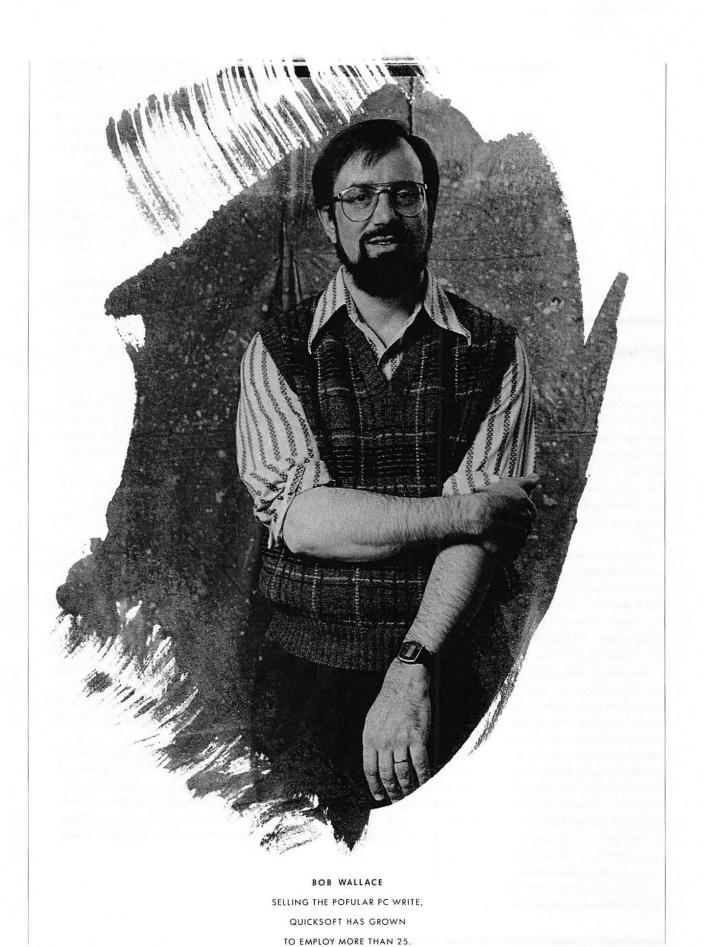
For developers like these, shareware represents neither a last resort for packages that the big publishers won't touch nor an act of altruism. Rather, shareware is their preferred form of marketing and distribution. "Try to imagine a business in which you get daily, enthusiastic reinforcement from people you've never met, and where you get checks in the mail with little or no capital outlay," says Jerry Medlin, author of Jerry Medlin's Accounting Series.

Andrew Fluegelman, a pioneer in sending software out the door with a request to send money if satisfied, called it "an experiment in economics." The experiment was a success, and Fluegelman soon hired people to han-

dle the checks that flooded into his office in payment for his *PC-Talk* communications program. Since then, programmers and users alike have embraced the pay-if-youlike-it concept as a way to avoid traditional marketing and distribution costs and to bestow ample profits on authors and bargains on users.

Shareware is not free, and its authors bristle if you call it public-domain software. They give users permission to copy and try their programs without charge. But they retain their copyrights and expect those who continue using the software to pay them. In contrast, authors of public-domain programs forfeit all rights.

In the past, image problems have battered shareware's commercial credibility. To some, *shareware* still connotes ragtag software written by hobbyists who don't answer support calls and who move without leaving a forwarding address. "The hardest thing about being a shareware author is convincing people that you're actually in business," remarks Marshall Magee, whose *Automenu* menuing system has spawned a company with ten employees.



AUGUST 1988 PC WORLD 185

### **The Corporate Share**

Shareware packages are becoming more polished, and their authors are growing increasingly adept at operating in Fortune 500 territory. Magee goes to great lengths to present a blue-suit-and-power-tie image and sells a shrink-wrapped version of *Automenu* with printed documentation and a box embossed with the Magee Enterprises logo. "Other shareware authors dub me Mr. Image," he laughs.

"In the past, shareware has been perceived as a mom-and-pop product," says Les-

### **COMPETITIVE COMMUNICATIONS**

They are the most intense of rivals and the best of friends. When Pro-Comm's Tom Smith and Bruce Barkelew get together at trade shows with Qmodem's John Friel III, they buy each other beers and swap jokes about error-checking protocols. "There's no real competition, except in selling orders faster," says Friel.

Datastorm Technology's Procomm has charged way ahead, with 50,000 registered users, says Smith. The Forbin Project's Qmodem SST runs second, with more than 7500 registered users. Both also claim impressive lists of site licenses.

From their PC-Talk—inspired user interfaces to their sharp color graphics, the two programs look like twins. Both offer long lines of error-correcting protocols and are blindingly fast. They even share a haunting likeness in their bells and whistles. ProComm has leapt ahead partly because "we had terminal emulation first," says Smith, "and that made us more appealing to large corporations." ProComm also touts a less cluttered user interface.

In 1986 when Barkelew and Smith started Datastorm, ProComm was

already circulating on bulletin boards. It was far from pulling in princely sums. But Datastorm now has 18 full-time employees, with a full-time technical support staff and 4 other workers who do nothing but process the 4000 orders received monthly.

In contrast, Friel works solo from his home in lowa, with his wife and sister lending a hand. His main sources of advertising and distribution are the five networked bulletin boards that he runs from his home and a roundtable on General Electric's GEnie. He is notoriously difficult to contact.

Until two and a half years ago, when he began to get more money in the mail than in his paycheck, Friel worked as a systems programmer/analyst for John Deere in Waterloo, Iowa. His commercial expectations are decidedly laid back. If users fail to send in a \$30 registration fee, he shrugs it off. He wrote the software, he says, for the technical challenge and the personal enjoyment. —J. G.

lie Fiering, manager of advanced technology at Banker's Trust in New York City. "I don't think that's true anymore." Fiering, a member of the executive board of the Microcomputer Managers Association, believes that the longevity of some shareware houses has helped to brighten the corporate view.

Most well-known shareware authors get more than half their receipts from corporations. John Friel III sold more than 600 site licenses for his *Qmodem SST* communications program, including one to Disneyland. "Even Mickey Mouse is a *Qmodem* user," quips Friel. *Qmodem*'s closest competitor, *ProComm*, is licensed even more extensively.

Nevertheless, corporate purchasing orders come hard for shareware, Fiering says. Products are unlikely to sneak in the door unless a corporate PC enthusiast picks a package off a BBS. And many corporate information managers feel that dialing into a BBS is a demeaning experience, says Cheryl Currid, manager of sales systems, planning, and information for Coca Cola Foods in Houston, Texas.

On a darker note, some businesses still fear that shareware companies will sue if some users fail to register. "But that's just preposterous," says Currid.

Ironically, shareware has growing appeal for corporations precisely because of the flexibility its authors show in negotiating licenses. Walter Kennamer, a senior manager in the national computer audit group at Ernst & Whinney, emphasizes that allure. "With 6000 PCs, it's very important for us to avoid the administrative hassles of keeping track of individual software packages," explains Kennamer. "We've had very good luck negotiating with shareware authors for site licenses."

Among shareware's added attractions is personal attention from its developers. If Currid feels that a key feature or two is missing, she says, she'll call the author directly and ask for an enhancement. When possible, authors are usually glad to make the effort.

### **Weekend Warriors**

The most prosperous shareware publishers follow a definite pattern. Their products start as weekend programming projects and slowly evolve into a cottage venture. Then, almost overnight, the venture blossoms into a full-scale business with full-time employees and office suites.

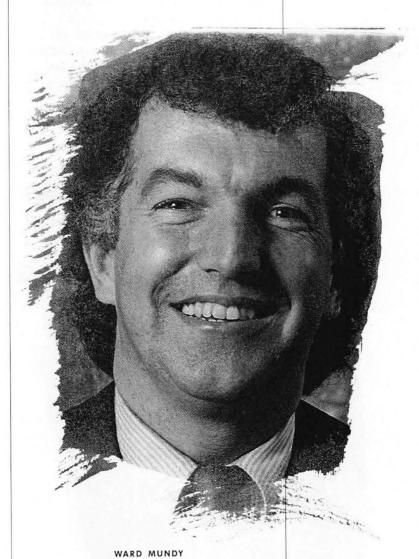
Bob Wallace, who is credited with coining the term *shareware*, is probably the best-known shareware entrepreneur. In 1983 Wallace left his job as one of Microsoft's first staff programmers, started Quicksoft with \$10,000, and wrote *PC-Write*; soon afterward he hired his first employee. The following year he grossed \$380,000. *PC-Write* now tallies more than 30,000 registered users and 77,000 purchasers of a user certificate, which gives the right to use the program; the company itself has more than 25 employees. "Shareware's great," Wallace says simply.

Jim Button was an IBM systems engineer when he wrote *PC-File* in 1982. "When I posted a shareware notice on it," he says, "my wife told me, 'You really are a crazy old man if you think anyone is going to pay you a penny voluntarily for that program." Within weeks, however, registrations were piling up so fast that Button had to rent a bigger mailbox. His ButtonWare firm now boasts a staff of 20 and eight products, and over 1000 dealers carry the packages. But Button still relies on shareware channels as his primary outlet.

Magee created *Automenu* while working his way through college as a programmer and consultant. After watching a client's secretary struggle with DOS, Magee wrote a simple menuing program. Then he uploaded the software to an Alabama BBS, and \$20 user registrations started trickling in. The first year he made nothing, the second only \$200, the third \$15,000, and the fourth \$175,000. Last year Magee's sales topped \$750,000.

But for every such prominent success story, there are at least a dozen stay-at-home shareware authors, some of them also quite successful (see "Buyers' Guide: Best of Shareware" in this issue). That's the case with Ward Mundy, author of the dBASE III clone WAMPUM (for Ward's Automated Menu Package Using Microcomputers). Di-

rector of information systems for the U.S. Court of Appeals in Atlanta and a PC consultant, Mundy wrote *WAMPUM* for private clients who lacked the expertise to write in *dBASE*. Today, between 40 and 100 \$25 registrations arrive at his home daily. "My



WAMPUM, A \$25 DBASE III CLONE,
HAS TURNED INTO A
PROFITABLE HOME BUSINESS.

2-year-old and 3-year-old lick the stamps," he says. "My wife answers the phone—much to her chagrin."

Phil Katz wrote *PKARC* one weekend "because it was something to do." Circulating on BBS's for just two years, the \$20 data compression package boasts over 2500 registered users and a sizable roster of site licensees. Katz did all the tech support and public relations himself via bulletin board until last year, when he hired his sister and a part-time employee and enlisted his mother



JERRY MEDLIN
DESPITE SCARES,

BULLETIN-BOARD VIRUSES ALMOST NEVER
THREATEN SHAREWARE USERS.

as a corporate officer. Katz recently quit his full-time job as a software engineer.

Four years ago a software publisher asked Marc Adler to write a UNIX word processor. When the publisher did a poor job of marketing it, Adler reclaimed his stake, ported the software over to the PC, and renamed it *New York Word*. Now, he says, the \$40 package claims 1200 registered users plus a few site licensees. "Only 1 to 5 percent of the people who use it ever pay," Adler estimates. "But the encouraging letters from people using your program make it all worthwhile."

Jerry Medlin got his start nine years ago writing accounting software for the Radio Shack Model 1. Now the Napa, California, accountant distributes as shareware four \$35 small-business accounting programs that bear his name: Jerry Medlin's General Ledger, Accounts Receivable, Payroll Writing, and Accounts Payable. The accounting series garners about 200 new users per month. "I suppose there are people out there who are using the program and not paying," Medlin says, "but we try not to think about them."

### **Taking Stock of Shares**

Beginning with all the users who never pony up, shareware has its share of woes. Many magazines balk at reviewing such packages. Some mail-order vendors bundle the software with public-domain packages and hawk them with claims such as, "100 free programs for \$10." A few authors have even seen their programs bootlegged—sent out with someone else's "pay me" request.

Nor are all shareware products born equal. "The upper echelon of shareware programs is certainly on a par with commercial software," says Kennamer. "But there are more and more of those programs that someone whipped out over a weekend."

Then there are scares about Trojan horse and virus programs. A *Trojan horse* conceals a potentially malevolent program that remains hidden and dormant until some condition or time, such as April 1st or Friday the 13th, triggers it. The invading program is often a *virus*, a program that can reproduce and secretly attach a copy of itself to other files. The virus then spreads to other systems when infected files (new Trojans) are

later innocently downloaded or copied.

Katz was hit hard earlier this year by a Trojan—a reputed bug fix for *PKARC* that would turn a healthy copy of the program into a Trojan. While none of the other authors polled have spotted Trojan versions of their programs, most have taken measures to safeguard their code and to copyright screens against tampering.

But authors generally agree that virus programs are more hype than reality. "I've never seen a virus, and I've never known anyone who has," says Medlin. "Not only that, the Association of Shareware Professionals has actually been spending a lot of time trying to track one down and reproduce it, but so far we haven't been able to do so."

The association, which just celebrated its first birthday, also educates the public about the differences between shareware and public-domain software and aims to establish professional standards for the genre. However, not all programmers are falling into line.

Vernon D. Buerg, perhaps the most widely known of public-domain authors, calls shareware a marketing ploy. "I'm not opposed to money, but I think that there should be more sharing," he says. His *List* text-viewing package includes a suggestion that users send him a "gift" of \$15, but that was tacked on simply to stop friends from nagging him, he says.

Shareware advocates, though, see a radiant future. *Qmodem* author Friel points to all the hackers who may have great ideas but don't know any venture capitalists. "How are they going to get their programs out to the world unless they distribute them as shareware?" he asks. "As bright young kids see the shareware successes, they'll realize this is the only way to show their own potential."

Coca Cola's Currid agrees. "You don't develop good software with written specs and bureaucratic procedures," she says. "If you want something really innovative, you turn a guy loose and let him do what he wants. That's what shareware is."

### LEARNING TO SHARE

The quickest way to join the share-ware scene is to dial into local bulletin boards or major on-line networks. But once you hook up, you may find yourself confronting a list of "downloadable" files longer than Deuteronomy. All of these probably have been compressed, so your first task is to download the applicable data-compression software. Beyond that, though, which packages will you want?

Your best source of information is other users. Not only can share-ware aficionados steer you to the best programs for your needs, they can tell you how long the program's been around and how reliable the author is when it comes to bug fixes. So post a query on the bulletin board, or ask around at a user group meeting.

If you'd rather not deal with a BBS, try organizations that offer shareware on disk. PC-SIG is the most famous. The Houston Area League of PC Users' Public (Software) Library is another invaluable source. And don't neglect your user group, which is likely to keep its own extensive software library.

If you really want to exploit the bounty of shareware, assign one person in your company the task of searching and sorting it out, says Coca Cola's Cheryl Currid. She suggests buying subscriptions to BBS's with large collections of shareware and public domain programs. (Depending on where you live, long-distance phone calls to download software may be cheaper than connect time on services like CompuServe.) She also recommends keeping abreast of publications like Nelson Ford's Public (Software) Library Newsletters and user group

Should you be dogged by fear of Trojan horses, choose your distribution channels wisely. Download from bulletin boards with good reputations and keep abreast of Eric Newhouse's "Dirty Dozen," a regularly updated list of Trojans that is available on bulletin boards. The list also provides invaluable advice on protecting your system from Trojans. —J. G.

### The Public (Software) Library

P.O. Box 35705 Houston, TX 77235-5705 713/721-5205

### PC-SIG

1030D E. Duane Ave. Sunnyvale, CA 94086 800/245-6717, 800/222-2996 California

### **Eric Newhouse's Crest**

RBBS/CAMS (national clearinghouse for Trojans) 213/471-2518

Judy Getts, a PC World contributing editor, writes on communications issues from Wauwatosa, Wisconsin.

For more information on products mentioned in the article, see Buyers' Guide: Best of Shareware.

Our shareware expert spotlights the best in low-cost, highpower programs. Before you spend big bucks on commercial software, check our guide for economical alternatives.



hen you spend hundreds for off-the-shelf namebrand applications, the greater part of your software dollar goes for fancy user interfaces and documentation as well as unseen marketing and sales forces. The best shareware word processors, spreadsheets, data bases, and utilities compete strongly with commercial applications in features, ease of use, and bug-free power but sell for a fraction of the cost. (Just don't expect them to run under Windows.)

A number of on-line and off-line sources offer shareware free of charge, with the expectation that satisfied users who adopt a program for regular use will pay a registration fee. Besides the fact that dodging fees is just not right, it can also mean missing out on accompanying documentation, telephone support, and program upgrade notices that are usually well worth the fee.

If you subscribe to an on-line service like *GEnie*, *CompuServe*, or *The Source* that maintains libraries of downloadable software, you can retrieve any program in our Buyers' Guide at normal on-line rates. Programs on these systems are stored in compressed format to minimize transfer time and storage space, so you'll need a program like *PKARC* (listed in the guide) to decompress downloaded files.

If you're not the modeming kind, user group libraries and commercial shareware distributors are another rich source of software. The premier distributor, PC-SIG, pub-

George Campbell

lishes a catalog, *The PC-SIG Library*, that lists thousands of programs (see *Sourcebooks*, *PCW*, March 1988, for a review). PC-SIG sells programs for \$6 a disk in both 5½-inch and 3½-inch formats, or you can buy the entire library on CD ROM for \$295. Contact PC-SIG at 1030-D E. Duane Ave., Sunnyvale, CA 94086; 800/245-6717, 800/222-2996 in California.

Before you use a downloaded program, be sure to read any accompanying documentation files. Most programs include a README file that contains instructions for viewing or printing the manual, as well as important remarks on using the program.

Another good idea—especially for frequent on-line sojourners—is to back up your hard disk regularly. Viruses and Trojan horses sneak onto your hard disk to later wreak varying degrees of havoc. On-line services, commercial distributors, and most user groups carefully test software before placing it in their libraries. Private bulletin board systems are not always as meticulous, so novices might be better off staying with reliable sources.

Besides providing brief descriptions of top shareware applications in several major categories, this Buyers' Guide offers an extended list of indispensable utilities. Developers' addresses and phone numbers are listed where available, along with any services—beyond the basic permission to use the program—that come with the registration fee. Many programs do not charge a registration fee, even though they are still copyrighted and owned by their authors; others have been released to the public domain. In either case, the developers have little or no intention of offering technical support, upgrades, or any other service. Use this guide to help find the program that offers the right mix of features, services, and price for you.

### WORD PROCESSING

Galaxy 3.0 An easy, no-frills, menu-driven word processor that includes a spelling checker and reads *WordStar* files directly. OmniVerse, P.O. Box 2974, Renton, WA 98056; 206/228-7627. Registration fee: with printed manual and unlimited phone support \$49.95.

New York Word 2.21 A command-driven word processor with on-line help, NYW's features include math functions, line drawing, windows, footnoting, indexing, mail merging, and macros. Magma Systems, 138-23 Hoover Ave., Jamaica, NY 11435; 201/792-3954, 8 p.m. to 11 p.m. Registration fee: with printed manual \$45.

PC-Write 2.71 The shareware word processor with the largest number of registered users, *PC-Write* offers a spelling checker, on-line help, good printer and mouse support, windows, and macros (see *From the Software Shelf, PCW, August 1987)*. QuickSoft, 219 First Ave. N #224, Seattle, WA 98109; 800/888-8088. Registration fee: with printed manual and unlimited phone support \$89.

### DATA BASE MANAGEMENT

**3X5 4.0** This flat-file manager can store data free-form or in a traditional field structure. An enhanced version, 3x5+, offers variable-length records, improved indexing, report generation, and a word processor. Softshell, 1254 Thornbury Rd., West Chester, PA 19380; 215/793-1431. Registration fee: with product newsletter and support by mail \$49.95 (3x5), \$69.95 (3x5+).

PC-File + 2.0 Probably the most popular of all shareware programs, PC-File + can handle data bases as large as 65,792 records. The program is fast, powerful, and easy to learn. A relational report generator, a label utility, macros, context-sensitive help, and a word processor are built in. ButtonWare, P.O. Box 5786, Bellevue, WA 98006; 800/JBUTTON. Registration fee: with printed manual and one year's support \$69.95; after the first year, support costs \$35 a year.

**WAMPUM 3.1** WAMPUM is comparable to dBASE III in features and power but offers a menu-driven interface. It uses a dBASE III-compatible file structure and offers network support, multiple indexes, relational

functions, printer templates, macros, and password protection. Ward Mundy, 4160 Club Dr., Atlanta, GA 30319. Registration fee: for individual computers \$25, for network applications \$50.

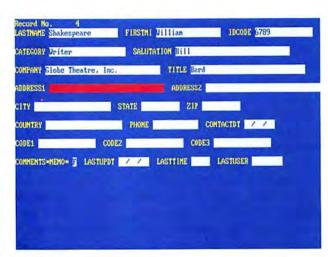
### SPREADSHEETS

ExpressCalc 3.0 This spreadsheet looks, feels, and acts like 1-2-3 but can't handle worksheets larger than 64 columns and 256 rows. Automatic data-type recognition and recalculation, familiar commands, hidden cells, and flexible reports make ExpressCalc functional, if not flashy. Expressware, P.O. Box 230, Redmond, WA 98073; 206/481-3040. Registration fee: \$49.

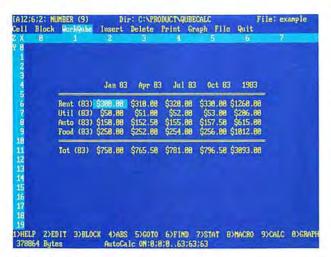
PC-Calc + 1.0 A powerful sibling of ButtonWare's PC-File +, PC-Calc + offers automatic graphing, split screens, context-sensitive help, macros, and coprocessor support, and it imports ASCII, DIF, 1-2-3, Symphony, and comma-delimited files. ButtonWare. Registration fee: with printed manual and one year's support \$69.95; after the first year, support costs \$35 a year.







WAMPUM



Alt-S Split Scrn Toggle Alt-T Screen Dump Alt-U Scroll Back Toggle Alt-A Iranslate Table Alt-X Change Comm Port Alt-L Log Drive Change Alt-M AMSI Music Mode Alt-B Beeps and Bells Alt-C Clear Screen Alt-D Dial Phone Alt-V View Edit File Alt-V Disk Directory Alt-X Exit Qmoden Alt-Y Delete a File Alt-Z Xon/Xoff Toggle Alt-B Session Log Toggle Alt-N Invoke QINSTALL Alt-O Change Sub-Dirs Alt-P Change Baud Rates Alt-E Character Echo Alt-F SCRIPT Execution Alt-G Terminal Emulation Alt-H Hang-up Moden Alt-I Program Info Alt-Q Redial Last Number Alt-R DOS Shell 8 Bit Toggle Alt-1 BS-DEL Suitch Capture File Up-Arrou Scroll Back Shft-Tab Add Linefeed Download Files Upload Files Ctrl-End BREAK Signal Ctrl-PrtSc Printer Echo PgUp Alt-2 80x25 Alt-3 80x35 Alt-4 80x43 Alt-5 80x50 Alt-6 80x57 ——I Copyright 1-The Forbin Project [ Qnoden Toggles 1-I Tine 1 110 110 Capture OFf 17:28:23 4945 Colfax Avenue S. Minneapolis, MN 55489 Support # : 612-824-1451 Linefeeds Scroll Back ON 110 110 Xon/Xoff Printer [ Online 1 LOG Session 00:02:28 8th bit usage ON Data Line : 612-824-8167 any key combination, [F1] for Help, or [ENTER] to retur

**Qmodem SST** 

**QubeCalc** 

**QubeCalc 3.01** A three-dimensional spreadsheet, comparable to *Boeing Calc* or *microCUBE*, that features context-sensitive help, *1-2-3* file compatibility, graphing, and macros. You can link several worksheets, move between worksheets with a single keystroke, or use data from any layer in calculations. FormalSoft, P.O. Box 1913, Sandy, UT 84091-1913; 801/565-0971. Registration fee: with printed manual \$69.95.

### COMMUNICATIONS

**Boyan D3** *Boyan* uses a command structure similar to *ProComm*'s and offers on-line help, a powerful script language, automatic upload pacing, and a 200-number dialing directory (see *The Software Shelf, PCW*, May 1988). Justin Boyan, 9458 Two Hills Ct., Columbia, MD 21045; 919/682-4225 (BBS). Registration fee: with BBS support \$35.

**ProComm 2.42** *ProComm* offers many popular file-transfer protocols (including CompuServe B), <Alt>-key commands, a host mode, powerful script files, and easy configuration for any system. Datastorm Technolo-

gies, P.O. Box 1471, Columbia, MO 65205; 314/474-8461. Registration fee: with printed manual \$50, without manual \$25.

**Qmodem SST** A major upgrade of *Qmodem*, *Qmodem SST* supports high-speed modems and multiple file-transfer protocols. A script language, on-line help, remote operation capability, a 200-number dialing directory, and mnemonic commands make it competitive with state-of-the-art commercial programs. The Forbin Project, P.O. Box 702, Cedar Falls, IA 50613; 319/232-4516. Registration fee: \$30.

### **GRAPHICS**

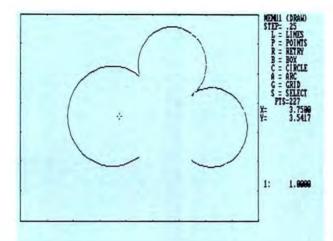
Curve Digitizer 3.0 This low-end, menu-driven CAD program is similar to AutoSketch, but it offers more features and is easier to learn. The program supports both mouse and cursor key pointing. It works with CGA, EGA, and Hercules boards and offers automatic box, circle, and arc generation, plus rotation, auto-dimensioning, and zooms. West Coast Consultants, 4202 Genesee Ave. #309, San Diego, CA 92117; 619/565-1266. Registration fee: with printed manual and unlimited phone support \$89, with manual alone \$49.

Flicker 2.12 Flicker is a slide-show presentation program that features scrolls, wipes, and fades; text and graphics integration; a screen-capture utility; image editing; and a simple but versatile script language. Brian Dooley, 14 Northgate Village, Burlington, NJ 08016. Registration fee: with printed manual \$25.

PC-Art 3.1 An excellent starter paint program for CGA and EGA users, *PC-Art* includes Microsoft Mouse and joystick support, zooms, fill patterns, text fonts, box and circle functions, and an image library. Mike Stone, 201 Heyden Dr., Eureka, MO 63025. Registration fee: \$25.

### DESKTOP UTILITIES AND DOS SHELLS

Automenu 4.0 This menuing system offers multiple nested menus that you create with an easy-to-learn editor. It also features on-line help, password protection, and mouse support. Magee Enterprises, P.O. Box 1587, Norcross, GA 30091; 404/446-6611. Registration fee: with printed manual and BBS support \$50.





**Curve Digitizer** 

Automenu

Baker's Dozen This collection of handy, nonresident desktop utilities includes a DOS shell, a mini-spreadsheet, a calendar, a file locator, text search features, sideways printing, screen capture, and a disk utility similar to that of *The Norton Utilities*. ButtonWare. Registration fee: with printed manual and one year technical support \$59.95; after the first year, support costs \$30 a year.

Homebase 2.5 A slick memory-resident utility, Homebase includes a DOS shell, a text editor, a data base, an appointment manager, a calculator, a communications program, and text cut-and-paste functions (see "Homebase-There's no Place Like It," PCW, July 1987). The program uses 180K of memory. Brown Bag Software, P.O. Box 60000, San Francisco, CA 94160-1719; 800/523-0764, 800/323-5335 in California. Registration fee: with printed manual and one year toll-free phone support \$89.95, with printed manual but no toll-free phone support \$49.95, program use only \$29.95.

**ShortCut 2.05** This versatile, fast, and intuitive memory-resident DOS shell, which you can unload from memory on command, has a moving bar menu and context-sensitive help.

Mossy Rock Systems, P.O. Box 420876, Sacramento, CA 95841; 916/334-5542. Registration fee: with printed manual \$30.

### UTILITIES

Program file names appear in parentheses to assist in on-line searches.

**BigEcho** (BIGECHO.ARC) This utility generates more than ten different large fonts on any display and is excellent for use within batch files. CTRLALT Assoc., 260 S. Lake Ave. #133, Pasadena, CA 91101. No registration fee.

**Boots** (BOOTS.ARC) *Boots* reboots your PC from the command line. It can do warm boots, cold boots, or lock out the <Ctrl>-<Alt>-<Del> function. Public domain.

Editor88 3.0 (E88.ARC) This small text editor with on-line help is ideal for creating short text files and batch files. M.R.E. Software, 150 Jones St., West Point, MS 39773. Registration fee: \$10.

### Extended Batch Language 3.08

(EBL.ARC) This utility lets you add user input functions, conditional branching, and other programming language features to batch files. Seaware, P.O. Box 1656, Delray Beach, FL 33444; 305/392-2046. Registration fee: with BBS support and additional on-disk documentation \$49.

FastCopy 2.0 (FSTCPY2.ARC)

This utility uses both floppy drives to make multiple copies of disks twice as fast as DOS does. Systems Software Support, P.O. Box 751022, Houston, TX 77275-1022; 713/484-8060. Registration fee: \$20.

FastScreen2 (FSTSCRN2.ARC)
This program converts a text file to a
.COM file that displays the text on
screen. It's perfect for batch files and
for displaying help files and menus.
Public domain.

**FixBeep** (FIXBEEP.ARC) Alter the frequency and duration of your computer's beep, or turn it off altogether. Mike Blaszczak, 112 Verlinden Dr., Monroeville, PA 15146. No registration fee; \$5 contribution suggested.

**Fkey** (FKEY.ARC) This utility reassigns function keys to produce DOS commands or other text strings. Public domain.



Filename.Ext	Bytes	Last Update	Filename.Ext	Bytes	Last Update
APR88		01/11/88 09:48		184	86/82/88 10:47
ASSIGN		12/89/87 11:38	HU .PGH	296768	18/12/87 13:48
AUG88		05/13/88 11:34	MV428792.TMP	1824	05/26/88 18:42
COMM		18/12/87 14:38	NORMAL .GLY	1024	18/12/87 17:38
CURRENT		18/12/87 14:49	VONLINE		01/05/88 12:06
FEB88		11/11/87 18:32	OUTLINE .STY	1824	18/12/87 13:41
FULL .STY	1536	18/12/87 13:41	PLAIN .PRD	852	11/13/87 10:49
HP2000 .GLY	1536	18/12/87 13:41	POSTSCRP. INI	10434	83/16/88 12:19
HYPH .DAT	24872	18/12/87 13:41	POSTSCRP.PRD	16350	83/16/88 12:19
JULBB		84/19/88 11:45	SAMPLE .STY	1824	18/12/87 13:41
JUNES		83/18/88 85:33	SEMI .STY	1536	18/12/87 13:41
LOG		86/82/88 18:26	SIDEBY STY	1824	18/12/87 13:41
MACRO .GLY	15360	18/12/87 13:41	SPELL-AM.EXE	111948	18/12/87 13:41
MAKEPRD .EXE	30450	18/12/87 13:43	SPELL-AM.HLP	3715	18/12/87 13:42
MAR88		12/82/87 15:59		175173	18/12/87 13:42
BBYAN		82/18/88 11:44	TTY .PRD	852	11/13/87 18:48
MEHO		11/25/87 12:56		468	85/11/88 13:51
MEMO .GLY	648	18/12/87 13:41		327488	18/12/87 13:43
MERGEPRD. EXE	46887	18/12/87 13:41		51710	18/12/87 13:40
MOUSE .SYS	14325	18/12/87 13:44			18/21/87 12:28
HU .HLP	65886	18/12/87 13:48			
		Bytes 2392 Sec			
	101100	29103 2372 000			
C:\WORD>					

BigEcho

SDL

FXMaster 3.2 (FXMASTER.ARC) This memory-resident printer utility lets you set all functions of an Epson MX/FX/LX or compatible printer from a pop-up menu. Brian Raub, 14 Rolling Rd., Overbrook Hills, PA 19151. Registration fee: \$10.

**List 6.2a** (LIST62A.ARC) Infinitely superior to DOS's TYPE command, *List* lets you browse through a file in any direction. Vernon D. Buerg, 456 Lakeshire Dr., Daly City, CA 94015. Registration fee: \$15.

LQ 2.0 (LQALL.ARC) This memory-resident print-enhancement utility creates multiple fonts and letter quality output on your 9-pin Epson-compatible printer. Granny's Old-Fashioned Software, Rt. 4, Box 216, Boone, NC 28607. Registration fee: \$35.

MasterKey (MSTRKEY.ARC, MKEY.ARC) A full-featured DOS utility program comparable to *The Norton Utilities*. R. P. Gage, 1125 6th St. N #43, Columbus, MS 39701. Registration fee: \$20.

**Move 1.0** (MOVE.ARC) This utility copies files from one directory to an-

other, then deletes the original file. Excel-Soft, 24 High Point Rd., Lincroft, NJ 07738. Registration fee: \$10.

PKARC 3.5 (PKX35A35.EXE) The best file compression and archiving utility available. PKWare, 7032 Ardara Ave., Glendale, WI 53209. Registration fee: \$20.

**Qdups 1.5** (QDUPS.ARC) This utility locates duplicate files on your hard disk and lets you choose which ones to delete. Claude Biron, 103 W. 23rd Ave., Vancouver, British Columbia, V5Y 2H1 Canada. No registration fee; \$15 contribution suggested.

Ramdisk (RDISK.ARC) You can change the size of this removable RAM disk or unload it from memory at any time. Public domain.

**SDL 3.0** (SDL.ARC) This two-column version of DOS's DIR command also lists file attributes. Public domain.

**TheDraw 2.21** (TDRAW221.ARC) This ANSI-based screen design utility for programmers features color, animation, and on-line help. TheSoft Programming Services, 1929 White-cliff Ct., Walnut Creek, CA 94596. Registration fee: \$10.

Timer 1.5 (TIMER.ARC) This utility times the length of use of any program and displays it on screen when you quit—useful for billing purposes. Calvin Shields, 6605 Lure Ln., Louisville, KY 40229. No registration fee; \$1 contribution suggested.

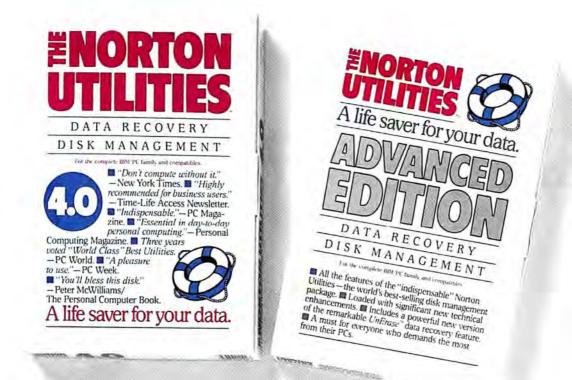
**TSR 1.6** (TSR.ARC) Unloads memory-resident programs, freeing system RAM. Public domain.

**Waitn** (WAITN.ARC) Allows you to pause batch-file execution for a specified length of time. Public domain.

Whereis 4.0 (WHEREIS4.ARC) Searches multiple disk drives for files; accepts wild cards. Public domain.

**XEQ** (XEQ.ARC) Saves disk space by archiving short .COM files into a single library file. Hardwood Software Assoc., 143 Ash St., Hopkinton, MA 01748. No registration fee.●

George Campbell is a contributing editor for Compute's PC Magazine, for which he writes a column on shareware.



# vitsno

At last.

After five long years alone at the top of the best-seller lists, the Norton Utilities™ is being challenged by another software package.

Which is no small feat, considering that Version 4.0 is selling even faster than its prede-

cessors did.

Unfair competition. Of course, in order to compete with the Utilities, this upstart new package first had to copy it.

It had to include the famous *UnErase*," which has rescued the derrières of thousands of grateful PC users.

As well as the unique File Info, which lets you attach descriptions of up to 65 characters to your files.

Not to mention the Norton Integrator, which lets you control everything from a single program and gives you on-line help for each function.

In fact, The Advanced Edition of the Norton Utilities includes every single one of the features, functions and enhancements that have made Version 4.0

so popular.

Right down to the user interface which, according to the InfoWorld Review Board makes the Advanced Edition "as easy to use as possible."

And that's not all.

The more the merrier. Because the Advanced Edition goes on to include a wish list

of brand new technical features and functions.

Like Speed Disk, for tightening up disk space and optimizing access.

And Format Recover, for unformatting your accidentally reformatted hard disk.

As well as a FAT Editor, a Partition Table Editor, a Directory Editor and access to absolute disk sectors.

All of which explains why InfoWorld called the Advanced Edition "a great program that has gotten even better."

We just call it good company.



Designed for the IBM\* PC, PC-AT and DOS compatibles. Available at most software dealers, or direct from Peter Norton Computing, Inc., 2210 Wilshire Blvd. #186, Santa Monica, CA 90403. To order: 800-451-0303 Ext. 40 (VISA and MasterCard welcome). MCI Mail: PNCL Fax 213-453-6398. © 1987 Peter Norton Computing.

### **Word Speedup Tips**

A treasure trove of tips lends wings to Microsoft Word.

There's something for everyone, whether you use version 3.0 or 4.0.



George Campbell icrosoft Word is one of those products that does practically everything right but often takes its time about it. The program's latest incarnation really flies (see "Word 4.0: Fast at Last," PCW, February 1988), but impatient users always want to stretch the envelope. Thanks to some little-known tricks, you can push versions 3.x and 4.0 to their limits without buying extra utilities—or strapping on test-pilot gear.

### Jump-Start 3.0 in Character Mode

Word's graphics mode is one of its most popular features, but the price of being able to see italics and other real-life formatting is slow scrolling. One of the easiest ways to speed up Word 3.x is to start it in character mode (4.0's default). Rather than typing WORD at the DOS prompt to load the program,

type WORD/C. Depending on your processor, the payoff is at least a 25 percent speed gain.

In character mode, most text attributes are represented by underlining or color changes, depending on the monitor type. Unless you're preparing a document with a number of character formats, character mode should be sufficient; you can always load Word in graphics mode (WORD/ G) later to view those italics. In Word 4.0 you can toggle instantly between character and graphics modes by pressing <Alt>-<F9>. If your enhanced color display is driven by an EGA with only 64K, you can get a high-resolution black-and-white graphics mode (instead of the coarse CGA-emulation mode) by starting Word with the /M switch.

### Specify the File

To start work faster, you can simultaneously bring up *Word* and the file you want to edit using a single DOS command. At the prompt, simply type WORD, a

space, and the name of the desired file. The file can be located in any drive or directory; just include the drive and/or path before the file name. For example, the command WORD C:\DOCS\REPORT tells Word to load the file REPORT.DOC located in the \DOCS directory of drive C:. You can also use this technique to create a new file quickly—just specify the new file's name and answer Y to the 'Enter Y to create file' prompt.

If you want to edit the last file you worked on, you can even dispense with the file name. Type WORD/L at the DOS prompt, and *Word* pops open the document and shoots the cursor to its last location in the file. (Note that switches can also be combined: To edit the last file in character mode, you'd type WORD/L/C.)

### Create Printer Templates in 3.0

When you start Word 3.0 without specifying a file, it assumes that the first printer and the first font listed for that printer are the defaults. (Word 4.0 defaults to those of the last file edited.) Changing those values for each new document means wending your way through Word's multilevel Print and Format menus. But there's a better and faster way: Load Word 3.0 with an empty file that has the de-

faults you want, type in the new document, and save the results under a different name. You can use a printer template with any document and generate a library of custom printer templates for any number of special occasions.

To create a template, start Word 3.0, open a file named SETUP.DOC, press the <Space> bar once, press <Esc>, and type PO to reveal the Print Options menu. Select the printer and any desired options, and press <Enter> to record your choices. Move to the Format Character menu with <Esc>FC, tab over to the 'font name:' option, select a font, and press <Enter>. Then save this file.

The next time you want to create a new document with this specific printer configuration, type WORD SETUP at the DOS prompt, press <Enter>, and type merrily away. Save the document with a different name, and the SETUP.DOC template is preserved.

### Remove Menu and Borders

If you want to cut down on scrolling, enlarge the on-screen working area by removing *Word 3.x*'s three-line menu. *Word 4.0* users can gain another few lines by removing screen borders. To suppress the menu display, press <Esc> and select Options. At the 'menu:' option, select No. In *Word 4.0*, skip over to the 'screen borders:' option and like-

wise select No. Press <Enter>, and the menu and 4.0 borders vanish. As with all Options choices, these settings become the default when Word starts. Note that the menu reappears whenever you press <Esc>.

### Speed Up the Cursor

If you use Word 4.0, there's a trick hiding in the Options menu that accelerates Word's cursor and all keystroke repeats. Look for the 'cursor speed:' option and enter a number from 0 (very slow) to 9 (lightning fast); Word's default is 3. On an AT, 5 is probably right; on an XT, you may want a higher setting.

### Use 4.0's Autoexec Macros for Repetitive Tasks

Now that Word 4.0 features a macro processor equal to Word-Perfect's, you can put macros to work speeding up mundane operations. For example, you can quickly create a macro that always directs Word at start-up to log on to a specific directory, such as C:\WORD\LETTERS, and present a directory listing. The secret lies in modifying Word's Autoexec glossary, which automatically executes whenever Word is loaded.

To make such a macro, you would load Word 4.0, start

macro recording by pressing <Shift><F3>, select <Esc> Transfer Options, type C:\WORD\LETTERS, and press < Enter>< F1>. Then press <Shift>-<F3> to end macro recording. When Word prompts you for the name of the macro by displaying 'COPY to: { }' at the bottom of the screen, you would type Autoexec and press <Enter>. (If you also wanted to trigger this macro with a <Ctrl>-key combination, such as <Ctrl>-LT, you would type Autoexec^<Ctrl>-LT instead.)

If you want this macro to run every time Word loads, save it in Word's default NORMAL.GLY glossary, by selecting <Esc> Transfer Glossary Save and

### **POWER TIP NO. 4**

### Quick Microsoft Word Spelling Checks

To track down a single guestionable word with the Microsoft Word spelling checker, you must select Lookup from the Library Spell menu, type in the word, and press < Enter>. As a faster alternative, try the thesaurus. By pressing <Esc>LE (or <Ctrl>-<F6>), you can confirm whether your suspect word exists and, if so, whether it's misspelled. The thesaurus also suggests other words you might be looking for-often, the correct one.

> Robert Luhn Senior Editor

pressing <Enter>. If you later want to remove the macro from NORMAL.GLY, select <Esc> Transfer Glossary Clear. Press <F1> to list the glossary names, select the one you want to zap, press <Enter>, and answer Y to the 'Enter Y to erase glossary names' prompt.

### Use Glossaries to Save Keystrokes

To shave seconds off the time it takes to enter text, create a personal glossary of oft-used words and phrases. When you find yourself repeatedly typing a phrase like as soon as possible, add it to the glossary. Later, you'll be able to insert a word, a phrase—even whole paragraphs—with a few keystrokes. The trick works with versions 3.x and 4.0.

Any combination of characters can be added to the glossary. Simply highlight the text in question and select <Esc> Copy. At the 'COPY to: { }' prompt, supply a memorable kevword, such as ASAP, and press <Enter>. The entry now has a name-but no glossary to call home. To create the glossary and save the entry, type select <Esc> Transfer Glossary Save. You'll notice that Word suggests NORMAL.GLY as a glossary name. Since you're creating a special glossary, replace NOR-MAL.GIY with some easy-to-remember name-such as MY-GLOSS—and press <Enter>.

Now you must attach the glossary to the current document. Select <Esc> Transfer Glossary Merge, enter the name of the glossary (MYGLOSS), press <Enter>, and you're ready to roll. To insert the phrase as soon as possible, simply type the keyword ASAP, press <F3>, and the text pops into place. You can stuff more phrases into the glossary at any time and retain character or paragraph formatting information already in effect. When you exit Word or load a new document, you'll be prompted to save the altered glossary.

If you use a dummy SET-UP.DOC file when starting Word, you can merge this personal glossary with the default NORMAL.GLY glossary, and it will be loaded every time Word is started. To merge the two glossaries, select <Esc> Transfer Glossary Merge and type SETUP.DOC. But if the glossary is a highly specialized one that's used only occasionally, save it separately and call it up as needed.

### **Format Documents First**

If you think a new document's style will be relatively uniform throughout, format the piece before you enter any text. By preselecting such variables as page size, font, justification, and margins, you can save many steps at print time and monitor the changing appearance of your document. The technique is much faster than using Word's style sheets, which are best suited for complex documents that incorporate many formatting changes. Just make sure you're satisfied with the format you choose.

Before entering any text, press <Enter> four or five times to create some blank lines. Press <Shift>-<F10> to select the area. Now use *Word*'s menus or its shortcut formatting keys to set margins, page size, line spacing, and any other characteristics you will use throughout the document. Once the basic format is in place, return the cursor to the top of the screen and start typing. The text will automatically conform to the electronic mold you've created.

If you generate a variety of documents requiring different formats, create a series of matching preformatted SET-UP.DOC files as described earlier, load the appropriate file, and start typing. Don't forget to save the completed document with a different file name to preserve the template.

If you use *Word 4.0*, you can save even more time by creating macros to automate the preformatting process. In addition, you can use 4.0's line-draw function to create forms for receipts and invoices.

### Search and Highlight Text Fast

Word has few peers when it comes to speedily selecting a sentence, line, or paragraph for block operations. But selecting a word or a phrase located far from the cursor can be maddeningly slow, especially if you use Word 3.x or lack a mouse. With Word's search function, however, you can select a word or phrase in a flash. If you need to highlight text starting at the cursor, switch on Word's Extend Selection command first by pressing <F6>; this technique works when searching both forward and backward in a document.

To quickly select a word, issue <Esc> Search, enter the text, and press <Enter>; Word zips to the word and highlights it. If you want to select a swatch of text starting at the cursor, press <F6>, issue <Esc> Search, type in the few words at the end of the desired text, and press <Enter>.

Similarly, you can use Word's Jump command to highlight text from the cursor to a specific page. (Naturally, you must paginate the document with <Esc> Print Repaginate before using the Jump command so you know where you're jumping to.) That done, you can press <F6> to anchor the extended selection highlight, issue <Esc> Jump, supply the page number, and press

### POWER TIP NO. 5

### Generic Print Files in Microsoft Word

Microsoft Word users who mail document files on disk or telecommunicate text files to users who don't use Word can create a print file that retains Word's pagination, margin settings, headers and footers, and page numbers. Select the PLAIN.PRD printer driver from the Print Options menu, or copy it from the Word printer disk, and press <Enter>. Then press F (File), type a file name, and press <Enter>. Instruct the recipient to send the file to a printer with the DOS COPY command by typing COPY filename.DOC PRN.

> George Campbell Los Osos, California

<Enter>. The highlight will scurry to the top of the appropriate page. You can also combine the <F6>-plus-Search approach with other cursor keys, such as <Home> or <Ctrl>-<End>.

### Time- and Date-Stamp Documents

If you have a clock/calendar board in your PC, or if you regularly set the system date and time when you restart the computer, *Word* offers a quick way to enter the date or time. Just position the cursor at the desired location on the page, type date or time, and press <F3>. *Word* automatically substitutes the system date or time in the document.

### **Split Up Long Documents**

To speed document loading, saving, and scrolling, split very long documents into logical sections for preliminary editing, saving each section as a separate file. Once you've finished editing, use <Esc> Transfer Merge to combine the documents for pagination and document-wide operations.

None of these tips requires extra hardware or sweaty exercise, but they can make a real difference in day-to-day operations. Word 3.x users who choose not to upgrade can overcome much of that version's lethargy, and 4.0 users can really make the program fly. Who's the winner? The envelope, please. 

■

George Campbell is a columnist for Compute's PC Magazine. He lives in Los Osos, California. Order Status, Technical & Other Info. (602) 246-2222 FAX # (602) 246-7805

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### CONSUMER WATCH

### Advice and information for the computer consumer

Interested in a \$1995 printer for \$398? Here are some retail outlets that offer heady bargains—provided you shop with caution.

Anita Amirrezvani

### Let's Make a Deal

If you have a sense of adventure and are willing to do some research, you can find excellent bargains by shopping through liquidators, auctioneers, or surplus stores. Typically, these outlets buy large lots of new or used merchandise and sell it to consumers at dramatic discounts. The goods come from diverse sources: vendors about to go out of business, healthy companies that need to sell off excess inventory, and manufacturers liberating themselves of discontinued items.

Damark International in Minneapolis is a liquidator that offers a broad range of products. "We buy and liquidate everything from soup to nuts," says David Russ, vice president of purchasing. "We do a lot of computer business simply because that industry is prone to drastic changes. Whenever obsolescence occurs, we're able to step in and offer large quantities of a product below dealer cost."

Damark recently advertised a Xerox/Diablo 630 letter quality printer for \$398 plus \$26 shipping; the manufacturer's suggested retail price was \$1995. "Xerox's wholesale cost on the product was about \$900, and of course we bought it for much less," says Russ.

Most of the computer products Damark sells come with full manufacturer's warranties. "Manufacturers benefit by continuing to service the customers because then they can sell them cables, or whatever," says Russ. "Usually they'll stand behind their products."

Similar bargains are available through COMB, a general liquidator also located in Minneapolis. A typical COMB catalog recently offered a no-name modem with telecommunications software for \$79, Polaroid disks for \$39 per 100, and a 384K memory board for \$129 plus shipping. Both COMB and Damark send catalogs upon request.

But not all liquidators offer manufacturer's warranties, and most don't provide technical support. Take the Computer Surplus Store in Milpitas, California, which co-owner Chuck Schuetz describes as "probably the largest surplus store in the world." Housed in a 100,000square-foot building, the Computer Surplus Store sells everything from \$59 refurbished monitors to sophisticated high-tech and scientific equipment. The company even sells products that don't work-like a 20MB hard disk drive for \$35.

"Generally, we guarantee working items for 30 days, with replacement or repair," says Schuetz. "But we don't offer any technical support. That's why we ask buyers to do their homework. Customers who know (continues)

what they're doing get a very good deal and take a little bit of a chance."

Like many liquidators, the Computer Surplus Store encourages bargaining. "As we say in our ads, 'It's like a swap meet every day,'" says Schuetz. You can also ask the company to keep an eye out for specific products.

Some companies sell liquidated products in addition to their regular inventory. Dallasbased BG Micro offers chips, controllers, sockets, switches—as well as a \$29.95 printer. "That printer was originally made by Canon for the PCjr, and we have a little \$3 adapter that makes it compatible with other PCs," says manager Tammy Mayse. "We also sell a PC XT-compatible keyboard for \$25, or three for \$69.95."

Mayse cautions consumers to shop around for the best price before buying an item advertised in a liquidation sale. "Just because the ad says liquidation doesn't mean you're getting the lowest price," says Mayse. "I found this out through experience—I bought a Canon electronic typewriter through a liquidator for \$219, and a month later I saw it in a retail store for \$198."

If you need software, one large source is AT&T Liquidators, a retail store and mailorder outlet in Santa Ana, California. Manager Art Tendler boasts an inventory of 1 million programs—something for every computer ever made, including IBMs, Osbornes, DECs, VIC-20s, and Ataris.

"The maximum we sell anything for is 75 percent off retail," says Tendler. "Most of our items go for \$9.95 to \$19.95."

Tendler also organizes retail liquidation sales across the United States. Consumers can sign up on the company's mailing list to be informed about sales in their area.

And Tendler offers an unusual incentive: "Everything we sell is 100 percent guaranteed. If consumers don't like a product, we'll exchange it or refund their money. I also guarantee the lowest price in the world."

Shopping at auctions is another way to get bargains. Ross-Dove, a high-tech auctioneer in Foster City, California, sells more than \$50 million worth of equipment per year, according to marketing vice president Alex Steele. "Consumers can usually save between 20 and 25 percent by buying from us," says Steele. "A used PC in good condition that normally retailed for \$2000 would probably sell for about \$1500."

Auctions are usually held once a week and are advertised in the San Francisco Chronicle, the Los Angeles Times, and the Boston Globe and listed on an auction calendar mailed out to interested parties. All items are open to public inspection one day before the auction and on the morning before the sale. Most items don't require minimum bids, and buyers pay no commission. Naturally, the better you know the market, the more likely you'll be able to bid intelligently.

But consumers should shop with care. Says Steele: "We don't test the equipment before putting it up for sale. If we surmise that there's a defect, we'll say so, but the buyer buys it as is."

That's a risk many shoppers are willing to take. For best results, however, take some precautions before shopping at an auction or a liquidation sale. Learn how to examine a product for defects; familiarize yourself with market values; and scope out available security blankets, like warranties and technical support. And when you see a bargain, pounce on it—most liquidated items come in limited quantities.

### **AT&T Liquidators**

2640 S. Harbor Blvd. Santa Ana, CA 92704 714/751-2667

### **BG** Micro

P.O. Box 280298 Dallas, TX 75228 214/271-5546

### COMB

1405 Xenium Ln. N Minneapolis, MN 55440-9176 800/328-0609

### **Computer Surplus Store**

715 Sycamore Dr. Milpitas, CA 95035 408/434-0168, 408/434-1060 (orders)

### Damark Int'l

7714 Brooklyn Blvd. Minneapolis, MN 55443 800/445-2191

### **Ross-Dove**

1118 Chess Dr. Foster City, CA 94404 415/571-7400

### **SHOP TALK**

### In Short Supply

I've encountered problems with SupplyLine, a mail-order company in Lombard, Illinois. I placed a small order for some printer ribbons on February 9, using a credit card to pay the \$74.63 bill. In a follow-up call on March 8, SupplyLine said my order had been shipped February 19. Knowing that the Army post office system is painfully slow at times, I waited. I began trying to contact SupplyLine again at the end of March, getting busy (continues)



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signals both day and night. Since then, I've found out that Supply-Line's phones have been disconnected, with no further information available for the long-distance consumer.

James T. Zdrowski United Kingdom

Editor's note: In a visit to SupplyLine's offices, PC World found no signs of life or business. Any problems with orders should be handled in the usual manner: Because Mr. Zdrowski paid by credit card, he can contact his credit card bank by mail and explain why he wants the charges removed. Customers who paid by check should send a letter of complaint to Consumer Watch and to Office of the Attorney General, Consumer Protection Division, 100 W. Randolph, 12th Floor, Chicago, IL 60601, or call 312/917-3580 for information.

### Torn Between Two Word Processors

For the past year I've enjoyed using PFS: Professional Write despite its limitations. But when I saw an ad offering PFS's major competition, Q&A, for just \$29.95 plus the title page from my PFS manual, I decided to try it. No sooner had I received Q&A that I got a note about the new upgrade to Professional Write. Even though I am a registered user, the company refuses to honor my right to an upgrade because I do not have my title page. Nowhere do they state that the title page is necessary.

Mark J. Heulitt, M.D. Durham, North Carolina

Editor's note: In a phone interview, Software Publishing spokesperson LaVon Collins said that sending the title page is not

required. "If you don't have your title page, photocopy the front of your disk and send that to us as proof of purchase," Collins said. But first, users should explain their situation to a Software Publishing upgrade representative at 800/255-5550. Then, in a letter requesting the upgrade, users should specify whom they spoke with at Software Publishing.

### **Looking for Logicsoft**

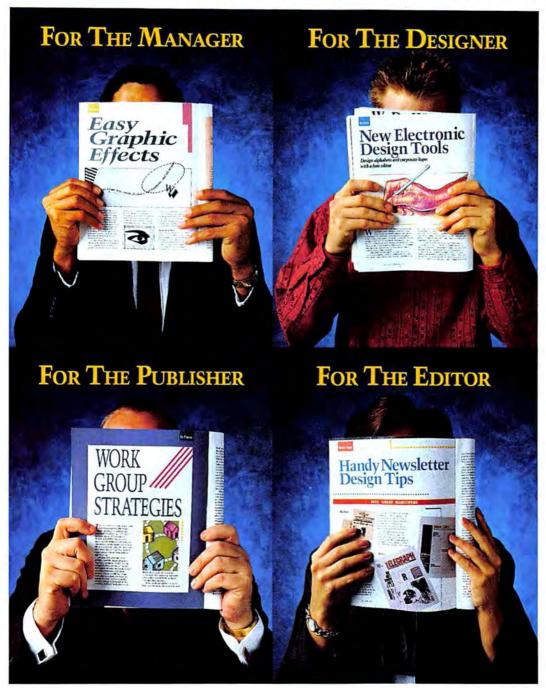
I've noticed that Logicsoft's ads, which regularly appeared in *PC World* and *PC Magazine*, have been absent since last December. Do you know what has happened?

David Kohn Tucson, Arizona

Editor's note: Logicsoft public relations director Rick Liotta says the company discontinued all its magazine advertising at the end of last year. "We are now concentrating our efforts on direct marketing and catalog sales," says Liotta. The best way to find out about products and prices is to call or write Logicsoft and request a copy of the company's catalog. The phone number is 800/645-3491.

Meanwhile, Consumer Watch sent four consumer complaints to Logicsoft early this year, most touching on problems with getting refunds. Consumer Watch never received a response, but according to Liotta, "We've had a few people asking about their credits being held up. The reasons have to do with some backlog and a miscommunication with our financial institution, but it's all being cleared up." (continues)

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#### The PC-8000's Bad Memory

The Federal Trade Commission (FTC) has charged NEC Home Electronics with deceptively advertising from 1981 to 1984 that consumers could easily increase the amount of RAM in PC-8000 computers by purchasing a 32K memory board. In fact, according to the complaint, memory expansion required either special programming skills or access to an operating system that was never sold in the United States.

In March a consent agreement was put forward for public comment. The agreement (which is not an admission of guilt) requires NEC Home Electronics to pay a total of \$15,000 to 100 consumers who purchased the 32K memory boards. The company must also refrain from making false claims about the memory capabilities of its products.

If you purchased one of the memory boards, contact the FTC at 202/326-2180 to find out if the consent agreement has been made final. You can then apply for a refund by writing NEC at 1255 Michael Dr., Wood Dale, IL 60191-1094.

#### **PC Plaudits**

In April I received a Western Union mailgram from Brøderbund Software advising me of a flaw in the upgrade to Memory-Mate (a text indexing and retrieval program). I did not get around to using the upgrade, so I have not suffered any as a result. But I want to congratulate and thank the Brøderbund organization for being responsible businesspeople and advising me in a prompt manner. I know it cost a substantial amount of money.

Alan Saltzman Hollywood, California Editor's note: According to Brøderbund spokesperson Jenay Cottrell, old MemoryMate text files did not transfer correctly into the new version. An amended version of the upgrade shipped at the end of May.

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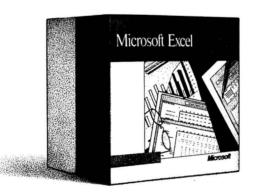
#### **POWER TIP NO. 6**

#### **Antivirus Vaccine**

You can protect hard disk data from dangerous virus programs with the DOS AS-SIGN command Before you load a suspect program. type ASSIGN C=A at the DOS prompt and press <Enter>. If a virus program then tries to access drive C:. DOS will send the call to drive A: instead. At this point, you can run the program and inspect it for a virus. Once you're satisfied that the program is clean, undo ASSIGN by typing ASSIGN and pressing < Enter >.

George Campbell Los Osos, California

# Stop your soul searching.

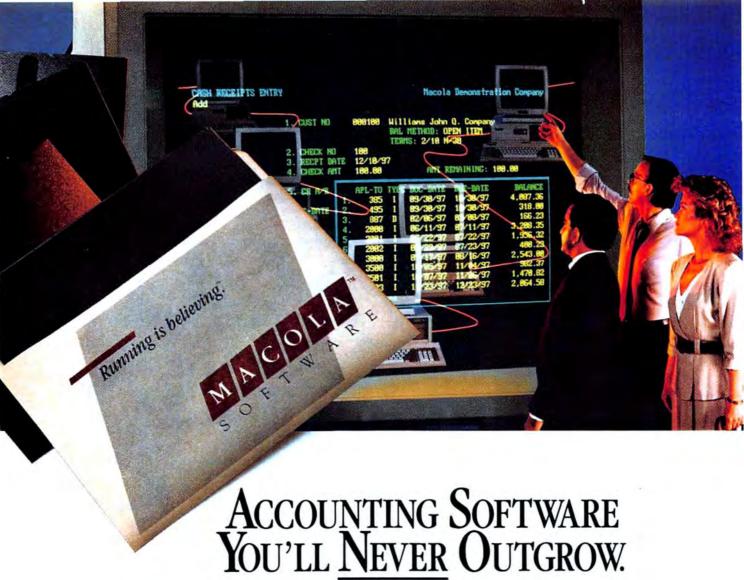


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Stash the system unit, tune up your disk drives, format 720K disks in 1.44MB drives, use Lap-Link with the Model 80, settle the conflict between Express and Word, upgrade a Compaq Portable with a 3½-inch drive, and more

Karl Koessel

#### Stand-Up System

Q. I'm quite happy with my AT clone—except that it takes up so much room on my desk. I've seen IBM ATs standing on their sides under people's desks. Can I do this without damaging my clone? I'm particularly worried about the hard disk.

Anne White Santa Barbara, California

**A.** Sure. You can buy a plastic stand made just for that purpose or make a stand yourself. Just be sure that the system unit will not accidentally tip over (the hard disk may not survive a fall), that there's plenty of airflow so the machine won't overheat, and that you don't jolt it when vacuuming, especially if you leave the system (and therefore the hard disk) running.

#### **Back on Track**

Q. My PC clone is about three years old, and lately it's started to act up. Sometimes a disk that works perfectly in drive A: can't be read by drive B:, and vice versa. I get the error message 'Data error reading drive A:; Abort, Retry, Ignore'. Pressing R for Retry works sometimes, but other times it doesn't. What's wrong with my disk drives? Do they need to be replaced?

John Hamilton Charlotte, North Carolina A. Could be that the drive is getting read errors simply because the disk is not centered. The drives work by positioning an arm, called an actuator, that holds a magnetic read/write recording head (similar to that used by a tape recorder) over one of 40 concentric recording tracks (80 for high-density drives). Try gently opening and half-closing the drive door a few times to center the disk before it's clamped into place.

Read errors can also occur when the disk isn't spinning fast enough because it is pinched by its protective jacket. Grab the disk at the center hole's rim and test whether it turns easily within the jacket. If not, square the edges of the jacket to reduce the pressure on the faces of the disk. (This problem is often caused by overstuffing disk storage boxes or keeping disks in or under books and magazines.)

However, it may be time to get your floppy disk drive heads realigned. After one or two years of use, it's not unusual to find that the actuator no longer positions the head accurately over a given track. Your local computer store or repair shop can easily give your PC drives the inexpensive tune-up they need. (continues)

.....

#### 1.44MB Drives Yield 720K Disks

Q. My IBM PS/2 Model 80 at work has a 1.44MB floppy disk drive. At home I have a laptop that uses 720K disks and can't read the Model 80's 1.44MB disks. When I want to bring data home, I have to remember to format a 720K disk on the laptop and then copy my data onto that disk from the Model 80. Occasionally I find that I haven't remembered to bring in a 720K disk and thus can't take work home. Isn't there a way to format disks to 720K in the IBM PS/2 Model 80?

Alan King Provo, Utah

**A.** Yes. Use the command FOR-MAT A: /N:9 /T:80 (followed optionally by /S if you want a bootable 720K floppy). This command works on Model 60s, too. It tells FORMAT that you want a disk with nine sectors and 80 tracks, the format for 720K DOS disks.

#### **Word and Express**

Q. I use Microsoft Word on an IBM AT and recently purchased Lotus Express, a memory-resident, background communications program for MCI Mail users. One major benefit of Express is its ability to receive E-mail while I work in another program. However, I can't run the programs simultaneously. When I load Word after Express has been installed, my system freezes. How can I get these two applications to work together?

Marc Schlesinger Los Angeles, California A. I'll bet you have an enhanced 101-key keyboard. If that's the case, all you have to do to get Lotus Express and Microsoft Word to work together is invoke Word with the command WORD /K. Of course, when you forget, the system will freeze. To circumvent that problem, create a batch file to start Word with the proper command string. If you don't already have a directory called C:\BATCH, make it and use it for all your batch files. Log on to the \BATCH directory and create a batch file called WORD-.BAT that simply contains the command C:\WORD\WORD %1/K (if your Word files are on a different drive or in another directory, adjust the command appropriately). Finally, edit the PATH command in your system's AU-TOEXEC.BAT file to remove its reference to the drive and directory containing Word's program files (usually it's C:\WORD), and add C:\BATCH; to the beginning of the list of directories. Reboot and, with Express loaded, you can run Word by typing WORD followed by a space and the drive, path, and name of the document file to edit.

With that problem out of the way, you'll notice that if *Word* is in graphics mode, *Express* won't come up when you press <Alt>-<Shift>-X. Simply press <Alt>-<F9> to toggle to text mode, and then call up *Express*.

You'll probably want to use Lotus Express Reader to compose most of your E-mail. Occasionally you'll want to transmit a Word document; it must be prepared before it can be properly sent as E-mail. After you have saved an E-mail document with a right margin of your choice but with no left, top, or bottom mar-

gin (<Esc> Format Division
Margins), use <Esc> Print
Options to select the PLAIN
printer driver and then <Esc>
Print File to print the document
to a disk file. Then load that new
file, remove the extra carriage
returns and page breaks, if any,
at its end, and resave it unformatted. It's now ready for
transmission.

#### Lap-Link and the PS/2 Model 80

Q. Release 2 of Lap-Link Plus is supposed to be compatible with IBM PS/2 computers. When transferring files between my laptop and my AT, I had no problems with the program (except for conflicts with a few memory-resident programs, which I now remove before using Lap-Link). But now that I have an IBM PS/2 Model 80, Lap-Link no longer works. Doesn't the program work with the Model 80, as the banner on its package implies?

Sam Torini Atlantic City, New Jersey

A. It will, but the Model 80's design doesn't let Lap-Link run in turbo mode or faster than 19,200 bps. To transfer files, bring up Lap-Link and press 0 for Options. Press < Cursor Up > four times, highlighting 'Turbo Copy Mode:', and press N to select 'No'. Press < Cursor Up > twice and < Cursor Left > twice to set the speed to 19,200 bps. Then press S and 4 to save these settings. Repeat this procedure for the other computer to establish the connection.

(continues)

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#### **Null and Word**

Q. Is there a way to send the null code (ASCII 0) from Microsoft Word to my printer? I have contacted Microsoft, and they were unable to help me. Word can send every other ASCII code to the printer. The ability to send the null code would enable me to switch from a downloaded character set to the printer's standard, ROM-based character set. The null code is a component of many printer command sequences and would be useful in other situations.

R. L. Droste Nepean, Ontario, Canada

**A.** It is unfortunate that Word can neither accept nor issue the null character. However, you can use Word's <Esc> Library Run command to execute the DOS command COPY codefile PRN. where codefile is the name of a file containing the appropriate printer command sequence. Use Word to enter the command sequence, substituting the word NULL for the null character. Save the file with a name such as ROMCHARS on a disk in drive B:, and quit Word. Place a copy of EDLIN (from your DOS disk) in drive A:. Type A:EDLIN B:ROMCHARS.DOC and press < Enter > . Type 1 and press < Enter > . Press < Cursor Right > repeatedly until the word NULL is revealed, then press < Cursor Left > four times and < Delete > four times. Press < Insert > , type < Ctrl > -V and then @ (<Shift>-2), and press <**F3**>and < Enter > . Finally, press E and < Enter > to save the file and

exit. Copying ROMCHARS.DOC to the printer (PRN), whether from within *Word* or from the DOS prompt, will now activate the ROM-based character set.

#### 3½-Inch Drive in a Compaq Portable

Q. In addition to my Compaq Portable, I use a laptop that has 720K 3½-inch disk drives. For convenience' sake, I'd like to have a 3½-inch drive in the Portable. Can I replace one of my Portable's 5½-inch floppy disk drives with a 720K 3½-inch drive?

Compaq will tell me only that doing so is "not a factory-approved modification." But then, no modification is acceptable in Compaq's eyes—the manual doesn't even tell you how to open the machine to put in an expansion board. Compaq would probably like me to buy a new machine, but my old one is doing just fine, thank you.

Nicholas R. Clifford Middlebury, Vermont

**A.** You can replace the Compaq Portable's 5¼-inch drive with a 3½—but not easily. To do so, you'll have to retap the 3½-inch drive's mounting-screw holes, make or buy a longer floppy disk controller ribbon cable, and modify the CONFIG.SYS file of your boot disk (DOS 3.20 or a later version is required).

To get the 5¼-inch drive out of the Portable, remove the plastic top, the metal cover over the expansion cards, the drive-mounting screws in the center of the rear rubber shock mounts only (for both drives), and the metal cover over the drives. Then flip the Portable on its face and re-

move the plastic bottom and the drive-mounting screws in both rubber shock mounts of drive B:. Put the unit back on its feet, disconnect the video cable from the middle of the second card, disconnect the floppy disk controller cable from the first card and from the drives and put it aside, and remove all expansion cards. Finally, unplug the power connector, remove the screw in drive B:'s front rubber shock mount, and slip the drive out. So far, so good; now comes the hard part.

The Portable's drive-mounting screws are not PC compatible and won't fit the holes in the 5¼-inch rack that holds the 3½-inch drive. Use the drive-mounting screws to retap the holes before putting the drive inside the Portable. Then slip the drive into position and replace the screw in the front rubber shock mount. Flip the Portable on its face again, replace the two bottom mounting screws, and put it back down.

Look at the controller cable that you removed earlier. The length of the cable between the drive connectors is too short to span the distance between the 5½-inch and 3½-inch drives because the 3½-inch drive's connection point is lower than the original 5¼-inch drive's. Make or buy a new cable that fits, and you can put the Portable back together.

At this point you have a working 360K 3½-inch drive B:. To make it a 720K drive, you'll need to modify your boot disk's CON-FIG.SYS file. If you're using DOS 3.2x, add the line DRIVPARM = /D:1/F:2 If you're using DOS 3.30 or a later version, use (continues)

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HELP Messages 83/12/87 83:89 PM message line describes the nature of the problem in the cell at which the cell pointer is currently located; when you move the cell pointer, the Gross Margin Analysis message will be updated to reflect the current pointer position. Data\Time Jan/86 Feb/86 Data does not pass validation criteria ALES \$8,312.34 \$11,816.88 \$7,369.34 \$741.38 The entry at the current cell pointer position does not pass the validation ROSS MARGIN \$943.88 \$18,274.78 formula that was defined in the schema definition form for this data field. Validation criteria for this field is: GROSS MARGINOU AND GROSS MARGIN(0.45 \*SALES \*\*\* End of HELP Message

Javelin\*-type time series model

in your conventional spreadsheet

English language formulas

C12: (GROSS\_MARGIN\Feb/86,\$2) [W11] SALES

raing Data does not your walidati

User-defined validation criteria

3 Warnings

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< Enter > ; Start DEBUG A>DEBUG < Enter > ; Invoke DEBUG's assembler < Enter > ; DOS Change Attribute call xxx:0100 MOV AX.4301 < Enter > ; Attribute for normal file xxxx:0103 MOV CX,0 xxxx:0106 MOV DX,120 < Enter > ; Point to file name at 0120 < Enter > ; Execute DOS call in AX xxxx:0109 INT 21 < Enter > ; No more instructions xxxx-010B -E 120 "d:\path\filename.ext",0 < Enter > ; Drive, path, & file name -G = 100.10B< Enter > : Execute AX=FF02 BX=0000 CX=0000 DX=0120 SP=FFEE BP=0000 SI=0000 DI=0000 DS=xxxx ES=xxxx SS=xxxx CS=xxxx IP=010B NV UP EI PL NZ NA PO NC xxxx:010B xx mnemonic instruction < Enter > ; Quit DEBUG -0

FIGURE 1: This DEBUG procedure resets a hidden file's attribute quickly and easily.

#### DEVICE = DRIVER.SYS

/D:1/ F:2 instead, and remember to format your 3½-inch disks to 720K with the command FORMAT C: (using FORMAT B: will yield 360K disks). In either case, reboot, and your Portable's new drive B: is ready for your 720K disks.

#### A Faster File Finder

After reading "Hunting the Hidden File" (*The Help Screen*, *PCW*, May 1988), reader John Switzer sent in his method for turning a hidden file into a normal one so that it can be deleted:

"Although your advice about removing hidden files was correct, directly modifying the disk directory sectors is a little extreme, especially when a quicker and easier solution is available. You can use DEBUG [found on the DOS Supplemental Programs disk of versions prior to DOS 3.30 and on the Operating disk for versions 3.30 and later] to write and run a very short assembly language routine that calls the DOS function for changing a file's attribute byte. With the attribute byte set to zero (normal, unhidden file), you can

then delete the file. This technique is far safer than directly modifying disk sectors and, unlike the May *Help Screen* solution, easily reveals files hidden in subdirectories."

My thanks to Mr. Switzer. To use his method, slip a disk containing a copy of DEBUG in drive A:, log on to that drive with A: < Enter > , and type the characters shown in bold in FIGURE 1, pressing < Enter > at the end of each line as indicated. (Don't enter the explanatory comments, which begin with semicolons, on the right.) For d:\path\filename.ext, substitute the drive, path, file name, and file extension of the hidden file. Remember to enter the double quotation marks, one set before the drive letter and one after the file extension, and the comma and zero that end the line. The command G=100.10B tells DE-BUG to execute the instructions that you have entered. You can ignore DEBUG's subsequent screen output and quit; the file is unhidden.

#### Third Floppy for PC and XT

Reader James Beckett objects to the solution presented in "A Third Floppy Drive" (*The Help*  Screen, PCW, February 1988), which requires the installation of a new floppy disk controller when a third internal floppy disk drive is installed. Beckett points out that "...one can purchase an external floppy drive cable [which attaches to the external rear connector of an XT's or PC's floppy disk controller] and loop it back into the XT [or PC] through an unused [expansion] slot opening. You do not need a new floppy disk controller, only an external drive cable, a 31/2inch drive, and a mounting kit." Although this approach will work, bear in mind that the uncovered expansion slot increases the amount of radio frequency interference emitted from the PC and alters the internal airflow used to extract componentdamaging heat from the system.

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 Karl Koessel/336-4141, CompuServe 74055,412, or The Source STE908.



Unretouched Screen Images

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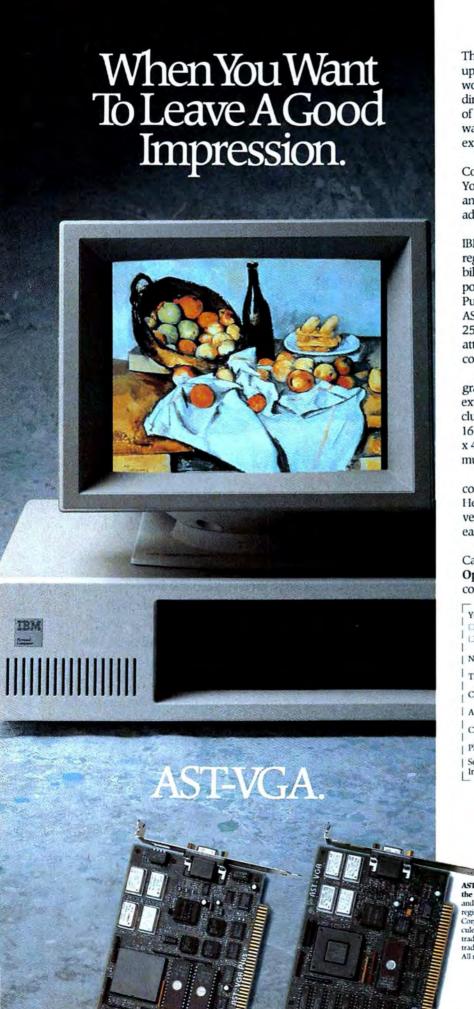
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#### STAR-DOT-STAR

\* . \*

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Add formfeeds to screen prints, convert dBASE files for mail merging, view WordPerfect text without moving the cursor, enter multiple DOS commands from within Word, and meet a new monthly feature: Developer's Toolbox.

Edited by Tom Swan

#### **Down in the Dumps**

Have you ever accidentally started printing midpage because you previously printed a screen with <Shift>-<Print Screen> and forgot to advance the paper?

My memory-resident program, PSFF.COM, will prevent that mishap by dumping your screen and pressing the formfeed button for you.

PSFF.COM produces normal printouts of the display when you press the left <Shift> key with <Print Screen>. But press the right <Shift> key with <Print Screen>, and the program adds a formfeed after printing the screen. This allows the next print job to begin at the top of a new page.

Bruce L. Gregory Ridgefield, New Jersey

Editor's note: PSFF.COM works on enhanced, 101-key keyboards, too. Just hold down the right <Shift> key and press <Print Screen>.

To create PSFF.COM, enter the BASIC program X-MAKER2.BAS (LISTING 1) and add the lines shown in PSFF-DAT (LISTING 2). Run the result. Then, at the DOS prompt, type PSFF and press < Enter > to install the modified print-screen function. Do this only once after booting to avoid loading multiple copies of the memory-resident program. For the programmers among you, PSFF.ASM (LISTING 3) lists the program's as-

sembly language source code. Assemble the listing with Microsoft's Macro Assembler, using the commands MASM PSFF;, LINK PSFF;, and EXE2BIN PSFF PSFF.COM.

#### dBASE Made Perfect

I keep a mailing list in a dBASE III data base from which I create WordPerfect secondary merge files. Because there is no direct way to translate dBASE files into WordPerfect documents, I wrote CREATSEC.PRG [LISTING 4] to do the job for me. The program first creates a temporary file in delimited ASCII format and then uses WordPerfect's CONVERT utility to create the merge document, ready for printing form letters or envelopes.

Because your name-and-address file structure is probably different from mine, you'll need to modify the field names listed in the line that begins with 'flist='. You might also want to add your WordPerfect directory to the RUN command. For example, if CONVERT.EXE is stored in C:\WP, change RUN CONVERT to RUN C:\WP\CONVERT in LISTING 4. (continues)



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```
10 DEFINT A-Z:CLS:KEY OFF:DEF FNHEX(X$)=VAL("&h"+X$)
20 MSG$="Now testing for data errors...please wait" : GOSUB 190
30 SUM=0:READ LN:IF LN<0 THEN 80
40 READ H$: IF VAL(H$) < 0 THEN 70
50 IF LEFT$(H$,1)="*" THEN GOSUB 210 : GOTO 40
60 SUM=(SUM+FNHEX(H$))*2:SUM=(SUM\256)+(SUM MOD 256):GOTO 40
70 READ CKSUM$: IF (SUM MOD 256)=FNHEX(CKSUM$) THEN 30 ELSE GOTO 170
80 MSG$="Press any key except ESC to create "+F$+": "
90 GOSUB 190 : A$=INPUT$(1) : PRINT : IF A$=CHR$(27) THEN END
100 LOCATE 6,1:PRINT "Working ... ";
110 OPEN F$ AS #1 LEN=1 : FIELD #1,1 AS BX$
120 READ LN: IF LN<0 THEN 160
130 READ H$: IF VAL(H$) < 0 THEN READ CKSUM$: GOTO 120
140 IF LEFT$(H$,1)="*" THEN GOSUB 240 : GOTO 130
150 LSET BX$=CHR$(FNHEX(H$)) : PUT #1 : GOTO 130
160 CLOSE:PRINT:PRINT F$;" has now been created.":END
170 PRINT: PRINT "Error in DATA line"; STR$(LN); ".";
175 PRINT:PRINT "SUM="; SUM
180 PRINT "Check your work.":BEEP:END
190 CLS : LOCATE 3,1 : PRINT "X-Maker II" : RESTORE : READ F$
200 LOCATE 5,1,1 : PRINT MSG$; : RETURN
210 ZZ=VAL(MID$(H$.2)) : FOR I=1 TO ZZ
220 SUM=SUM*2 : SUM=(SUM\256)+(SUM MOD 256)
230 NEXT : RETURN
240 ZZ=VAL(MID$(H$,2)) : FOR I=1 TO ZZ
250 LSET BX$=CHR$(0) : PUT #1 : NEXT : RETURN
```

LISTING 1: Use X-MAKER2.BAS, \*.\*'s program-making program, with PSFF.DAT (LISTING 2).

```
1000 DATA "psff.com"

1010 DATA 1,EB,3F,90,*4,FB,50,1E,E4,60,3C,37,75,2A,-1,F3

1020 DATA 2,33,C0,8E,D8,A0,17,04,A8,01,74,1F,E4,61,8A,E0,0C,-1,1C

1030 DATA 3,80,E6,61,8A,C4,E6,61,B0,20,E6,20,CD,05,52,BA,*2,B8,-1,1E

1040 DATA 4,0C,00,CD,17,5A,1F,58,CF,1F,58,2E,FF,2E,03,01,B8,-1,49

1050 DATA 5,09,35,CD,21,89,1E,03,01,8C,06,05,01,BA,07,01,B8,-1,1D

1060 DATA 6,09,25,CD,21,BA,62,01,B4,09,CD,21,BA,41,01,CD,27,-1,90

1070 DATA 7,0D,0A,50,53,46,46,20,49,6E,73,74,61,6C,6C,65,64,-1,34
```

LISTING 2: Using BASIC, merge PSFF.DAT's DATA lines with X-MAKER2.BAS (LISTING 1), and run the combined program to create PSFF.COM.

```
; PSFF.ASM: Print Screen With Formfeed
; Written by: Bruce Gregory
;

cseg segment para public 'CODE'
assume cs:cseg,ds:cseg,es:cseg
org 100h ; .COM file entry point
begin: jmp start ; jump to TSR loader
(CONTINUES)
```

LISTING 3: Assemble PSFF.ASM to create PSFF.COM, adding automatic formfeeds to your printscreen commands.

(continues)

```
; ---- New keyboard interrupt 9 handler
addroff dw 0 ; original interrupt vector (offset)
addrseg dw
                      ; original interrupt vector (segment)
int9: sti
                             ; turn on interrupts
       push
                              ; save ax register
       push
              ds
                             ; save ds register
                           ; get keyboard data
       in
               al,60h
               al,37h
                              ; test for <Print Screen> key
       jne
               exit
                              ; exit if key is not <Print Screen>
       XOL
               ax,ax
                              ; set ax = 0000
               ds,ax
                              ; set ds = 0000 to read BIOS data
       mov
               al, byte ptr ds:[0417h]; get keyboard flags
               al,01h
       test
                             ; test for right <Shift>
                             ; exit if right <Shift> not down
       iz
               exit
       in
               al,61h
                              ; get keyboard control information
                              ; save in ah
       mov
               ah, al
       10
               al.80h
                              ; set high bit
               61h.al
                              : clear keyboard
       out
                             ; get saved control information
               al,ah
       out
               61h, al
                             ; restore 8255A output data
               al,20h
                             ; end of interrupt command
       mov
                             ; send command to int control port
       out
               20h, al
               05h
                              ; perform screen dump
       push
               dx
                              ; save dx register
               dx,0000h
                              ; select printer #0
       mov
       mov
               ax,000ch
                             ; ah=print char; al=ASCII formfeed
               17h
                              : perform formfeed
                             ; restore saved dx register
       pop
               dx
               ds
                              : restore saved ds register
       pop
       pop
               ax
                              : restore saved ax register
       iret
                              ; return from interrupt
;---- Jump to original BIOS keyboard interrupt (9)
              ds ; restore saved ds register
       pop
exit:
       pop
                              ; restore saved ax register
       imp
             dword ptr cs:[addroff] ; jump via original vector
;---- Terminate and stay resident (TSR) loader
start: mov ax,3509h ; get current interrupt 9 vector
       int
                             ; call DOS function
              addroff, bx ; save offset address
       mov
               addrseg, es ; save segment address
       mov
       mov
               dx, offset int9 ; ds:dx = address of our handler
              ax,2509h ; change vector to our int 9 code
       int
               dx,offset message ; display "installed" message
       mov
               ah,9 ; print ASCII$ string
       mov
       int
                             ; call DOS function
       mov
               dx, offset start ; ds:dx = lowest available address
       int
                              ; terminate, stay resident to ds:dx
               13, 10, 'PSFF Installed', 13, 10, '$'
message db
                              ; end of segment
       ends
cseq
               begin
                              : end of text
```

LISTING 3: (continued)
(continues)

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- □ I. Consultant/advisor
- J. Microcomputer specialist/manager/ analyst
- ☐ K. Programmer
- ☐ L. Educator
- ☐ M. Professional (lawyer, doctor, etc.)
- □ Z. Other (specify) \_\_\_\_

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  - ☐ Yes (indicate quantity below) ☐ No

	Existing (quantity)	Plan to buy (quantity)
□ 1. IBM		
99. Other (specify)		

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  - ☐ Yes (indicate quantity below) ☐ No

	Existing (quantity)	Plan to (quanti
□ 1. IBM		
☐ 2. DEC VAX		
☐ 3. Sun/Apollo		
99. Other (specify)		

- 5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?
  - ☐ Yes (indicate quantity below) ☐ No

99. Other (specify)

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		Currently	Plan to buy within 1-12 m
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3.	Macintosh SE		
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G. Establish specifications	G	G	G
H. Recommend to others	H	H	H
I. Sell	I	1	I
<li>J. Train people to use/ or provide support</li>	J	J	J
K. Use	K	K	K
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Z. Other (specify by name and quantity)	Z	Z	Z

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    □ C. 10-19 □ G. 500+
    □ D. 20-49 □ H. None of the above
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  - □ A. 1-9 □ D. 100-499 □ G. 2500-4999
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The program prompts you for the names of two files: the name-and-address data base file and the merge file you want to create. After replying, press <Enter> to select all records, or specify a condition such as zipcode = "82801" to select only matching records.

After creating the delimited file, TEMP.MMF, the program runs *WordPerfect*'s CONVERT utility, creating the merge document and erasing the temporary file.

Jim Griffin Sheridan, Wyoming

Editor's note: Use any ASCII editor to enter and save CRE-ATSEC.PRG. Make sure you have WordPerfect's CON-VERT.EXE program on disk. From the dBASE dot prompt, type DO CREATSEC and press < Enter > to run the program.

#### Now You See It

While editing WordPerfect documents, I often need to view the preceding or following page without moving the cursor from the current line. The only way to accomplish this with native commands is to move the cursor to the top or bottom of the screen and press the cursor keys until new lines come into view. I then have to reposition the cursor to continue editing.

To speed up the process, I wrote two macros, ALTT.MAC and ALTB.MAC [FIGURES 1 and 2]. To create the macros, type the keystrokes in the left column of each figure exactly as shown. The comments on the right explain how the macros operate.

Using the macros is easy. Press <Alt>-T, and the current line moves to the top of the

```
* CREATSEC.PRG Program to create a WordPerfect merge document

from a dBASE name-and-address data base file

CLEAR

SET TALK OFF

ACCEPT "Data base to use? " TO db

ACCEPT "Name of WP merge file? " TO fo

ACCEPT "Condition for search? " TO con

con=IIF(LEN(con)>1,"FOR "+con,"")

USE &db

fi="TEMP.MMF"

flist="FIELDS fname,lname,address,city,state,zipcode"

COPY TO &fi &flist &con TYPE DELIMITED

RUN CONVERT &fi &fo 7 , (13)(10) ",(13)(10)

ERASE TEMP.MMF
```

LISTING 4: Run this dBASE III program, CREATSEC.PRG, along with WordPerfect's CONVERT utility to create a merge document from a name-and-address data base file.

FIGURE 1: This WordPerfect macro, ALTT.MAC, moves the current line to the top of the screen.

<ctrl>-<f10></f10></ctrl>	Turn on the macro recorder
<alt>-B</alt>	Give the macro a name
<ctrl>-<enter></enter></ctrl>	Enter a hard page break
<cursor left=""></cursor>	Move to bottom of previous page
<ctrl>-<home></home></ctrl>	Issue goto command
<cursor down=""></cursor>	Put current line on bottom of screen
<home><home><cursor right=""></cursor></home></home>	Position cursor ahead of hard page break
<delete></delete>	Delete the hard page break
<home></home>	Specify extreme move
<cursor up=""><cursor up=""></cursor></cursor>	Adjust bottom line
<cursor up=""></cursor>	
<home><cursor down=""></cursor></home>	Move cursor to line
<ctrl>-<f10></f10></ctrl>	Turn off the macro recorder
The state of the s	

FIGURE 2: This WordPerfect macro, ALTB.MAC, moves the current line to the bottom of the screen.

screen, exposing the next 23 lines. Press <Alt>-B and the current line moves to the bottom, showing the 23 lines above it. And all without ever touching a cursor key.

Gary Corbin Washington, DC Editor's note: The cursor's position will change if <Alt>-B is invoked when the cursor is 23 lines or less from the top of the document. Fortunately, there is no reason to execute the macro in this situation because all the text that would be revealed is already on screen. (continues)

#### **DOS Sojourns**

Microsoft Word would have my vote for top word processor but for one idiosyncrasy: The <Esc> Library Run command allows only a single DOS command before returning to the program. This limitation makes entering multiple DOS commands exasperating. For example, even a simple job like changing directories and running a utility program requires too many keystrokes for my taste.

Luckily, I've discovered a simple work-around to the problem. Just type C:\COMMAND at the 'Library Run' prompt. This loads a secondary copy of COMMAND.COM, which allows you to enter as many DOS commands as you want. After you're done sojourning in DOS, type EXIT and press <Enter> to return to Word.

James Reynante San Diego, California

Editor's note: Mr. Reynante's suggestion works for any program that allows you to run a DOS command. For example, from WordStar's opening menu you can press R (for 'Run a program'), type C:\COMMAND, and press < Enter>. After entering your DOS commands, type EXIT and press < Enter> to continue editing.

#### Pop-Up Bug

I discovered a bug in POP-UP.PAS ("Pascal Pop-Ups," Star-Dot-Star, PCW, February 1988). Because the cursor position is not initialized, the program might not work properly. Adding ulc := 20; ulr := 6; just before the TextMode(3) statement ensures smooth operation.

George L. Shevenock II Pontiac, Michigan

Editor's note: A printing glitch also deleted the single quote marks surrounding the text inside the Write statements on page 271. Each statement should appear in the following form: Write( 'text');

#### DEVELOPER'S TOOLBOX

Software tools are indispensable to program developers, easing the chore of writing programs. Properly equipped, a programmer can take less time to produce an application with more capabilities and fewer bugs. But with so many programming utilities available, how do you find the right tools for the job?

Developer's Toolbox will help you answer that question. Each month in this new *Star-Dot-Star* section, I'll cover products of special interest to in-house developers—those who spend a major portion of their time programming—regardless of the language they use.

I'll be looking at editors, engines, environments, debuggers, on-line guides, fourth-generation application development systems, graphic-interface tool kits, and more. And I want you to tell me about the tools you wish someone would invent. (Maybe somebody already has.) Let me know about your favorite programming utilities. Write to me in care of the address at the end of this column, or send MCI mail directly to my handle, TSWAN.

#### Do You Need a Programmer's Editor?

Many compilers and assemblers, including Microsoft's Macro Assembler, C, and Pascal, plus the newer Turbo languages from Borland, operate directly from the DOS prompt. To write programs in these languages, you need a separate editor. After trying out several packages, I've settled on *Brief* from Solution Systems.

Like dozens of competitors, Brief edits plain ASCII text files—but that's just the beginning. Version 2.01 comes with a macro library, a setup program, and a macro for running Turbo Pascal 4.0. The User and Macro Language Guides are well written, and the tutorial is a breeze.

Brief has scores of features that developers will appreciate. The macro language is more like a complete C development system than a macro processor. How many files would you like open on screen simultaneously, ready to edit? Brief, as it is shipped, can open over 100 files at a time. You can choose from several indentation and template choices for Pascal and C programmers, and the code you write is formatted automatically. Brief's undo command is the best I've seen in any program. Pressing <Alt>-U reverses the previous 30 (adjustable to 300) commands or mistakes, making Brief the most forgiving editor around.

You can configure *Brief* to run your favorite compiler or assembler, although compiling this way can chew up memory faster than a 1-2-3 whiz kid on a roll. Instead, most users will probably exit the editor to compile and then restart it to continue editing. According to Solution Systems, a planned revision will swap *Brief* to expanded memory or to a RAM disk, leaving 8K resident and allowing you to run memory-hungry compilers like Turbo C.

Brief has a few drawbacks. I wish I could select file names from a directory. Keyboard reassignments should be easier to make. And there's only one cutand-paste buffer; I could use several.

Despite these minor gripes, though, *Brief* is a top-notch editor for developers. You'll still need your word processor for prose, but for writing code, you won't find shortcomings in *Brief*.

#### WHERE TO BUY

#### Brief 2.01

Solution Systems 541 Main St. #410 South Weymouth, MA 02190 800/821-2492

List price: \$195

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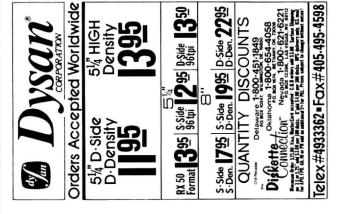
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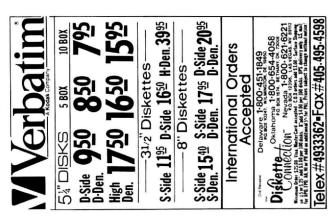
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# PostScript Telegraphs Its Punch

PostScript, Adobe's PC-based page description language, is suddenly omnipresent.

It's pricey and powerful—and, for now, probably better heard about than seen.



Robert M. Carr

Technically speaking, Morse code was the first software protocol. In the hands of a few skilled masters, its dots and dashes made the world a bit smaller. Today, Morse code's dozens of descendants describe ways in which computers communicate over wires. Two relatively new protocols appear certain to flourish: SQL and PostScript, Morse codes for the 1990s.

What SQL is to the business of querying big data bases, Adobe's PostScript is to exploiting new-age laser printers. Post-Script printers win the prize as the costliest implementation of a de facto standard in the PC arena; many carry price tags exceeding \$5000.

It's a sign of the times that an arcane specification best left to software developers and graphic artists has become a buzzword among users at large. For many of these users, PostScript is simply the latest in a line of printer protocols; it is to laser printers what Epson and Diablo emulation are to dot matrix and daisy wheel printers, respectively. But that, of course, is only part of an evolving story.

PostScript's relatively quick rise to marketplace stardom poses a blunt question to PC users considering PostScript hardware: to pay or not to pay? To respond intelligently, we must understand the special needs that PostScript satisfies, and why—valuable as it is—it should remain invisible to most of us.

Some PC standards come and go quickly, eclipsed by fresh technologies. The Lotus/Intel/ Microsoft expanded memory specification is a classic example, doomed in its prime by OS/2's 16MB reach. PostScript looks much hardier, but it's still a kid. Although new applications by the score include token PostScript support, only a paltry number exploit it fully. If you're given to cost-benefit analyses, that fact might give you pause about adding a PostScript printer to your arsenal.

#### **Calling a Convention**

Like Morse code, PostScript is a convention (that is, a standard definition) for a certain kind of communication. Just as Morse code enables individuals at either end of the wire to transmit and receive, PostScript ties desktop publishing software to a new generation of intelligent, high-resolution laser printers.

Conventions and standards don't just happen; they're usually a blend of marketing prowess and technical excellence. Epson sold dot matrix printers by (continues)

the shipload, and in due course its PC-to-printer dialect converted the industry. Other protocols, PostScript included, are anointed as standards through collective industry-wide support. Post-Script licensees include such heavyweights as Apple Computer, Dataproducts, Digital Equipment, IBM, QMS, Texas Instruments, and Wang Laboratories. In this case, the industry consensus behind PostScript offers some evidence of how laser printing has transformed the nature of the output game.

For openers, PostScript's rise reflects the shortcomings of several aging standards, including parallel and serial communications. Both varieties of cable move data fairly slowly. These thin wires were sufficient when printers didn't have much to send; a daisy wheel printer theoretically needs no more than 2K of data to print a page. High-resolution laser printers, however, can easily require a megabyte of data to generate a page of graphics at 300 dots per inch. Transmitting a 1MB bit map by serial cable can easily kill an afternoon (or seem to).

To pick up the tempo while continuing to rely on cables with such admittedly limited throughput, you need a high-level protocol like PostScript—essentially a description rather than a bit map—that reduces the amount of data moving over the wire.

This matter of throughput is closely related to how the printer handles the data once it arrives. If you use a high-level, vector-style protocol like PostScript with a laser printer—a bit map device—the printer must be

equipped with its own horsepower. That's partly why Post-Script printers include full 16-bit CPUs and enough RAM to rebuild the vector description in high resolution.

There's yet another reason why describing printed pages with bit maps is unwieldy. Bit maps are device dependent, a constraint that tends to inhibit the urge to hook up any hardware to, or run any software on, a wide variety of printers. Unlike the Epson and Diablo standards, which achieved a sort of device independence as printer manufacturers and software vendors backed them, PostScript was engineered to operate entirely free from the vagaries of anyone's printer.

#### The PDL Club

PostScript belongs to the new genre of page description languages (PDLs). All PDLs provide compact, abstract summaries of the printed page. With a PDL, you can describe the text and graphics that make up a page with commands like 'Draw a line from point 1 to point 2' or 'Print the following characters (at a certain location).'

As it converses with the printer, the PC describes the page in very general terms, delving into detailed bit maps only when the original form of an image—say a company logo—was derived from a paint program or similar source. The high-level description is capable of mixing text and graphics fluidly and assumes nothing about printer attributes.

Unlike other PDLs (which respond to a fixed set of commands), PostScript is both a page description language and a full programming language.
PostScript combines variables,

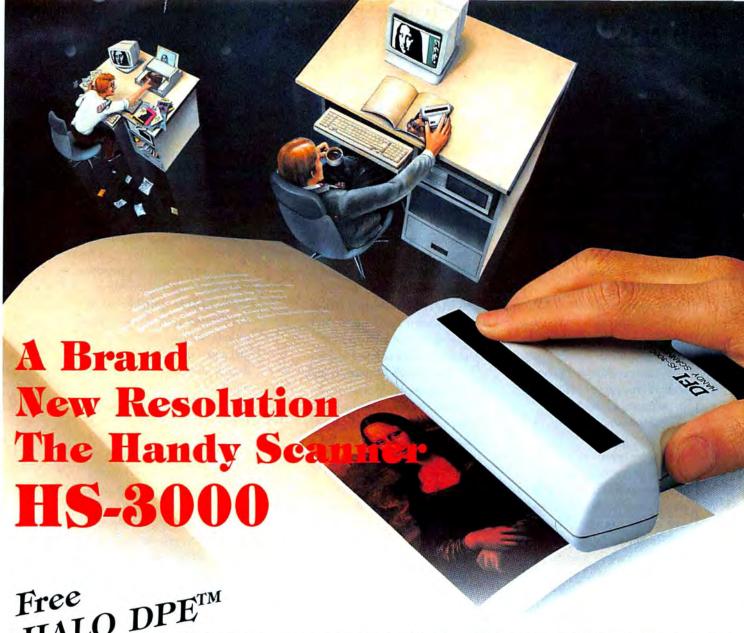
arrays, looping, and procedures with a host of graphic and text primitives. It's deft enough to handle a broad spectrum of printing technologies, from deskbound laser printers to Linotype phototypesetters.

By combining the flexibility of a programming language with a printer-oriented page description language, PostScript delivers ample power to those who need to design sophisticated graphics applications. In practice, a software developer is more likely to describe an image by inserting PostScript routines within the larger program than to write an entire PostScript-based application.

PostScript programs require a PostScript interpreter. Like BA-SIC, the PostScript interpreter needs a CPU on which to run, and PostScript programs are sent to the printer as straight ASCII text files. PostScript thus keeps the instruction stream legible, so it's easy to capture such instructions to a file and review or tinker with them before they're routed to the printer.

Ideally, PostScript-savvy desktop publishing packages will hide the protocol from view, apart from those occasions when you might want to view or modify the actual instructions. As a rule, PostScript will be about as visible to you as Morse code was to the customer who filled out the telegraph message and handed it to the telegraph operator. The only interface you'll need to conquer will belong to the primary application; behind the scenes, PostScript will be there, supercharging the application at print time.

On the other hand, because PostScript is interpreted, it can (continues)



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be used in an interactive mode much as BASIC can. A good number of PostScript printers support such a mode, in which a PC running terminal emulation software can communicate with the printer directly. You interact with a command-line prompt, issuing commands one at a time in a fashion reminiscent of dBASE's dot prompt.

The point isn't that you'll regularly want to run a PostScript printer in interactive mode, but that doing so is at least feasible. With its readable ASCII instruction streams, interpretive mode, and programmability, PostScript is, on paper, a consummate printer protocol.

#### **Just Your Type**

Just as it provides superb printer control, so PostScript offers an unprecedented ability to manipulate images themselves. It does not distinguish between text and graphics, treating a character as just another graphics object. This tack fosters the effortless intermingling of text and graphics that is so crucial to desktop publishing.

Each PostScript font exists within the printer in a single, universal description called an outline font. These fonts enable PostScript to generate type in any size, weight, detail, and rotation. To a greater degree than in other PDLs (which assume the laser printer stores actual bitmap fonts), PostScript enables you to set fractional point sizes, set font width and font height separately, slant text, fill text with a shade or pattern, and control the stroke width of font characters.

PostScript programs can include their own libraries of routines. Accordingly, it's a simple matter for an application to download routines-called procedure definitions-appropriate for the print job at hand. Such definitions underscore Post-Script's readability, compactness, and flexibility. A CAD program can download a shorthand "rectangle" procedure, for instance, or you can write a new procedure that displays text in any offbeat design you like. The resulting procedure can be downloaded to a PostScript printer for subsequent reuse.

PostScript's business is highlevel image description, so it should come as no surprise that it's at its weakest as a file interchange medium. The better desktop publishing programs will continue to import text formatting directly from the word processing source, omitting PostScript from that loop.

#### **Behind the Specs**

With its obvious gifts, should a PostScript printer be on your must-buy list? Check your software shelf: See any applications

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William Rodarmor Assistant Editor that tap PostScript's latent talents? Powerful as PostScript is, many (if not most) users today may find it constitutes overkill—and that it's overpriced. Few can quibble with Adobe's position that PostScript is an excellent model for PDLs, but for now, you can, and perhaps should, make do with less.

In a year or two, the previous paragraph may be good for a smile. By then, graphics-intensive Presentation Manager applications will have hit the market, and a new crop of desktop publishing applications will be looking their best on PostScript printers. But it's doubtful that spreadsheets, data managers, and word processing packages will exploit PostScript's advanced features—at least not during the lifetime of any printer you buy in 1988.

The ostensible PostScript support in some of today's gardenvariety applications doesn't give much cause for hope. Most treat PostScript devices as little more than dot matrix printers, at best splicing an occasional bit map into endless rows of characters. Still, as an internal standard, PostScript's future success lies largely with the software development community, so my pessimism may not be entirely warranted.

If money is the object here, the economics of PostScript printers may already be in flux. As a language, PostScript is as prone to cloning as were dBASE, C, and Pascal. A dozen companies reportedly are racing to produce PostScript-compatible interpreters, in the hope that printer manufacturers seeking (continues)

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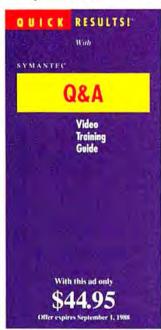
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to save on licensing fees will prefer a look-alike to the genuine article. Would-be clone vendors are promising to couple higher performance with lower prices.

Few PostScript clones have made it to market yet, so judgments are premature. For now, if the PostScript-compatible printer in question works well with the software you plan to use, by all means consider it. Compatibility questions are always dicey, however; if the given application truly exploits Post-Script, you might consider pairing it with a PostScript clone only after both have been extensively tested.

Most users need affordable printing technology, scaled more to their real needs than to Post-Script's inherent power. For many, lower-priced printers with simple PDLs that permit multiple fonts in a text-based document will suffice. By the time applications order PostScript to turn back flips, today's laser printing marvel will be ready for an upgrade. And by then, Post-Script printers should easily cost half as much.

None of this is meant to take anything away from PostScript as a printer protocol with staying power. Some very heady companies have already adapted PostScript as a standard and included it in *some* of their printers. Also like Morse code, PostScript figures to endure—whether most of us see it or not. Also like Morse code, it matters only that we see its results. •

Robert M. Carr is the creator of Framework II and cofounder of Go Corporation, a software start-up.



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Bar Coding  Business Opportunities	page 23
Catalogs	page 23
Computer Insurance	page 23
Contracts	page 23
■ Data/Disk Conversion	page 23
Disk Copy Service	page 23

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■ Bar Coding	page 235
■ Business Opportunities	
Catalogs	
Computer Insurance	page 236
Contracts	page 236
■ Data/Disk Conversion	page 236
■ Disk Copy Service	
Disks	page 237
■ Mailing Lists	
Publications	page 238
Rental	
Supplies	
■ Typesetting	

SOLIVARE	
■ Accounting	page 239
■ Business Applications	page 239
■ Church Applications	page 240
- Communications	041

Communications	page 241
■ Construction	page 241
■ Data Base	page 241
■ Data Entry	page 241
■ Desktop Publishing	page 242
■ Development Tools	page 242
■ Educational	040
■ Engineering	page 242
■ Entertainment/Games	page 242

- Line idiline Odines	page 242
■ Financial	page 243
■ Flow Charting	page 243
■ Graphics	page 244

■ Health	page 244
■ Home Use	page 245
■ Inventory Control/Management	page 245

■ Languages	page 245
■ Legal	
■ Mailing List Programs	
■ Maintenance Management	
■ Manufacturing	page 246
■ Medical	
■ Music	page 247
■ Project Management	page 247
■ Public Domain/Shareware	page 247
■ Real Estate	page 248
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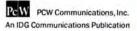
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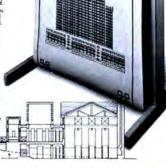
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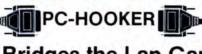
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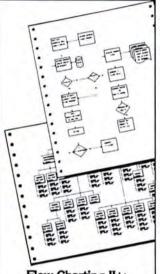
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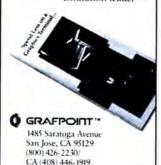
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### PRODUCTS FEATURED IN THIS ISSUE

### Reader Service Number

### Add-On Board

- 601 IntelliPort PS8, Computone Systems, page 90
- 602 Micronics 1616-01, Micronics, page 148
- 603 Micronics 2016-01, Micronics, page 148
- 604 Micronics 2020-01, Micronics, page 148
- 605 PC Password, Computer Commodities USA, page 94

### CAD/CAM

606 EasyCAD2, Evolution Computing, page 98

### Communications

- 607 Boyan D3, Justin Boyan, page 192
- 608 ProComm 2.42, Datastorm Technologies, page 192
- 609 Qmodem SST, The Forbin Project, page 192
- 610 Telepower + , Lantor, page 90

### **Computer System**

- 611 AST Premium/386, AST Research, page 134
- 612 Blackship 286, Blackship Trading Company, page 101
- 613 Clone Technologies AT-1, Clone Technologies, page 106
- 614 Compaq Desktop 386s, Compaq Computer, page 82
- 615 Compaq Deskpro 386/25, Compaq Computer, page 82
- 616 Epson Equity II +, Epson America, page 96
- 617 Fivestar 286, Fivestar Computers, page 105
- 618 IBM PS/2 Model 50 Z, IBM, page 80
- 619 IBM PS/2 Model 70, IBM, page 80
- 620 IBM PS/2 Model 80-111, IBM, page 134
- 621 Maxum Turbo XE, 47th Street Computer, page 111
- **622** Micro 1 286, Micro 1, page 102
- 623 Netpro 386/25, Simple-Net Systems, page 87
- 624 Plain Vanilla PC, PC Designs, page 113
- 625 Standard Turbo/10, CompuAdd, page 111

### Reader Service Number

- 626 Tandon PAC 286 Plus, Tandon, page 140
- 627 TBS Int'l 286 Turbo Plus, TBS Int'l, page 104
- 628 THE PC/10, PC Network, page 114
- 629 Whole Earth Turbo System, Whole Earth Electronics, page 110

### Data Base

- **630** 3X5 4.0, Softshell, page 191
- **631** 3X5+, Softshell, page 191
- 632 PC-File + 2.0, ButtonWare, page 191
- **633** PFS: Professional File 1.01, Software Publishing, page 116
- 634 PowerBase 2.3, PowerBase Systems, page 117
- 635 Professional File 2.0, Software Publishing, page 94
- 636 RapidFile 1.2, Ashton-Tate, page 122
- 637 Reference File 1.0, Reference Software, page 121
- 638 Reflex 1.0, Borland Int'l, page 118
- 639 WAMPUM 3.1, Ward Mundy, page 191

### Data Entry

640 IntelliForm, Mind Path Technologies, page 90

### **Development Tool**

641 Brief 2.01, Solution Systems, page 222

### **Disk Drive**

642 IBM PS/2 Model 25 hard disk, IBM, page 80

### Display

- **643** Amdek 210, Amdek, page 125
- 644 AST Premium Display/ Monochrome, AST Research, page 125
- **645** Casper GM-1266, TW Casper, page 126
- 646 CTX 2400, CTX Int'l, page 126
- 647 Datafox SM-12SFA7, Datafox, page 126
- 648 Diamond Scan monitors, Mitsubishi Electronics America, page 87
- 649 imTEC 1252, Leading Technology, page 127
- 650 Magnavox Professional PC Monitor 80, N.A.P. Consumer Electronics, page 127
- 651 Packard Bell PB 1272, Packard Bell Electronics, page 127
- Quimax DM-12, Quimax Systems, page 128

### Reader Service Number

- 653 Samsung MD-1278, Samsung Electron Devices, page 128
- 654 Tatung MM-1255, Tatung Company of America, page 128
- **655** Thomson 230, Thomson Consumer Products, page 129
- 656 Xtron MF147, Xtron Computer Equipment, page 129

### Educational

**657** Lotus 1-2-3 Video Training, Soft Vision, page 94

### Graphics

- 658 Curve Digitizer 3.0, West Coast Consultants, page 192
- 659 Flicker 2.12, Brian Dooley, page 192
- 660 IBM Storyboard Plus 1.0, IBM, page 180
- 661 PC-Art 3.1, Mike Stone, page 192
- 662 Show Partner F/X 3.0, Brightbill-Roberts, page 180

### Information Management

663 Info-XL 1.0, Valor Software, page 168

### **Input Device**

664 Linus Write-top, Linus Technologies, page 88

### Integrated Software

665 Framework III, Ashton-Tate, page 96

### Language

666 Turbo Pascal 4.0, Borland Int'l, page 172

### Modem

667 Mini Modem, QIC Research, page 88

### Printer

668 Epson LQ-1050, Epson America, page 146

### Scanner

669 Page Reader 2.0, Saba Technologies, page 98

### Spreadsheet

- 670 ExpressCalc 3.0, Expressware, page 191
- 671 PC-Calc + 1.0, ButtonWare, page 191
- 672 QubeCalc 3.01, FormalSoft, page 192

### Reader Service Number

### Utility

- 673 Automenu 4.0, Magee Enterprises, page 192
- 674 Baker's Dozen, ButtonWare, page 193
- 675 BigEcho, CTRLALT Associates, page 193
- 676 Decision Analyst, Frontline Systems, page 92
- **677** Editor88 3.0, M.R.E. Software, page 193
- 678 Extended Batch Language 3.08, Seaware, page 193
- 679 FastCopy 2.0, Systems Software Support, page 193
- 680 FixBeep, Mike Blaszczak, page 193
- 681 FXMaster 3.2, Brian Raub, page 194
- 682 Homebase 2.5, Brown Bag Software, page 193
- 683 List 6.2a, Vernon D. Buerg, page 194
- 684 LQ 2.0, Granny's Old-Fashioned Software, page 194
- 685 MasterKey, R. P. Gage, page 194
- 686 Move 1.0, Excel-Soft, page 194
- 687 PKARC, PKWare, page 194
- 688 Project Calc, Frontline Systems, page 92
- 689 Qdups 1.5, Claude Biron, page 194
- 690 ShortCut 2.05, Mossy Rock Systems, page 193
- 691 SideKick Plus 1.00A, Borland Int'l, page 164
- 692 The Draw 2.21, The Soft Programming Services, page 194
- 693 Timer 1.5, Calvin Shields, page 194
- 694 XEQ, Hardwood Software Associates, page 195

### Word Processing

- 695 Galaxy 3.0, OmniVerse, page 191
- 696 MindReader 2.0, Brown Bag Software, page 98
- 697 New York Word 2.21, Magma Systems, page 191
- 698 PC-Write 2.71, QuickSoft, page 191
- 699 Professional Write 2.0, Software Publishing, page 94
- 700 WordStar Professional 5.0, MicroPro Int'l, page 92

### Reader Service

- 49 Acer Technologies Corp., page 28
- 179 Acer Technologies Corp., page 40
- Advanced Computer Products, page 273
- 210 AdvanTech, page 270
  - 2 ALPS America, pages 66-67
- 306 American Small Business Computers Inc., page 25
- Arlington Computer Products, pages 268-269
- 16 Ashton Tate, pages 56-57
- 302 ATI Technologies, page 65
- 57 Barcode Industries, page 32
- 20 Bible Research Systems, page 24
- 66 Big Blue Disk, page 18
- 88 Borland Intl., page 5
- 87 Borland Intl., page 7
- 21 Borland Intl., page C2, P1
- 215 Buffalo Products, page 137
- 24 Bulldog Computer Products, pages 160-161
- 6 Cahners Exposition Group, page 203
- Compaq, pages 49-52
- 164 Computer Brokers, page 260
- 213 Computer Direct, Inc., pages 84-85
- 200 Computer Discount Warehouse, pages 262-263
- 91 Computer Expo, page 264

### Reader Service Number

- 181 Concentric Data Systems Inc., page 181
- DAC Software, Inc., page 167
- Daybreak Technologies Inc., page 211, 213
- 208 DCA/Crosstalk, page 55
- 271 DCA/Crosstalk, page 97
- **74** Dell Computer Corp., pages 132-133
- 217 Diamond Flower, page 227
- 60 Diskette Connection, page 223
- **231** Emulex, page 45
- Epson America Inc., pages 37, 38-39
- 183 FormWorx Corp., page 183
- **227** Gateway 2000, page 259
- 184 GE Computer Service, page 99
- GE Information Services, page 169
- 172 General Parametrics, page 141
- **202** Group L, page 218
- 79 Haventree Software, Ltd., page 20
- 228 Hercules, page 41
- 26 Hewlett Packard, page 73
- 39 Hewlett Packard, page 75
- Hyundai, page 24
- ICR-FutureSoft, page Outsert
- 186 Information Research Corp., page 48
- Informix Software, pages 172-173
- 199 Itron, page 91
- 41 Kenosha Computer Center, page 267
- 98 Kensington Microware, Ltd., page C3
- 99 Key Tronic Corp., pages 10-11

### Reader Service Number

- 229 Konan, page 159
- 84 Living VideoText, page 33
- Lotus Corp., pages 68A-68H
- 252 Macola Software, page 208
- 112 Mannesman Tally, page 163
- Maxell, page 8
- 233 Maynard Electronics, Inc., page 229
- 170 Meridian Technology, pages 30-31
- Micrografx, page 42
- Micrologic Corp., page 157
- 8 Microware, page 58
- 65 Montgomery Grant, page 275
- 113 NBI, pages 34-35
- 222 NEC Home Electronics, pages 138-139
- 253 NEC Home Electronics, pages 26-27
- NEC Information Systems, page 9
- 132 Nitro Micro, page 261
- NSTL, pages 177, 178-179
- Oracle, page 12
- PC Connection, pages 152-155
- 160 PC Cooling Systems Inc., page 151
- 135 PC Network, The New page 271
- 144 Peachtree Software, page 95
- 201 Personal Computer Support Group, pages 16-17
- **220** Personal Computer Support Group, page 46
- 188 Personics Corp., page 59
- 92 Peter Norton Computing, page 195
- 218 Publishing Technologies, Inc., page 171
- 221 Renegade Technologies, pages 60-61
- 226 RightSoft Inc., page 93

### Reader Service Number

- 125 RP Systems, page 272
- 174 707 Computer Sales, page 258
- 225 Safe Power Systems Inc., page 54
- 309 Samsung Electronic Devices, page 147
- **223** SF Micro, page 266
- 283 Shamrock, page 265
- 97 Sigma Designs, page 15
- Softline, page 175
- 18 Softlogic Solutions, page 204
- **76** Software Link, The, page 143
- Software Publishing Corp., page 149
- Software Spectrum, page 207
- 194 Sourcemate, page 131
- 230 SPSS Inc., page 224
- 203 Sterling Castle, page 53
- **193** S-100, page 274
- 197 Tandy/Radio Shack, page 21
- 178 Telemart, pages 144-145
- Texas Instruments, page 89
- Toshiba America, Inc., page 62
- **207** Tussey Computer Products, page 71
- 11 Ven-Tel, page C4
- 277 Video-7, pages 22-23
- Warehouse Data, page 200
- **47** White Crane Systems, page 36
- 175 WordPerfect, pages 78-79
- 290 Zenith Data Systems, page 215

PC W	DID	Please print or type all information.				
The Magazine for PC	Decision-Makers	Name	Title	501 502 511 512	CATALOG INFORM 503 504 505 506	507 508 509 510
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Reader Service Number

### **HARDWARE** Boards/Cards/Chips

- 210 AdvanTech, page 270
- 228 Hercules, page 41
- 229 Konan page 159
- 220 Personal Computer Support Group, page 46
- 221 Renegade Technologies, pages 60-61
- 277 Video-7, pages 22-23

### Communications

- 179 Acer Technologies Corp., page 40
- 302 ATI Technologies, page 65
- 231 Emulex. page 45
- 11 Ven-Tel, page C4

### Computers

- 49 Acer Technologies Corp., page 28
- Compaq, pages 49-52
- 74 Dell Computer Corp., pages 132-133
- 184 GE Computer Service, page 99
- Hyundai, page 24

# Reader Service Number

- 223 SF Micro, page 266
- 197 Tandy/Radio Shack,
- Toshiba America, Inc., page 62

### Hardware Desk Top Publishing

172 General Parametrics, page 141

### **Input Devices**

99 Key Tronic Corp., pages 10-11

### LAN

199 Itron, page 91

### Monitors

- 222 NEC Home Electronics, pages 138-139
- 253 NEC Home Electronics, pages 26-27
- 309 Samsung Electronic Devices, page 147
- 97 Sigma Designs, page 15
- 290 Zenith Data Systems, page 215

### Other Peripherals

- 233 Maynard Electronics, Inc., page 229
- 225 Safe Power Systems Inc., page 54

### **Printers**

ALPS America, pages 66-67

# Service Number

- 215 Buffalo Products, page 137
- Epson America Inc., page 37
- Epson America, pages 38-39
- 26 Hewlett Packard. page 73
- 39 Hewlett Packard, page 75
- 112 Mannesman Tally, page 163
- NEC Information Systems,
- Texas Instruments, page 89

### Scanners/Digitizers

- 57 Barcode Industries, page 32
- 217 Diamond Flower, page 227

### Storage

 Maxell, page 8

### SOFTWARE

### Accounting/Financial

- DAC Software, Inc., page 167
- 252 Macola Software, page 208
- 144 Peachtree Software. page 95
- 194 Sourcemate, page 131

# Reader Service Number

### CAD/CAM

- 306 American Small Business Computers Inc., page 25
- Micrografx, page 42

### Communications

- 208 DCA/Crosstalk, page 55
- 271 DCA/Crosstalk, page 97
- 170 Meridian Technology, pages 30-31

### **Database Management**

- 87 Borland Intl., page 7
- 181 Concentric Data Systems Inc., page 181
- Oracle page 12

### **Desk Top Publishing**

- 113 NBL pages 34-35
- 218 Publishing Technologies, Inc., page 171
- Software Publishing Corp., page 149

### Educational

66 Big Blue Disk. page 18

### **Entertainment/Game**

66 Big Blue Disk, page 18

(continues)

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Reader Service

### Graphics

79 Haventree Software, Ltd., page 20

### **Integrated Software**

- Informix Software, pages 172-173
- 230 SPSS Inc., page 224

### Other

- 20 Bible Research Systems, page 24
- 183 FormWorx Corp., page 183
- 84 Living VideoText, page 33
- Lotus Corp., pages 68A-68H

### Spreadsheet/Templates/

- Daybreak Technologies Inc., page 213
- 201 Personal Computer Support Group, pages 16-17
- 188 Personics Corp., page 59
- Software Spectrum, page 207

Reader Service Number

### Utilities

- 88 Borland Intl., page 5
- 181 Concentric Data Systems Inc., page 181
- Daybreak Technologies Inc., page 211
- **202** Group L, page 218
- 186 Information Research Corp., page 48
- Micrologic Corp., page 157
- 188 Personics Corp., page 59
- 92 Peter Norton Computing, page 195
- 226 RightSoft Inc., page 93
- 18 Softlogic Solutions, page 204
- 76 Software Link, The, page 143
- 203 Sterling Castle, page 53
- 47 White Crane Systems, page 36

### **Word Processing/Aids**

- 16 Ashton Tate, pages 56-57
- 21 Borland Intl., page C2, P1
- 175 WordPerfect, pages 78-79

Reader Service Number

### MISCELLANEOUS

### **Computer Accessories**

- 98 Kensington Microware, Ltd., page C3
- 160 PC Cooling Systems Inc., page 151

### **Mail Order**

- Advanced Computer Products, page 273
- Arlington Computer Products, pages 268-269
- 24 Bulldog Computer Products, pages 160-161
- 164 Computer Brokers, page 260
- 213 Computer Direct, Inc., pages 84-85
- 200 Computer Discount Warehouse, pages 262-263
- 91 Computer Expo, page 264
- **227** Gateway 2000, page 259
- ICR-FutureSoft, page Outsert
- 41 Kenosha Computer Center, page 267
- 8 Microware, page 58
- 65 Montgomery Grant, page 275
- 132 Nitro Micro, page 261
- PC Connection, pages 152-155

### Reader Service Numbe

- 135 PC Network, The New, page 271
- 125 RP Systems, page 272
- 174 707 Computer Sales, page 258
- 283 Shamrock, page 265
- Softline, page 175
- 193 S-100, page 274
- 178 Telemart, pages 144-145
- 207 Tussey Computer Products, page 71
- Warehouse Data, page 200

### **On Line Services**

 GE Information Services, page 169

### Other

- 6 Cahners Exposition Group, page 203
- NSTL, pages 177, 178-179

### Supplies

60 Diskette Connection, page 223

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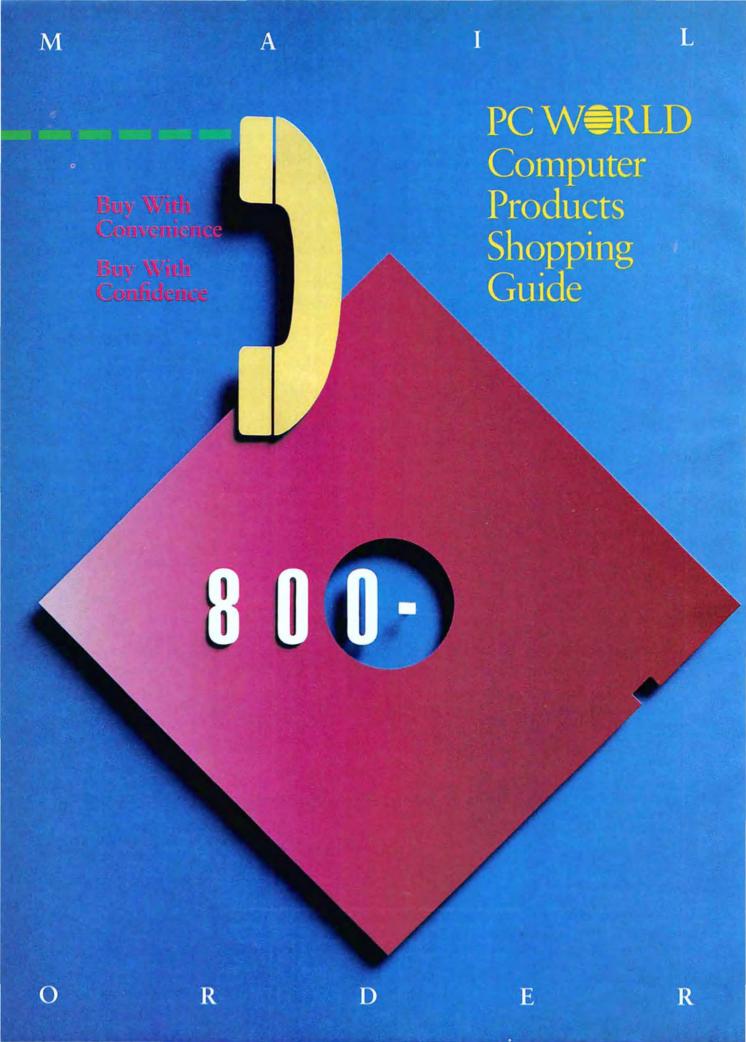
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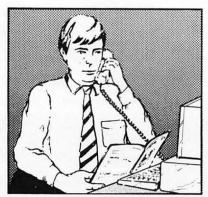
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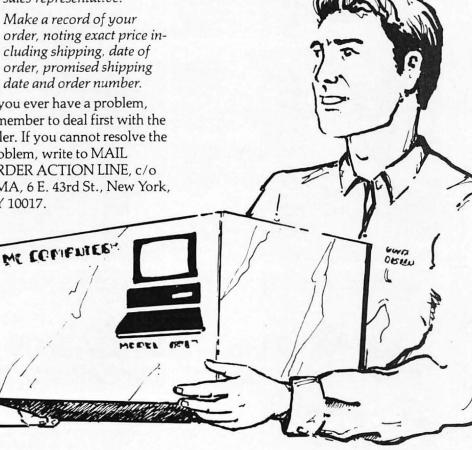
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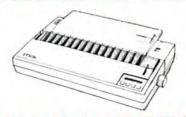
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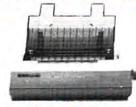


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### **Options**

- Cut-sheet feeder
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### LQ-850

- 264 cps in draft mode
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- SmartPark paper handling Front panel controls
- **Options**
- Tractor Feed
- Cut-sheet feeder
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### LQ-1050

- · 264 cps in draft mode
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- 6K buffer
- SmartPark paper handling
- 136 Column carriage · Front panel controls

### **Options**

- Tractor Feed
- Cut-sheet feeder
- 32K buffer



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# EPSON

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- 136 column
- Friction and tractor feed
- Automatic single-sheet loading
- Front panel controls
- IBM ProPrinter character set

### Options

- 32K buffer
- · Cut sheet feeder

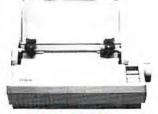


### FX-86e

- 240 cps in draft Elite mode
- 48 cps in Near Letter Quuality mode
- 8K buffer
- San-serif font standard
- Friction and tractor feed
- Automatic single-sheet loading
- Front panel controls IBM ProPrinter character set

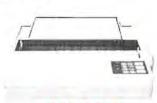
### Ontions

- 32K buffer
- Customize for special tasks



### LX-800

- 180 cps (12 CPI) in draft mode 30 cps in Near Letter Quality mode
- Front panel controls
- Pull tractor feed
- Single sheet loading
- Ontions
- · Cut sheet feeder



### EX-800

- 300 cps (12 CPI) in draft mode 54 cps in Near Letter Quality mode 8K buffer
- 8 typestyles
- Front panel controls
- Push tractor feed
- Single sheet loading

### **Options**

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- · 32K buffer

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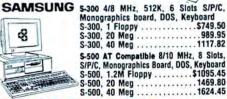


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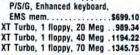


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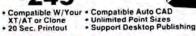
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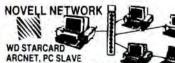
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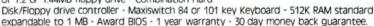
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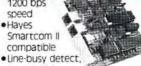
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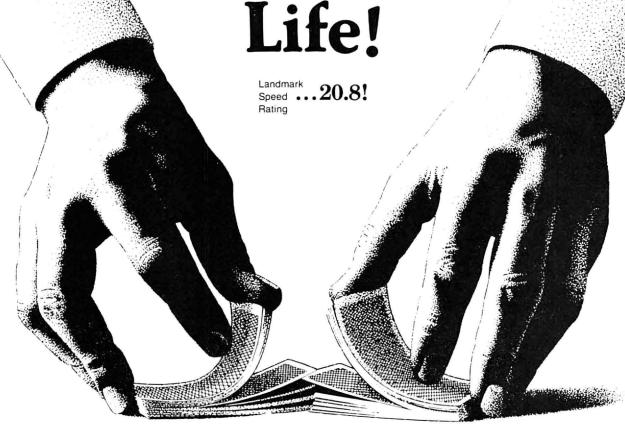
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Battery Backup \$325 Modem \$250	LX 800 150/30 cps	AST 6 Pack w/384k
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# The Data Base Solution



Michael G. Rubin

he role of the electronic spreadsheet in popularizing personal computers is well documented. In fact, the spreadsheet has proven so effective and its interface so intuitive, we tend to use it for nearly everything.

At my company I've noticed an alarming—though not surprising—tendency to force-fit all data collection and manipulation functions into row-and-column format. For example, a coworker in our sales department asked me to review a 2000-row behemoth that wasn't calculating properly. This 96K wonder actually comprised 39 concatenated reports and required two full minutes to load on an admittedly antiquated 8088 machine.

The disadvantages were obvious and would have been only slightly ameliorated by a faster processor. Locating specific data elements required painstaking scrolling. Copious amounts of disk space and RAM were exhausted by duplicate column and row headings. And generating even the most routine output from this information "system" was a study in thumb twiddling.

Obviously the spreadsheet wasn't meant to handle all our PC tasks, any more than the microwave oven was expected to cook all our meals. I'm as addicted to slash commands as the next guy, but for the sake of company productivity, I find myself faced with the difficult task of moving the PC users I support away from the comfort of spreadsheets and into the uncharted realms of data base management software.

I surveyed the 50 PC users in our corporation and found that half had installed 1-2-3 or Super-Calc on their machines, while only two had even looked at a data base management package. Predictably, the spreadsheet jockeys loved the ease of use and modeling power inherent in a worksheet and thought that they had to tolerate the output limitations. Spreadsheets are fine for quick-and-dirty analyses-and even for some fairly sophisticated ones-but productivity bogs down when applications get into thousands of cells.

I'm tempted to offer these frustrated power users the "magic" solution: a data base package that could reduce data redundancy, storage constraints, and I/O inefficiencies.

We've already achieved indirect labor productivity gains of 15 to 20 percent in some departments by developing data base applications for material planning and automotive fleet management.

But anyone who has dueled with the dBASE dot prompt knows that casual contact with a fully relational data base can lead to headaches, nausea, and other flu-like symptoms. A data base requires commitment, and knowing that prevents me from handing over dBASE's encyclopedic manuals.

Instead I've offered to teach what I know about *dBASE* to two power spreadsheet users who I suspect have the intestinal fortitude to tackle it. One has accepted; the other is thinking it over.

It's a slow start, but now that PC users have gotten their feet wet with spreadsheets, maybe more will move on to the next level. My hope is that the current round of data base software introductions—with friendlier interfaces and application generators and compilers—will encourage more people to swap rows and columns for records and fields. ●

Michael G. Rubin is director of the international division of Del Laboratories, a major cosmetic manufacturer.

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