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PC WORLD

JULY 1991 $3.95

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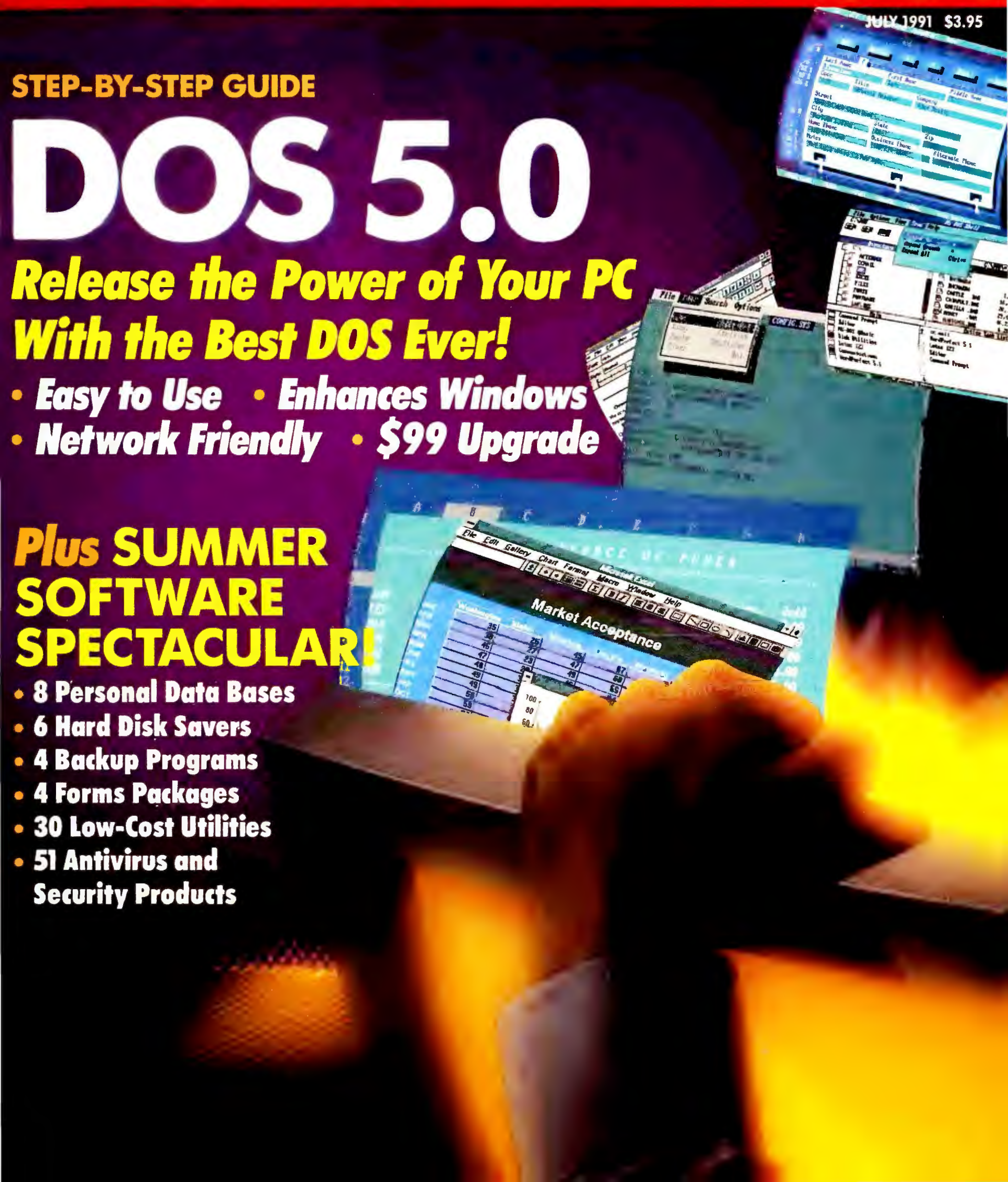

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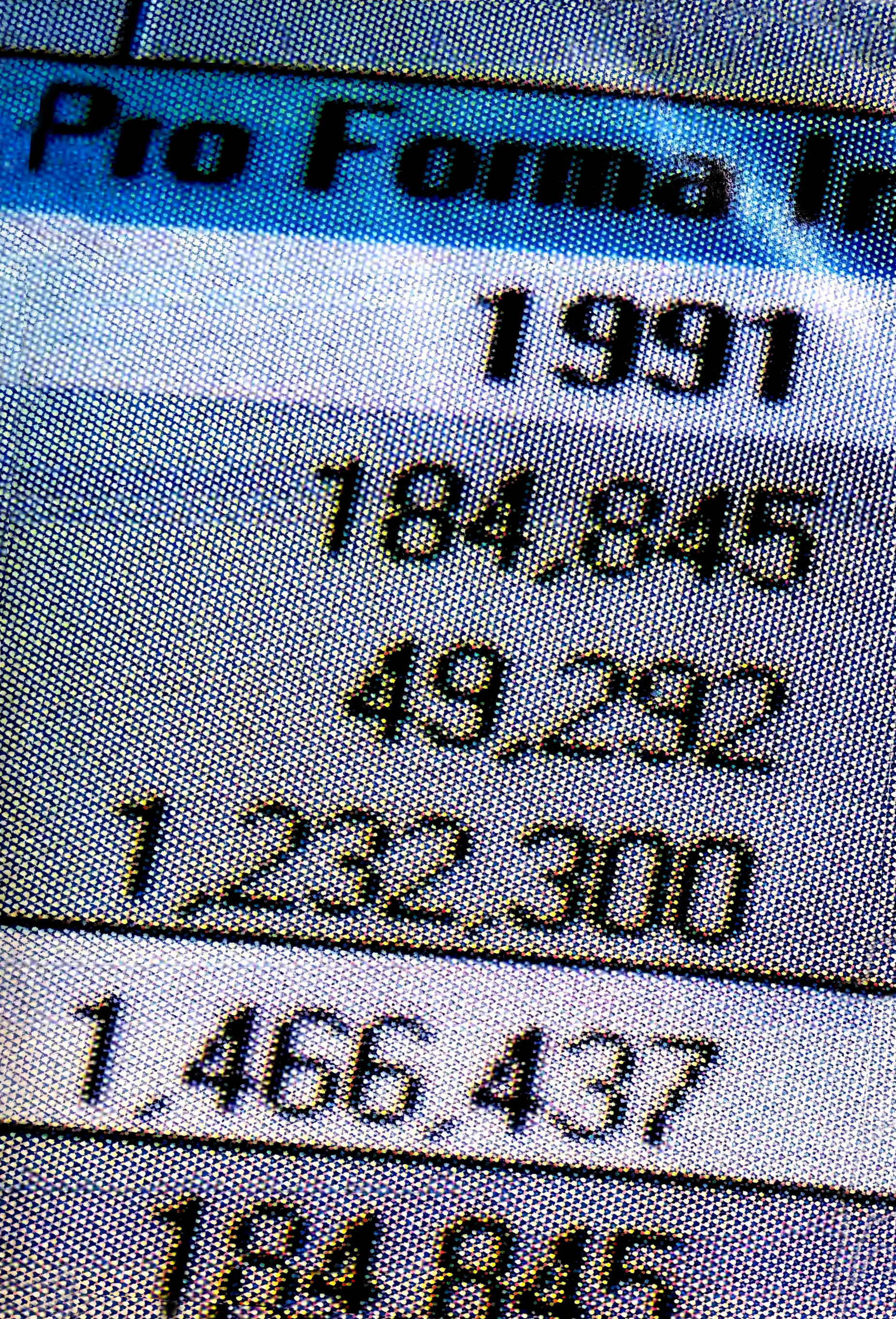

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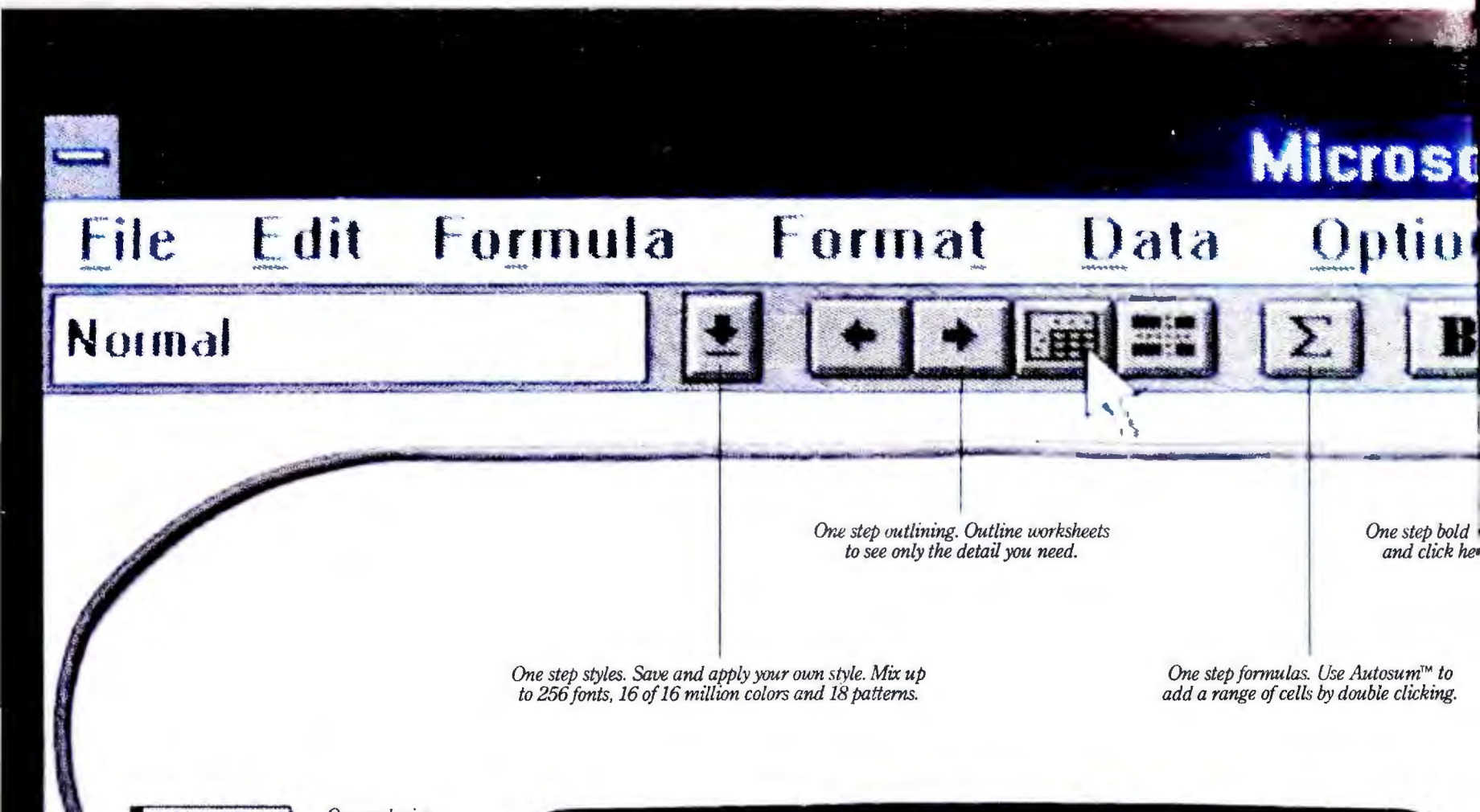

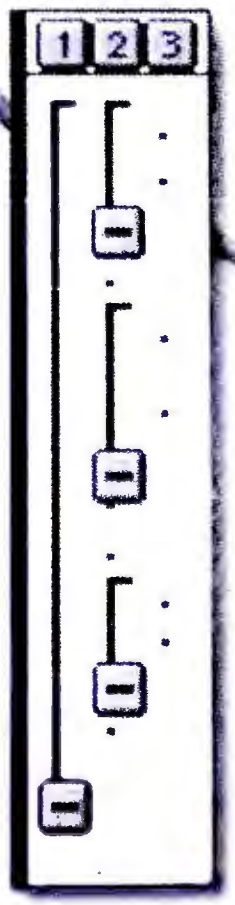

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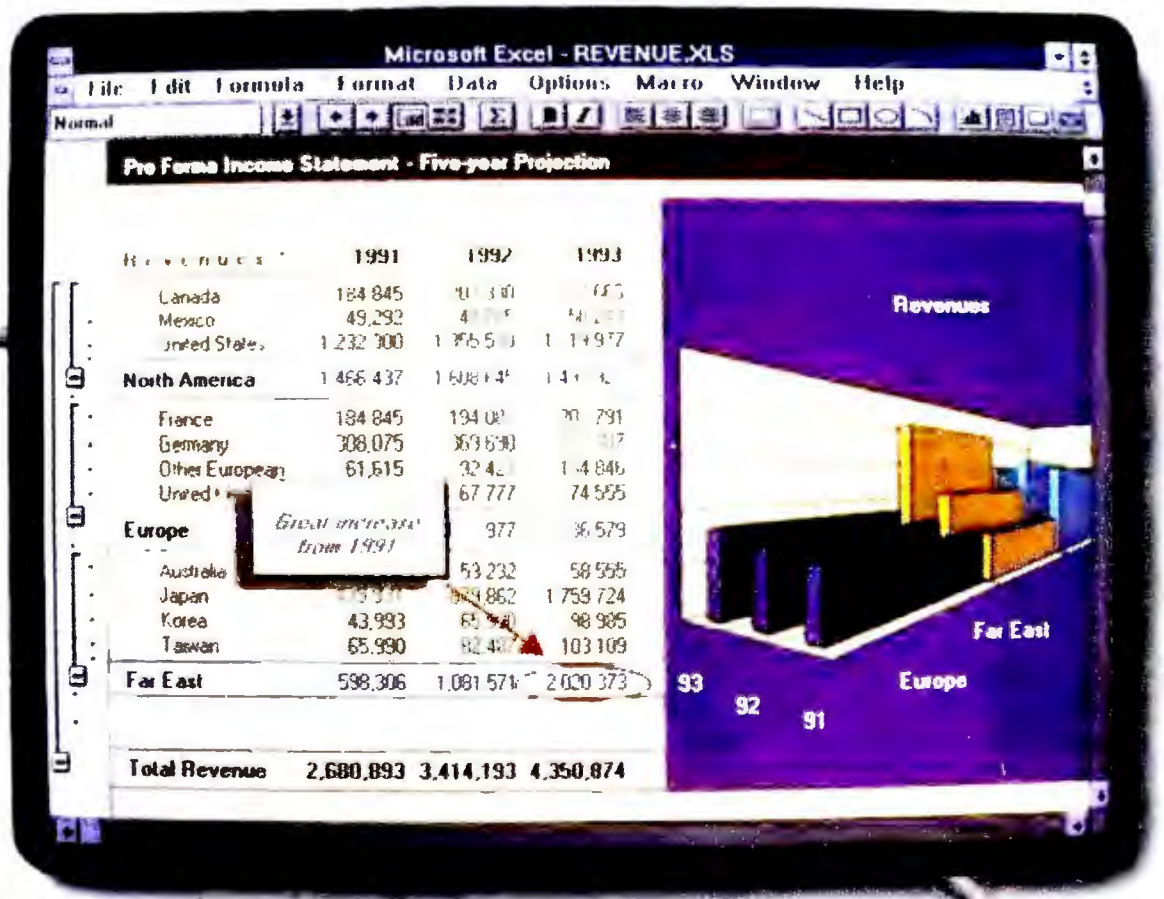

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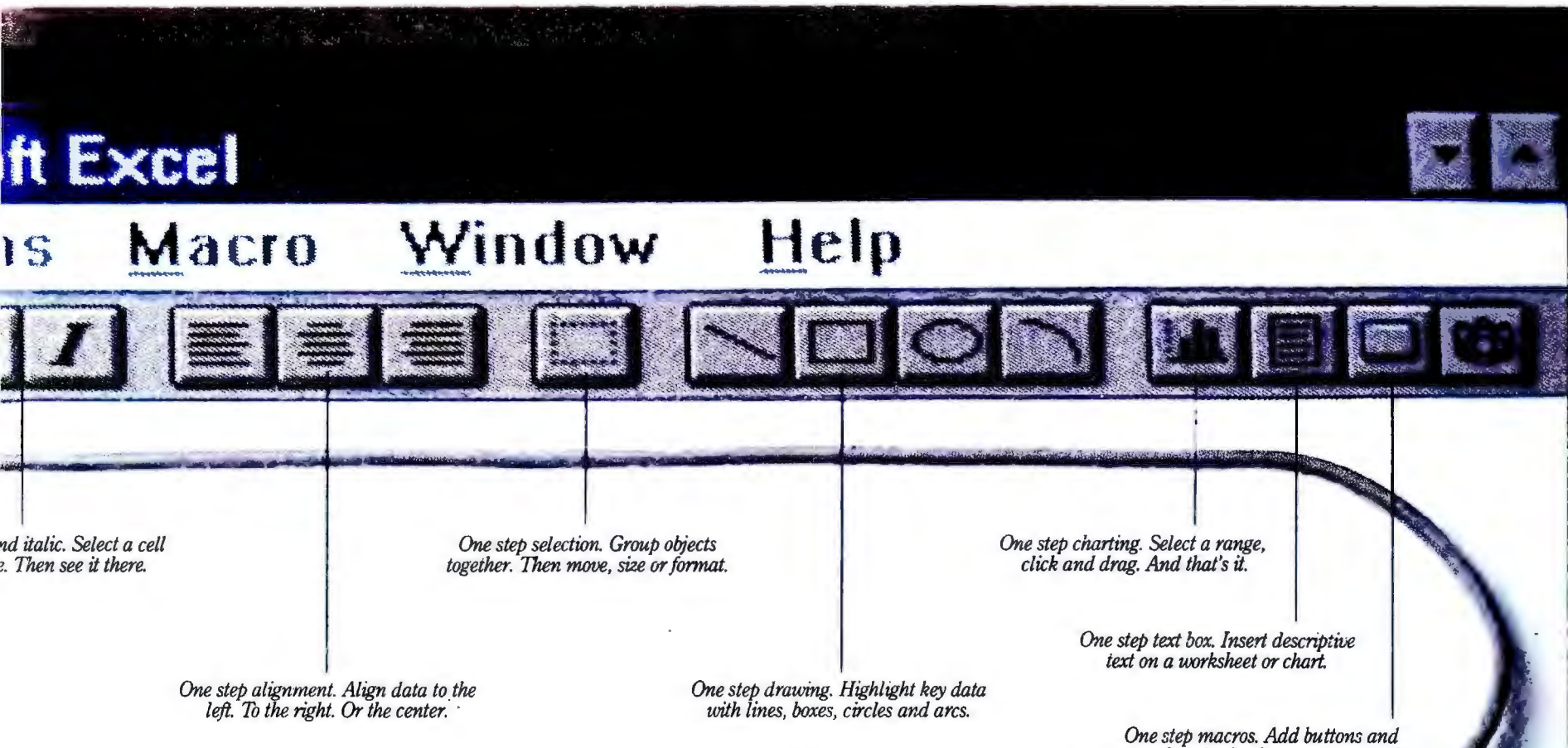

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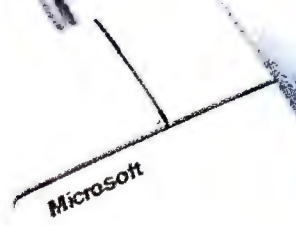

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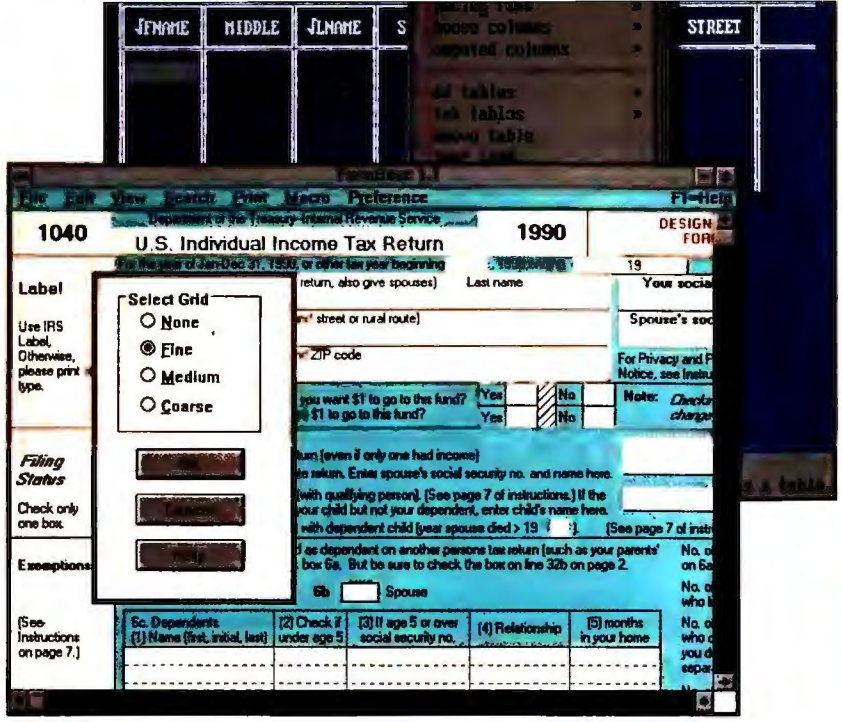

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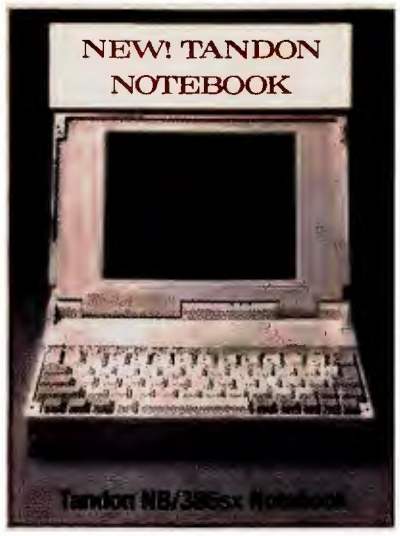

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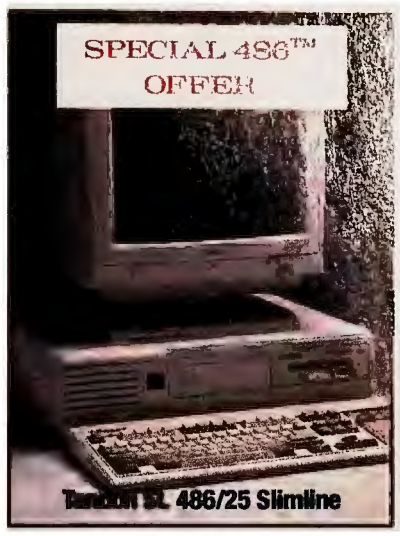

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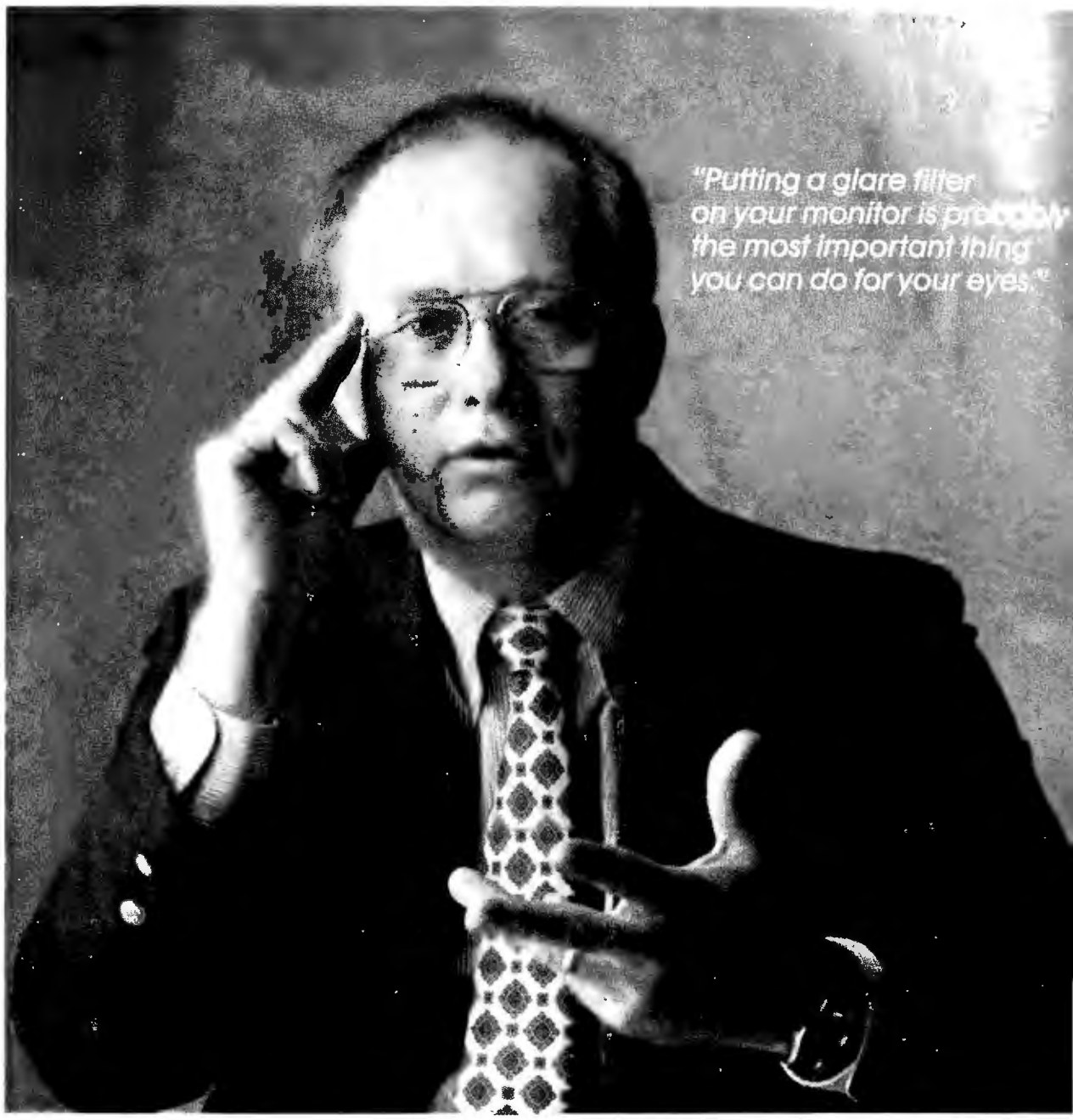
"Since I began using a computer five years ago, my eyeglass prescription has increased three times."

Tom Judd, president and founder of Curtis Manufacturing, on why you should use a glare filter.



"Headaches, blurry vision, scratchy and burning eyes, overall visual fatigue ... These are the most common manifestations of monitor glare.
The solution? Get a glare filter.
The Curtis Anti Glare Glass Filter has been specifically designed to reduce monitor glare and improve on-screen contrast. Using one reduces headaches, visual fatigue, and even neck and back strain.
When I asked our design team to develop the highest quality, best value glare filter on the market, I learned that certain filter elements worked better than others."

Glass vs. plastic:
"When I tested the plastic models, they scratched so easily after one cleaning, I could see for myself that glass was significantly better."

Glass vs. mesh:
"I have a high resolution color monitor. When I put a mesh filter on it, the monitor was harder to read, not easier. The mesh made the characters appear fuzzy."

Two-sided optical coating vs. one:
"I learned that monitor glare would hit both sides of the filter. A glass filter with optical coating on both sides visibly reduces glare better."

Cleaning the filter:
"All glare filters need to be cleaned occasionally. I asked, 'How?' Our design team answered by including a bottle of specially formulated, non-streaking cleaner and a lint-free cloth in every package.

Reversible frame:
"I asked for a durable, cosmetically attractive and ergonomically designed frame. Our designers delivered with a unique high-impact injection molded plastic frame which is black on one side—for those who want the utmost ergonomic design—and gray on the other side—for those who want to match the aesthetics of their monitor."

The results:
"The technical specifications of our filters are impressive: glare reduced by 95%, contrast improved 20 times. The design team told me how successful our product was, but I didn't realize it until I put one on my computer. What a difference! In fact, the Curtis Anti-Glare Glass Filter worked so well, I had one added to every computer at our corporate headquarters."

If you'd like to know more about the Curtis Anti-Glare Glass Filter and other Curtis products that make life in front of a computer easier and less stressful, write or call for our free brochure: *Tips to Computing More Comfortably,* or for answers regarding the VDT radiation issue ask for *VDT's & Radiation Q&A for the Computer User.* Curtis Manufacturing Company, Inc., 30 Fitzgerald Drive, Jaffrey, NH 03452-1931.
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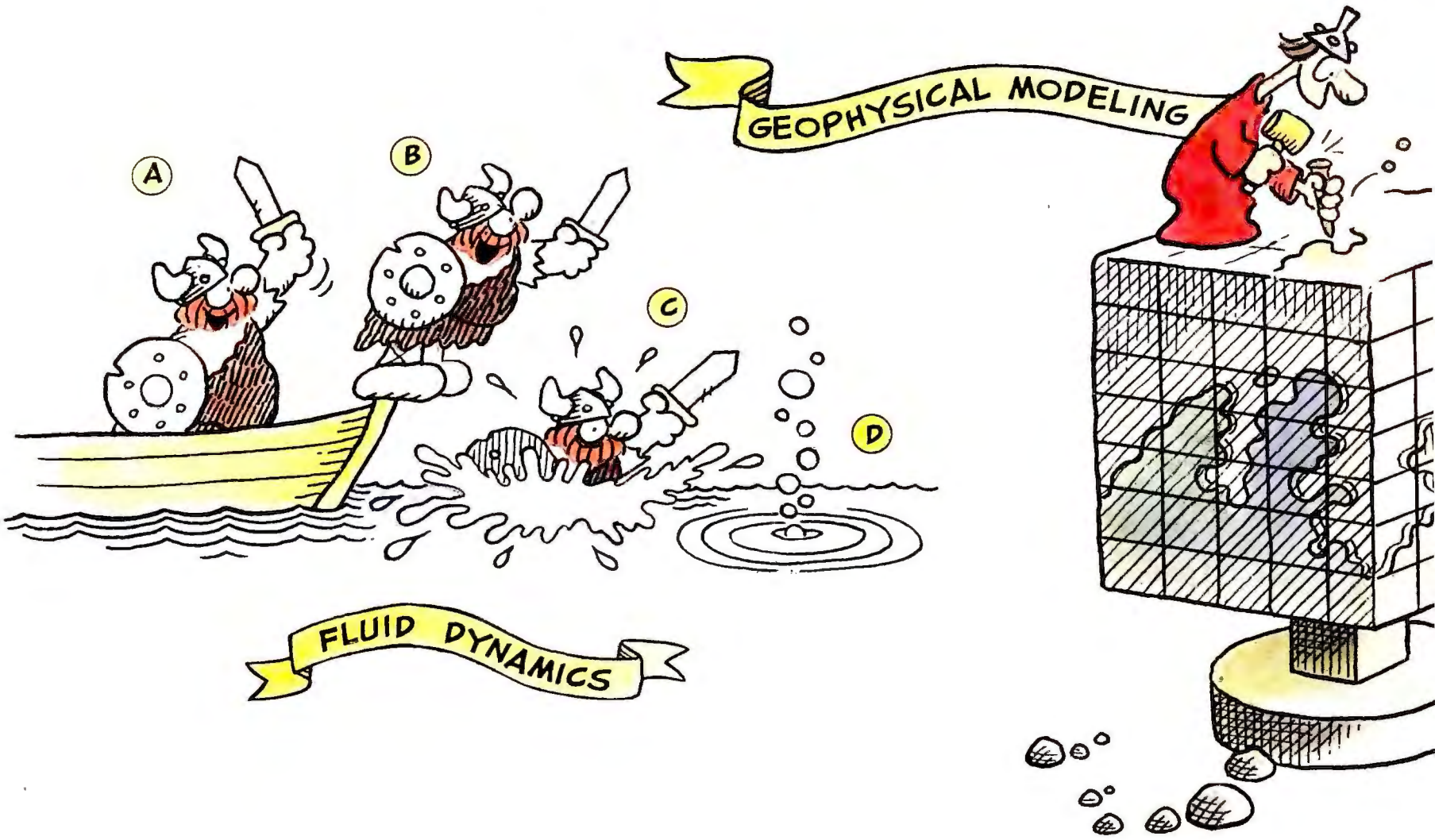
The IBM RISC System/ The power you've been seeking



It's a never-ending quest for power seekers. You're always looking for ways to run your favorite applications faster. Well, search no more. The RISC System/6000™ family of POWERstations and POWERservers gives you power that soars as high as 23 MFLOPS.

	MFLOPS	MIPS	SPECmark™
POWERstation 320	8.5	29.5	24.6
DECstation 5000-200	3.7	24.2	18.5

When it comes to porting, your ship has come in. Of course, all the speed in the world wouldn't mean much without the applications you need. So the RISC System/6000 family already has more than 2,500 of the most popular technical and commercial applications up, running and running fast. And if you think you know a good thing when you see it, so do software vendors. That's why you'll also be seeing more and more applications coming on board the RISC System/6000 platform all the time. And if you like to build your own solutions, there's a full arsenal of enablers and relational data bases from leading vendors, as well as CASE tools and a host of popular programming languages.

A smorgasbord of solutions. Applications already announced include the IBM engineering design packages CADAM™, CAEDS™, CBDS™,

MFLOPS are the results of the double-precision, all FORTRAN Linpack test 100x100 array suite. The Dhrystone Version 1.1 test results are used to compute RISC System/6000 Integer MIPS value where 1,757 Dhrystones/second is 1 MIPS (Vax 11/780). SPECmark is a geometric mean of ten benchmark tests. All performance data are based on published benchmark information.

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PC MAGAZINE
EDITORS' CHOICE
November 13, 1990
Canon BJ-10e

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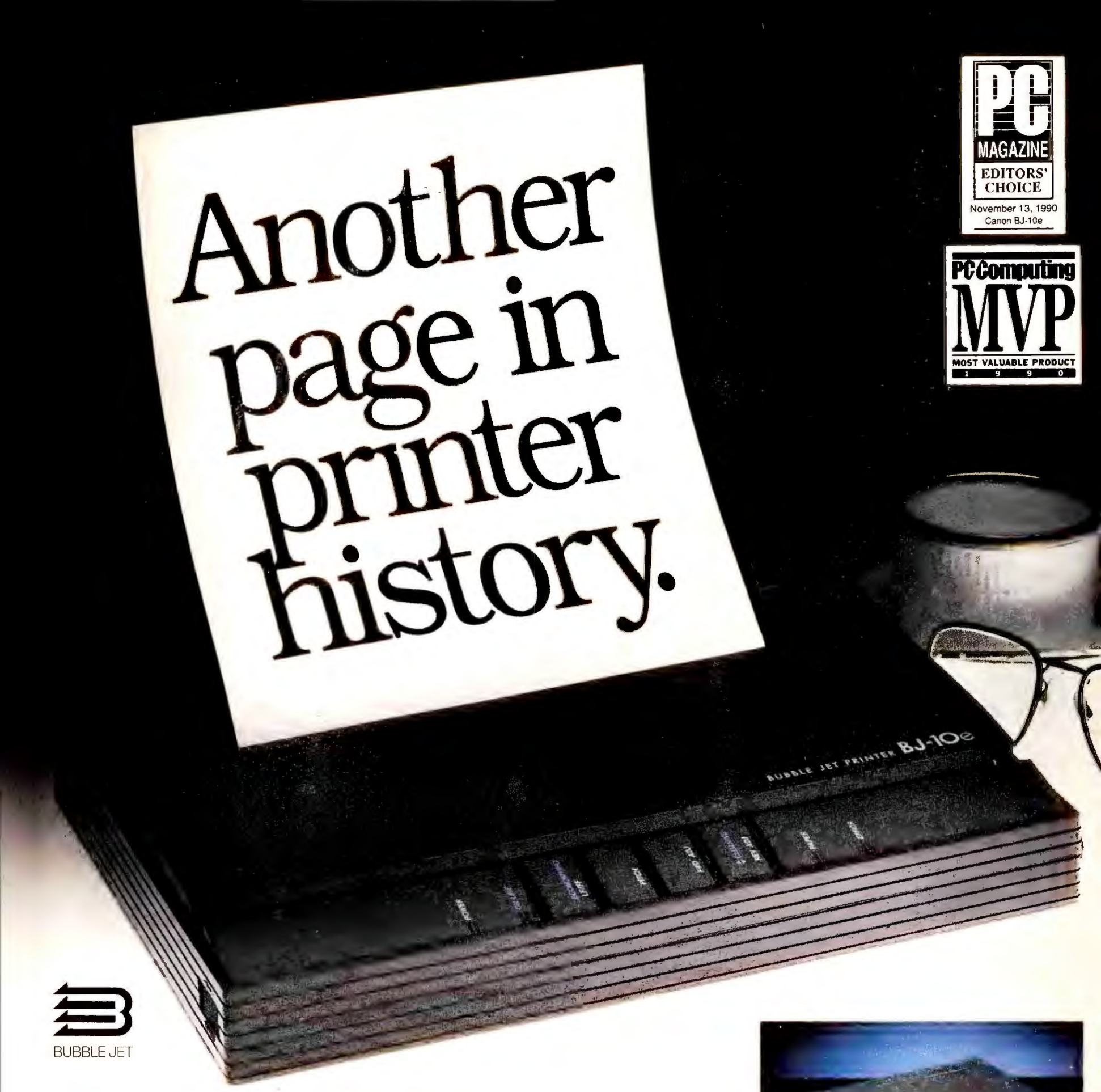

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How fast is it? It prints 83 characters per second and won't slow down when printing in bold or various type sizes. It even handles complicated graphics such as the scanned-in image printed here. And, it's so quiet it can be used in the middle of the night with someone asleep just a few feet away.

Plus you never have to worry about maintenance because it uses an economical pop-in BJ cartridge, containing the print head and ink supply, which prints approximately 700,000 characters (HQ mode). But best of all, the BJ-10e works everywhere you could possibly need it, fitting neatly into a briefcase.

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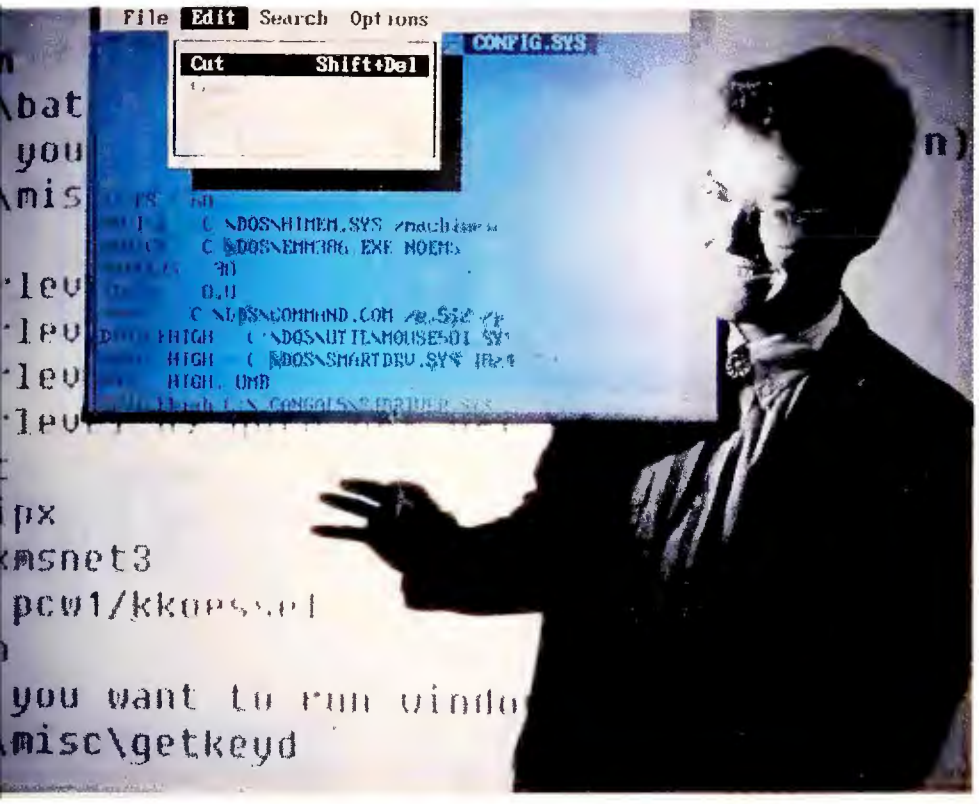


Contributing Editor Scott Spanbauer shows off DOS 5.0's spiffy new interface.

ROBERT CARDIN

DOS Gets A Face-Lift

Remember when everyone, *PC World* included, predicted that OS/2 was poised to take over the world? Sure you do. And you know why OS/2 failed: It ate RAM like a starved lion, it lacked applications to show off its advantages, and—worst of all—it just wasn't DOS.

DOS is more than a piece of software; it's a phenomenon. Over nearly ten years, thousands upon thousands of fabulous applications have latched onto this unassuming operating system, like long-lost relatives pursuing a lottery-winning cousin.

Nobody really *likes* DOS—users avoid dealing with it, and techies routinely deride it—but millions of people depend on it every day to run the programs that run their businesses. Few in the PC world, it seems, want to try their luck with anything else.

With DOS 5.0, the latest version and the subject of this month's cover story, the world's most successful operating system finally gets a proper make-over. Virtually everyone agrees that the previous attempt, DOS 4.0, was an unmitigated disaster—it *looked* better, but boy, was it buggy. DOS 5.0 not only eradicates the bugs, it sports an even easier interface and adds a load of extra features.

Contributing Editor Scott Spanbauer, who previewed DOS 5.0 for us, spent quite a while digging into beta versions, tallying up the new release's pluses. He installed 5.0 using the menu-driven, bulletproof setup routine. With one hand tied behind his back, he whipped his mouse around the new graphical shell, which finally lets you move files without copying them, deleting them, and entering file names every step of the way. He eagerly exploited the new memory management features to free up an extra 46K for applications on his 386. Fearlessly, he zapped data and deployed the undelete and unformat utilities.

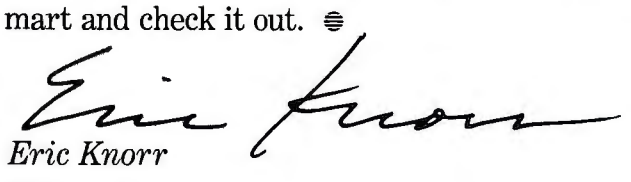
"Now?" asked Scott several months ago, thinking it must be time to turn in his preview. Not yet, we said, because Microsoft wasn't quite finished. Apparently, a lot of people were still beta testing the operating system to make sure it was certified bug-free.

So Scott kept plugging away. He squeezed out another 64K of base RAM by moving his disk cache to high memory. He used 5.0 to load his favorite applications and hot key between them, and wondered whether he really needed *Windows* after all. Then again, with a little more memory free, *Windows* seemed to run faster.

Scott called again weeks later, thinking we'd forgotten about him. By then we'd learned that Microsoft had launched the biggest beta test program in history. Thousands of users were pounding away on 5.0 at Microsoft's behest. At least Scott didn't feel alone. He flipped through every hypertext help screen and exercised the new text editor. He even tried QBASIC, the version of *QuickBASIC* that now comes with DOS.

Finally, it was time.

As Scott's preview makes clear, for all the improvements, DOS 5.0 is an evolutionary—not a revolutionary—product. Everything about DOS 5.0 is painless, even the price: Current DOS users can go to their favorite dealer and buy the upgrade for a mere $99.95. Now that Microsoft has finally bowed to the will of the people and released a DOS that's easy to use, we're betting you'll want to run down to the nearest software mart and check it out.



Eric Knorr
Editor

There is a difference and a

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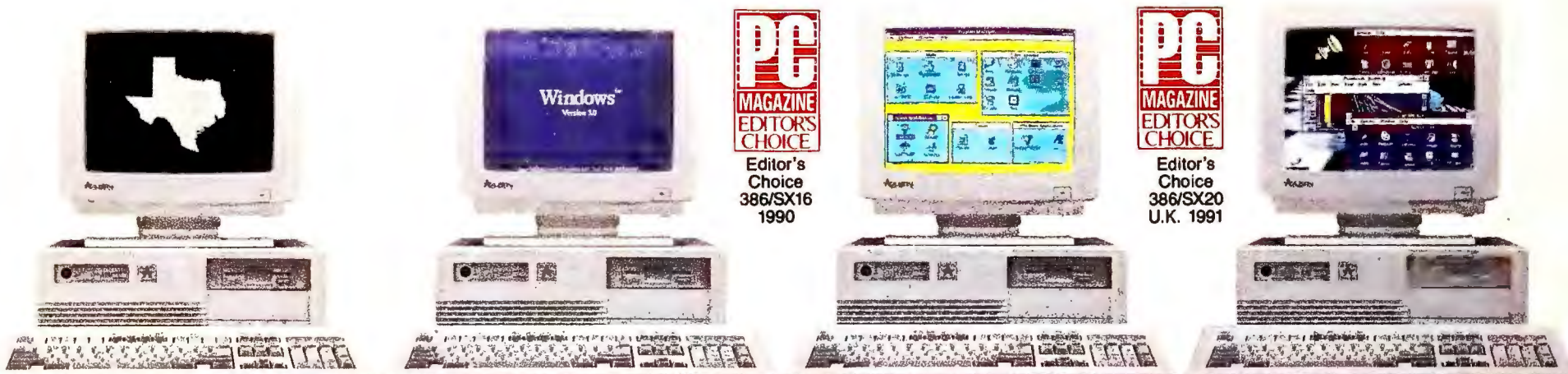

PC MAGAZINE EDITOR'S CHOICE
Editor's Choice 386/SX16 1990

PC MAGAZINE EDITOR'S CHOICE
Editor's Choice 386/SX20 U.K. 1991

$1090

AUSTIN 286/16
STANDARD CONFIGURATION
Microprocessor: 80286 running at 16MHz.
Special Features: GE on-site service.
Storage: 40Mb IDE hard drive. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 1Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: TTL monochrome monitor with video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

$1890

AUSTIN 386/SX16 WINSTATION
STANDARD CONFIGURATION
Microprocessor: 80386SX running at 16MHz.
Special Features: Pre-loaded with Microsoft Windows 3.0 and MS-DOS 4.01. Microsoft mouse. GE on-site service.
Storage: 40Mb IDE hard drive. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 2Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor with 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

$1990

AUSTIN 386/SX20 WINSTATION
STANDARD CONFIGURATION
Microprocessor: 80386SX running at 20MHz.
Special Features: Pre-loaded with Microsoft Windows 3.0 and MS-DOS 4.01. Microsoft mouse. GE on-site service.
Storage: 40Mb IDE hard drive. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 2Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

$2490

AUSTIN 386/25 WINSTATION
STANDARD CONFIGURATION
Microprocessor: Intel 80386 running at 25MHz.
Special Features: Pre-loaded with Microsoft Windows 3.0 and MS-DOS 4.01. Microsoft mouse. GE on-site service. Small footprint chassis.
Storage: 85Mb IDE hard drive. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 2Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

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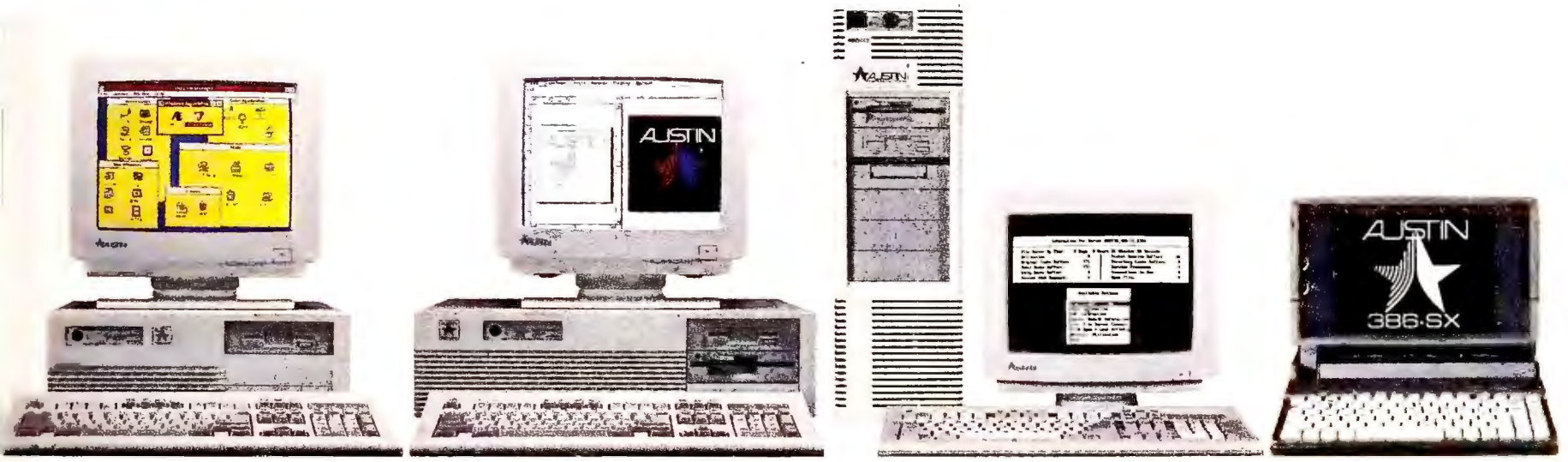

$3290

AUSTIN 386/33 WINSTATION
STANDARD CONFIGURATION

Microprocessor: 80386 running at 33MHz.
Special Features: 128K system cache. Pre-loaded with Microsoft Windows 3.0 and MS-DOS 4.01. Microsoft mouse. GE on-site service. Small footprint chassis.
Storage: 125Mb IDE hard drive with 32K cache. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 4Mb RAM
Expansion: 7 expansion slots (6 16-bit and 1 8-bit).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

$3990

AUSTIN 486/25 WINSTATION
STANDARD CONFIGURATION

Microprocessor: Intel 80486 running at 25MHz.
Special Features: Internal 8K cache and floating point unit. Pre-loaded with Microsoft Windows 3.0 and MS-DOS 4.01. Microsoft mouse. GE on-site service.
Storage: 125Mb IDE hard drive with 32K cache. 1.44Mb or 1.2Mb floppy disk drive.
Memory: 4Mb RAM (expands to 32Mb on system board).
Expansion: 8 EISA expansion slots (6 Bus Master Slots).
I/O Ports: 1 parallel and 2 serial ports.
Video: 14" VGA color monitor. 16-bit VGA color video adapter.
Keyboard: Enhanced 101 keyboard with tactile/click touch.
Compatibility: DOS, OS/2, Novell, Unix.

$6730

AUSTIN 486/33E WINTOWER
STANDARD CONFIGURATION

Microprocessor: Intel 80486 running at 33MHz.
Special Features: EISA bus architecture. Internal 8K cache and floating point unit. Optional 128K external cache. Landmark v1.14 rating-167.8 MHz. Power meter rated @ 14.93 MIPS. Shadow RAM. EMS LIM 4.0 support. Microsoft package. GE on-site service. Vertical chassis.
Storage: 330Mb SCSI hard drive. 1.44 Mb or 1.2Mb floppy disk drive.
Memory: 8Mb RAM (expands to 64Mb on system board).
Expansion: 8 32-bit EISA bus master.
I/O Ports: 2 parallel and 2 serial ports.
Video: 14" VGA monochrome monitor. VGA video adapter.
Keyboard: Enhanced 101 keyboard.
Compatibility: DOS, OS/2, Novell, Unix.

$2295

AUSTIN 386/SX16 NOTEBOOK
STANDARD CONFIGURATION

Microprocessor: 80386SX running at 16MHz.
Special Features: Weight 6.1 lbs. without batteries. Notepad size. Dual removable battery packs for up to 7 hour battery life. Audio/Visual low battery warning indicator. Leather carrying case. Batteries & Universal AC adapter/charger included.
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Memory: 2Mb RAM (expands to 8Mb on system board).
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After all, we designed LANtastic to make the productive power of a full-featured LAN accessible to anyone who wanted to streamline their computer operations. And whether you're connecting two PCs or 30 or 200, you can rest assured that you are buying into a product that will grow as you grow, with a commitment to developing innovative products that anticipate the needs of business people like yourself.

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LAN TIMES READERS CHOICE 1991

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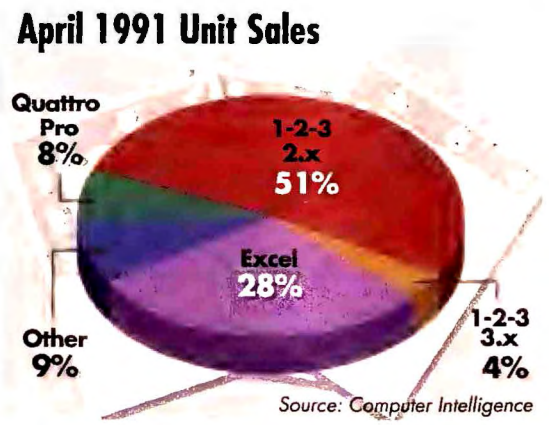
MIKE HOGAN

1-2-3 Opens Up Windows

Offers Best of Both Worlds With Extras

Lotus plans to ship by late summer the eagerly awaited *1-2-3 for Windows*, a full-blown *Windows* package that's keystroke compatible with earlier *1-2-3* versions. Offering 12 million–plus *1-2-3* customers a clear upgrade path to the fast-growing graphical environment, the new spreadsheet is expected to bring many more users to *Windows*.



1-2-3 for Windows could change a spreadsheet market already in a state of flux.

1-2-3 for Windows "looks, acts, feels, and talks like a *Windows* product, but everything you've done in *1-2-3* still works," says product marketing manager Paul Stroube. The new version of the spreadsheet offers pulldown menus, DDE hooks, and other standard *Windows* support. *1-2-3* devotees also get a safety net: A pop-up Classic window has the familiar *1-2-3* menu. *1-2-3 for Windows* runs all existing macros unchanged, reads and saves any *1-2-3* file in the original format, and utilizes style sheets from earlier add-ins such as *Impress*.

1-2-3 for Windows also sports a palette of "smart icons" to speed up standard tasks such as printing or inserting columns. Users can select icons to install, or create their own icons using macros. Additionally, it includes enhanced charting, the Solver technology of *1-2-3/G*, and bundled Adobe fonts. Expected to list for $595, it will be a $49 upgrade from any other *1-2-3* version for six months after ship date.

Lotus is a latecomer to the environment but will soon boast the most complete *Windows* line—*1-2-3*, *Freelance Graphics for Windows*, *Ami Pro*, *cc:Mail*, and *Lotus Notes*—tied together via smart icon palettes and other important touches. *1-2-3 for Windows* solves the conundrum of companies that want to shift to *Windows* but have major investments in *1-2-3*, says InfoCorp analyst Bill Higgs.

GORDON STUDER

DEC Launches PC Initiative

After years of watching the PC bandwagon roll by, $13 billion Digital Equipment Corporation has launched a major initiative behind aggressively priced PCs and its traditional strength in network computing. DEC PCs are not likely to be sold at retail soon, but DEC recognizes that the fight for the corporate computing dollar starts on the desktop, says PC product manager Geoff Burr. Roughly 55 percent of Fortune 1000 computer spending goes for PC technology.

While DEC's revamped line still reflects its high-end orientation, analysts laud its price and value. The new flagship is the DECpc 433 Workstation, a 33-MHz 486 featuring customized graphics, 8MB of memory, a 64K cache, a network adapter, a floppy drive, a mouse, and a SCSI adapter, all for $5999. Built by Intel, the 433 runs standard VGA applications at very high speeds and supports applications written for *AutoCAD*, *Windows*, and the TIGA and 8514/A graphic environments at resolutions of up to 1280 by 1024 with 256 colors. Among other new offerings is a $11,995 486 server built by Tandy, manufacturer of most DEC PCs.

While little known to single-PC buyers, DEC has quietly created a large business around network-oriented products. PC group manager John Rose estimates that DEC will sell $300 million in PCs and $1.2 billion in related services and add-ons this year.

The Yankee Group's Paul Zagaeski applauds DEC for finally putting its long-avowed open-systems desktop strategy into action. Nina Lytton of the *Open Systems Advisor* newsletter predicts DEC's greatest appeal will be its round-the-clock network support. "It's nice to see DEC finally showing some common sense about the PC business."

AT&T Computers to Wear NCR Label

Telecommunications giant AT&T is acquiring NCR Corporation, but its stated intent is to sell its computers under the NCR label. AT&T wants to get behind NCR's plan to replace mainframes with lower-cost microprocessor-based systems compatible with Intel-based desktops.

In fall 1990, NCR gave up proprietary architecture to begin reshaping its line into seven levels of Intel-based systems, ranging from a 3-pound, pen-based portable expected this summer to a recently introduced mainframe substitute using up to 288 386s or 486s in concert. This "open, cooperative computing approach" gives NCR customers at all levels access to a vast amount of additional software—including DOS, OS/2, and UNIX-based applications.

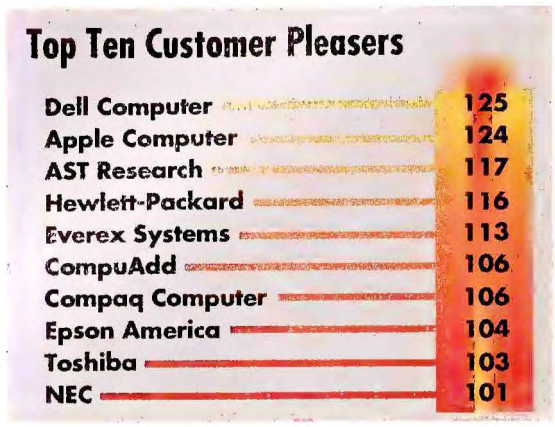
In late May, NCR bolstered the heart of its line with a 386SX notebook under $4000 and a 486SX desktop. NCR PCs are designed to appeal to corporate customers. NCR combines Micro Channel architecture with strong OS/2-based solutions for mission-critical applications, but NCR has always been a little pricey for dealerships.

However, NCR cut prices 15 to 20 percent in May and is pushing to extend its retail distribution beyond Businessland to other dealers in the top 100 metropolitan areas nationwide, reports NCR assistant vice president Gary Horning.

AT&T's primary motivation is to jump-start its own huge but unprofitable computer business by turning it over to NCR, says AT&T spokesperson John Skalko. It also wants to sell telecommunications equipment and services to NCR computer customers in retail and financial arenas as well as overseas. The nation's fifth-largest computer maker, NCR does 60 percent of its business offshore; only 15 percent of all AT&T revenues are generated there.

Dell Tops Satisfaction Poll

Dell Computer of Austin, Texas, has been ranked number one in customer satisfaction in J.D. Power & Associates' first-ever independent survey of personal computer users. Best known for its automotive surveys, the market researcher interviewed 2253 computer users in small to medium-sized businesses.



J.D. Power ranks small firms above market leaders in user satisfaction (100 is average).

The results surprised many because second-tier vendors like AST Research and mail-order firms like CompuAdd scored higher than sixth-ranked Compaq or IBM, which went unranked because it scored below the industry average of 100 points.

The $500 million Dell, which has been conducting a frontal assault on the prices of its much larger rival Compaq, trumpeted its victory in full-page ads the day the results were announced. But others note that the poll was limited to individuals and small businesses and doesn't measure performance for corporate buyers, where big manufacturers dominate.

Dell's and AST's high marks don't imply that Compaq and IBM offer poor service, says Graham Beachum, who has worked for Dell and IBM and now competes against them as vice president and general manager for Tandon Computer's North American operation. "Go into a corporation and try to suggest that IBM and Compaq don't have good service," he says. "They'll hand you your hat." Tandon's operation is still too new to be ranked.

J.D. Power measured six indicators of user satisfaction: product capabilities, software and hardware compatibility, reliability, ease of use, and support; product capabilities and support were weighted most heavily. Dell scored well across the board, reports Don Wright, who directs Power's PC research. Users also reported they were very satisfied with their PC purchases overall. However, they said they were generally dissatisfied with the level of support from PC makers. Almost a quarter of respondents didn't have problems fixed to their satisfaction. "This is probably the area in which the industry is weakest," notes Wright.

J.D. Power plans to prepare four industrywide reports annually—one on corporate users' satisfaction is due in the third quarter.

Tandon's American Invasion

Accelerating its push into U.S. markets, Tandon Computer is reportedly preparing to release a system that offers a novel method for initial configuration and upgrades. Scheduled for summer delivery, the desktop will be modular, offering processor and hard drive options in the form of plug-in cartridges. A user or dealer will be able to lower a front panel and plug in a range of 286, 386, and 486 processors as well as hard drives "like Nintendo cartridges," says one source. Memory will be upgradable via SIMMs.

Tandon refuses to acknowledge rumors of the new computer, which come hard on the heels of the April introduction of an aggressively priced notebook that's positioned against Compaq's market-leading 386SX-based LTE.

About 95 percent of the Moorpark, California, company's $422 million in sales still comes from overseas, but Vice President and General Manager Graham Beachum says the U.S. operation became profitable in March.

Beachum has pushed single-user sales via an 800 number and the Inmac catalog and set up a sales force to go direct to corporations. He also has enticed 60 Walden Software stores, 135 Intelligent Electronics stores, and many large value-added resellers and distributors into the fold. PC giants like Compaq and IBM, who swear loyalty to the dealer channel, might worry about conflicts. Not Beachum, who counters, "Compaq and IBM had the strategy for the eighties. In the nineties, you have to be all over. We do whatever works."

His ad campaign stresses support and price. Ironically, Tandon margins are anything but lean because the company sells mostly high-end servers and workstations for corporate networks.

GORDON STUDER

Weitek Opens Windows Faster

Math coprocessor kingpin Weitek Corporation has introduced a low-cost chip that more than doubles the speed of the most common *Windows* screen operations and provides super-VGA support. Samples of the Weitek 5086 User Interface Controller are in the hands of third-party suppliers that could retail inexpensive add-on boards by October, says vice president of marketing Tim Propeck. The chip could appear in new computers by COMDEX Fall.

The 5086 alleviates the most common bottleneck associated with graphical user interfaces: the screen redrawing that accounts for about 85 percent of all system calls. Whereas character-based applications need to process only 2 bytes of information every time a program displays a character, a GUI application administers 72 to 800 bytes per character. A large graphic can easily demand hundreds of times that number. This overhead translates into time spent watching the *Windows* hourglass.

The Weitek 5086 cuts that time in half for the typical spreadsheet or word processing application, says Joseph Mouhanna, manager for product development. The slower the system, he says, the bigger the benefit: "A 16-MHz 386SX with the 5086 runs *Windows* faster than a 25-MHz 486."

Since the chip also includes standard super VGA support, board or system makers will be able to offer both capabilities for about $150, notes Propeck, about the price of a board with super-VGA alone. While a diversification for Weitek, this is computation-intensive activity that exploits its strength. Anticipating the sale of 10 million GUI-based systems this year, the company plans to add audio and still-video accelerator extensions for multimedia next year. Weitek expects to do the same for full-motion video by 1993.

The Hottest Value In The Industry Just Got Even Hotter!

INTRODUCING THE NEW G

NEW MINI DESKTOP 286 AND 386SX MODELS ARE BIG ON PERFORMANCE!

Sometimes the best things come in small packages. This saying definitely applies to Gateway 2000's spunky little 286 and 386SX computers. These systems now come in a space-saving mini desktop model that's sizzling with powerful new features.

The motherboard in the 286 and 386SX systems was custom-designed and manufactured for Gateway 2000 using ASICs (Application Specific Integrated Circuits) to create a cleaner, more reliable board. We integrated the floppy drive controller, the video chip set and the I/O card on the motherboard, to leave five 16-bit slots open in the standard configuration.

The Gateway 2000 286 system operates at 16 MHz, rather than 12 MHz, for better performance. Our 386SX is available as a 16 MHz or a 20 MHz system. The 386SX-20 includes a 32K cache, which makes this system another truly outstanding Gateway price/performer.

HOT-PERFORMANCE 386 AND 486 SYSTEMS ARE IN ICY GRAY, CURVILINEAR MODELS

Although Gateway's 386 and 486 systems look entirely new, we limited changes on the inside to fine-tuning performance and reliability. In the Midwest, we firmly believe in the adage, "If it ain't broke, don't fix it." And these award-winning, price/performance systems did not need fixing.

All 386 and 486 systems include a fast and reliable IDE (Integrated Drive Electronics) hard drive with built-in cache. For added reliability and lower RF emissions, we've incorporated ASICs in the design of our motherboards whenever the change improved cost/performance. Because our 386 and 486 computers already include the fastest, most reliable video card on the market, the only way we could improve video performance was to increase the size of video RAM. So we did. All Gateway 2000 386 and 486 systems come standard with 1 MB video RAM. We also made our new Crystal Scan 1024NI color monitor standard with these systems. The 1024NI is non-interlaced, giving you a flicker-free video display with up to 1024 x 768 resolution.

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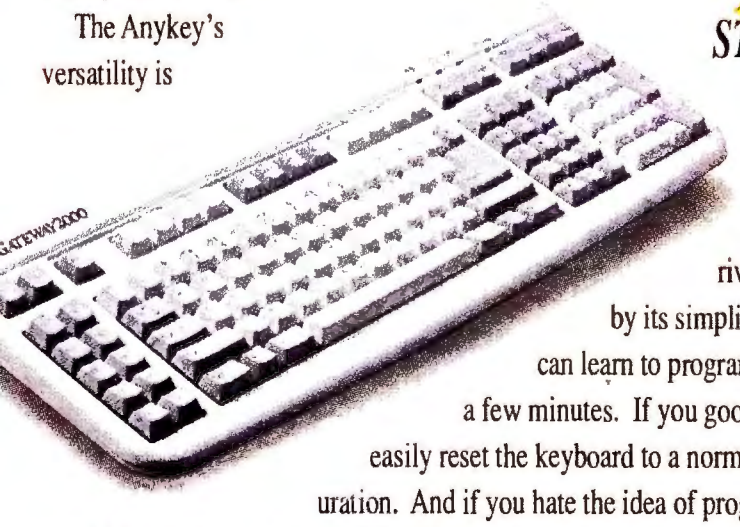
We call our new 124-key programmable keyboard the AnyKey because any key can be programmed to perform any function – anything you can imagine, quickly and easily. Or you can remap the keys to create your own keyboard layout. It's a revolutionary new concept designed to let you talk to your personal computer in a very personal way.

GATEWAY 2000 COMPUTERS

The AnyKey includes a numeric pad and a separate, full-function cursor pad with diagonal keys, plus two sets of function keys located along the top and left side.



The Anykey's versatility is rivaled only by its simplicity. You can learn to program it in just a few minutes. If you goof, you can easily reset the keyboard to a normal configuration. And if you hate the idea of programming anything, you'll still love the feel and extra keys on the AnyKey. The AnyKey keyboard is standard with all Gateway 2000 computer systems.

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LOOKING AHEAD

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RICHARD LANDRY

The Operating System That Wouldn't Die

Ten years and five versions later, DOS is still the desktop operating system of choice. How much life is left in the old survivor?

It's hard to believe that anything can last ten years in the PC world, but DOS —the operating system that launched the PC revolution—is about to enter its second decade, and it's still going strong.

That's not what was supposed to happen. Way back in 1987, a mere six years into DOS's existence, IBM and Microsoft hatched a plan to relegate the program to the dustbin of PC history. DOS didn't have the steam to keep up with the next generation of high-performance hardware and graphical software being designed in the PC giants' development labs. So it had to go, and the sooner the better. By now, most of us were supposed to have moved from DOS to its designated successor, OS/2.

But a funny thing happened on the way to the upgrade store. PC users went crazy over the new hardware—386 processors, VGA graphics, fast hard drives —but we didn't respond nearly so positively to the software side. Compared to lean, mean DOS, OS/2 came off looking fat, slow, and silly. It gobbled up RAM, didn't really take advantage of the new hardware, and was incompatible with the old DOS software.

Four years later DOS still lives, thanks to millions of PC users who voted with their pocketbooks to keep it around. Thanks to Microsoft, too, which came back with a double-barreled answer to the OS/2 debacle in the form of DOS 5.0 and *Windows 3.0*. Now Microsoft is championing the DOS-*Windows* combination as the preferred desktop solution for users who want to tap the power of next-generation PCs. But if DOS wasn't broken in the first place, why then did IBM and Microsoft try to fix it with OS/2?

DOS 5.0: OS/2 Lite

Those of us with short memories forget that it hasn't been all hearts and flowers between DOS and PC users, either. DOS 4.0 was a wholesale rout, for some of the same reasons that OS/2 met with an icy reception. Version 4.0 added significant new talents to the operating system's repertoire: support for large hard disks, and a new interface designed to appeal to novice users. But 4.0 was too RAM-hungry to use in business settings that stretched the limits of PC hardware and software. If you tried to use DOS 4.0's new options while running a big data base on a local area network, for example, you quickly discovered another meaning for the term *short memory.*

DOS 5.0 represents a return to the original idea behind DOS: to provide a simple, fast, powerful environment to run productivity software. While DOS 5.0 has its share of frills—a spiffier interface, on-line help, and task-switching capabilities—most users are going to get the greatest benefit from this version's winning way with memory. Networked data bases won't pose quite the same challenge; version 5.0 can load network software into unused memory space above 640K, making it a better operating system for networks than any previous version (see the cover story "DOS Does It Right").

When you add DOS 5.0 to *Windows,* you get a clearer sense of Microsoft's bottom-up strategy for filling in the gap left by OS/2. DOS 5.0 makes *Windows* run better. *Windows* makes DOS shine with a graphical user interface, multitasking capabilities, program-to-program communications, and powerful network support. For most users, *Windows* represents the simplest, best way to harness next-generation hardware power in order to accomplish more, and do it faster. What *Windows* won't do is prevent errant programs from clashing with each other and bringing the PC to a grinding halt. Microsoft's at work on a more powerful version of *Windows* that addresses this problem, but the fix ultimately lies with DOS itself.

OS/2 2.0: A Better DOS Than DOS?

IBM—and many of its customers, too—maintains that the DOS-*Windows* combo does little to help companies trying to automate their business practices with the aid of PC technology (see *Industry Outlook* in this issue). For these

(continues)

JOCK McDONALD

companies, networked, graphical workstations aren't just a way to help individual users get their work done faster or better. They're a means to link all the information resources of an organization so decision makers at every level can use them effectively. For that kind of computing environment, Big Blue says you'll need a product like OS/2 2.0 (due sometime this fall), which combines high-performance workstation power with good DOS and *Windows* compatibility—a first for OS/2.

If it took *Windows* to turn IBM serious about creating a version of OS/2 that users will really love, then perhaps OS/2 2.0 will motivate Microsoft to turn DOS-*Windows* into the mission-critical software environment that businesses really need. And naturally, it's going to take PC users to demand that IBM and Microsoft cooperate more and argue less. After all, there could be a lot of life left in *both* operating systems.

As always, I'm interested in your opinions on this or any other subject. Write to me at *PC World*, 501 Second St. #600, San Francisco, CA 94107; fax 415/442-1891; MCI Mail Richard Landry/301-3685.

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To print the current date in your *1-2-3* or *Quattro Pro* worksheet, place @ in the header or footer. The format of the printed date is determined by the format you select for the clock display on the status line. Reset the date's format with */Options¦Other¦Clock* in *Quattro Pro* or */Worksheet Global Default Other Clock* in *1-2-3*.

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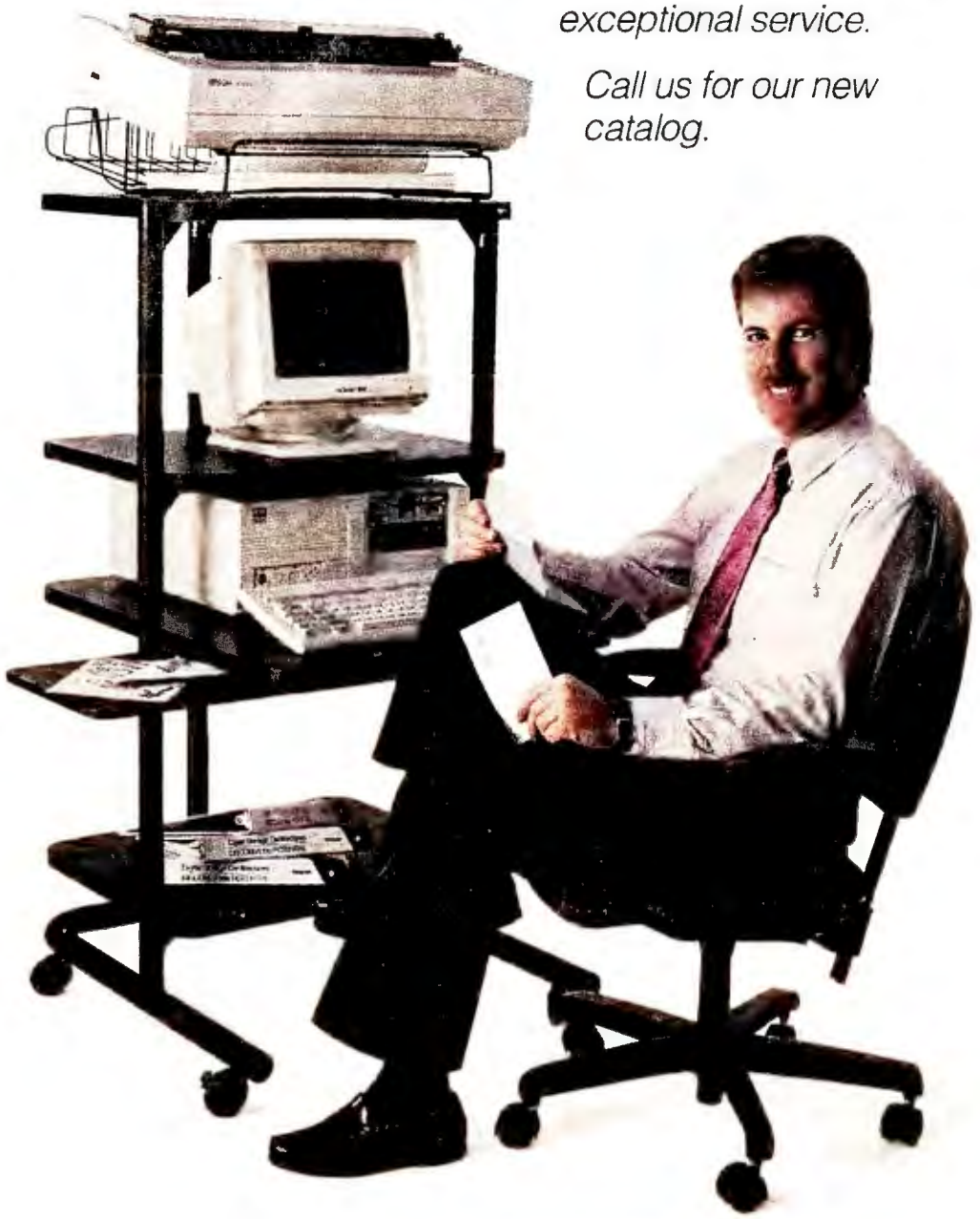

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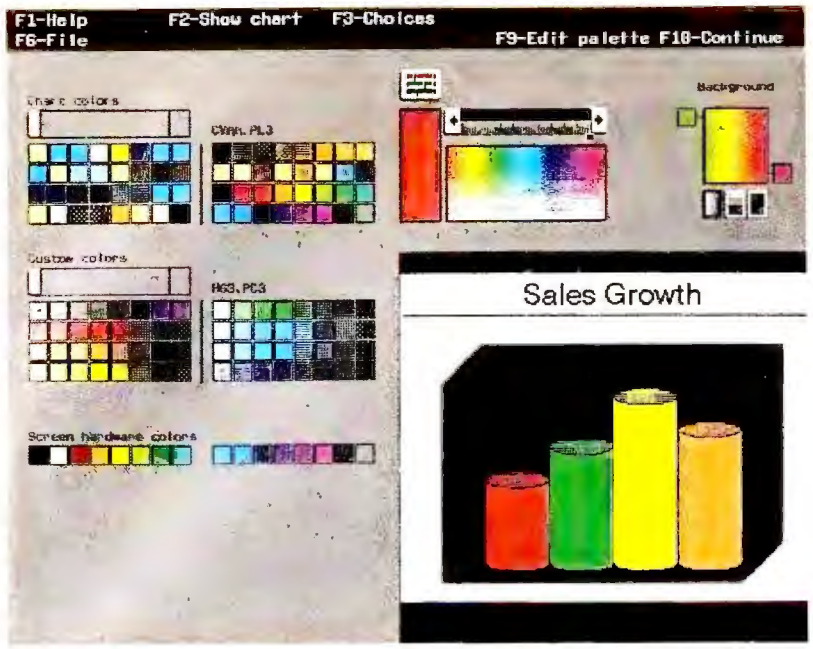

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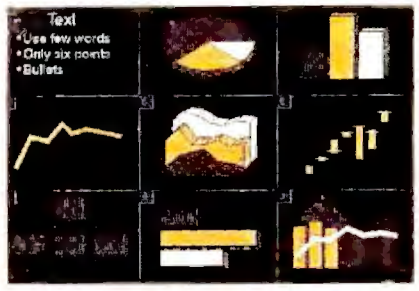

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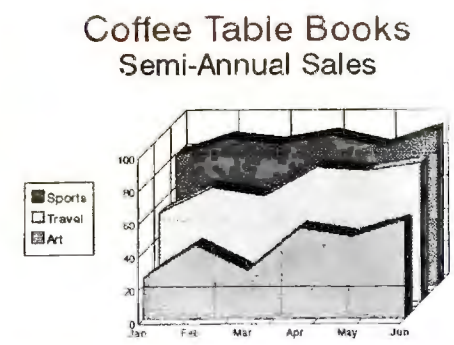

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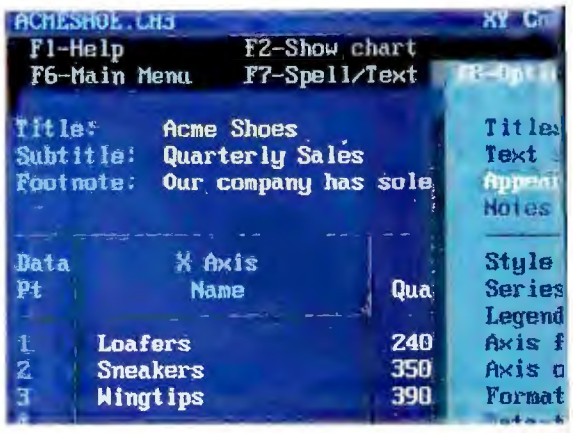

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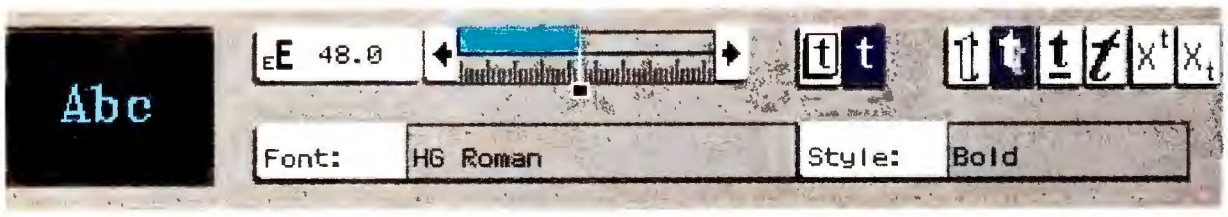

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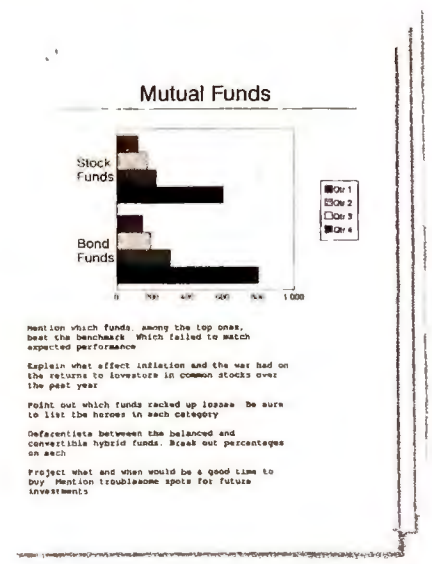

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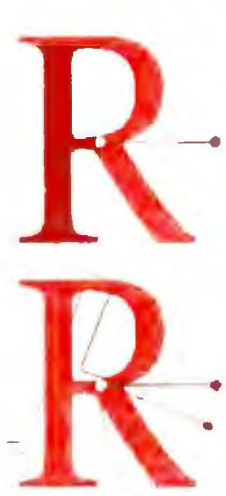

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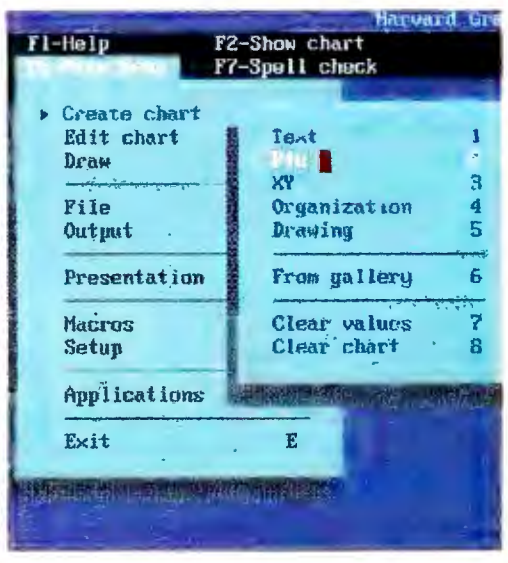

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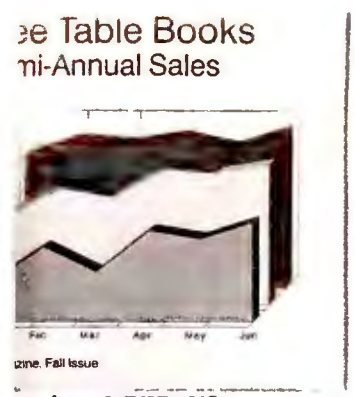

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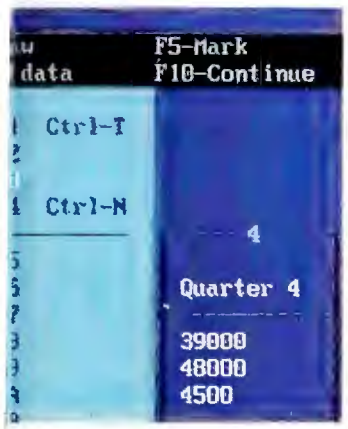

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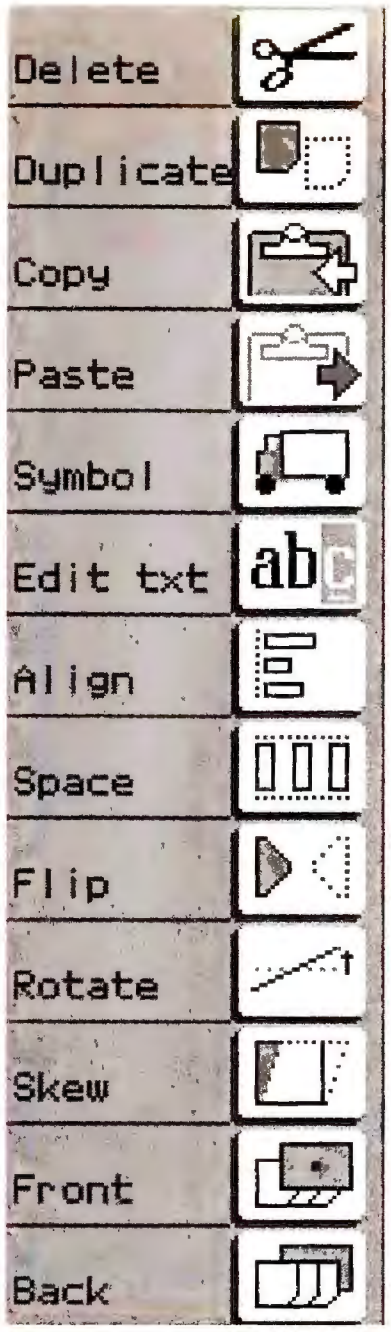

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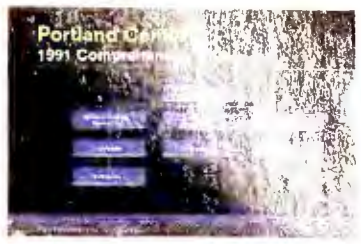

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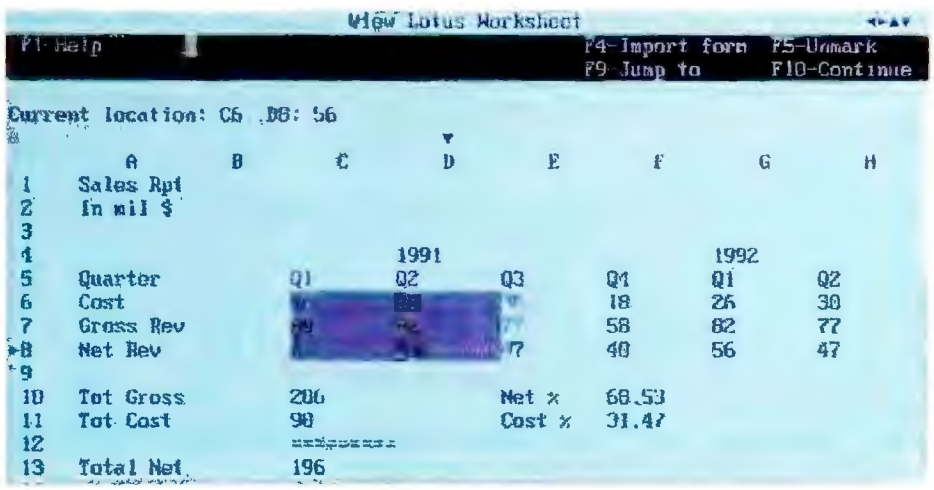

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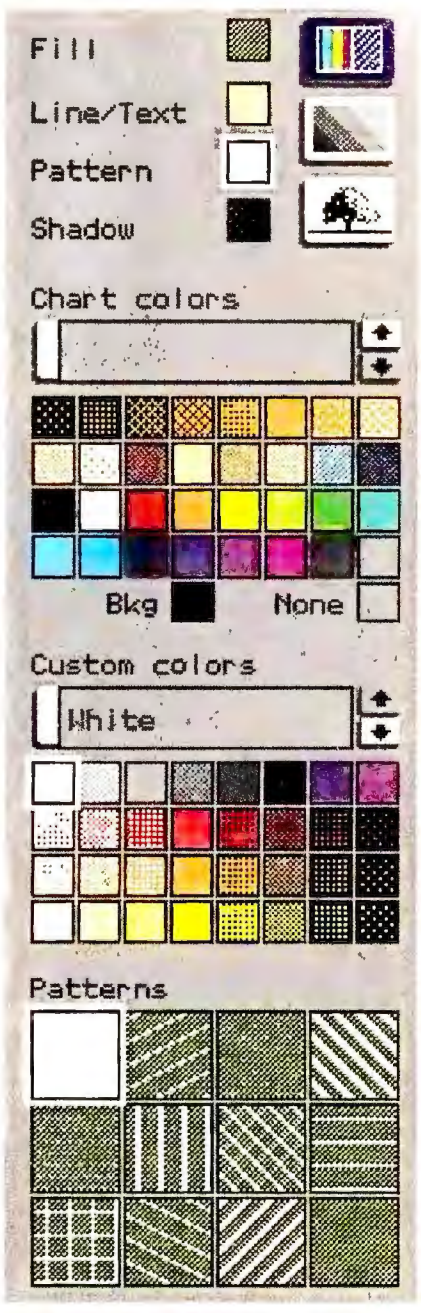

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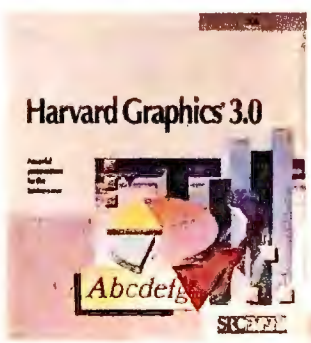

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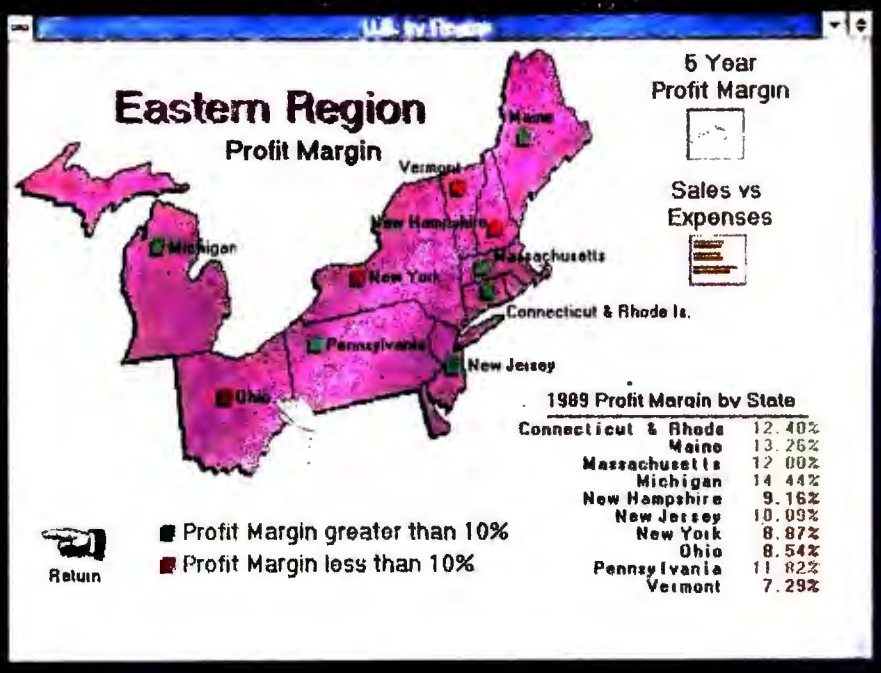

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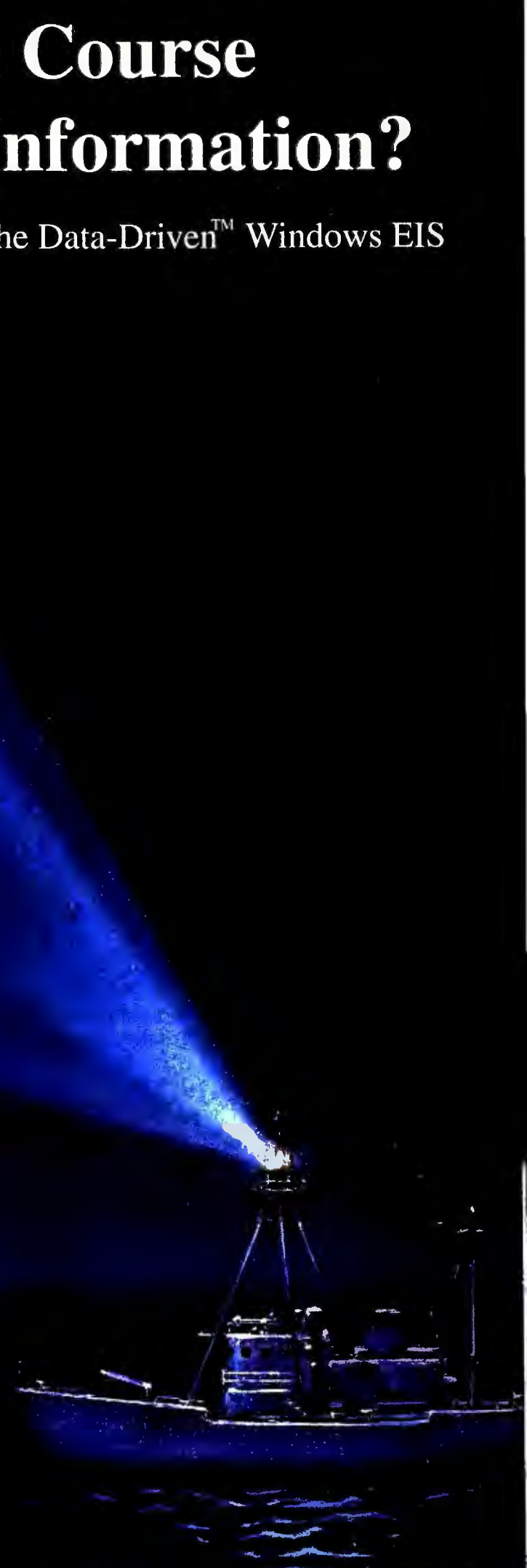

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LETTERS

Reactions and responses from the PC World community

SANTIAGO COHEN

Can IBM Come Back?

I enjoyed Richard Landry's "Where's Big Blue's Big Mo?" in April. I think IBM's present lack of status in the PC community came from Big Blue's attempt to go too far too fast with some of its products. Instead of setting standards, IBM alienated itself from its users. No one wants to throw away something that works well in exchange for promises. Users flock to *Windows* because the environment allows a smooth transition: You can continue using your DOS applications while you acquire *Windows* programs. We all want more flexibility and power—but not at the price of dumping our entire DOS investment for a totally new OS/2 environment.

Roger Ramteerath
New York, New York

ANTHONY RUSSO

You make a major error in underestimating IBM. No, IBM hasn't bought the *Windows* bill of goods, and yes, some at IBM would like to see those terrible tens of millions of PCs turned into mainframes. But many others realize that the time of dominance by traditional big iron is over. As *the* computer giant, IBM has often proved more nimble than expected, and Big Blue's research facilities are still equal to any and better than most. Don't be surprised if the proliferation of personal workstations signifies the end of the DOS-PC era. If so, IBM may set the new standard with the RS/6000 without having to bear the *Windows* albatross.

John Neubert
Madison, New Jersey

World Class Service

Two of the 49 categories in your influential 1991 World Class Awards are dedicated to service and support, one for best hardware company and the other for best software company. But what about third-party service providers? Independents are well positioned to offer customer-specific support for the multivendor hardware and software environments typical of most sites. Many companies find the highest value in service providers whose only business is service. As a guide for these customers, please include an independent service category in next year's ballot for your prestigious award.

William J. Patch
Valentino/Patch, Inc.
Wayne, Pennsylvania

Reading on the Job

Of all the computing magazines we receive at work, yours is the most informative and practical, with articles accessible to the amateur and of interest to the professional. My co-workers and I enjoy reading *PC World* so much it's almost an addiction—here's hoping our boss doesn't catch us reading it on the job!

Wong Chong
Lachine, Quebec
Canada

Bringing Down the Cost of Support

I recently called a software support line and paid full long-distance rates to wait on the line for a half hour. If the company had a toll-free support number, I would have been waiting at their expense—but in either case, someone has to foot a huge phone bill. The whole problem could be avoided if companies used dedicated support numbers that didn't get answered until a support technician was available.

Clarence S. Potter
Dunkirk, Maryland

Better Communications

I read your review of 14 communications programs in April ["Easier Tools for the On-Line World"] with considerable interest. I'd like to add some information for serious CompuServe users. Because this service charges by the hour, a specialized access program designed for CompuServe can help you navigate the forums and do most of your communications work off line, which really reduces the bite on your wallet. You can download *Tapcis* (shareware) from the *Tapcis* forum, or *AutoSIG* (freeware) from the IBMCOM forum. And *Crosstalk*

(continues)

Mk.4 2.0 and *Crosstalk Communicator* users can transform their packages into powerful CompuServe front ends by using the CISOP script, free on the *Crosstalk* forum.

Raymond Chuang
Mountain View, California

Imagine my disappointment at not finding *Telix* rated in your April communications software review. For just $39, *Telix* includes 12 protocols and a slew of other features. This program is a prime example of great shareware, and it deserves recognition as one of the best communications programs available.

Andrew F. Hobbs
Hamilton, Ohio

The Real Issue With LANs

I'm a network manager for a large company, and I think your March review "Can You Do Better Than NetWare?" missed the mark. The LAN issue of the 1990s is not NetWare versus VINES or *LAN Manager,* but how users can best solve problems in the work group environment. You need to focus on *use* first —each network operating system (NOS) has pros and cons, and not one is best in all situations. I require work group managers to furnish business plans before I select one of the three different NOSs my company supports. Unless you plan and design well, any operating system (including your Best Buy) can become a real application nightmare.

Tom Margrave
San Jose, California

We agree that, with any purchase, you have to consider your own needs first when choosing a NOS. We based our evaluation on issues pertinent to a smart buying decision—the information you need to have in hand when determining which product will serve you best. One of our first suggestions is to avoid a server-based NOS when an easy-maintenance peer-to-peer LAN will do the job. Of the server-based products we reviewed, NetWare 386 earned the Best Buy with its reliability, performance, and light workstation-RAM requirements; it's the best choice for most LAN applications. SFT NetWare 2.15c is still a good choice for small LANs, and Banyan's VINES 4.0 is best for large multiple-server networks. —Ed.

Breezing Through Reconciliations

I've used three of the four personal finance programs you reviewed in April ["More Profits From Personal Finance"], and I agree with most of your comments. One thing you didn't mention, though, was that if you use *Quicken 4.0,* you can automatically reconcile your bank statement and checking account using a new service Intuit is providing through banks around the United States. My bank now provides

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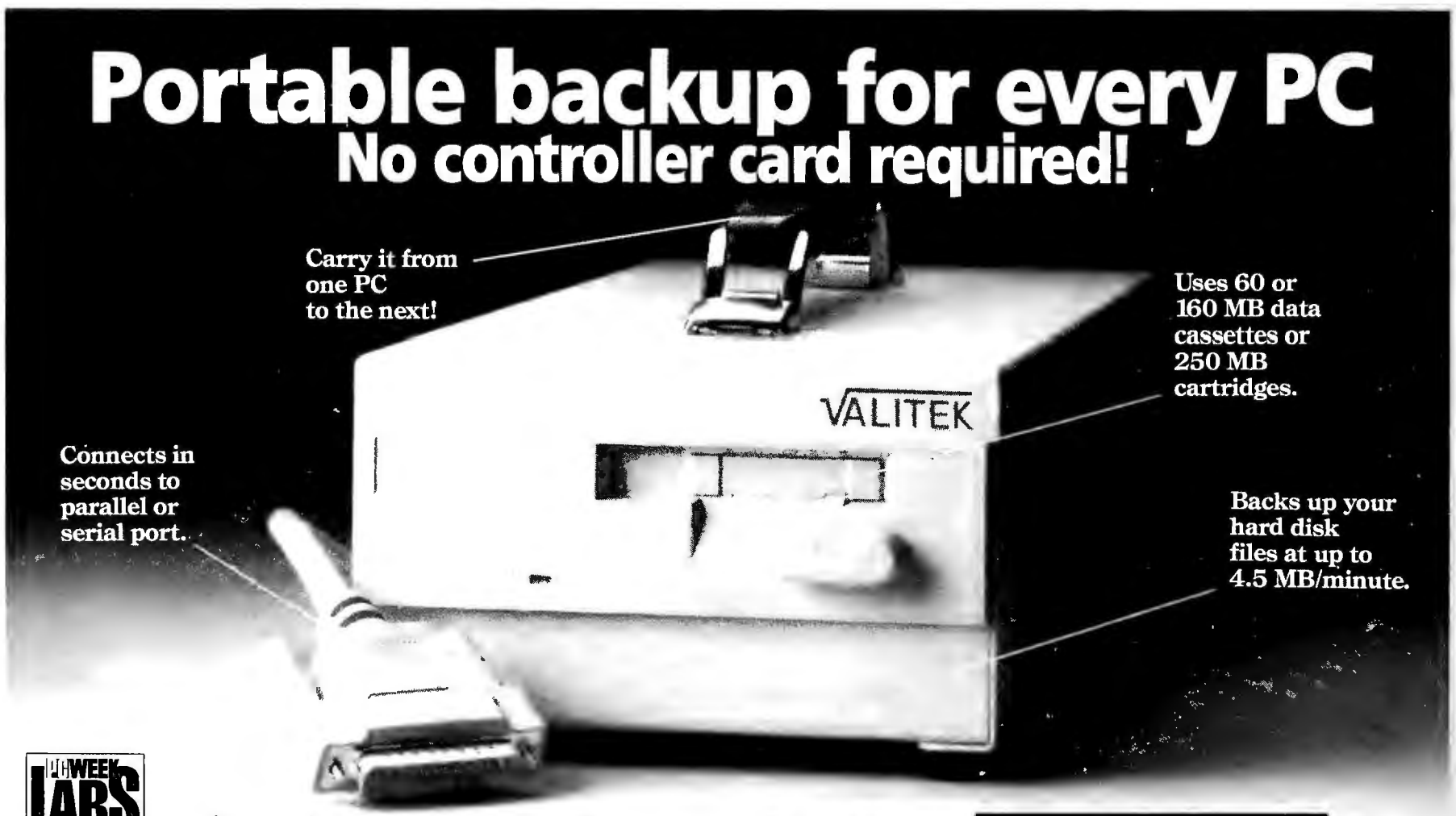

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my monthly statement on disk along with Intuit's *Accuret* software. *Accuret* reads my *Quicken* checkbook record and quickly and reliably reconciles it with the statement. I pinpoint errors in seconds that used to take hours to find. What a breeze!

Lewis Hendricks
Fort Lauderdale, Florida

A Personal Financial Opinion

After reading your personal finance review, I strongly disagree with your choice of *Andrew Tobias' Managing Your Money 7.0* as the Best Buy. I purchased *Managing Your Money*, but trying to use it was a struggle. Ultimately, I bought the much easier-to-use *Quicken 4.0*. For my money, all the extra features in *Managing Your Money* don't make up for the increased difficulty and cost. *Quicken 4.0* is a far better value.

John Mitchell
Irving, Texas

The Buck Stops Here

I'm grateful for your April review of *Andrew Tobias' Managing Your Money 7.0*. Ironically, we've discovered an embarrassing number of obscure but important bugs that got by us and our beta testers. So if our Best Buy elicits protests from some customers we've inconvenienced, we acknowledge their justifiable annoyance. I just want to assure *PC World* readers that bug fixes are being sent out automatically to registered owners. What's more, MECA assures me that major additions to its technical staff should go a long way toward eliminating these kinds of problems in the future.

Andrew Tobias
Miami, Florida

Advice Worth Taking Home

Steve Bass's April *Taking It Home* column, about backing up your CMOS settings to an emergency boot disk, set me to thinking. If my battery died or my computer crashed, I'd be working for hours duplicating work I'd done over a year ago (of course I kept no notes). Now that I've taken the steps he suggested, I'm sure that this one article was worth the price of my *PC World* subscription.

Ron Abrams
Cleveland, Ohio

Steve Bass is absolutely correct when he writes in his April column that an uninterruptible power supply goes a surge protector "one better." An uninterruptible power supply *with surge protection* saves you from power failures and undervoltage and overvoltage situations. But contrary to the impression he conveyed, not all UPS products have built-in protection. Power disturbances can ride any line into your system (including LAN and phone lines). When

(continues)

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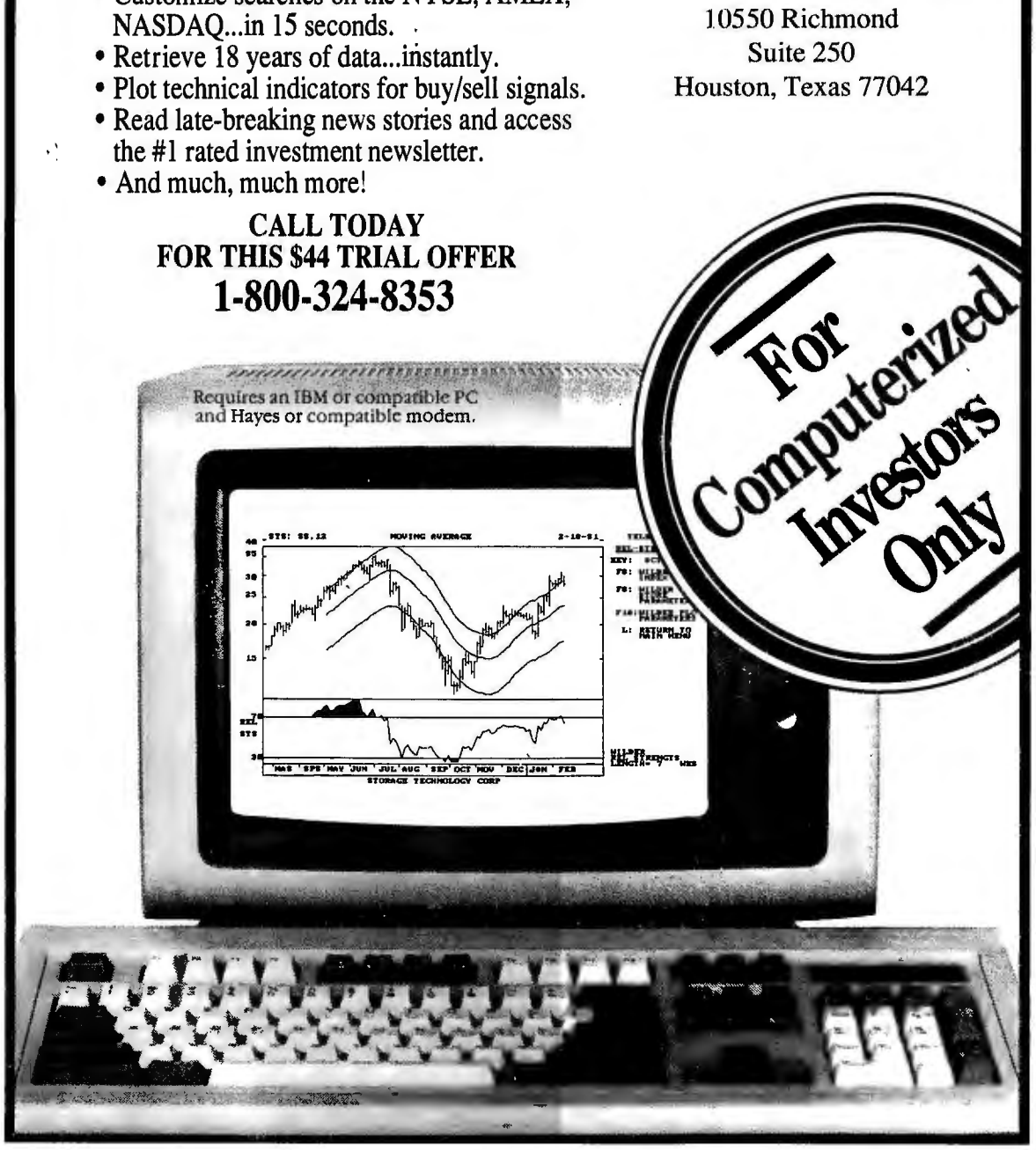

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It's probably because they want to avoid comparison. Next to our SyncMaster™4 the differences become very apparent. Our flat screen EVGA monitor lets you have a full inch more than the NEC Multisync®4D, yet it sells for the same price.

With its 17″ display, the SyncMaster 4 gives you more space to create in, from larger windows to more legible text. And the flat surface screen does it all without the strain-producing glare you get from round face displays like the Multisync 4D. When you include its additional up front controls for easy access, our SyncMaster 4 is the clear choice.

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Cabinet depth	*453mm*	*475mm*
Controls	*On/off up front Degauss up front pincusion up front*	*On/off recessed Degauss in back None*
Modes	*Supports EGA*	*None*
Retail price	*$1499*	*$1499*

Now you know why they don't show screen graphics in their ads.

Samsung 17" flat screen SyncMaster 4

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these surges pass into your system unimpeded, they can cause anything from decreased equipment life, to data loss, to a PC-sized piece of toast. The only effective solution is to plug your UPS and all other connections into a quality surge protector.

Brian Gustafson
San Rafael, California

Corrections and Clarifications

The Executive Summary for "Easier Tools for the On-Line World" in the April issue had an incorrect entry under Remote mode for Best Buy *HyperAccess/5 1.1.* The entry should have been "Good." *PC World* regrets the error.

Our May preview of the IBM PS/2 Model L40 SX notebook gave an erroneous indication of the screen's gray-scale capabilities. Actually, the L40 SX can display 32 shades of gray.

"Fax Boards and Fax Gateways," our March Buyers' Guide, should have said that the ZoFax 96/24 from Zoltrix of Fremont, California, doesn't support PostScript and won't support *Windows 3.0* without third-party software.

Our May review of *Corel Draw 2.0* contained an error. *Corel Draw 2.0* can separate color bit maps.

Send your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Include your name, city and state, and phone number. We reserve the right to edit letters.*

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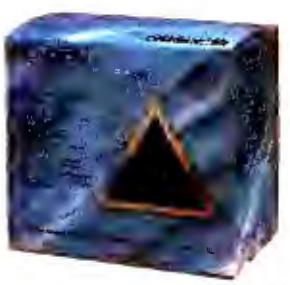
PC Magazine — Editor's Choice



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Bullets offer a crisp, professional-looking way to organize memos or business letters, but dealing with character sets can be a pain. Using *WordPerfect*, you can insert quick bullets without worrying about character sets. Just press <Ctrl>-V (the Compose key), and enter an asterisk as the first character. The second character you enter determines the type of bullet inserted: a period creates a small filled bullet; an asterisk a medium filled bullet; lowercase o a small hollow bullet; uppercase O a large hollow bullet.

Debra Faulkner
Framingham, Massachusetts

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An unimpressive report is something you'll never have to create again.

Align titles or text across a range of columns—left, right, or center—with one simple command.

You can wrap text around graphs automatically.

Add freehand drawings or symbols to call attention to critical data.

A feature that only 1-2-3 offers to DOS spreadsheet users is the ability to embed as many "live" graphs on a worksheet as you'd like.

Improved, 3D-effect graphs can add even more impact to your report.

Mix bold, italics, underlines, colors, and typefaces to create over 100 text style combinations—more than any other spreadsheet.

Thanks to Auto Compress, you can easily make an entire report fit on one page.

WeCycle Waste Corporation
The Materials Research Group Recommendation:
FOCUS: ALUMINUM

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continue to

This stu
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expand
proport
during

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The Materials Research Group Recommendation:

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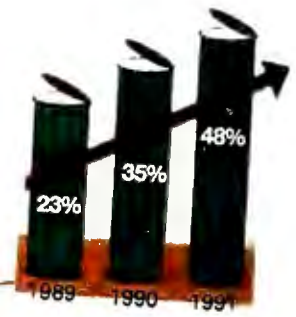
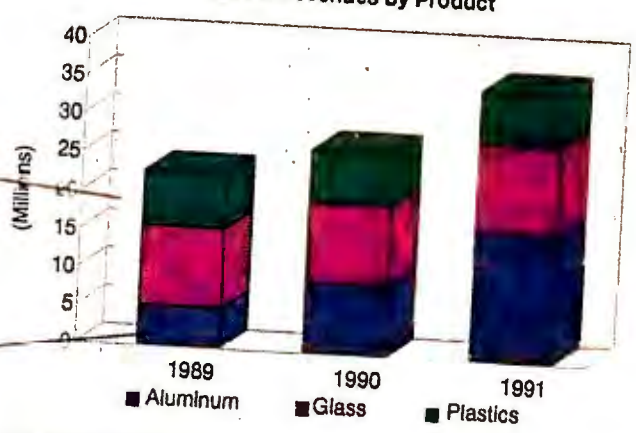


This study conducted by the Materials Research Group provides the basis for our most recent recommendation that WeCycle continue to expand its aluminum recycling capacity by another 70% over the next 6 years. The graph to the right shows the increasing proportion of our business provided by the aluminum division during the past three years, now approximately half of all revenues. It is our opinion that, at this rate of growth, aluminum recycling will continue to offer our company its greatest opportunity for expansion over the next decade, and certainly into the 21st century.

Gross Revenues by Product



WECYCLE PRODUCT	1989	1990	1991
Aluminum			
East	2,323,426	4,019,527	7,315,539
Central	1,372,347	2,374,160	4,320,972
West	1,726,492	2,986,831	5,436,033
Total	5,422,265	9,380,518	17,072,544
Glass			
East	2,496,721	2,567,821	2,798,925
Central	3,598,757	3,217,693	3,507,285
West	4,217,635	4,471,294	4,873,710
Total	10,313,113	10,256,808	11,179,920
Plastics			
East	2,897,493	3,171,243	3,234,668
Central	1,873,938	1,823,697	1,860,171
West	2,378,942	1,967,421	2,006,769
Total	7,150,373	6,962,361	7,101,608

Glass and Plastics

As can be inferred from the graph to the left, glass and plastics recycling has been holding steady throughout this same period, and has consequently become a smaller proportion of our overall sources of revenue.

Although this group would strongly recommend that WeCycle Waste Corporation do all that is necessary to increase its activities in these areas, our studies have shown that aluminum will become increasingly the material of choice in the shipping, heavy manufacturing and container industries.

Aluminum

It is our opinion that sources of aluminum products will be pressed close to their limits over the next decade.

Therefore, we propose that WeCycle Waste Corporation invest in more aluminum capacity during the next five years in order to take the best advantage of this increasing market demand.

le your spreadsheet
ng your hardware.

There's a lot to like about the new otus® 1-2-3® Release 2.3.

For starters, it's not just a graphical preadsheet. It's a fast, graphical spreadheet for DOS. It's easy to use. And it orks as well on an older XT with just 12K of memory as it does on the newest 36 machine.

It also shares many features in common with our powerful 3D spreadsheet, Release 3.1. Including its superb spreadsheet formatting and publishing capabilities and full mouse support. Along with its popur Auto Compress feature that gives you trouble-free way of making larger worksheets print on a single page.

We've also added new features you won't find in other spreadsheets. Like the Viewer (based on Lotus Magellan® technology) which helps you find the file you want before retrieving it. And a very helpful Auditor that simplifies the job of documenting and analyzing complex worksheet logic.

With its WYSIWYG graphical environment, you can do all your formatting "live" on screen.

Of course, you won't just like what Release 2.3 does. You'll like how it feels. It's quick and smooth. With a WYSIWYG (what-you-see-is-what-you-get) graphical environment that lets you format text, data, and graphics "live" on screen. Plus, what you see on screen is what you'll get when you print. With the mouse, you can execute commands, highlight cells or ranges, open dialog boxes, place and size graphs, change type styles, fonts and point sizes. All with unparalleled speed and ease.

Lotus 1-2-3 Release 2.3 runs smoothly and quickly no matter what hardware you're running it on.

What's more, Release 2.3 gives you a wide range of printing and reporting capabilities. Including the capacity to place as many live graphs on a worksheet as you'd like.

Along with 96 type style combinations, new 3D-effect graphs, drawing and annotation tools, and the most font support, choices of colors and shading available.

Compatibility? As with any 1-2-3 product, it's no problem. Because Release 2.3 will read all of the files you've created on previous versions of 1-2-3, including files you've formatted using Allways™ and Impress.™ So you'll preserve all your work, as well as your training.

For more information about the new Release 2.3 or for upgrade details, call us today at **1-800-TRADE-UP, ext. 1217.**

What's New In Lotus 1-2-3 Release 2.3.

- A WYSIWYG graphical environment with live on-screen formatting
- Lotus Magellan viewer technology for fast file previewing, retrieving and linking...all without leaving your active worksheet
- More graph types, including 3D-effect graphs and graph annotation capabilities
- Auto Compress, for a trouble-free way of making larger worksheets print on single page
- Dialog Boxes for an easier, more interactive way of working
- Text-editing for easy on-sheet word processing, including automatic word wrap, even around graphs
- The Auditor for documenting or highlighting your spreadsheet logic
- Improved memory management for building larger worksheets up to 12 MB in size
- New printer drivers that support all leading laser and dot-matrix printers
- Context-sensitive Help and an interactive tutorial

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The new Lotus 1-2-3 for DOS

Lotus

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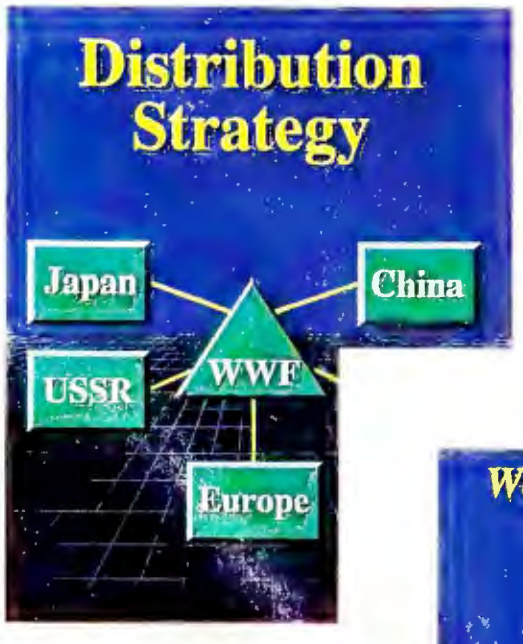
Not to mention



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3. Mail this completed order form along with your payment and proof of ownership to: **Lotus Development Corp., Freelance Graphics Upgrade Dept., P.O. Box 9130, Cambridge, MA 02139-9130.**

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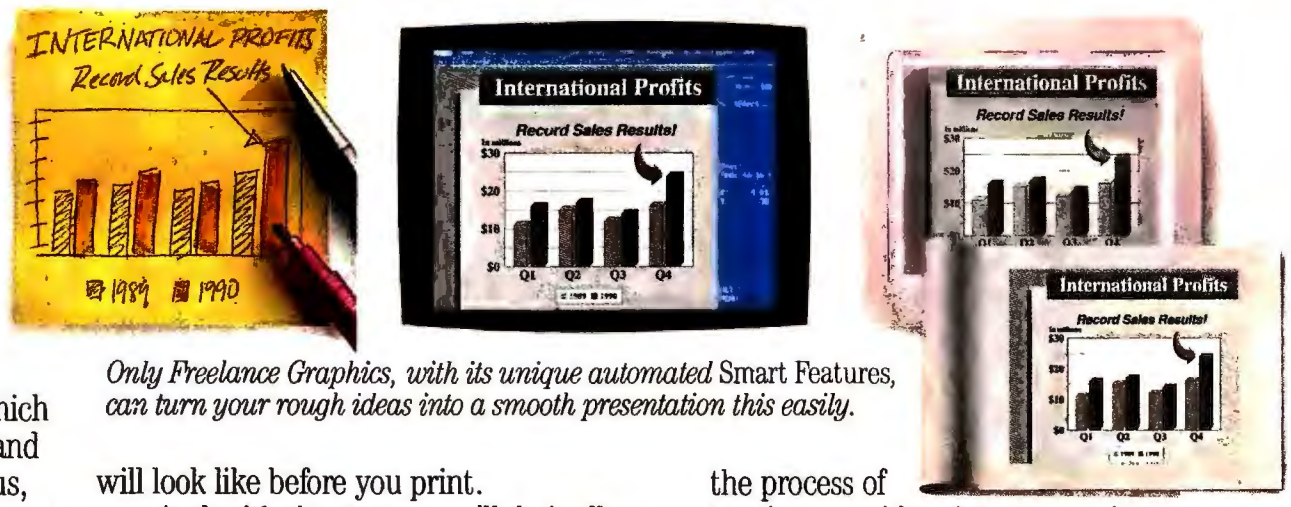

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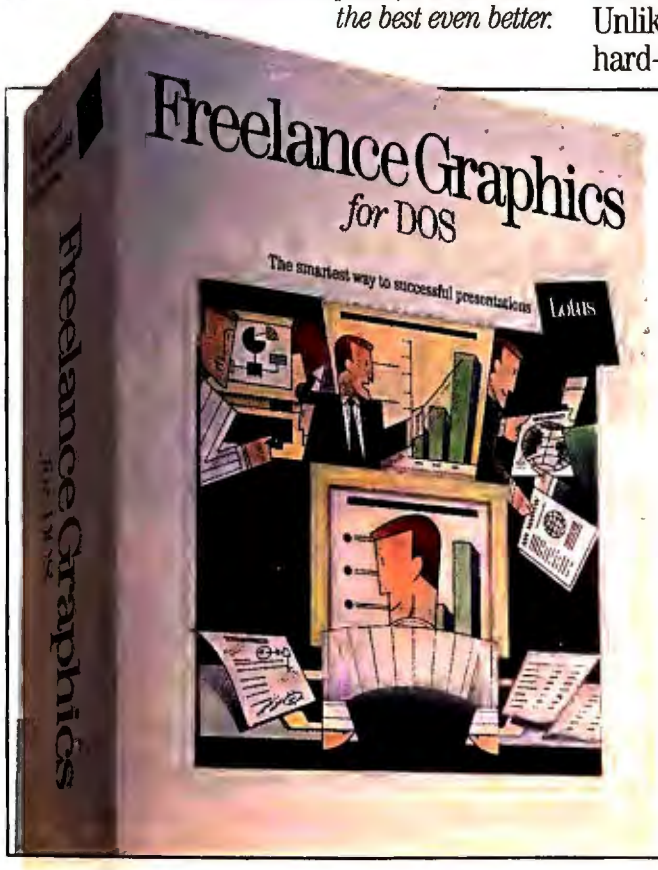

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Robert Lauriston and Karl Koessel

Distinguish Spreadsheet Blanks from Zeros

Q. *In my work, I produce various environmental surveys of animal life, managing the data I gather with* Excel. *When I sum columns of data,* Excel *returns a value of zero regardless of whether I've entered zeros (that is, I counted no fish in that stream) or the column is simply blank (I wasn't able to survey that stream). How can I make* Excel *distinguish between zero and blank?*

Duane L. Higley
Philomath, Oregon

A. You can solve your problem using the IF and NA functions. To sum the range A1:A10, for instance, use the formula **=if(count(a1:a10),sum(a1:a10),na())**.

The structure of the IF function is the same in all popular spreadsheets: its first parameter is an expression or value that may be true or false; the second parameter is the result you want displayed if the first parameter is true (or not equal to 0), and the third is the result if the first parameter is false (or equals 0). Here, the IF function's first parameter counts the number of cells in the range that actually contain data. If all cells are blank, COUNT(A1:A10) equals 0 and the IF function displays '#N/A'. Otherwise the function shows the result of SUM(A1:A10).

In *1-2-3, Quattro Pro,* and most other spreadsheets, you can use the formula **@if(@count(a1..a10),@sum(a1..a10),@err)**, which returns 'ERR' instead of 'N/A' when the range is blank.

Speed Up WordPerfect's View Document

Q. *On my 286,* WordPerfect 5.1 *is very slow when its View Document (page preview) command switches the system into graphics mode. Scrolling down a few lines seems to take forever and produces a lot of activity on the hard disk. Would adding more memory help, or do I need a faster hard disk, a disk cache, or some combination of these? Or will the forthcoming* WordPerfect for Windows *eliminate this problem by allowing me to edit in graphics mode?*

William J. Schultz
New Concord, Ohio

A. The speed of *WordPerfect*'s page preview function depends primarily on the speed of the system's processor. The amount of free conventional memory (which is where *WordPerfect* buffers the preview image before moving it to video memory) is also a major factor affecting performance. Therefore, using a faster hard disk and/or a disk cache won't do much to speed up page preview. Adding extended memory will help only if doing so enables you to free up conventional memory (by moving device drivers, memory-resident programs, and—if you use DOS 5—much of DOS itself into extended memory). Adding expanded memory can help a little since the more you have, the more likely it is *WordPerfect* will be able to use it to free some conventional memory for page preview.

In the meantime, you can do a few things to speed up page preview. If you have a color monitor, changing Setup's View Document options (**<Shift>-<F1>dv**) to display text and graphics in black-and-white will help slightly. Starting *WordPerfect* with **wp /n2 /w=*** will give the program access to more conventional memory (/n2 means you won't be opening two documents at once, and /w=* means use all available conventional memory instead of the default 85 percent). However, you can preview your pages most quickly if you use the plus and minus keys on the cursor pad (with Num Lock off) to view the last and first halves of a page instead of scrolling one line at a time with <Cursor Down> and <Cursor Up>.

WordPerfect for Windows probably won't solve your problem. While editing in graphics mode is convenient, especially if you have heavily formatted documents with a variety of fonts and graphics, it's slower than working in

(continues)

ANTHONY RUSSO

character mode. As a result, many people find any *Windows* word processing program irritatingly slow on a 286.

Upgrading DOS

Q. *I recently replaced my computer's B: drive with a 32MB hard disk. The system boots MS-DOS 2.11 from a floppy, but lots of software and hardware I'm interested in requires DOS 3.1 or a later version. Is there some way of replacing my system's 2.11 with 3.3 or higher?*

W. E. Benjamin
Longwood, Florida

A. Although you can probably get MS-DOS 3.3 or 4.01 from your computer dealer, or an IBM version from retail software outlets, MS-DOS 5.0 (see "DOS Does It Right" in this issue) is far superior, widely available, and there's a specially priced upgrade version that you can use since you already own a version of DOS.

MS-DOS 5.0 is very easy to install. Just boot your system with your old DOS, slip MS-DOS 5.0's installation disk in drive A:, and run the installation program. It will take care of setting up AUTOEXEC.BAT and CONFIG.SYS, informing you of any changes it makes.

Be sure to tell the installation program that you want to install DOS on your hard disk; booting from a floppy doesn't make sense when you have a hard disk (unless you have a very old system that requires a device driver to recognize the hard disk). You don't have to reformat your hard disk or temporarily remove its files; the installation program will take care of everything for you. (Except maintain power—before you install the new DOS, make sure your backup is current, just as you always should before making major changes to your hard disk.)

Sound and Music Options

Q. *I have spent a great deal of time working with both Macintosh and IBM computers. One noticeable difference between the two is the superior sound capability on the Macintosh. Is there a way that I can make my PS/2 more sound and music capable?*

Jay H. Lee
Ithaca, New York

A. A number of currently available boards add Macintosh-style sound to PCs. The two with the widest support are the Ad Lib and the Sound Blaster. Since they use the same sound chip, games written for one will run fine on the other. However, the Sound Blaster is more powerful than the Ad Lib. It can enhance sound not only for games but for multimedia programs like *Autodesk Animator* and *IBM Storyboard*, and it includes a microphone jack for 8-bit sampling (so you can record your own sounds). If you're musically inclined, you can upgrade the board to add MIDI support, which lets you record or control

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external synthesizers, drum machines, or other MIDI devices with sequencing software (Voyetra's *Sequencer Jr.* is included).

But if you're really serious about music, Roland's LAPC-1 is probably a better choice for you. This board combines the functions of the very popular MT-32 synthesizer module (which offers professional-quality sounds like those in the best-selling D-50 synthesizer) and the industry-standard MPU-401 MIDI interface, making it compatible with all major MIDI programs for the PC. Many of today's popular games also support this board.

The brand-new ProAudio Spectrum adds stereo and higher-quality sampling to the mix. In addition, it has an on-board SCSI port for plugging in a CD ROM drive. Though there's not much you can do with a CD ROM yet, ProAudio Spectrum should eventually be able to handle any software based on Microsoft's forthcoming *Windows* multimedia standard. The ProAudio should also be able to run the same games the Ad Lib and Sound Blaster do.

If your local dealer doesn't carry these boards, check out Computers & Music or Soundware, two California mail-order companies that specialize in MIDI products. Their free catalogs are also a great way to get an overview of the many other sound and music add-ons available for your PC.

WHERE TO BUY

Ad Lib
Ad Lib Inc.
220 Grand Allée E #850
Quebec, Quebec, Canada G1R 2J1
800/463-2686, 418/529-9676
LIST PRICE: $149.95, Micro Channel version $219.95
Reader service no. 684

Computers & Music
647 Mission St.
San Francisco, CA 94105
800/767-6161
Reader service no. 685

LAPC-1
Roland Corp. U.S.
7200 Dominion Cir.
Los Angeles, CA 90040
213/685-5141
LIST PRICE: $595 (ISA/Micro Channel flip board), 1-in 2-out MIDI connector with tape sync $150; package including LAPC-1, MIDI connector, keyboard, and software $995
Reader service no. 686

ProAudio Spectrum
Media Vision
47221 Fremont Blvd.
Fremont, CA 94538
800/348-7116, 415/770-8648 (fax)
LIST PRICE: $389, (ISA bus only) 1-in 1-thru 2-out MIDI connector $69.95
Reader service no. 687

Sound Blaster
Brown-Wagh Publishing
130-D Knowles
Los Gatos, CA 95030
800/451-0900, 408/378-3838, 408/378-3577 (fax)
LIST PRICE: $239.95, Micro Channel version $349.95; 1-in 5-out MIDI connector $129.95
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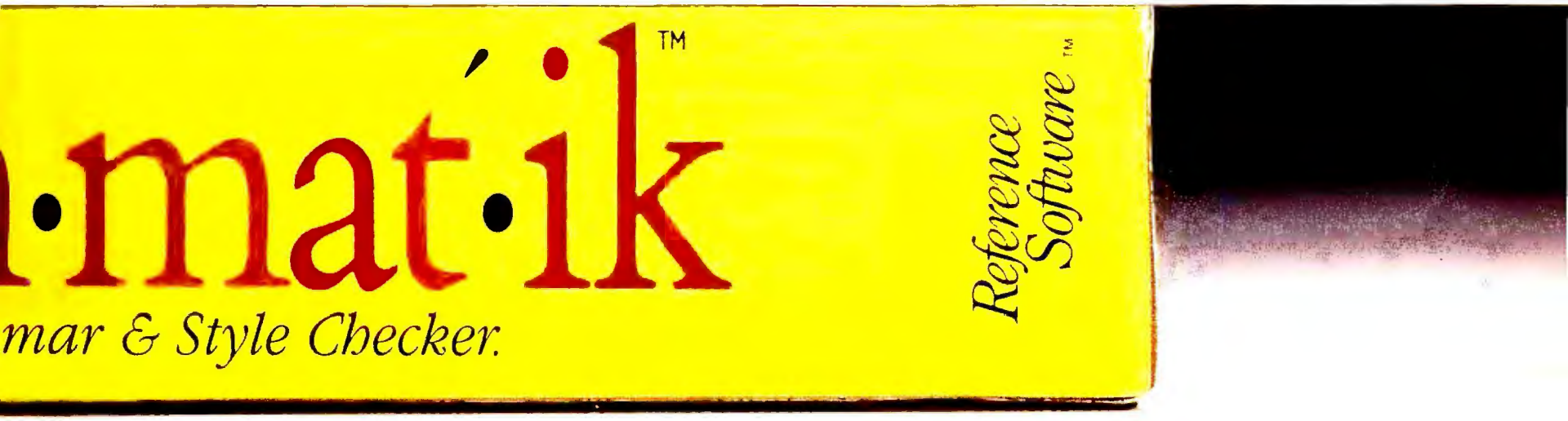

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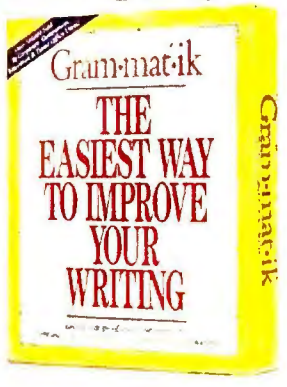

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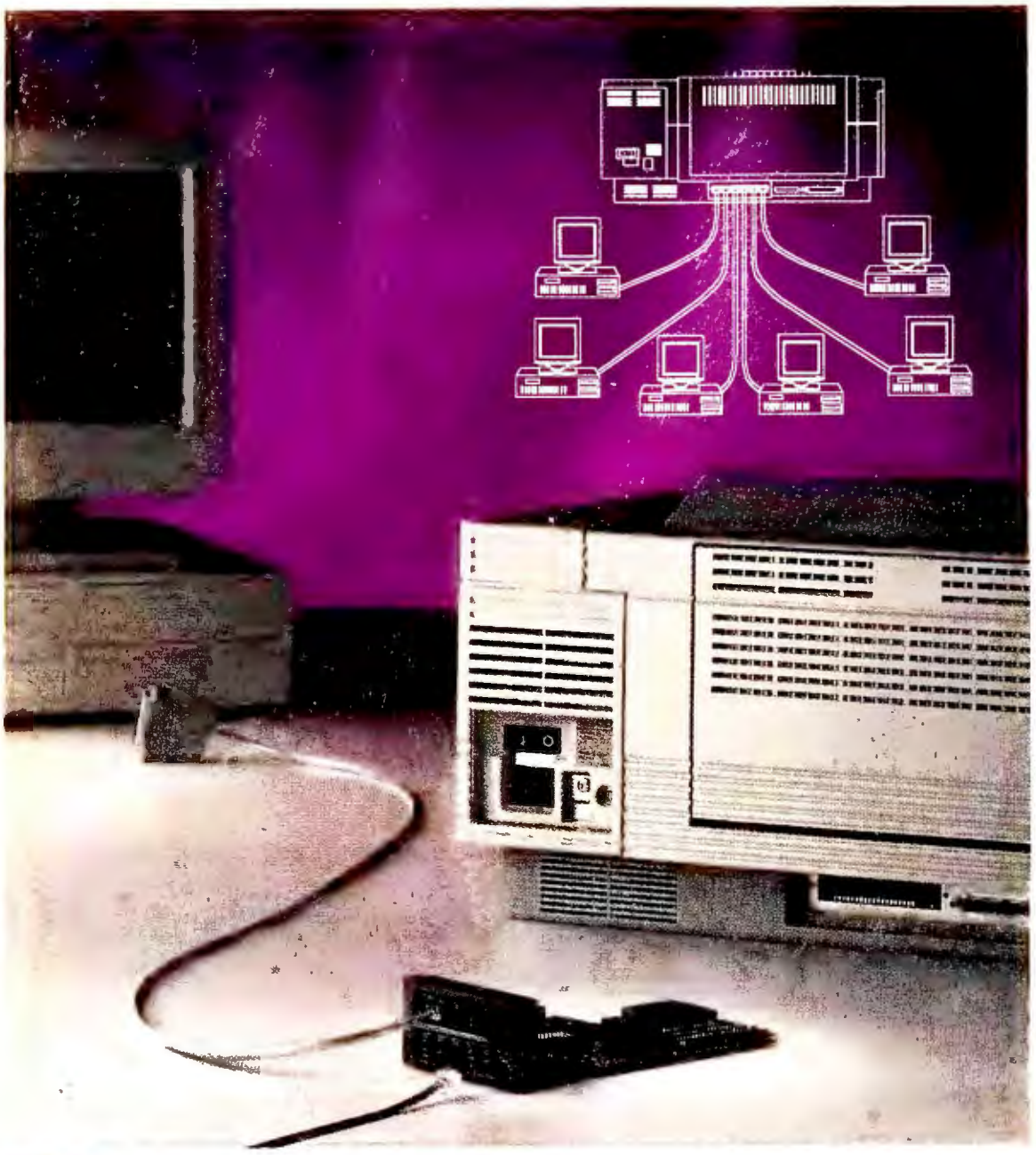

PC MAGAZINE

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Robert Lauriston is a contributing editor and Karl Koessel the technical editor for PC World.

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POWER TIP NO. 187

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A lot of people use *Paintbrush* in more than one video mode or with different printers. Instead of running PBSETUP to change *Paintbrush's* defaults, create variations on the PAINT.BAT file generated when the program is first installed. Say, for example, that your system (and PAINT.BAT) is currently configured for 256 colors at 640 by 480, yet you sometimes need to run the program with 16 colors. Rename PAINT.BAT to 256.BAT, run PBSETUP, and generate a new PAINT.BAT with the appropriate settings. Exit PBSETUP, and rename that new PAINT.BAT to 16.BAT. Now you can run *Paintbrush* in either mode with a few keystrokes.

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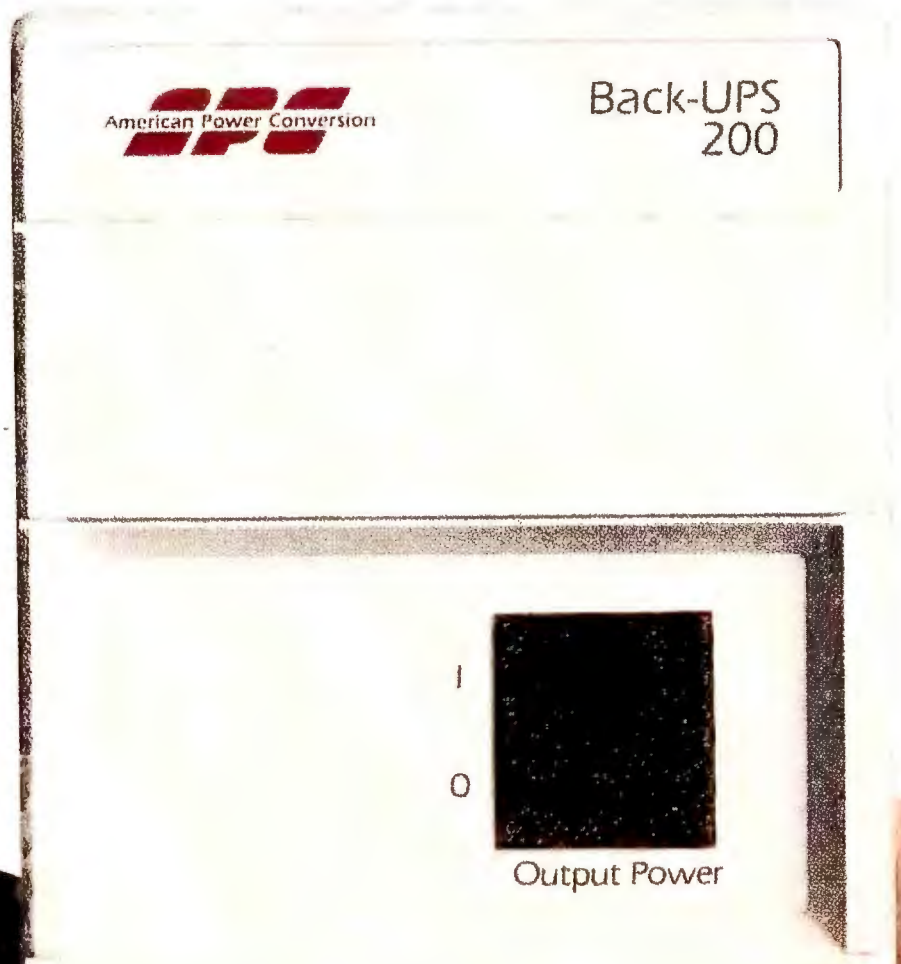

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NETWORK Q&A

Improving NetWare 286's Administrative, Menuing, and Troubleshooting Tools

Keith Nickerson

Q. *We're very happy with NetWare 286's compatibility and performance. However, its administrative tools, menu system, and troubleshooting abilities aren't as flexible or powerful as we'd like. Can you recommend the best of the many third-party add-ons to compensate for NetWare's weaknesses in these areas?*

Marcia Chen
Modesto, California

A. Not a problem. In fact, one of the biggest advantages of Novell's NetWare network operating system is the tremendous number of third-party utilities that are available to complement and enhance NetWare's functionality. Here are my picks in each of the categories you've mentioned:

Able Administration

Although NetWare's administrative utilities track a lot of information about servers and their users, that information is buried several layers further down the NOS's complicated menu tree —and you can't print it out or dump it to a file for easier reference. *BindView+* enables you to gather this scattered information into a wide variety of reports, or export it to ASCII text, spreadsheet (WK1), or data base (DBF) files for further analysis.

BindView makes it easy to run reports on group rosters, directory rights, print queues and forms, server setups, and so on. The program also lets you define rules for passwords and security settings, then searches the server and reports on violations. For instance, if you told *BindView* that only accounting department staff should be able to delete financial records, the report would list anyone else with rights to delete those files.

The program is limited mostly by your imagination. For instance, you could print out all users and groups with rights to selected directories, generate a report of all *Windows* WIN.INI files and their owners, list each user's log-ins and log-outs for the past month, turn NetWare's optional accounting information into invoices—the possibilities seem endless.

Better Menus, Extra Security

NetWare's own menu utility is fairly limited, and notably hard to set up and maintain. The best alternative I've seen is *NetMenu.* All users on a file server share a single master menu file, making it very easy to maintain. You define what menu choices each user gets, based on file and directory rights, user group membership, and even workstation configuration.

NetMenu also boosts security. You can require passwords for menu selections, submenus, exiting to DOS, and <Ctrl>-<Alt>-<Delete> reboot. A flexible screen blanker locks the keyboard and demands reentry of a NetWare password before you regain use of the machine. You can limit how many users can access a directory at once, which could help you avoid violating your software licenses.

NetMenu requires no additional memory at the workstation. It comes with a utility that imports any existing NetWare MNU files into the *NetMenu* master file. Also bundled is a utility that tracks who uses which workstation and when.

Masterful Monitoring

While NetWare tracks a variety of statistics about server operations, it doesn't tell you much about what's happening on the network cable. Thomas-Conrad's *TXD* utility tracks network cable activity (packet sends, retries, receives, errors, and so on) over any network hardware supported by Novell, including token ring, ethernet, and Arcnet.

Although *TXD*'s hardware independence limits its abilities somewhat, hardware problems usually produce software errors. This means *TXD* is an excellent tool for troubleshooting problems and bottlenecks like LAN-hogging applications, faulty network boards, and so on. Priced at only $195, it deserves a place alongside The LAN Support Group's *BindView* and Network Enhancement Tools' *NetMenu* in every network manager's virtual toolbox.

WHERE TO BUY

BindView+ 3.0
The LAN Support Group, Inc.
2425 Fountain View #390
Houston, TX 77057
800/749-8439, 713/621-9166,
713/977-9111 (fax)
LIST PRICE: $395 first server, $195 each additional server
Reader service no. 690

NetMenu
Network Enhancement Tools, Inc.
P.O. Box 271105
Houston, TX 77277
713/974-1810
LIST PRICE: $295 per server
Reader service no. 691

TXD
Thomas-Conrad Corp.
1908-R Kramer Ln.
Austin, TX 78758
800/332-8683, 512/836-1935
LIST PRICE: $195 per site
Reader service no. 692

For more information about all products in Network Q&A, circle reader service no. 911.

Keith Nickerson is the editor of the NetWare Advisor *and a member of the publishing team at Business Systems Group, a Houston-based systems integration firm.*

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PC Magazine, April 30, 1991

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but most states offer similar consumer protections. Such regulations rarely cover computers purchased for business use, but they can be of great help to the home user. Check with your state's department of consumer affairs for more information.

Business users are not without recourse, however. One of the most powerful weapons available to business PC buyers is the threat of no longer doing business with a given manufacturer or dealer. One PC may not make a difference to most vendors, but the greater the volume of your business, the more clout you'll have in getting problems resolved.

(continues)

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PC WORLD

BUG WATCH

Up-to-date information about hardware and software bugs

DR DOS 5.0

Because of the algorithm that Digital Research uses to download fonts to HP LaserJet printers, the download process takes roughly four times longer in DR DOS 5.0 than in MS-DOS. Digital Research is aware of the problem and has made a fix available; users can get it from the company's CompuServe forum or by mail. A spokesman indicates, however, that in rare instances the fix can cause the printer to time out (exceed its built-in time limit for accepting data), forcing the user to start the download process from scratch. A complete fix will not be available until the next version of DR DOS is released.

Digital Research
408/646-6464,
408/649-8209 (fax)

QuickBASIC 4.5

The decompression utility in *QuickBASIC 4.5*'s setup program reportedly conflicts with some TSRs. In some instances, running the utility ties up all available sectors in the hard disk when a TSR is installed in AUTOEXEC.BAT. According to a Microsoft representative, roughly a dozen users reported the problem, but the company's technical staff could not duplicate it. *QuickBASIC* users who encounter the problem should contact Microsoft's technical support department for a fix.

Microsoft Corp.
206/454-2030

WordPerfect 5.1

Users running *WordPerfect 5.1* under *Windows 3.0* have encountered problems when trying to save or retrieve files from their floppy drive. According to a WordPerfect representative, the problem can be corrected by entering **/nc** in the Optional Parameters field of the *Windows* PIF file. If that still does not correct the problem, users should enter **/nc/nk** in the Optional Parameters field.

WordPerfect Corp.
800/541-5096,
801/226-7900

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DesignCAD 3D version 3.1 sells for $399.

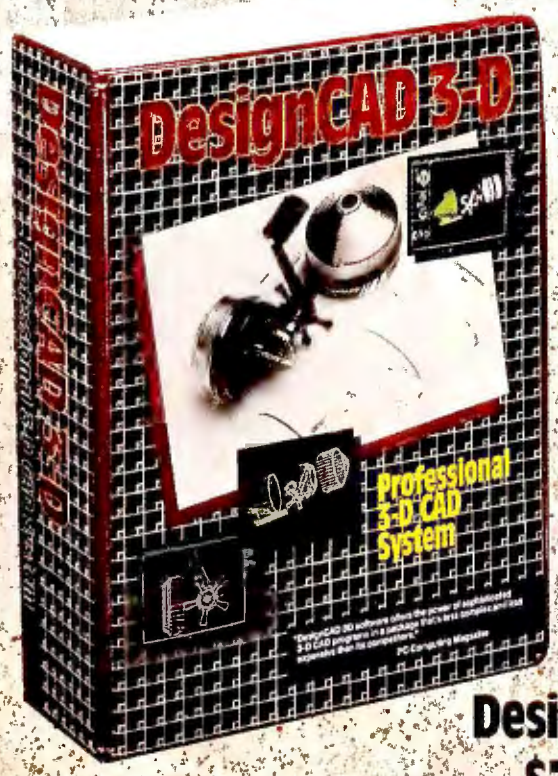
Does this include everything? Yes. We include everything! The programming language, the hardware device drivers (more than 450), built-in shading capability, hidden line removal capability, solid-object modeling capability, translators to-and-from other file formats, are all included!

How can you afford to sell a program like this at such a low price?

This is our most often asked question. We have a simple answer. Volume. We sell thousands of these programs each month! If we were to charge thousands of dollars per copy (like our competitors) we would restrict our sales to the professional trades only. By lowering our price we sell to professional architects and engineers as well as the ordinary individual! Many ordinary individuals purchase DesignCAD 3D for personal projects. Many people purchase DesignCAD 3D and perform CAD Drafting at nights and on weekends as a second job!

People design "dream homes" and "widgets"

The uses are limited only by YOUR imagination!



If there ever was a CAD program out to prove that AutoCAD, CADKEY, VersaCAD, and other $3000 programs are overpriced, it's DesignCAD!

(MicroCAD News review)

PC MAGAZINE EDITORS' CHOICE December 11, 1990 DesignCAD 3D, Version 3.1

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(918) 825-4844 • FAX (918) 825-6359

Remember - American Small Business Computers also sells a 2D version of DesignCAD. It costs only $299! Write or call for FREE brochures that will help you determine which program best suits your need.

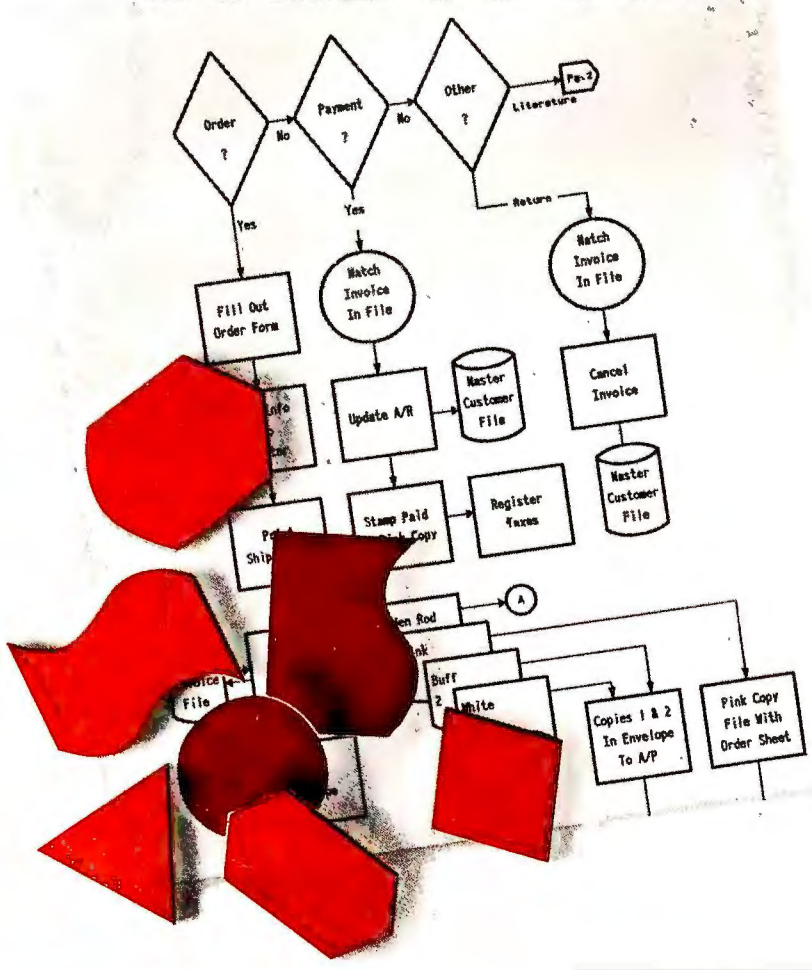
Circle 306 on reader service card

If the carrot approach fails, though, businesses should consider arbitration through such groups as the American Arbitration Association or the Better Business Bureau. Arbitration is often quicker and more cost-effective than taking a computer manufacturer or dealer to court (see *Consumer Watch,* May 1989).

Whether you bought your system for home or business use, it can be argued that at some point *everyone* has the right to return a defective computer for a replacement or a refund under the implied-warranty-of-merchantability section of the federal Uniform Commercial Code (UCC), which states that a product must measure up to certain minimum standards (e.g., a computer must compute).

San Francisco attorney Lee Hagelshaw, a partner in the law firm of Hagelshaw and Cole and the author of *The Computer User's Legal Guide* (Chilton Book Company, Radnor, Pennsylvania, 1985), suggests giving a vendor two *(continues)*

BUILD TO SUIT.



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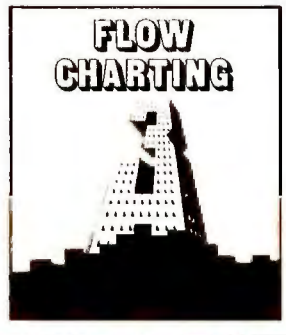

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Circle 233 on reader service card

PC WORLD **SERVICE EXCELLENCE**

SERVICE EXCELLENCE AWARD

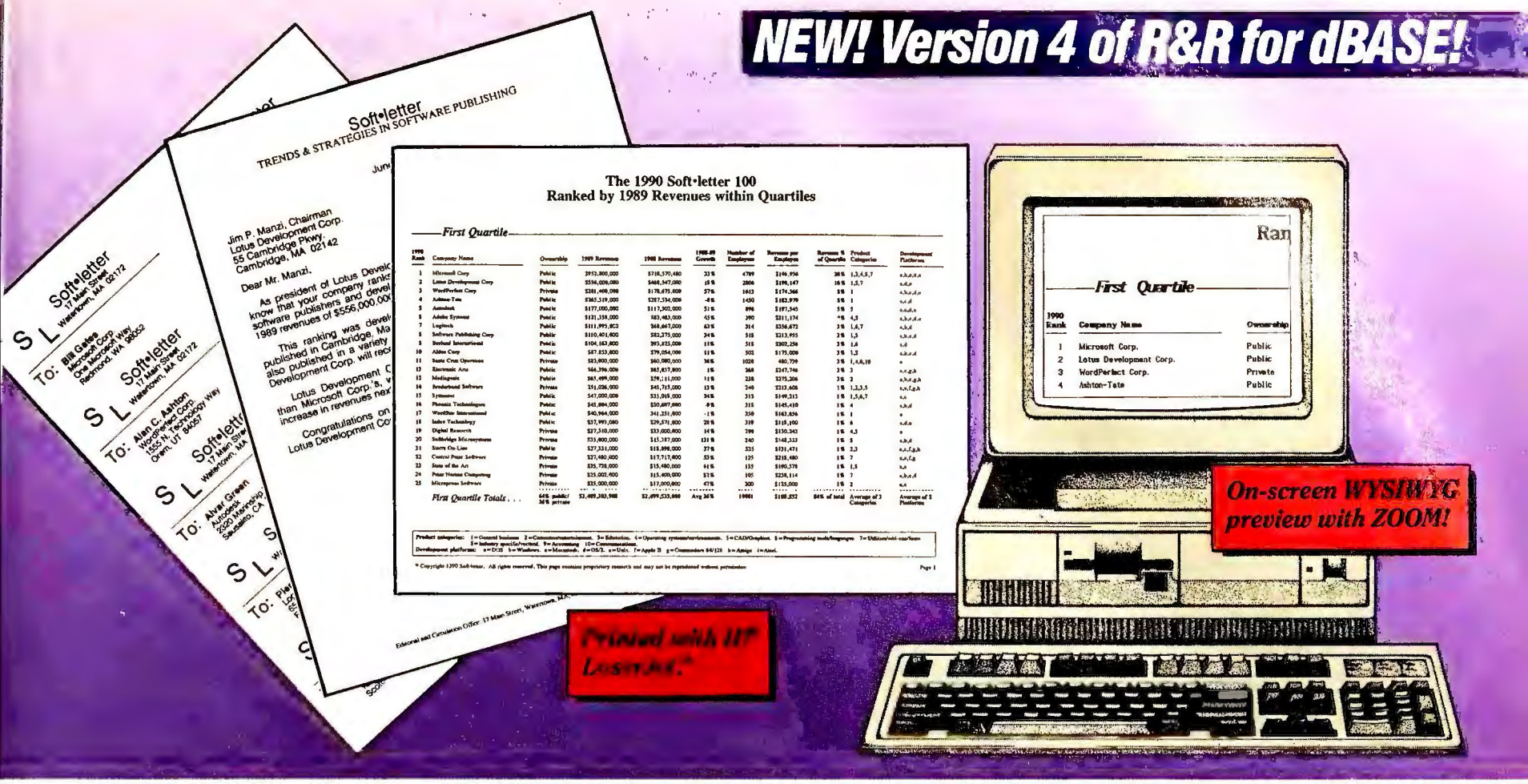
Each month Consumer Watch *recognizes one company's commitment to service, based on reports from readers.*

I purchased an Epson LQ-850 printer in January. I originally had attached it to an AT computer, and it operated perfectly. I decided to use it with my 12-MHz XT computer via a switch box. Although the printer continued to function through the switch box when receiving data from the AT, it would print out only garbage from the XT.

I wrote to Epson's customer service department and included sample output from both computers. About two weeks later I received a phone call from the Epson technical service department. The technician spent 20 minutes on the phone with me getting additional information and then listed four possible solutions to my problem. He also gave me an 800 number to call if none of them worked. The first solution was to try a new printer cable on the XT. A $5.95 investment corrected everything.

All I expected was a letter outlining the possible solutions. A personal phone call is more than just good customer service.

Robert Kyle
Minneapolis, Minnesota



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ıll the resolutions you'll need.

Especially since the MultiSync 3D also has a microprocessor-based digital control system that provides automatic screen configuration, lets you select the ideal resolution for your software, and even has a

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For literature call NEC at 1-800-826-2255. For details, call 1-800-FONE-NEC. And in Canada, call 1-800-268-3997.

Macintosh compatibility includes Macintosh II, IIx, IIcx and SE/30

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Circle 188 on reader service card

chances to correct a problem. He believes you can use the implied-warranty-of-merchantability argument to legitimately request a refund or a replacement unit. Note, however, that this right is not explicitly granted under the UCC, so business users in particular should be prepared to argue this position in court.

Self-Help for PC Buyers

Veteran PC purchasers say the best way to avoid legal hassles is to take adequate precautions before—and after—you buy.

The first step is to make sure you understand the manufacturer's warranty. Request a copy of the warranty *before* making a purchase, and read it carefully to determine not only the length of coverage, but other important details, such as who's responsible for paying freight charges if a product has to be shipped back for repair. Warranties are often confusing and full of complicated legalese. There are two types: *express* and *implied.* Express warranties refer to the factual claims and assurances made by the manufacturer. Implied warranties are based on reasonable expectations of product performance (such as the implied warranty of merchantability mentioned above) and need not be spoken or written.

If you're ever forced to take a vendor to court, written documentation of all warranties will be crucial to your case. So if you purchase a system on the advice of a company's salesperson who told you that a product is well suited to a particular task (such as performing as a file server), you should get that information in writing. Some vendors will be unwilling to provide such written assurances, but their reluctance should give you pause about doing business with them.

Your work isn't over once you've bought the system. "A lot of systems come with diagnostic disks, but a lot of people are too impatient to get going, so they don't check things out fully. Problems don't turn up until much later in the game," says Tracy Licklider, president of the Boston Computer Society.

You don't have to be a technical whiz to check out a system and make sure everything's running smoothly. One of the best ways to uncover any hidden problems is simply to turn the system on and leave it on for a minimum of 48 hours. Although many vendors claim they burn in new equipment, it never hurts to do it yourself to verify that everything's in working order and that the system can withstand intensive use.

Other steps you can take include installing—and using—all your software applications and testing out a variety of peripherals to check the serial, parallel, and communications ports. Most impor-

(continues)

So You're Feeling Squeezed

Ouch. Another typical day at the office — rush projects, training seminars, capital crunches and trade shows — just for starters. No need to panic. *Now there's help.*

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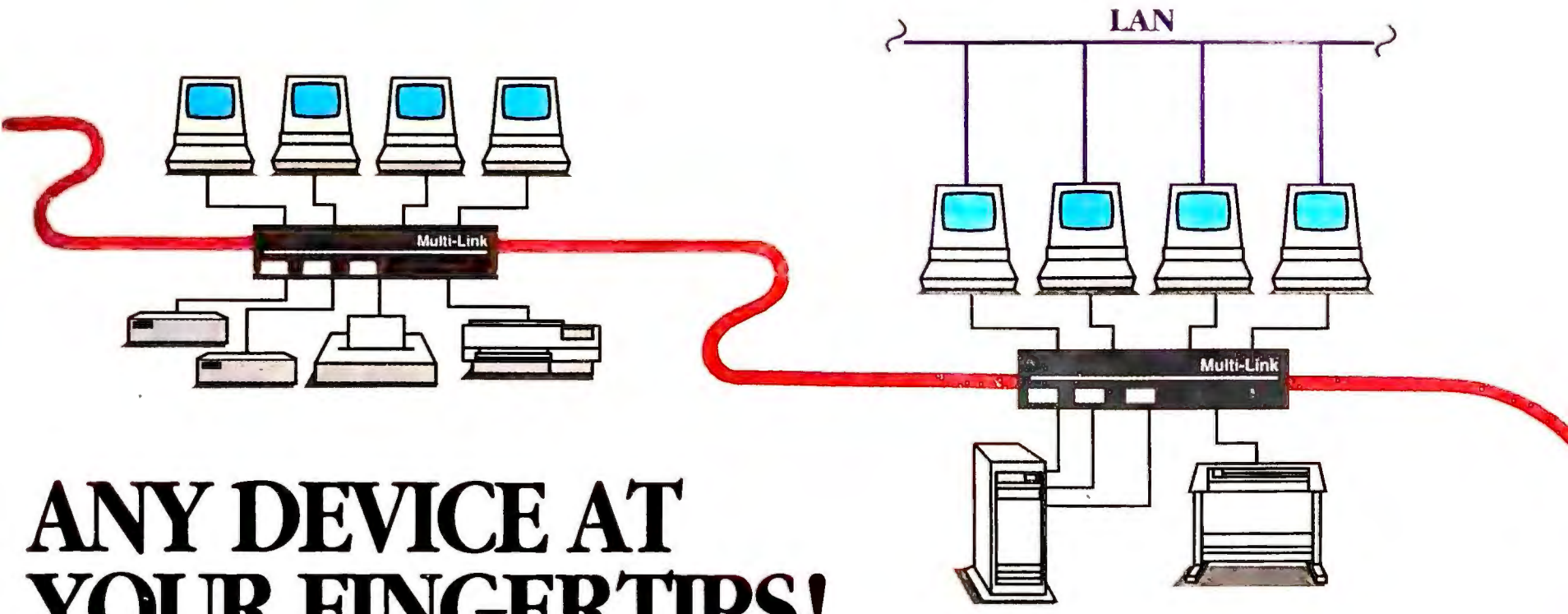

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tant, be aware of your warranty rights and exercise them to the fullest.

SHOP TALK

Aggressive Sales Tactics Lead to Problems

I responded to an ad from SMC Software Publishers offering 15 disks of shareware for only a $5 shipping fee. SMC called me to get a credit card number to bill the $5, and a salesman described, quite hurriedly, the Software of the Month Club. I had no interest, as I really didn't understand all the rules and wasn't expecting such a sales pitch. The ad didn't even mention such a club.

At the end of the month, my credit card statement arrived, reporting the $5 charge and a charge of $14.95 for membership, which I did not order. I have since been on the phone with SMC seven times at my expense. I have yet to receive the $5 worth of disks. They will not credit my account for the membership that I did not order. I also fear that SMC plans to charge me an additional $5 every four weeks as long as I am a "member," which in my opinion I am not.

Blake R. Krebs
Tampa, Florida

Editor's note: Consumer Watch *has received several letters from readers who unwittingly became members of the Software of the Month Club though all they wanted was to take advantage of the firm's advertised offer of 15 disks for $5. The company's ad, which appears in several PC publications, makes no mention of the software club.*

After being contacted by Consumer Watch, *SMC credited the membership fee to Mr. Krebs's account. He has also received the 15 disks he ordered.*

According to June Neff, SMC's membership services coordinator, an overzealous salesman signed up several new members without their consent. She adds, however, that new members can request a refund of the membership fee, provided they do so immediately after joining the club.

We were unable, however, to get a satisfactory explanation from anyone at the Software of the Month Club as to why the company did not mention the club angle in their ads, as is the norm with book club advertisements soliciting new members. A simple statement to that effect would eliminate much of the confusion.

Modem Miscommunication

I purchased a Hyundai HMD-2402P modem. I was impressed with the unit's 18-month warranty and took it as a sign of quality assurance and commitment on the part of Hyundai. This no longer seems to be the case. As I started to call

(continues)

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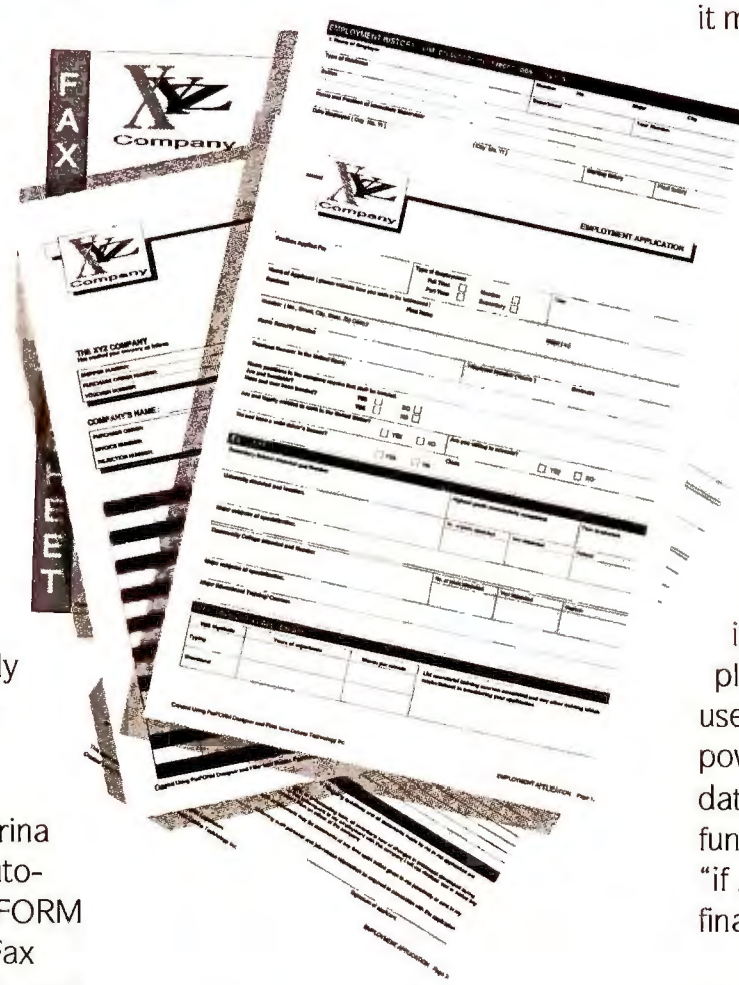

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PerFORM Pro's WYSIWYG "Designer" software runs under Windows 3.0. And it makes form designing easier and more complete than any of the old ways. You'll find an array of tools. A wide choice of typefaces. Over 100 sample forms. And the ability to add graphics like your company's logo. For security, PerFORM PRO's powerful electronic signatures can secure data. And the final form design can also be locked.

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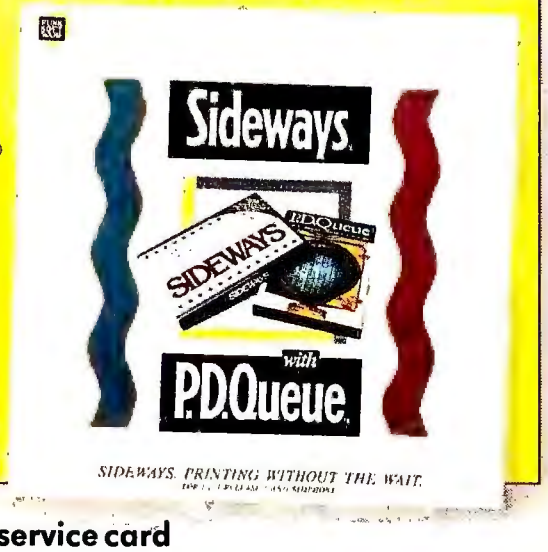

FUNK SOFT WARE

FOR 1-2-3 RELEASE 2 AND SYMPHONY.

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Circle 60 on reader service card

local BBS's, the modem would refuse to log on to certain HST modems at 2400 bps. I tried calling Hyundai and was told they knew about the problem and that the modem was being phased out, but [no one] offered to resolve my problem (even though the modem was still under warranty). Now I am stuck with a 2400-bps modem that will lock up a BBS if I try to log on at 2400 bps.

Neil A. Viglione
Lawrence, Massachusetts

Hyundai responds: The problem Mr. Viglione was experiencing in connecting to certain BBS's occurs only when the HMD-2402P internal 2400-bps modem attempts to connect to a U.S. Robotics HST modem. The HMD 2402P is Hayes compatible and is compatible with other 9600-bps modems.

We resolved the situation by offering to change the internal modem for Hyundai's external modem, the HMD-2404M, which works with the U.S. Robotics HST modem and all others.

Nick Naimo
Vice President, Operations

Editor's note: Although Hayes-compatible modems are often not compatible with U.S. Robotics' HST protocol at 9600 bps, all modems should be able to connect to an HST modem at the slower 2400-bps rate.

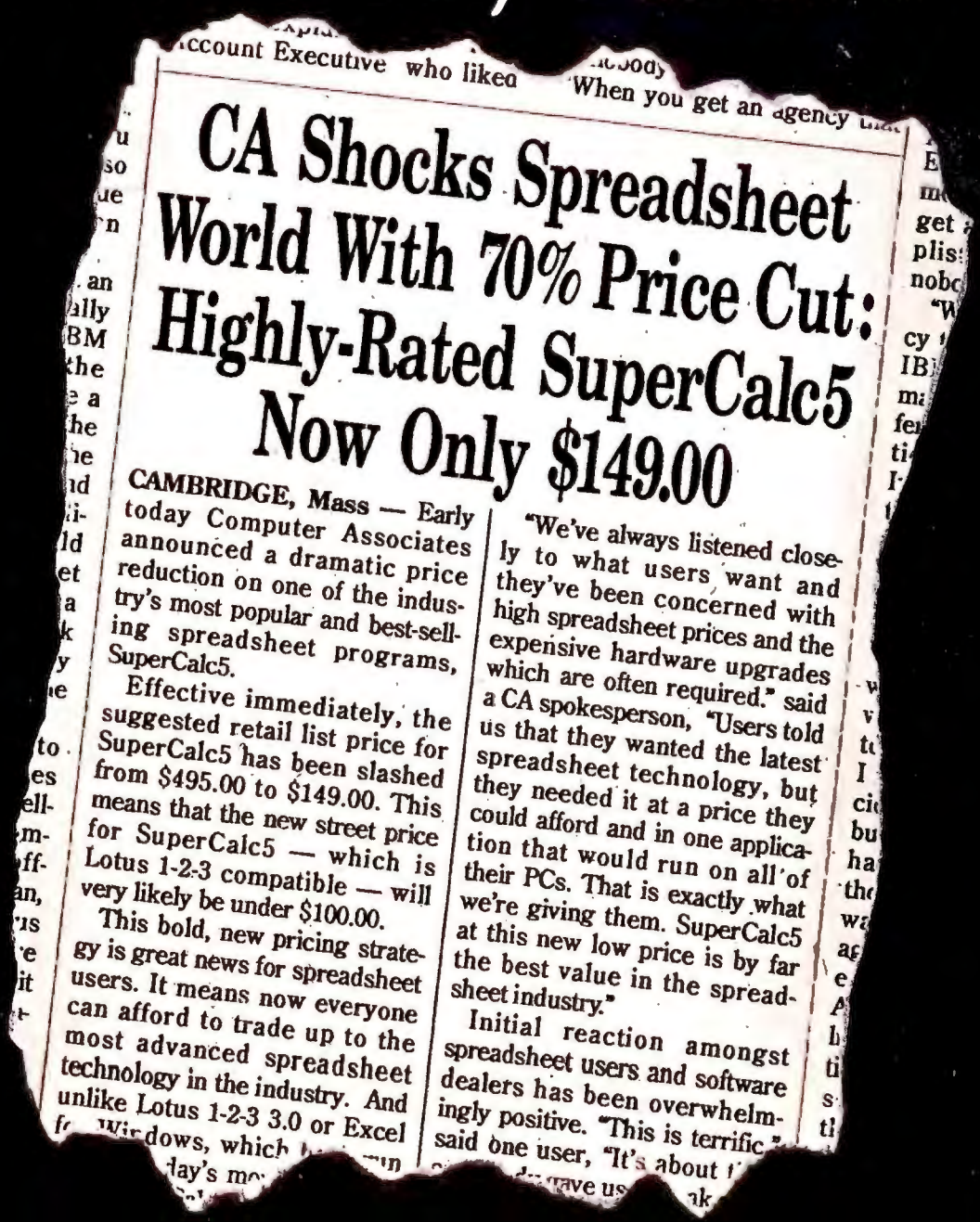
In Praise of Packard Bell

While thumbing through my April 1991 issue of *PC World*, I read Doug George's *Consumer Watch* letter of dissatisfaction and your general skepticism regarding Packard Bell's technical support. I must say I was surprised, since my experience with them has been excellent.

I bought a new Packard Bell 386/25 in February. My first and only call to the company's service number led to a call back within two hours, and [the technician] worked with me with knowledge and patience until the system was working perfectly. They actually called me

(continues)

Before You Blow $500 On Lotus 1-2-3, Excel Or Quattro Pro, Read This.



CA Shocks Spreadsheet World With 70% Price Cut: Highly-Rated SuperCalc5 Now Only $149.00

CAMBRIDGE, Mass — Early today Computer Associates announced a dramatic price reduction on one of the industry's most popular and best-selling spreadsheet programs, SuperCalc5.

Effective immediately, the suggested retail list price for SuperCalc5 has been slashed from $495.00 to $149.00. This means that the new street price for SuperCalc5 — which is Lotus 1-2-3 compatible — will very likely be under $100.00.

This bold, new pricing strategy is great news for spreadsheet users. It means now everyone can afford to trade up to the most advanced spreadsheet technology in the industry. And unlike Lotus 1-2-3 3.0 or Excel for Windows, which ...

"We've always listened closely to what users want and they've been concerned with high spreadsheet prices and the expensive hardware upgrades which are often required," said a CA spokesperson, "Users told us that they wanted the latest spreadsheet technology, but they needed it at a price they could afford and in one application that would run on all of their PCs. That is exactly what we're giving them. SuperCalc5 at this new low price is by far the best value in the spreadsheet industry."

Initial reaction amongst spreadsheet users and software dealers has been overwhelmingly positive. "This is terrific," said one user, "It's about ...

It's the beginning of a revolution.

The affordable spreadsheet revolution. Now every user in America can afford the most advanced spreadsheet technology. The latest breakthroughs. Newest features. Hottest 3-D graphics.

CA90s

CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

It's all there inside SuperCalc5. With Lotus 1-2-3 compatibility, presentation quality graphics and spreadsheet linking, SuperCalc5 has become one of the most popular, best-selling spreadsheets in the industry.

More than 3,000,000 copies have been sold and unlike some others, SuperCalc5 runs on virtually every type of PC that exists.

If you've been thinking about moving up to a more powerful, full-featured spreadsheet, now's the time. Move up to SuperCalc5 and get everything you've always wanted for hundreds of dollars less than Lotus 1-2-3, Excel or Quattro Pro. For the name of your nearest SuperCalc5 dealer call 1-800-CALC-149.

Do it right now. After all, at this price, why wait?

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Software superior by design.

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Circle 26 on reader service card

back several times over a two-week period to check that all was still OK.

Victor J. Schuler
President
Environmental Consulting Services
Middletown, Delaware

Think you've gotten a raw deal—or a great one? Send the details to Consumer Watch, PC World, *501 Second St. #600, San Francisco, CA 94107; MCI Mail PC World Editorial; CompuServe 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest.*

POWER TIP NO. 188

Q&A Mass Update Macro

Q&A offers a Mass Update feature for recalculating all records in a file, but it's often difficult to set up. An easier method is to write a pair of macros that update your file 100 records at a time.

To create the first macro, call up a record by selecting *File Search/update* and entering a file name. Press **<Shift>-<F2>**, select *Define macro*, and press the key combination that you want to assign the macro to—**<Alt>-A**, for example. Press **<F8><F10>** ten times, which updates the next ten records, then press **<Shift>-<F2> <Enter>** to save the macro. To create the second macro, press **<Alt>-A** ten times and assign it to **<Alt>-B**. From now on, you can press **<Alt>-B** in the Search/Update screen to update the next 100 records.

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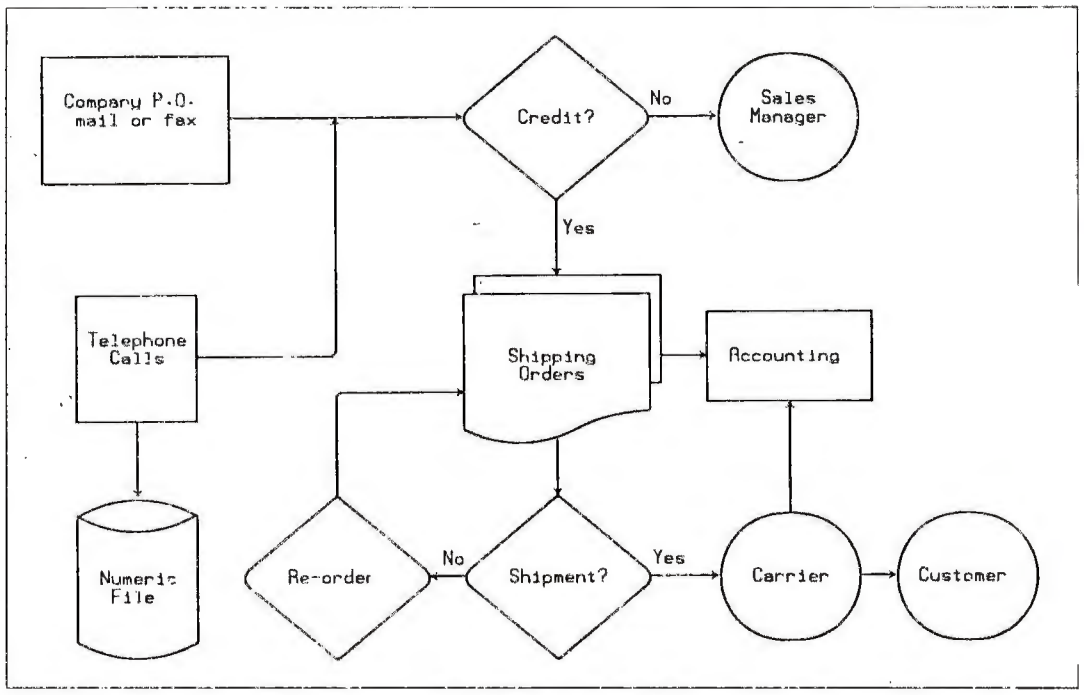

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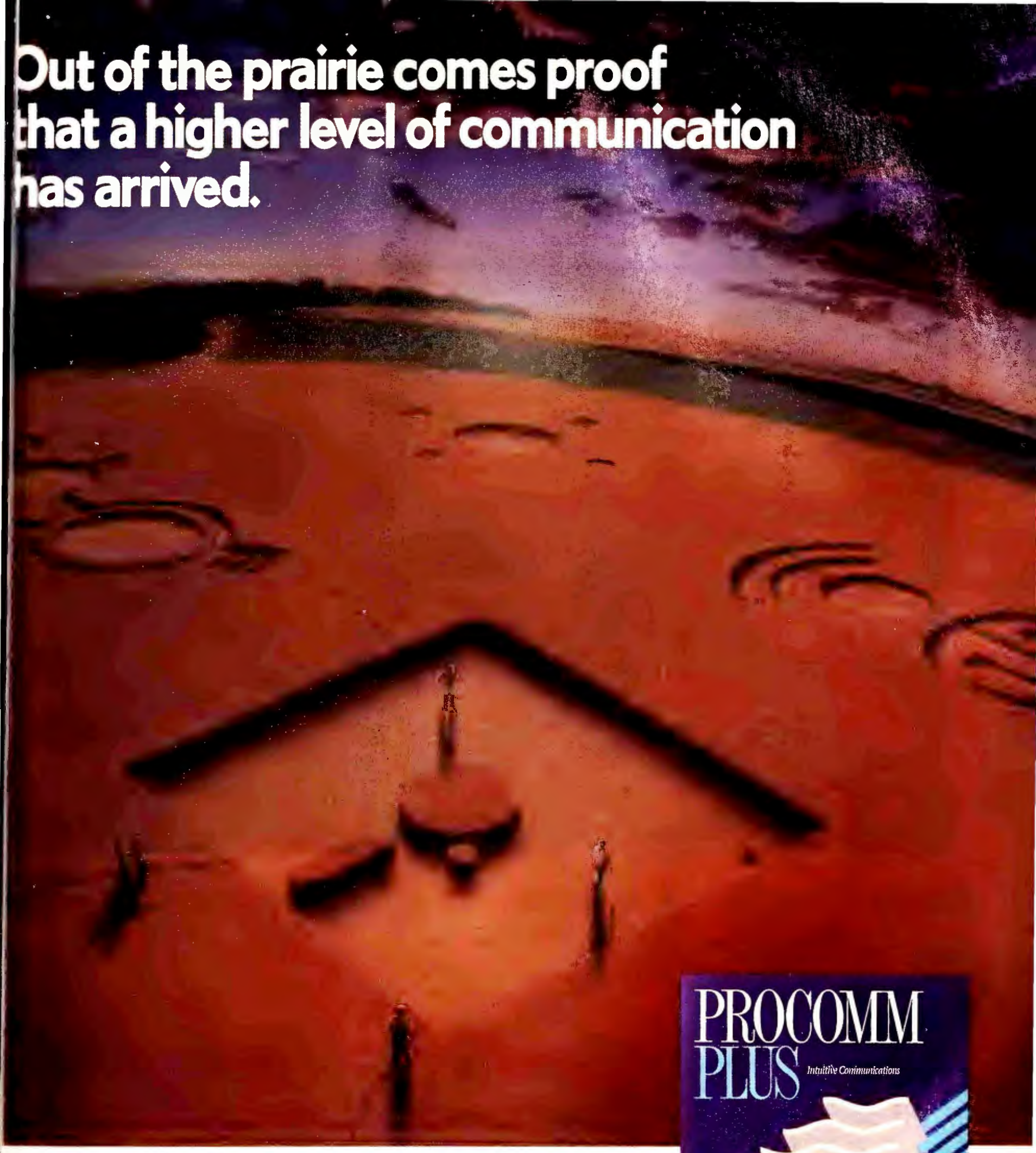

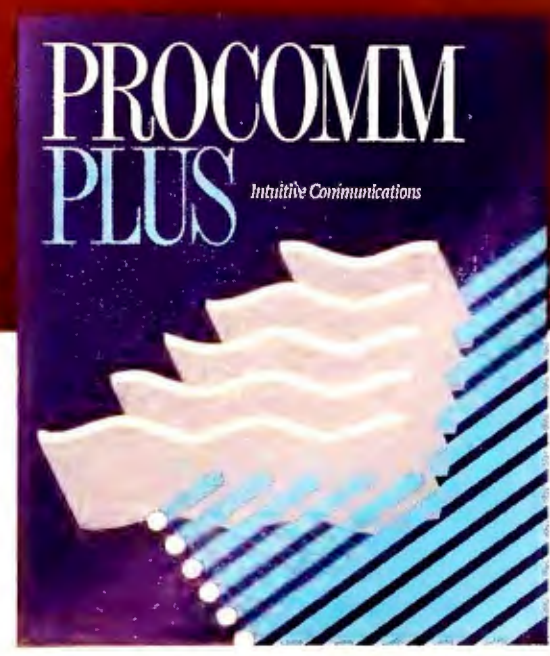

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PROCOMM PLUS 2.0. The new version of the best-selling communications software in the world. With internal Zmodem, an enhanced ASPECT script language with hundreds of new commands, and script compiling for much faster execution speed; an enhanced dialing directory with many new features; a time-saving Filename Clipboard (Patent Applied For); 33 terminal emulations with 132 column and full EGA/VGA support; and much more.

If you own PROCOMM PLUS, you can upgrade to PROCOMM PLUS 2.0 for just $39.00 by calling toll-free 1-800-333-4559. So call today. You'll get computer communication in its highest form. For a very down-to-earth price.

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Some days you have all the time in the world.

When the pressure is on, pour on the speed. With Hewlett-Packard's new LaserJet IIISi printer. A powerhouse that delivers at a throughput speed of 17 pages per minute.

With the LaserJet IIISi, you're up to speed the moment you give the "print" command. HP's RISC-based formatter and the PCL5 printer language, with vector graphics and on-the-fly typeface scaling, yield fast results. This printer also represents a new standard for I/O performance with optional Network Printer Interface cards for either Ethernet or Token Ring.

The LaserJet IIISi is specifically designed for shared-use environments. Its high-volume paper handling features include two 500-sheet input trays and a monthly duty cycle of 50,000 pages. HP offers software-selectable language switching between PCL5 and optional Adobe® PostScript.® For added versatility, your options include

The Financial

April 1, 1991

Financial News for N/B/M Shareholders

Vol. XIX, No. 4

N/B/M Meets Challenges

Marketing Changes & New Faces

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And some days you need the new 17ppm LaserJet IIISi.

an envelope feeder and two-sided printing.

Beyond speed and efficiency, the LaserJet IIISi delivers the sharpest 300 dpi print quality yet. In fact, HP's revolutionary combination of Resolution Enhancement technology and new microfine toner challenges the print quality of many 600 dpi printers.

The price of the new LaserJet IIISi, just $5,495,* is as impressive as the work load it handles. If you're ready to pick up the pace, call **1-800-752-0900, Ext. 2067** for more information on the fastest LaserJet printer and the name of your nearest authorized HP dealer.

HP Peripherals
When it's important to you.

HEWLETT PACKARD

*Suggested U.S. list price. ©1991 Hewlett-Packard Company PE12101

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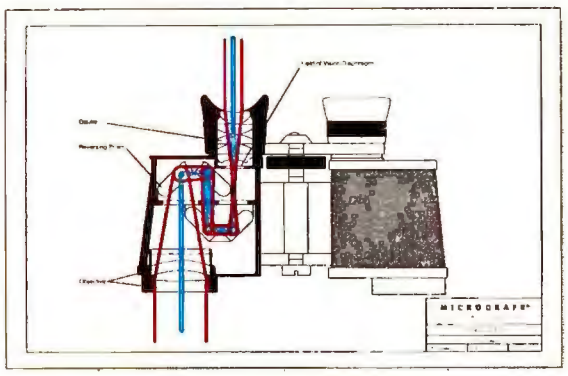
New 3.1 Release
Free Trial Software

Focus on Precision Illustration With New Designer 3.1

See for yourself. New Designer 3.1 turns your PC into a precision illustration tool, running under the Microsoft® Windows™ environment. You'll get more accuracy in technical illustrations, greater performance in graphic designs and higher speed in desktop publishing layouts. It's now easier to turn what you can imagine into an image all can see. Call for your free trial software and feel the high performance yourself.



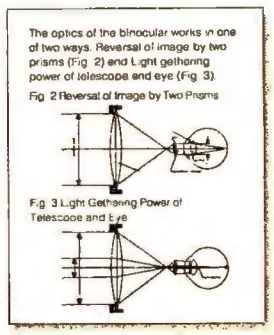
▲ *Higher performance in Designer 3.1 speeds up drawings with faster wide styled lines–even wide dashed lines. Object snap points make precision a given.*

The view from out front. With new Designer 3.1 you're ahead of the pack no matter how you look at it. With more usable features, higher performance operation and more flexible file handling, you'll be able to create and manipulate an image until it's just right. That's precision.

▲ *Choose from 16.4 million colors and save any number of custom palettes for later use. Combine text and graphics with bitmapped images and true layering.*

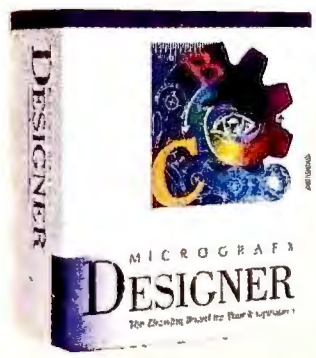
▲ *"The power-users choice . . . a customizable toolbox has a tool for just about anything; precise and accurate autotracing utility, CAD-like layering and superb color-publishing capabilities," says PC Magazine.*

▶ *Desktop published articles become clearer with precision illustration from Designer 3.1. Multiple file formats speed up import and export of files.*



Outside perspective reflects well. "Designer is an outstanding illustration package that receives Editor's Choice recognition. Designer is perhaps the most sophisticated of all the illustration packages," writes *PC Magazine*.

Software Digest reports that "Designer provides the best overall graphics package. The program offers state-of-the-art features, good performance, and unmatched ease of learning and use in a sophisticated package. Designer can handle virtually any free-form graphics or design task with ease." Designer was awarded a top-of-the-class rating.



Free hands-on trial. Call now, for a free working model of the new Designer, 800-733-3729, ext. 5050.

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MANAGER'S FILE #4

Understanding Software Licensing

On November 19, 1990, the Software Publishers Association (SPA) conducted a raid at the Northbrook, Illinois, offices of the Kemper Lesnik Organization. After a detailed audit of the software installed on the company's PCs, Kemper Lesnik was required to destroy all illegal software and pay $75,000 in penalties.

One copy, one user: That's the law for using PC software, but it's a law that is frequently broken, according to the SPA. The group believes that for every legal copy of a package in use, there's one illegal copy as well. Although that's only an estimate (based on actual software sales versus the organization's projections for growth in the PC software industry), it's safe to say that a lot of PC users are either unaware of or unconcerned with laws governing software use.

From a management perspective, it pays to understand the software licensing laws and to make sure that your employees do also. "Software use needs to be managed like any other resource," says Jodi Pollack, public relations director for the SPA. "You wouldn't buy one chair for two employees; you shouldn't buy one piece of software for two people, either."

The SPA is working diligently to police software use among corporations. In recent months, it has initiated legal action and raids against firms it believes are systematically violating software licensing agreements. Although the group focuses on firms that display what Pollack describes as a "blatant disregard" for the law, management is liable for any abuses—even if it's not management practice to copy software illegally.

So what can you do to make sure all your company's software is legal? The SPA recommends a variety of steps, including conducting an in-house audit of all PCs and establishing a corporate policy statement governing the use of software (see accompanying charts). The SPA distributes a free audit kit that includes *SPAudit*, a program that identifies all the software in use on a given PC. This inventory information can then be matched to purchase records or other documentation to verify that all copies of installed software packages are legal.

The SPA audit kit is available by writing: SPA Audit Materials, 1730 M St. NW #700, Washington, DC 20036.

Is Your Software Legal?

It pays for management and employees alike to understand the laws governing use of PC software.

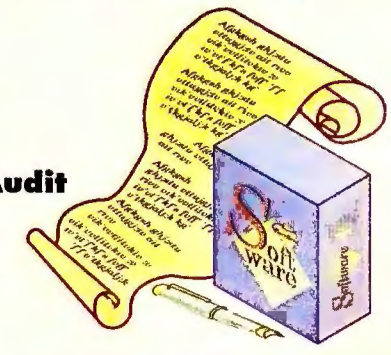
Sample Corporate Employee Agreement

1. *Company* does not own this software or its related documentation and, unless authorized by the software developer, does not have the right to reproduce it.
2. Employees share only in accordance with licensing agreement.
3. Misuse of software or related documentation shall be reported to the department manager or *Company's* legal counsel.
4. *Company* does not condone the illegal duplication of software. Employees who make, acquire, or use unauthorized copies of computer software shall be disciplined as appropriate under the circumstances.
5. I am fully aware of the software use policies of *Company* and agree to uphold them.

_____

Employee signature and date

Suggested Procedures for a Self-Audit



- ✓ Collect and review purchase records.
- ✓ Collect and review licensing agreements.
- ✓ Select a date for the audit (evenings and weekends are least disruptive), then send a memo to employees informing them of the procedure.
- ✓ Locate all personal computers, including laptops and portables, and print out a list of directories/files for each hard disk.
- ✓ Compare software found on hard disks with purchase records or with authorized disks or documentation.
- ✓ Consult employees before destroying software for which there are no records or disks, since it may have been purchased by the employee.
- ✓ Conduct a review quarterly.

Source: Software Publishers Association

Introducing the DBMS runs like a mainframe

Admit it .

Don't you get just a twinge of envy when you see a Mac user having fun while getting the job done?

You're not alone.

Millions of users who needed the power of the PC but wanted the ease-of-use of a Graphic User Interface (GUI) just splurged on Windows and the expensive hardware needed to get the most out of it.

But you don't have to do that.

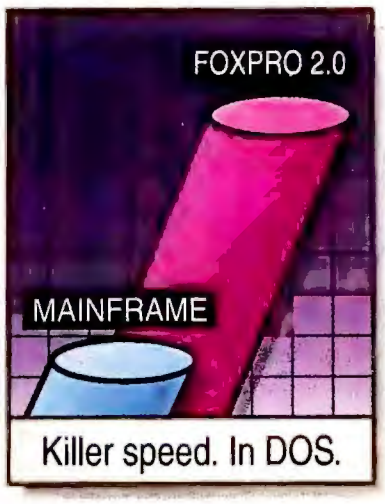
Because now there's FoxPro®2.0.

Why should the rich have all the fun.

FoxPro 2.0 gives you the ease-of-use of a Graphic User Interface on your character-based DOS PC.

Use pull-down menus to open multiple windows (in DOS) and see all the data you need to see at once. Build easy-to-use screens for entering and viewing data just by picking-and-clicking to place menus, buttons, checkboxes and scrolling lists anywhere you want them. Create sophisticated, elegant reports without the usual pain. Then assemble

:hat acts like a Mac and
n DOS.



everything into your own custom applications.

Without writing a single line of programming code.

But that's only the tip of the iceberg.

Beneath its Mac-like interface, FoxPro delivers all the power and technology needed for your database management systems in the 1990s.

Our new memory management techniques let you work with the memory you have now while speeding up your applications.

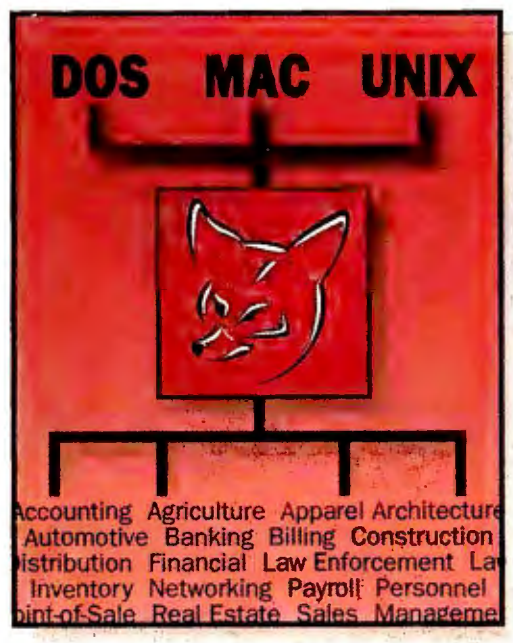
Our new compound indexes are less than a quarter the size of those in competitive products and far, far faster.

Our new Relational Query-By-Example (RQBE) is a simpler, interactive interface to the information you need.

Our new Rushmore™ query optimization† accesses that information two orders of magnitude or more faster‡ than ever before.

You'll like being able to seamlessly use the SQL SELECTs that RQBE creates in any of your applications. (And the new UPDATE, INSERT and CREATE TABLE commands, too.)

And you'll love the fact that to the rich development environment we've always had, we've added a project manager that keeps track of all the needed files and any changes, then automatically builds your application or .EXE files. An API that lets you dynamically link to libraries you write in C or assembler with a single FoxPro command. A BROWSE FOR that's the basis for an entire application itself. Fourth Generation Language (4GL) tools that make adding event-driven code to fully relational screens, menus, reports and labels a snap.



And we've made our networking even better than when NSTL said:* "... multiuser databases fall into two general performance categories: FoxPro/LAN and all the others ..."

There isn't a DBMS in existence with the power of FoxPro.

The bigger your business, the bigger your investment.

So we've maintained downward compatibility with your existing systems, and you can use FoxPro 2.0 to run your current dBASE (and Fox) applications on your present character-based DOS PCs.

While you develop better, faster database management systems using all the advanced power of FoxPro 2.0 to satisfy your future information processing needs.

To get the most out of your investments, call and ask about our Upgrade-Any-DBMS-for-$195 offer.

Call now for your FREE demo disk.

FoxPro 2.0 runs on a 512K XT yet in extended mode uses every bit of power in a 386 or 486. To try it yourself, call Fox Software for a free copy of our fully-featured demo or the name of your nearest dealer.

You'll be amazed at what FoxPro 2.0 can do for you. In DOS.

Call 1-800-837-FOX2 or 419-874-0162 today.

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FoxPro 2.0

The complete power trip.™

† Patent applied for. ‡ A PC and FoxPro beat a mainframe and DB2 with a million-record, 200 megabyte database! * Quote from Software Digest Ratings Report, Vol. 7, Issue 13 (Oct. 1990) refers to FoxPro 1.02. Software Digest is a registered trademark of NSTL, Inc. Upgrade price valid only in U.S.A. and Canada. FoxPro TM Fox Holdings Inc. © Fox Holdings Inc. 1991.

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DUE TO THE STRONG GRAPHIC CONTENT OF THIS PROGRAM, USER DISCRETION IS ADVISED.

We don't want to infringe on anyone's freedom of expression. But Charisma gives you so many graphic possibilities in one powerful, Windows-compatible program, we felt a warning was necessary.

Limit the number of fonts used to no more than two per presentation. Be consistent and use underlines, italics or bold type for emphasis.

Once you try it, you'll understand why. Charisma's extensive word and data charting functions, real drawing capabilities and total user control make it the most complete graphics solution for business. Unfortunately, some people have trouble resisting the temptation to use every Charisma feature on every presentation. That's understandable. When you have access to 16.8 million colors, more than 40 fully editable fonts, thirteen drawing tools, a library of 2200 clip art images and the ability to turn any graphic element into a bullet, it's easy to get a little too enthusiastic.

It's just as easy to get overly excited about the way Charisma lets you assemble entire presentations without switching between word processing, graphics and spreadsheet programs. Plus you see the results of your creativity immediately, since Charisma doesn't make you go back and forth between text and graphic screens. And with more than 30 import and export filters for graphic formats—including Harvard Graphics—Charisma gives you more power and control than ever before.

But you shouldn't expect any less from a program designed specifically to take full advantage of the Windows environment. Now, even without overdoing it, you can output the most provocative business graphics you've ever seen to 35mm slides, overheads and handouts. Or make your point with SlideShow, Charisma's on-screen graphics presentation utility that includes dozens of transition effects.

As you lay out word charts, use a template that provides maximum readability. Add spark to presentations by turning any graphic element, even your company logo, into a bullet.

Add visual interest and keep audience attention focused with freeform illustrations or custom edited clip art. One graphic per chart works best.

Break out information logically and understandably with a variety of chart types. Then use the Harmony Palette for a unifying blend of just the right colors.

Its strong graphic content prompted *InfoWorld*'s Michael J. Miller to say, "Charisma offers the greatest flexibility in creating and editing charts that I've seen."

We think you'll agree.

Call 1-800-733-3729, ext. 5050 (3710 in Canada) for your free working model of Charisma*.

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*Allow 4-6 weeks for delivery. Micrografx, Inc. 1303 Arapaho, Richardson TX 75081 - (214) 234-1769 (customers outside North America please dial extension 3710). Micrografx has offices in Los Angeles, Paris, London, Munich, Sydney and Copenhagen.

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Edited by ERIC BENDER

Intel Move Helps to Fight Off Rival CPU Makers

Low-Cost 486SX Remaps PC Midrange

20-MHz Chip Lacks Regular 486's Math Coprocessor

Now that you're used to thinking of the 386 as the common desktop denominator, forget about it. Intel has introduced a low-cost version of its high-end 486DX line. The 20-MHz 486SX is meant to move users still lollygagging among 386s on up to more integrated 486 computing.

The 486SX is essentially a 20-MHz 486DX with the math coprocessor lying dormant (see "486SX Systems: More Bang, Less Bucks" in this issue). Intel emphasized the importance of an integrated coprocessor when the 486DX debuted but has since found that only about 30 percent of users need one. Major savings on coprocessor testing costs represent one reason Intel can offer the $258 486SX for $330 less than the 25-MHz 486DX.

The optional 487SX coprocessor is really a full-fledged 20-MHz 486DX with the coprocessor enabled. When you install one of these $799 chips, it takes over completely from the 486SX. (But for coprocessor users, the 25-MHz 486DX system is a cheaper way to go.)

CPU	1990	1991	1992
16-MHz 386SX	4,245,000	3,990,000	2,400,000
20-MHz 386SX	479,000	2,531,000	3,600,000
25-MHz 386DX	1,414,000	2,383,000	2,800,000
33-MHz 386DX	312,000	885,000	2,100,000
20-MHz 486SX	**0**	**230,000**	**1,100,000**
25-MHz 486DX	281,000	469,000	446,000
33-MHz 486DX	65,000	546,000	1,200,000

The 486SX should rapidly achieve strong sales, according to Instat estimates. Overall, 386SX chips are the biggest sellers, and in each chip family, the highest performer is growing most quickly.

CPU Rivals Now Appearing

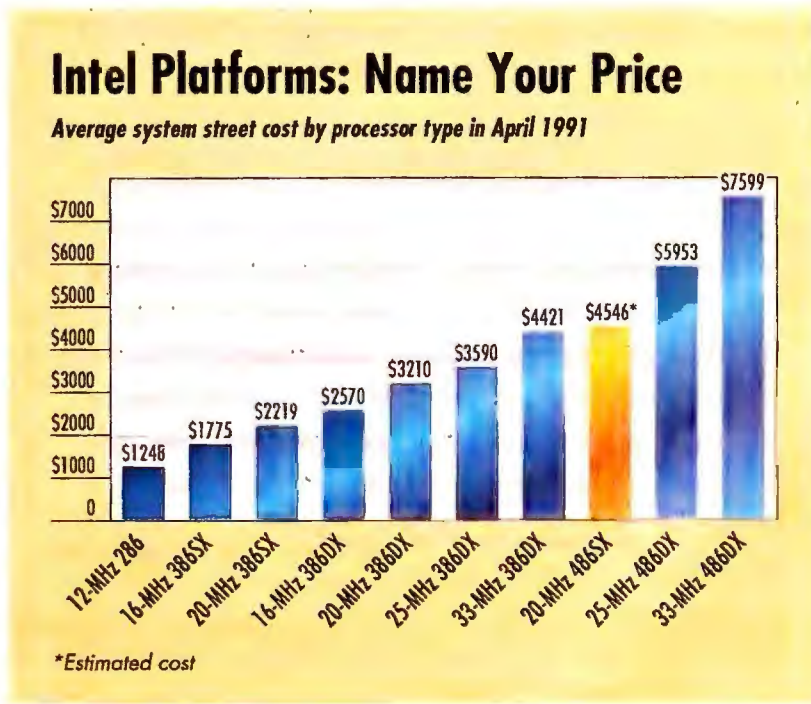
It's no coincidence that the 486SX appears just as rival semiconductor houses, led by Advanced Micro Devices, begin to offer 386-compatible CPUs. AMD has surmounted most of Intel's legal arguments against its 40-MHz 386 clone, the AM386DX, which lines up against both Intel's 33-MHz 386DX and the 486-SX. Comparable AM386DX and 486SX systems run neck and neck in price at $3000 to $4000. Which is faster? It depends who you ask.

"We don't think the 486SX is a revolutionary product," says David Frink, manager of public relations for AMD's Austin, Texas, chip-manufacturing operation. Frink claims that independent testing shows the 40-MHz AM386DX outperforming the 486SX. Everex's in-house testing contradicts that, reports Everex's marketing vice president Mark Marlow, but he admits that different testing methodologies could show either chip in a better light. "I don't think Intel would argue that a 20-MHz 486SX is going to perform better than a 40-MHz 386," adds Compaq product marketing vice president Lorie Strong.

But companies like Everex and Compaq see other advantages in the 486SX's design. The on-board cache controller and memory are intact, and the 486SX's relatively low clock speed saves on other components, most notably by accepting slower system RAM.

Analysts figure AMD's largest customers will be mostly offshore clone makers and U.S. mail-order firms such as Northgate and Club American that have already announced products. "There are no drawbacks to the AMD chip," states Dean McCarron, vice president of technology for Scottsdale, Arizona, market researcher Instat. But larger manufacturers are loath to jeopardize either their precious Intel chip allotments or the advance product information, which let many announce 486SX products the day after the chip's unveiling.

Over time, the introductions of the 486SX and the AM386DX will drive down prices for the entire spectrum of systems, says McCarron. He adds that at least through next year, the highest-volume section of the marketplace will still be among 386 processors.
—*Scott Spanbauer*

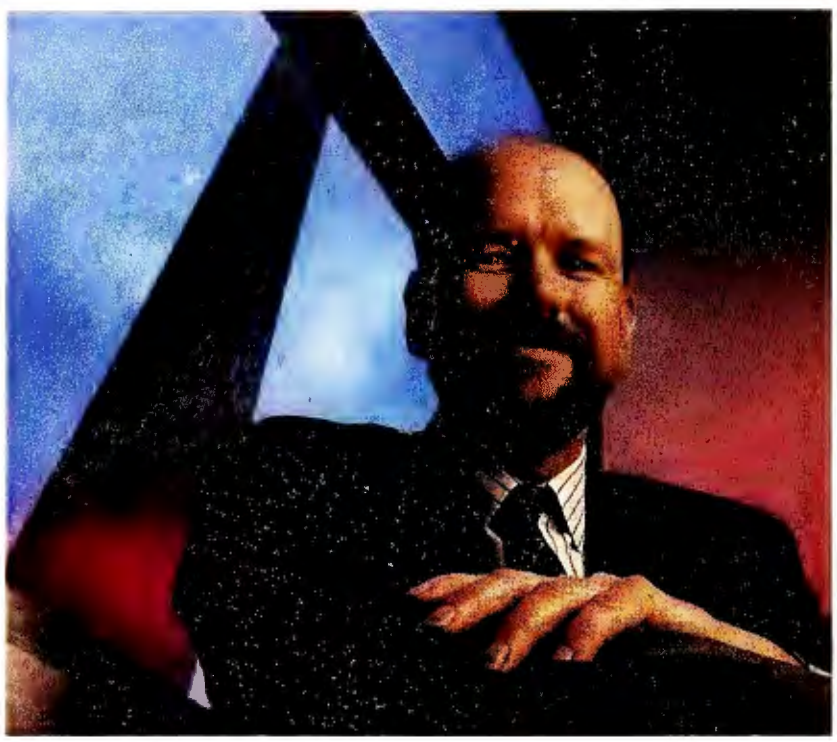


Basic costs for Intel PCs cover the gamut, as shown by street price figures from IDC PC Pricing Service and Metro Computing.

JEFF BERLIN

IBM Counteroffensive Bolsters OS/2—Finally

Corporations See Windows' Limits



OS/2 offers the power and reliability required for crucial applications at the Royal Bank of Canada, says George Oliver.

CURT TRENT

Four years after its grand debut as the successor to DOS, IBM's OS/2 seemed stuck somewhere between disappointment and debacle. Early versions of the next-generation operating system were mammoth, slow, clumsy, and often lacking basic amenities such as the abilities to print, run DOS applications, and work on networks. As IBM fixed those problems, *Windows* took off and took most PC software vendors with it—encouraged by Microsoft, IBM's former OS/2 partner.

But OS/2 remained critical to IBM's strategy, and this spring the $60 billion firm put some muscle behind it. "In a real sense, we're starting over," says Lee Reiswig, assistant general manager for programming, IBM desktop systems. Key is an upcoming version that's more advanced and DOS friendly than anything coming soon from Microsoft, and that appeals strongly to firms merging PCs with large systems. "In OS/2 we have the best of both worlds," says Charles Feld, vice president for management services at Frito-Lay in St. Louis.

"Next Generation" Defined

Arriving by year-end and requiring a 386 or better, OS/2 2.0 is a 32-bit system built upon a robust, flexible multitasking architecture that promises better performance than the 16-bit *Windows*. OS/2 2.0 also lets you directly manipulate files in icon form; you can print a document simply by dragging its icon over and dropping it on the printer icon. "Never again do you have to see a directory or a file listing," promises Reiswig.

Most important is DOS support, which IBM acknowledges has been wholly inadequate. OS/2 2.0 will run multiple DOS applications and give each of them 620K even with network and mouse support. You can cut and paste between DOS applications, run communications packages out of the box, and display applications in VGA mode. OS/2 2.0 sees *Windows* as a DOS application, so once you buy a copy of *Windows*, you can juggle *Windows* packages under OS/2 2.0—with better protection from system crashes than *Windows* provides.

Realistically, hardware requirements are similar; IBM says you'll need at least 3MB of memory and 10MB to 15MB of available disk space. OS/2 2.0 will sell for less than $200, and PC-DOS users can upgrade for $99 through year-end. IBM also is unbundling the OS/2 Extended Edition communications and data base components and working with Compaq and others to ensure they run on compatible PCs.

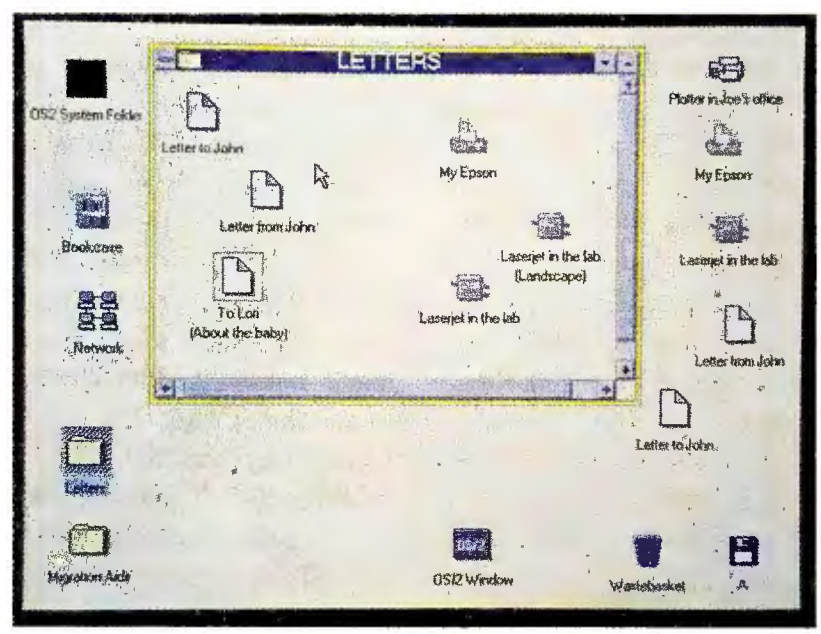
Application software remains the weak link. Over 300 Presentation Manager programs and more than 2500 OS/2 packages have been announced, but most developers yanked programmers away from OS/2 to work on *Windows* a year ago. Moreover, Microsoft is leading this crowd toward OS/2 3.0—a built-from-scratch 32-bit operating system with different programming interfaces. Four million copies of *Windows* have shipped and only 600,000 copies of OS/2.

Corporations on Course

But almost all of those OS/2 copies landed in Fortune 1000 firms that are quietly plugging away at crucial in-house programs. For these customers, OS/2 2.0 "is a no-brainer," says Paul Zagaeski, analyst with The Yankee Group in Boston.

"Everyone is trying to equate what IBM is doing to a PC environment," says Ron Roy, manager, division of information resource management for the state of Illinois's Department of Commerce and Community Affairs in Springfield. But, he declares, OS/2 is vastly more capable. "I'm sorry—you can't compare DOS and *Windows* to OS/2."

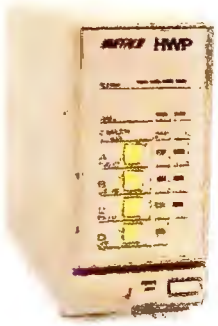
"*Windows* is a powerful product, with a lot of acceptance in the marketplace," notes George Oliver, manager of information delivery technology for Royal Bank of Canada in Toronto. "We still look at it as a graphical environment sitting on top of DOS, and it has all the issues that DOS has." With approximately 20,000 PCs installed, the giant bank plans a major push behind OS/2 2.0—partly because it can bring custom DOS code along. "OS/2 represents the cheapest way we can get to the kind of operating system we'll need," Oliver says. —*E. B.*



OS/2 2.0 will provide a more advanced user interface than Windows and smoothly run multiple DOS and Windows packages.

Printer Sharing Solutions

5 or 10 Ports



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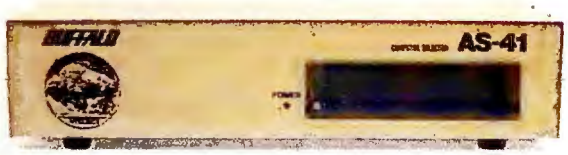
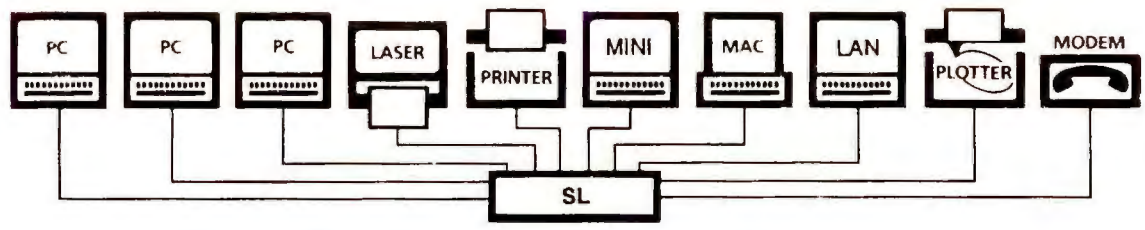


HWP — *5 Ports*

HWP-256	with 256KB	$325
HWP-512	with 512KB	$375
HWP-1000	with 1MB	$425



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All parallel ports; user configurable as either three inputs to two outputs, or four inputs to one output, buffered auto-switch

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The HWP uses Direct Memory Access (DMA) for data transfers into the buffer, making the HWP hardware capable of receiving parallel data at the high rate of 100,000 characters per second.

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Use either the pop-up menu or the front panel switches to select printers, select the next available printer, send multiple copies, clear data, and other functions.

AS-41 — *5 Ports* — *$200*

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Both include 15 ft. serial null-modem cable

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Automatically Routes and Buffers Data:
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Transfer files serially between PCs up to 115,200 bps; buffer serial data to the SL several times faster than normal 9,600 bps

Pop-up Menu via Hotkeys or Mouse:
Keyboard selection of printers and many other control functions; pop-up is for convenience, but is not required

Simple Installation:
Plug in your cables; if desired, run the installation software for the pop-up menu

Computer Dealers Shift Their Strategies

Buyers Pick, and Pay for, the Exact Services Required

The days of free advice, free installation, and free after-sale support are long gone from your local ComputerLand and Businessland stores. Years of price wars, vanishing profits, mergers, and closed outlets have dramatically changed the major dealer chains. And you'd better know the new rules of the game.

"There is an ever-widening discrepancy between client expectations and the channel's ability to deliver," cautions Lee Matchett, owner of a MicroAge store in Klamath Falls, Oregon. Dealers can either provide essentially substandard support and service for free, or charge for full services. "Either way, the customer is dissatisfied."

Although many dealers spend considerable time educating potential customers on the new style of business, others are less candid. "Once someone has their foot in the door, the level of service tends to drop," complains David Allessandro, manager of technical services at Textron Financial Services in Providence.

Scott Davis, systems manager at the Fred Hutchinson Cancer Research Center in Seattle, agrees. He called his dealer when problems arose during installation of a Compaq Systempro. "But he has 25 or 30 other clients, and we played telephone tag ad infinitum until I found a workaround myself."

Dealers Shift Focus

Other dealers have found compromises that keep customers happy. Diana Conley, who owned three ComputerLand franchises in the Chicago area, closed two outlets last year and is now running only her original store in Downers Grove, Illinois. "The market was just too cutthroat," she says. Conley has significantly altered the focus of her business. She has dropped paid advertising and depends on word-of-mouth referrals. "The people who are looking for low prices don't walk into my store," she says. "The ones who come here want quality service and support and are willing to pay for it."

SUSAN GREENWOOD

Afraid of asking your dealer to meet special needs? "I can call my dealer at his home and tell him to meet me at the shop at 3 a.m.," declares Allen Ochalek of Data Development.

"The motto of the big dealerships is, Stack 'em high, price 'em low, watch 'em go," says Steven Sroczynski, general manager of two ComputerLand stores in Sarasota, Florida. Sroczynski's stores, while offering the lowest possible price, make sure customers realize the price covers nothing beyond the product itself. At the point of sale, the buyer signs a "customer assurance sheet" that states this explicitly. Burn-in and installation, long-term maintenance, on-site troubleshooting, and network consulting are all sold à la carte. "Most businesses, large and small, still need some support," Sroczynski says. "We let them decide how much."

Spell Out Your Requirements

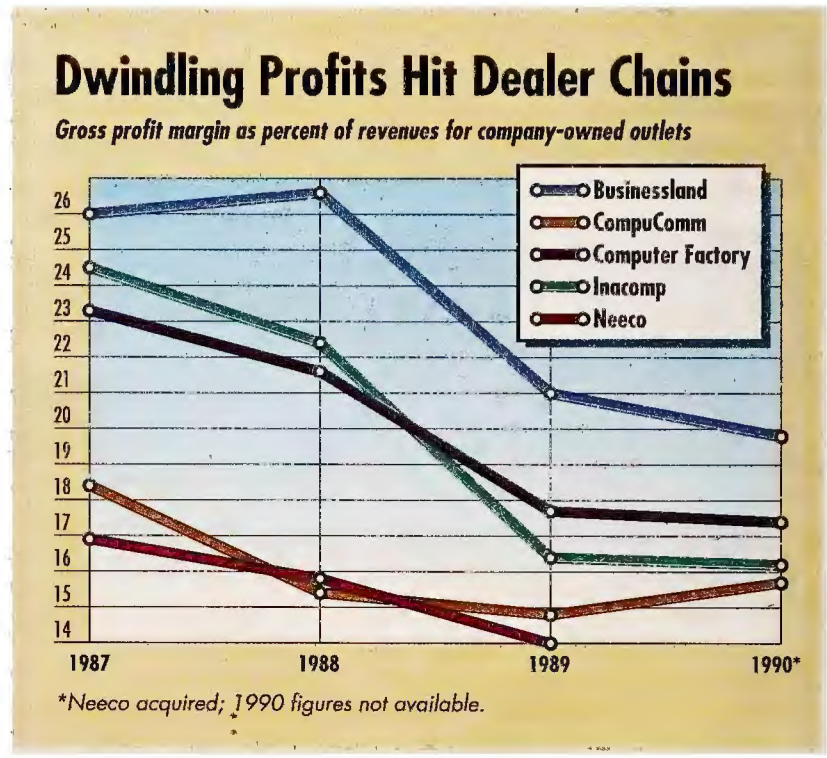
À la carte support allows customers to specify exactly which services they want—and then watch dealers scramble to provide them.

Each year the city of Palo Alto, California, estimates its PC hardware and software needs for the coming 12 months and asks dealers to bid on the contract. Diana Neff, director of information resources, says that 48- to 72-hour delivery on software and two-week delivery on hardware are essential. Neff rejects dealers who don't meet these requirements.

Some organizations farm out purchases to several resellers. Charles Schwab & Company in San Francisco gets PS/2s from Nynex, Macintoshes and related products from ComputerLand, as well as Dells and other compatibles from EDS. "We like to leverage our buying power," explains Philip Gordon, manager of end-user computing.

Fairview Hospital in Minneapolis fired its dealer when he wasn't flexible enough to meet the hospital's accounts payable policy. "Our terms tend to be longer than average, and as a result, our dealer kept putting us on credit hold," says Linda Ruekert, manager of the hospital's information center. A more flexible retailer got the contract.

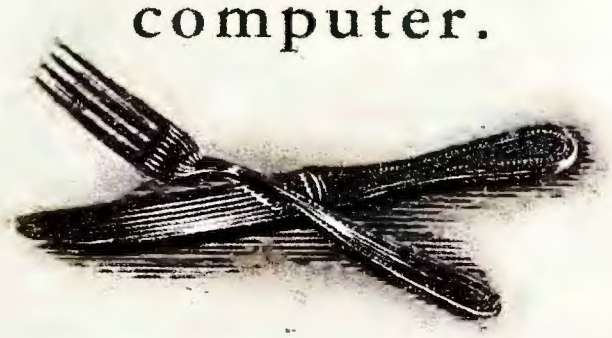
Even grueling demands can be met. Allen Ochalek is technical support manager for Data Development, a round-the-clock production facility in Stuart, Florida, that needs instant service when a PC breaks down. "I can call my dealer at his home and tell him to meet me at the shop at 3 a.m.," he says. "If he couldn't provide this, he wouldn't have gotten my business." —*Alice LaPlante*



JEFF BERLIN

Company-owned (nonfranchise) computer chains are struggling with ever-shrinking profit margins, notes Merrin Information Services. Financial pressures have sent a wave of mergers through dealer chains; among them, CompuComm is buying Computer Factory, and Inacomp has merged with Valcom.

Sure, the 386SX is your meat and potatoes computer.



But not all meat and potatoes taste the same.

If any computer deserves to be called meat and potatoes, it's the 386SX, which is fast becoming America's business machine.

Be advised, however, that meat and potatoes can mean anything from hamburger and fries to beef wellington and pommes de terre dauphinoises, with many gradations in between. Each is reflected in the dish's price. And in its performance on your palate.

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Circle 124 on reader service card

Printers Speed Up for Network Demands

Early Users Applaud Speed, Built-In Network Interfaces

Soon *network printer* won't mean just any printer hooked to a network. It will mean 15-page-per-minute speed, 20,000-page-per-month toughness, unlimited flexibility, and miserly cost consciousness. Add PostScript compatibility, more easily managed fonts, outsized multiple paper bins, internal network interface cards, and other accessories to complete the definition.

At Oregon State University in Corvallis, 13 Series II LaserJets work futilely away at the logjam created by 5000 student log-ins a week. Greg Scott, computer services manager for the business school network, is in the process of replacing that baker's dozen with 5 of HP's new 17-ppm IIISi's. Based on the first IIISi installed, says Scott, "we expect to see a significant improvement in throughput."

Rather than buying a clutch of low-end machines, organizations can buy a few printers with niceties like duplex paper options. Additionally, "these printers let you support more people on one printer," notes Scott. "I'm trying to push the organization into having a finite number of shared peripherals, instead of a printer on everybody's desk."

Bye-Bye, Network Black Box

Products like the IIISi squarely confront the barriers to network installation. Users welcome network interfaces that replace serial plugs and black-box solutions. "Those earlier attempts were just Band-Aids," says Scott. "Putting a network card in the printer is far and away a much better solution." HP's interface with NetWare, he adds, is "extremely clean." And you don't have to plug printers into a network server remote from the action.

Still, "there's a perception in people's minds that these printers have to be sold a lot differently," notes Aubrey Brickhouse, manager of printer marketing for the peripheral products division at Texas Instruments. Indeed, while TI has let resellers choose how to distribute the 16-ppm MicroLaser XL, HP restricts network-interface–equipped IIISi's to Novell-certified dealers.

"It remains to be seen if dealers selling these at 10 percent margins will have the infrastructure to get involved in networks," adds Brandon Nordin, an analyst at BIS Strategic Decisions in Norwell, Massachusetts. "Simple things like fonts become issues on networks."

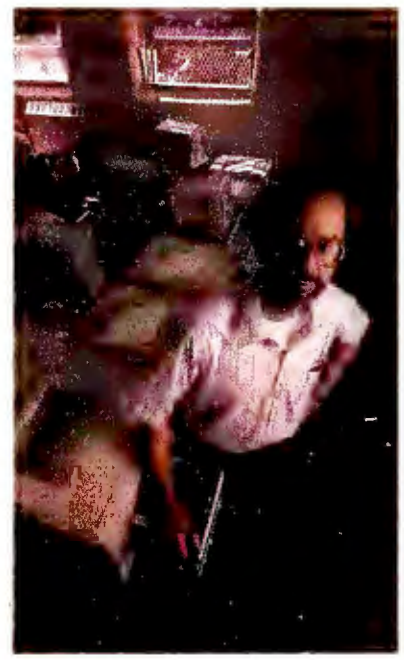
Putting Heat on HP

With their attractive mix of features and pricing, network-oriented printers are a small but fast-growing niche. From under 37,000 units last year, 12- to 19-ppm printers will soar to over 147,000 units in 1991, says Nordin.

HP's reputation as standard setter for PC printers, along with the $6595 price and cutting-edge performance of the PostScript-equipped IIISi, gives it an early edge. But HP will feel the heat from rivals.

Like the IIISi, TI's MicroLaser XL Turbo includes a RISC processor to cut through PostScript work, and a network interface. At about $5200, it will also boast some PostScript Level 2 features, a SCSI port, and automatic switching from PCL to PostScript—all of which the IIISi lacks.

Another early entry, Kodak's $6995 Ektaplus 7016, works as a 6-ppm copier as well as a 16-ppm PostScript printer. The copier is slow, but handy for duplicating just-printed documents, says Rod Rockwell, head personal computer technician at Nike in Beaverton, Oregon. The Ektaplus replaced a LaserJet II and an Apple LaserWriter for users on Banyan VINES or AppleTalk networks.

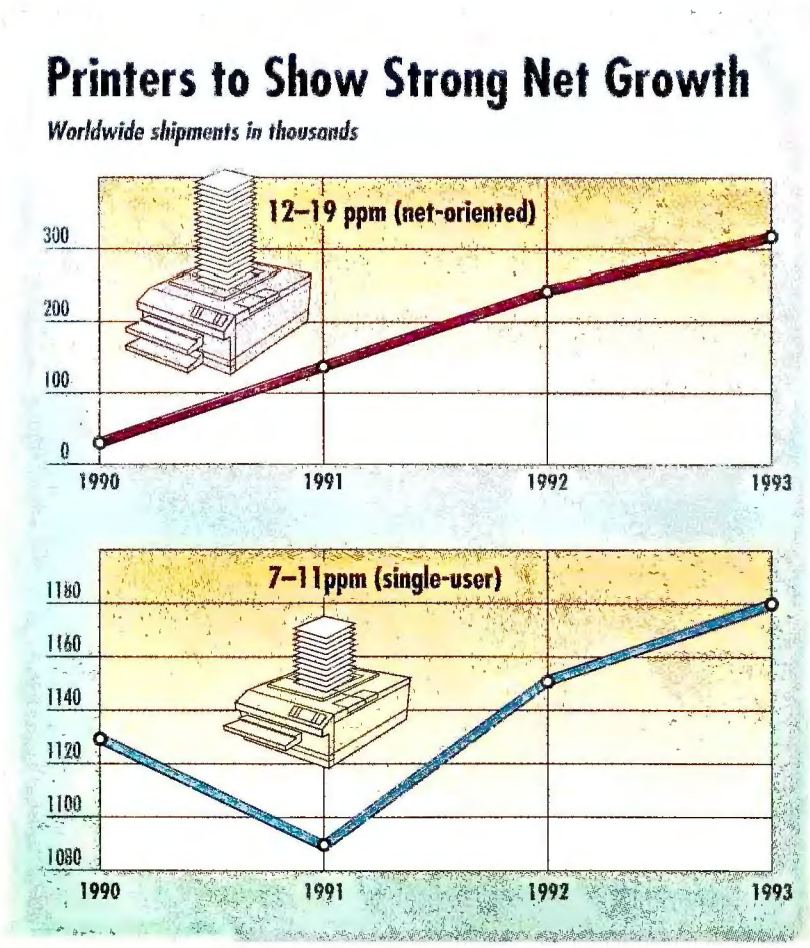


ROBBIE MCCLARAN

Oregon State University's Greg Scott says powerful net printers improve throughput and reduce support overhead.

Kodak can't match HP's Resolution Enhancement technology, which sharpens fonts on the IIISi, but Rockwell was glad to trade print quality for space savings. "The multiple functionality of the printer is better for us," Rockwell says. "We're getting use out of all three aspects of it: the copier, hooking it up to PCs, and using the AppleTalk port for Macs." —*Mark Henricks*

Alice LaPlante is a freelance writer in Palo Alto, California; Mark Henricks and Scott Spanbauer are contributing editors for PC World.



JEFF BERLIN

While sales of network-oriented laser printers represent a small fraction of the total laser printer market, that segment will grow rapidly, predicts BIS Strategic Decisions.

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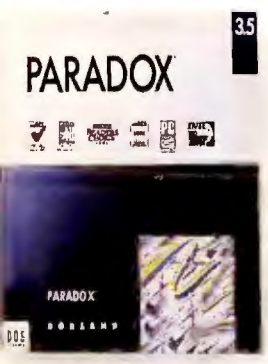

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Circle 37 on reader service card

PC WORLD STREET PRICE LIST

What to pay at retail for PCs, based on IDC's PC Pricing Report survey.

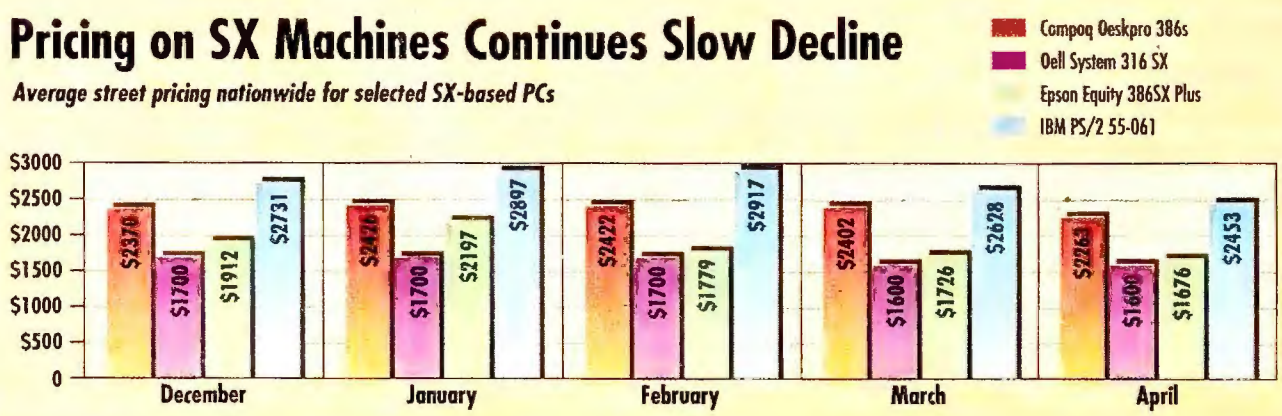
PC WORLD

	National				Metropolitan							
	List	Average	Low	High	Boston	Chicago	Dallas/ Ft. Worth	Los Angeles	Miami/ Ft. Lauderdale	New York	San Francisco Bay Area	Washington, D.C.
80286-based desktop PCs												
AST Bravo/286	$1695	$1277	$885	$1525	$1290	$1264	$1313	$1271	$1368	$1269	$1348	$1164
Compaq Deskpro 286n	$2399	$1768	$1287	$2159	$1743	$1776	$1757	$1730	$1629	$1797	$1795	$1701
Dell 210	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400	$1400
IBM PS/2 50 Z-031	$2745	$2023	$1638	$2525	$2032	$1986	$2059	$1882	$2064	$1985	$2122	$2115
Tandy 2500 XL/2	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1959	$1959
80386SX-based desktop PCs												
AST Premium II 386SX/20	$3195	$2443	$1677	$2876	$2417	$2476	$2454	$2457	$2547	$2392	$2607	$2227
Compaq Deskpro 386s	$2999	$2263	$1679	$2699	$2203	$2220	$2189	$2224	$2108	$2246	$2305	$2292
Dell System 316 SX	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600	$1600
Epson Equity 386SX Plus	$2399	$1676	$1200	$2095	$1761	$1626	$1433	$1521	$1645	$1797	$1658	$1706
IBM PS/2 55-061	$3295	$2453	$1971	$3031	$2555	$2362	$2471	$2381	$2521	$2456	$2486	$2469
NEC PowerMate SX/20	$2799	$1950	$1400	$2519	$1890	$2063	$1884	$1484	$1986	$1793	n/a	$1897
80386DX-based desktop PCs												
AST Premium 386/25	$5595	$4248	$3149	$5216	$4266	$4336	$4233	$4108	$4411	$4189	$4351	$3995
Compaq Deskpro 386/33L	$7999	$5991	$4479	$7199	$5802	$5722	$5839	$5749	$6007	$6345	$5992	$6074
Epson Equity 386/25 Plus	$4999	$3510	$2100	$4249	$3698	$3432	$3291	$3383	$3224	$3744	$3576	$3466
IBM PS/2 70-061	$4745	$3463	$2749	$4365	$3556	$3405	$3559	$3238	$3538	$3390	$3549	$3575
IBM PS/2 70-A61	$6245	$4608	$3295	$5745	$4683	$4587	$4684	$4341	$4756	$4238	$4825	$4840
Tandon 386/33	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079	$3079
Tandy 4033 LX	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898	$5898
80486-based desktop PCs												
AST Premium 486/25E	$8595	$6463	$4595	$7736	$6720	$6262	$6499	$6052	$6849	$6435	$6662	$6007
Compaq Deskpro 486/33L	$10,999	$8267	$6159	$9899	$8081	$7857	$8080	$7905	$8092	$8563	$8362	$8565
Dell 425E	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700	$5700
IBM PS/2 95 XP	$17,745	$13,001	$10,132	$16,325	$12,369	$12,751	$13,309	$12,028	$13,523	$13,224	$14,196	$13,439
NEC PowerMate 486/25E	$9899	$7044	$4950	$9899	$6543	$7388	$6660	$5247	$7609	$6926	n/a[1]	$6412
Portables/laptops												
Compaq LTE/286	$3499	$2557	$1959	$3149	$2534	$2616	$2544	$2448	$2558	$2504	$2507	$2573
Compaq LTE 386s/20	$6499	$4802	$3639	$5849	$4715	$4574	$4740	$4448	$4829	$5013	$4811	$4926
Dell 320LT	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799	$3799
Epson Equity LT-386SX	$4998	$3532	$2400	$4248	$3502	$3369	$3674	$3463	$3299	$3743	$3654	$3574
IBM P70 386	$7695	$5714	$4617	$6926	$5651	$5670	$5771	$4958	$5868	$5966	$5827	$5478
Toshiba T1000SE	$1499	$1030	$789	$1297	$1052	$1106	$1061	$968	$1211	$954	$1001	$1067
Toshiba T3100e	$3699	$2648	$2071	$3329	$2638	$2700	$2571	$2425	$3091	$2519	$2546	$2749

From an IDC survey of more than 180 computer dealers in eight metropolitan areas. Figures based on at least four price quotes for each machine. Prices are based on manufacturer's standard configuration without monitor. [1]Due to the limited number of NEC dealers in the San Francisco area, IDC was unable to collect enough price quotes.

Pricing on SX Machines Continues Slow Decline

Average street pricing nationwide for selected SX-based PCs



Pricing on 16-MHz SX PCs generally drifted down in early 1991, IDC surveys show. In April Compaq kicked off another round of price wars by cutting costs across its entire line.

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Brad Silverberg,
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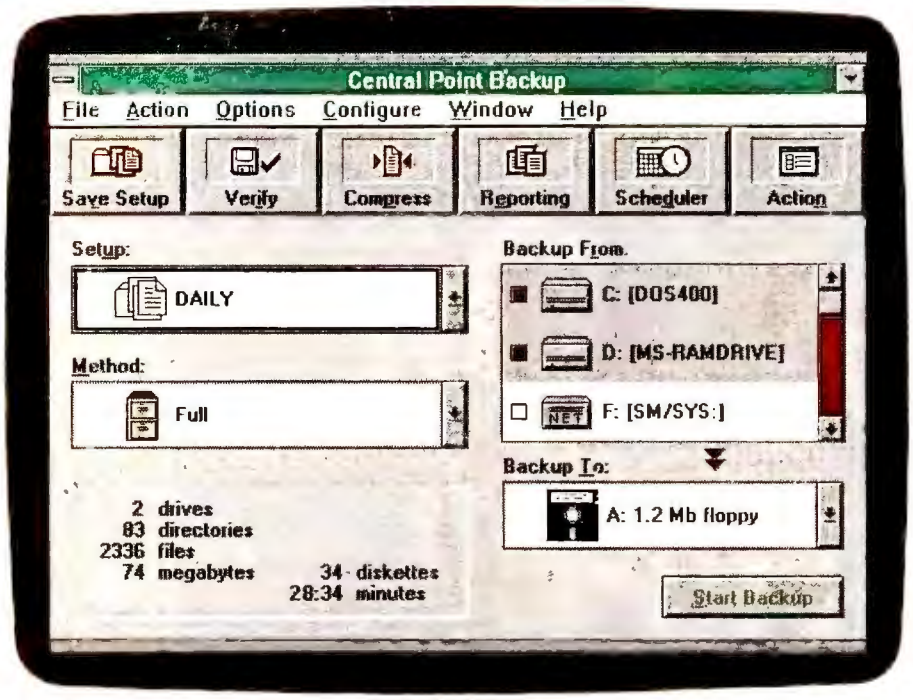
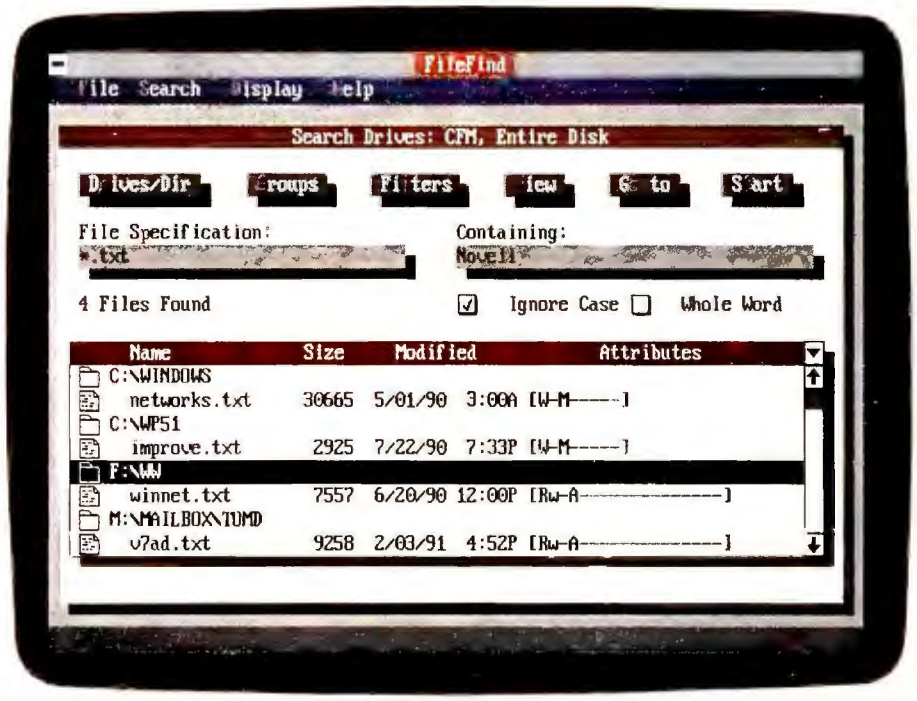
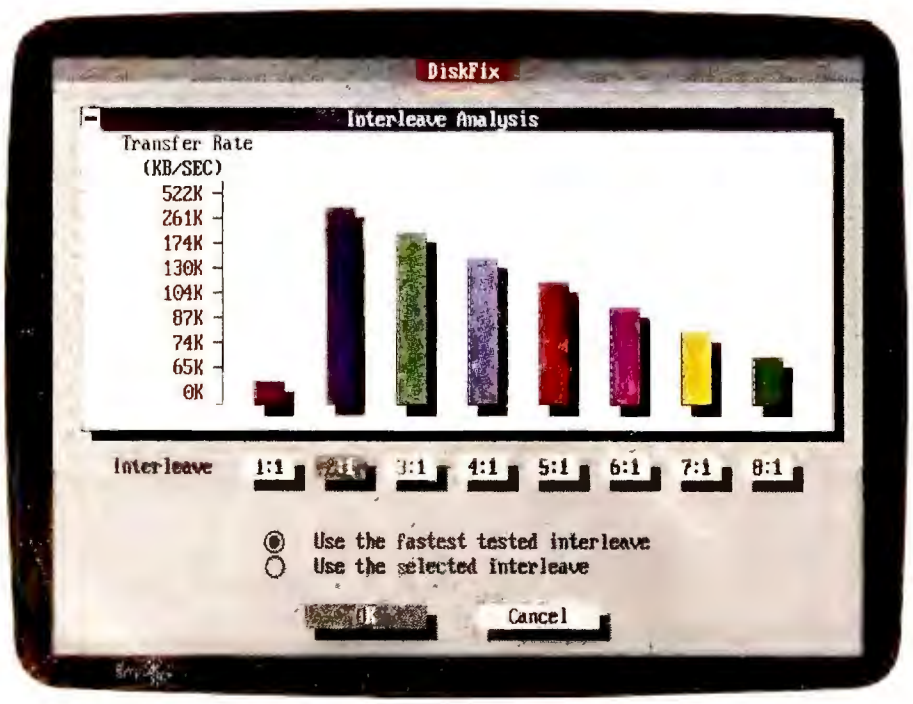


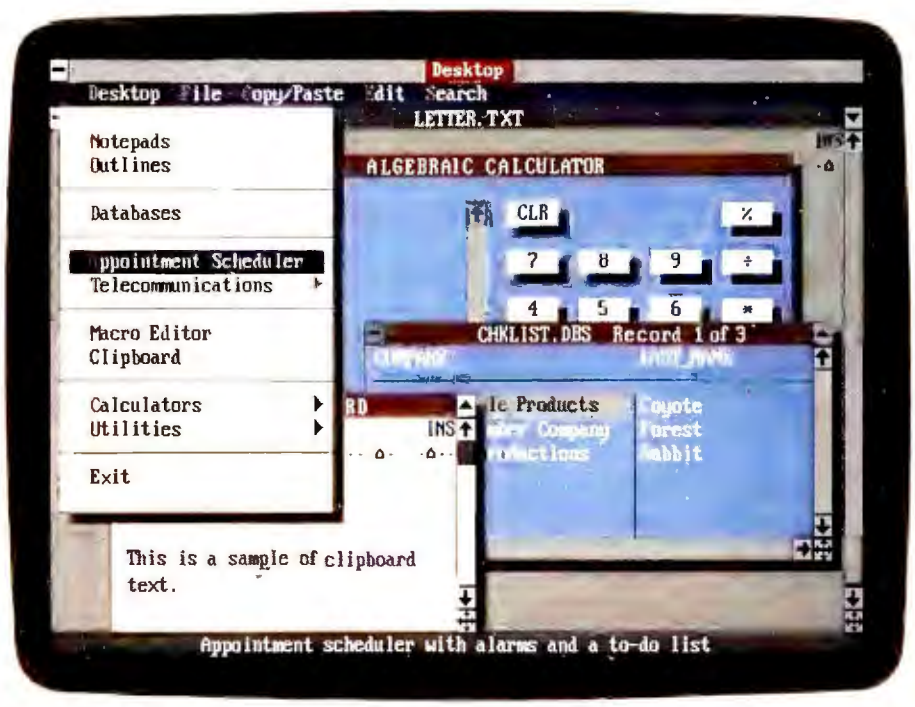
DOS and Windows Backup. Only PC Tools gives you award-winning backup for DOS and Windows in one box. Both programs use the same keystrokes and file formats so you can move to Windows without a hitch.



File Find with Viewers. Locate files across multiple disks by name, content or Novell attribute. View data from 37 popular programs. Launch, copy, rename, delete, and change attributes. Operates from the command line.



Disk Maintenance and Repair. To help avoid disk crashes and optimize data transfer, our DiskFix™ now does non-destructive, low-level reformatting. DiskFix solves dozens of other disk problems as well.



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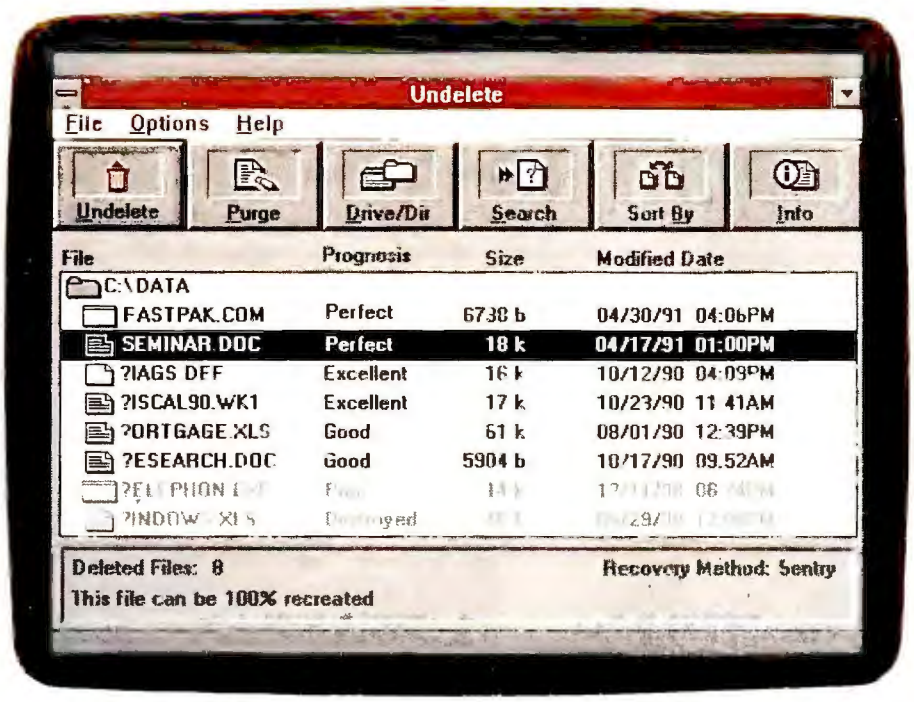
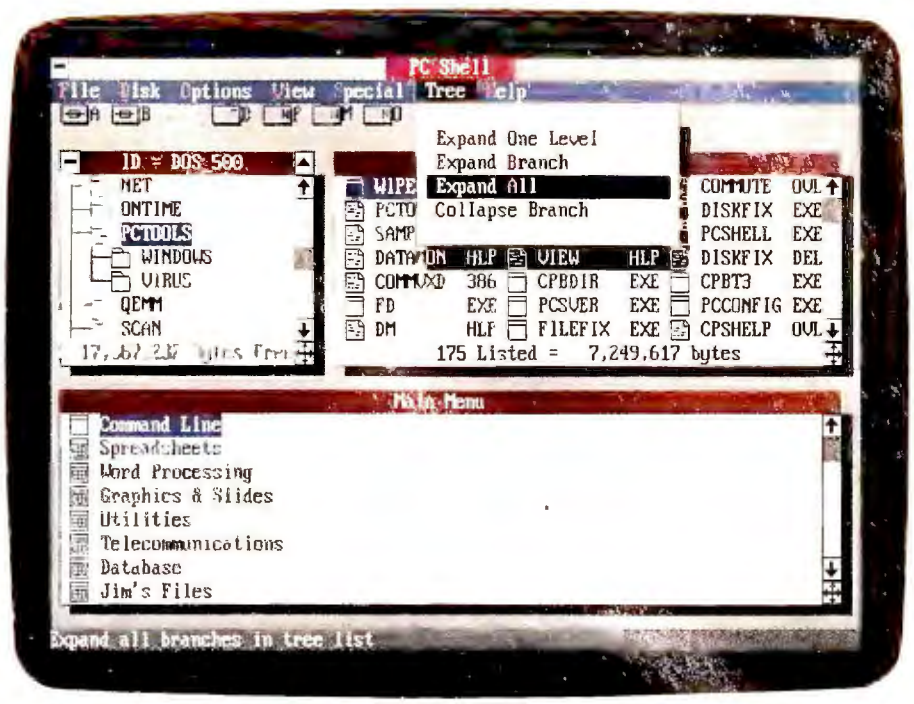
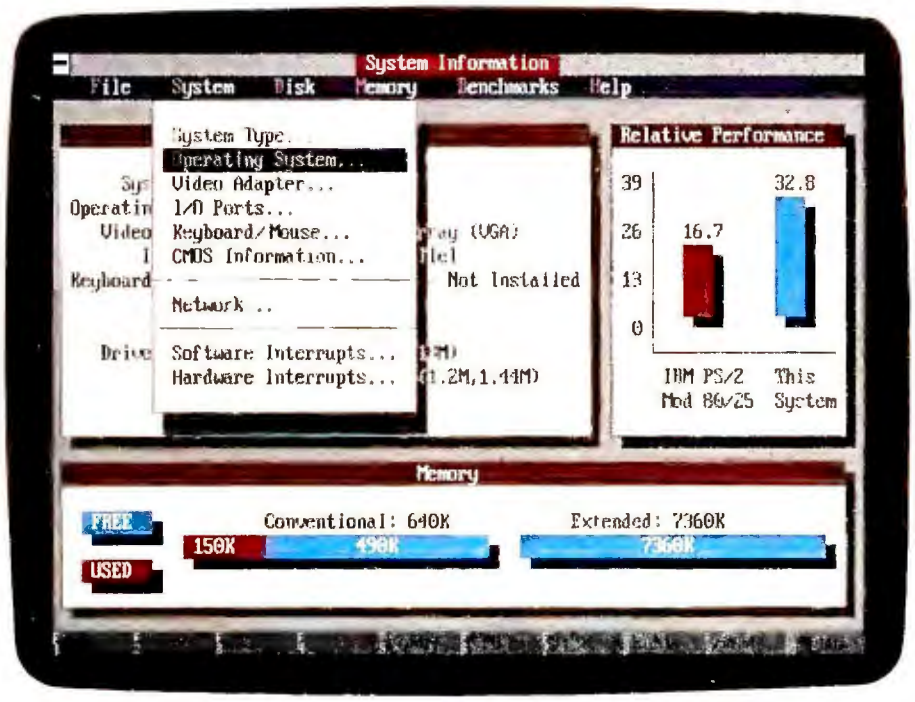


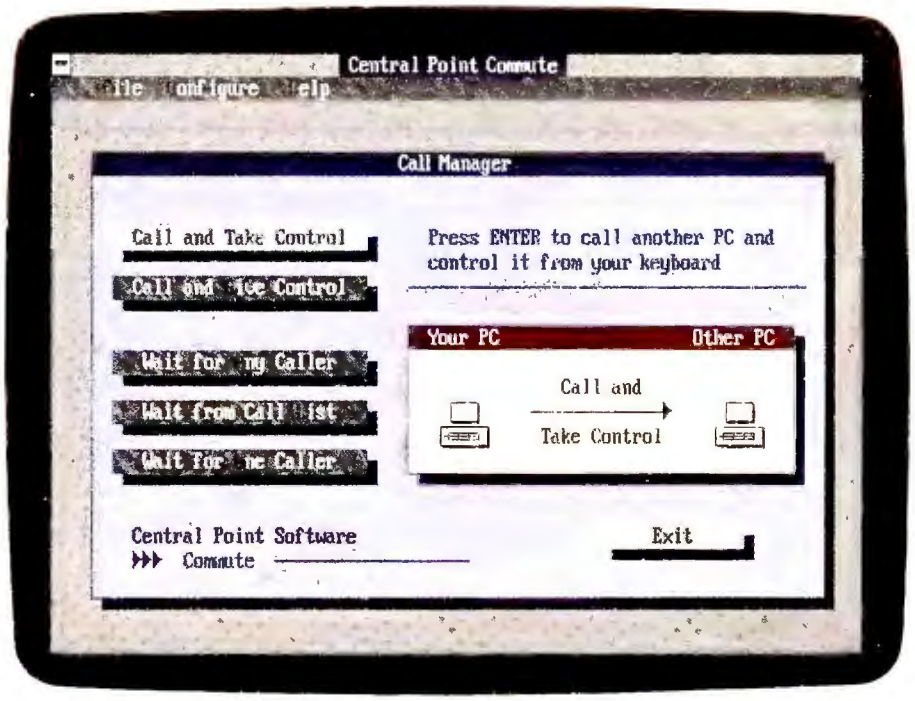
DOS and Windows Undelete. Our new Undelete can save erased files in a protected location - on local or network drives. It's all based on the same undelete technology we licensed to Microsoft for DOS 5.0 – only better.



DOS 5.0 Compatible Shell & File Manager. Designed for DOS 5.0 keystroke and menu compatibility, PC Tools 7.0 gives you a powerful system for launching applications and managing your hard disk. Includes viewers for 37 popular programs.



System & Network Information. Reports on over 160 attributes, including video, I/O, Memory, mass storage, and four performance benchmarks. On NetWare, SI displays all servers, usage, users, and Novell groups.



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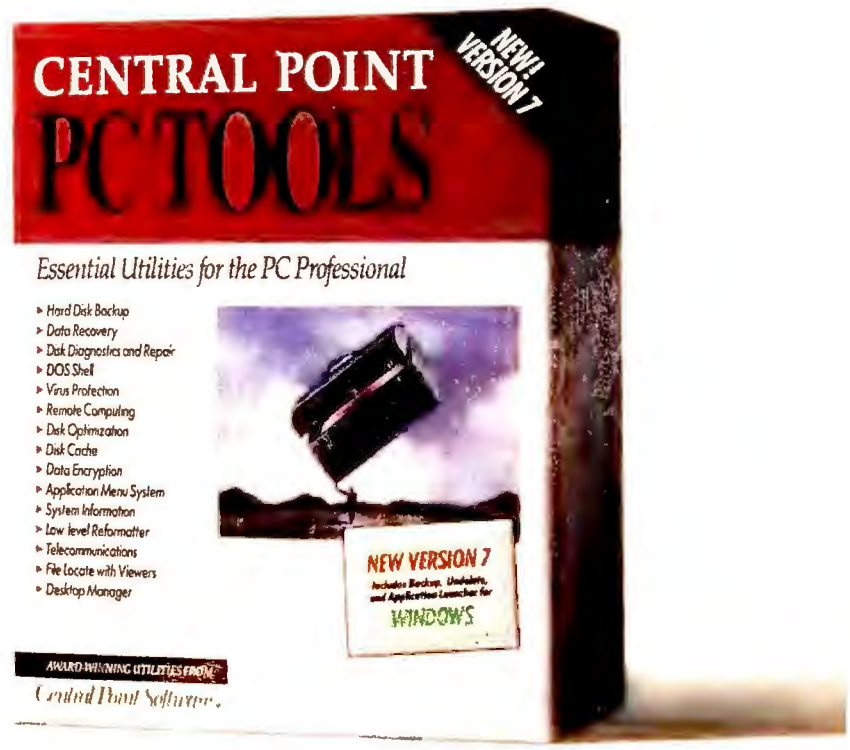

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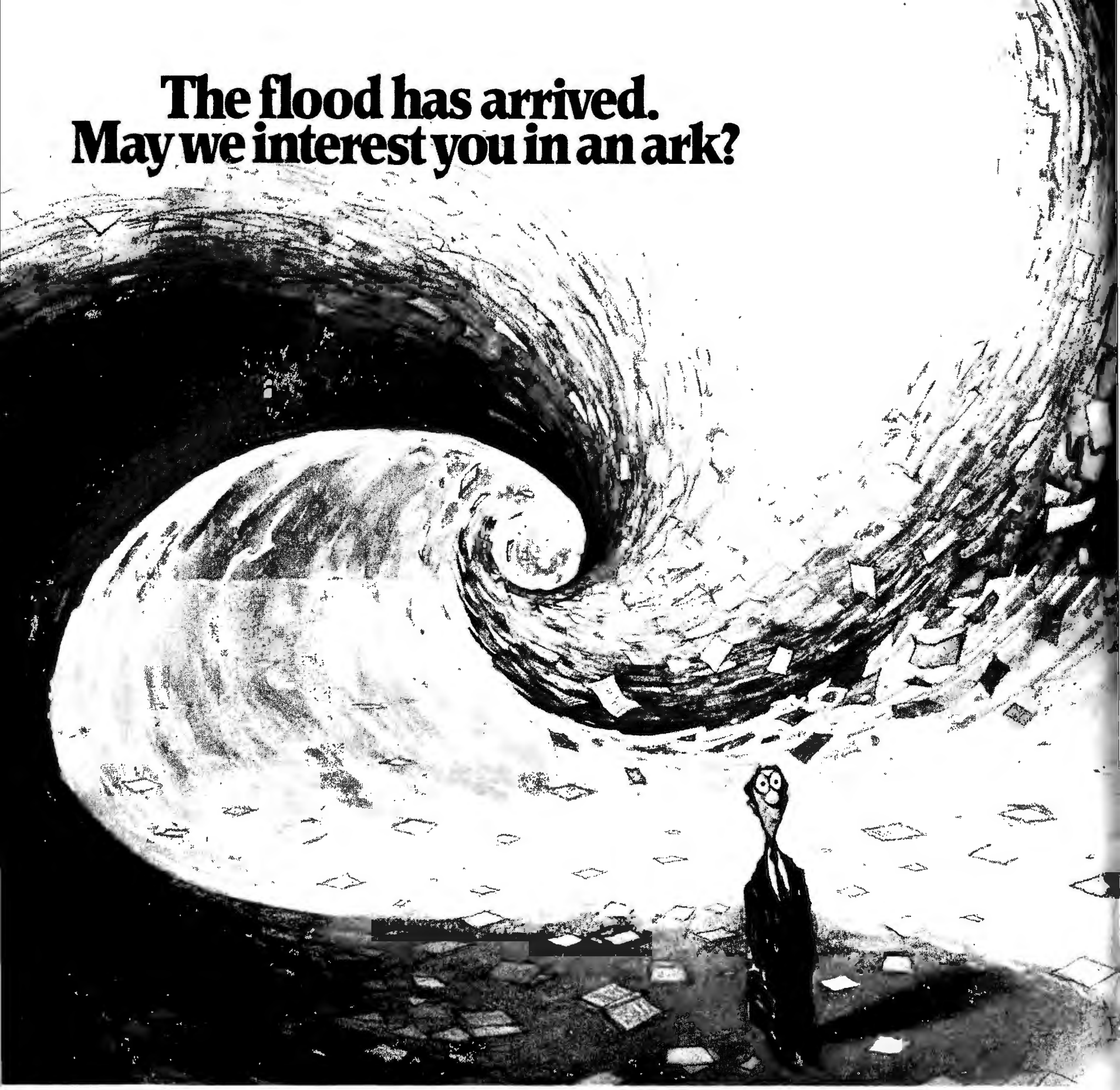
The flood has arrived. May we interest you in an ark?



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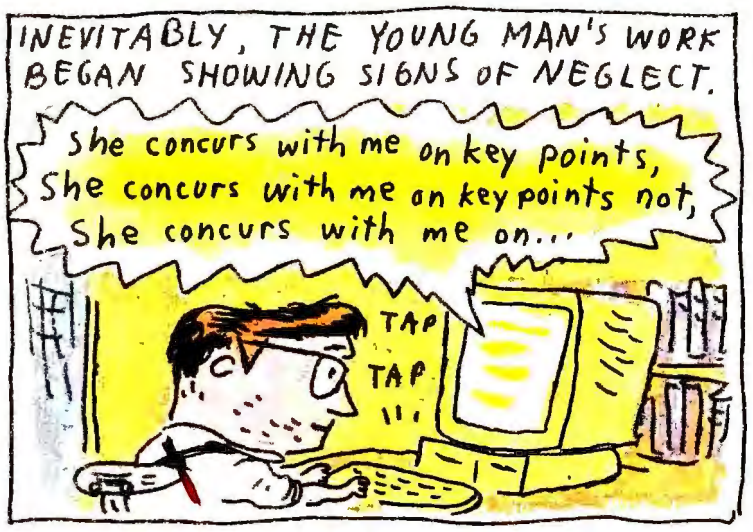

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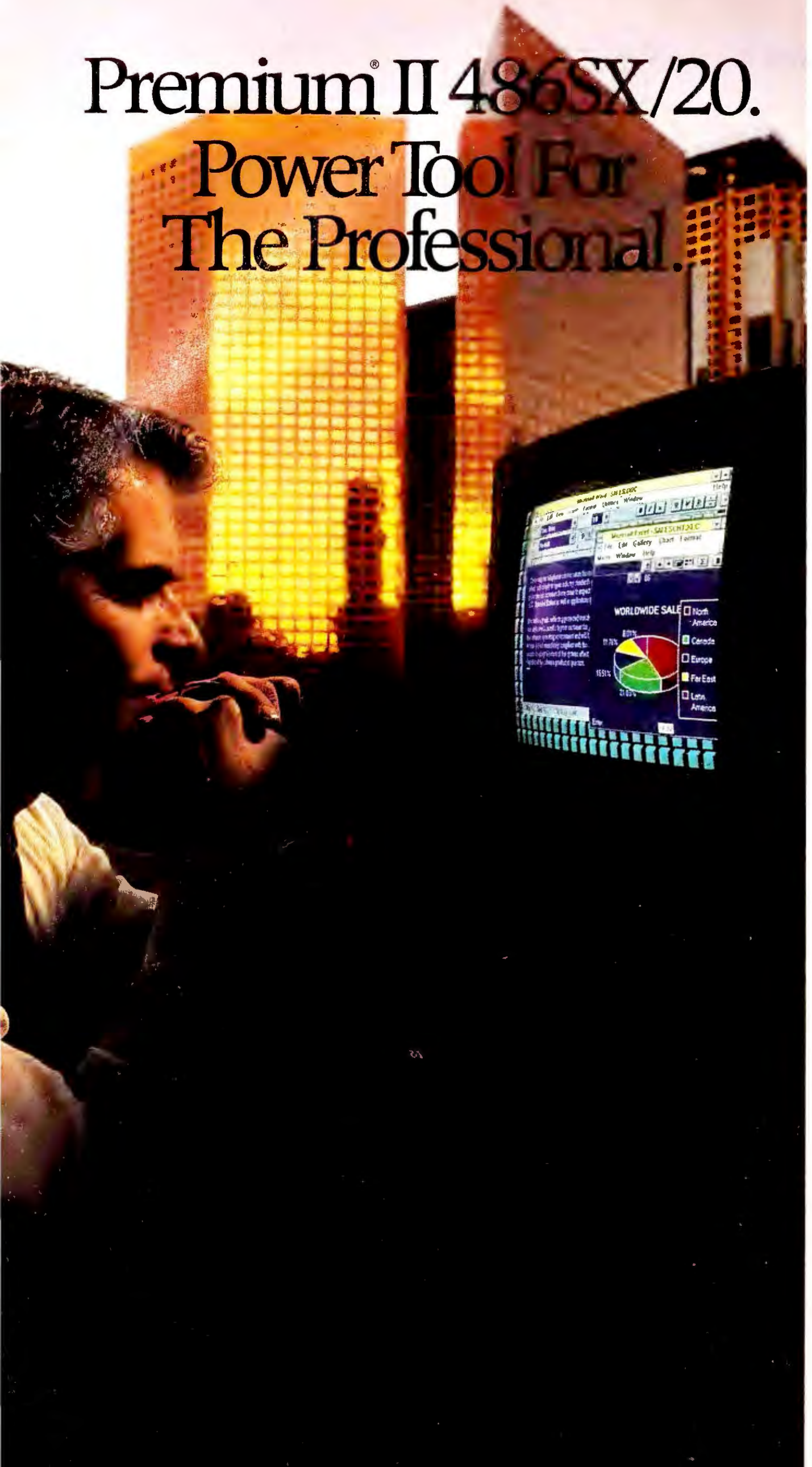

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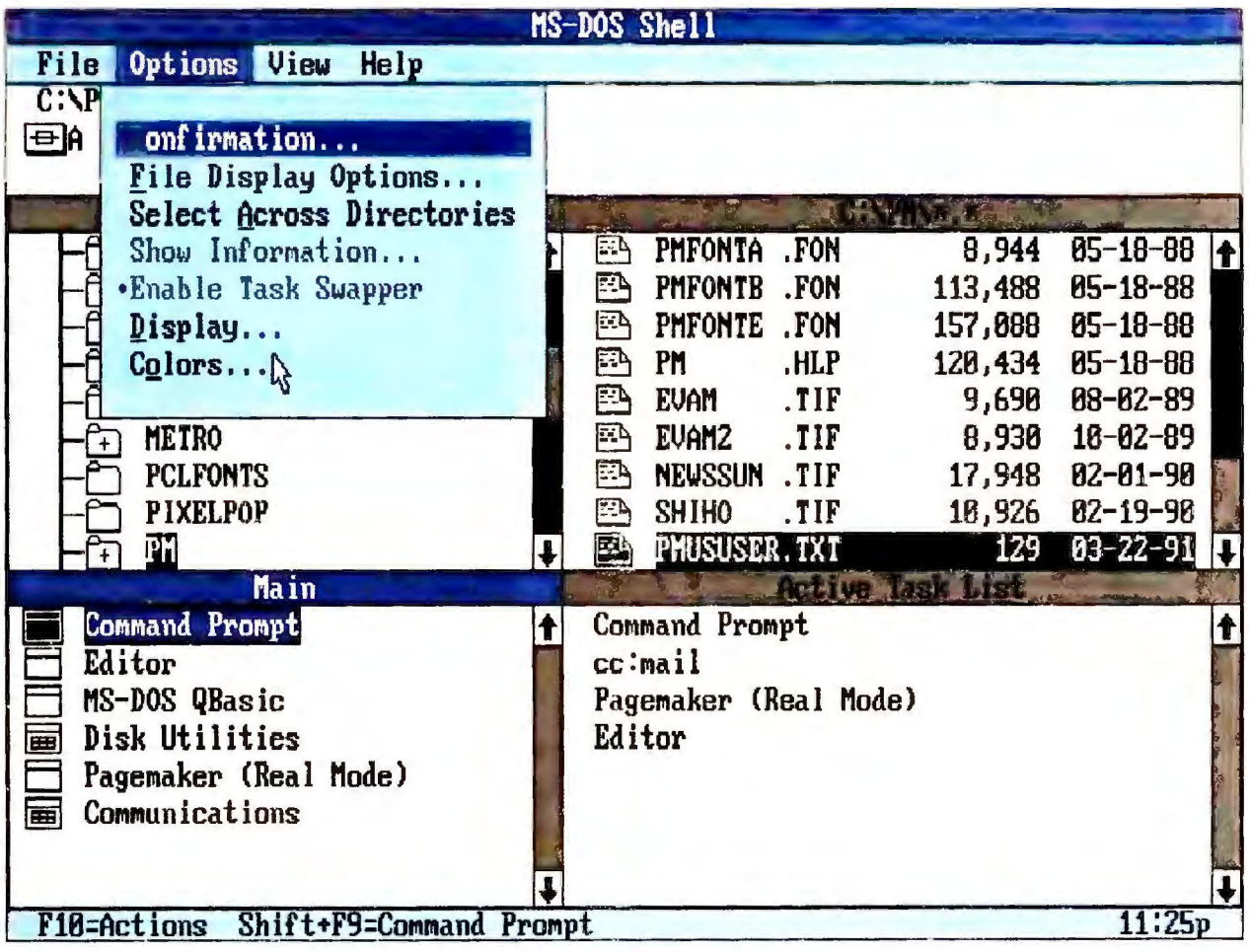
DOS Does It Right

At last, a DOS you can really use. With a Windows-like file manager, on-line help, more memory for applications, and the ability to load multiple applications, DOS 5.0 is unquestionably the best DOS ever.



DOS 5.0's shell offers several features found in Windows, including work-alike program and file managers and a task list that lets you switch between several running applications.

Scott Spanbauer

COVER STORY

It's been worth the wait—nearly four years for most users. DOS 4.0, released in 1988, was so hobbled by bugs, stiff memory requirements, and a difficult installation procedure that hardly anyone made the switch. Now DOS 5.0 has arrived to make up for lost time.

What could be so impressive about a DOS upgrade? For starters, as with 4.0, you get an easy-to-use shell interface for manipulating files and launching applications. And like 4.0, 5.0 lets you create hard disk partitions (drives D:, E:, and so on) larger than 32MB. But 4.0 is only a foundation onto which 5.0 pours a cornucopia of improvements.

Chief among them is more free memory for applications on 286 or better systems—56K more than 4.0, and 46K more than 3.3. New memory management helps DOS coexist better with both *Windows* and networks. Even better, you can now load multiple applications and switch between them.

The list goes on and on. You get undelete and unformat data recovery utilities, a full-screen text editor, a file search utility, built-in *QuickBASIC*, a handy new macro facility, and painless installation, plus on-line help to hold your hand through it all. And unlike any DOS before, 5.0 is available retail for $99.95. The question to ask about this DOS isn't *whether* you'll upgrade, but *when*.

Changing Hearts and Minds

Sensitive to DOS 4.0's image problem, Microsoft has taken extraordinary steps to inspire universal confidence in 5.0. The DOS 5.0 beta testing program, the largest ever launched, lasted nearly a year and included more than 5000 users, giving the company ample opportunity to exterminate any lingering bugs. However, DOS 5.0's memory usage gymnastics may uncover weaknesses in your hardware. For instance, a few older ver-

SNAPSHOT

MS-DOS 5.0

With o truckload of improvements, DOS 5.0 proves thot the world's most popular operating system still flourishes.

KEY FEATURES

- **More memory free for applications**
- **Shell includes program task switcher**
- **Undelete and unformat utilities**
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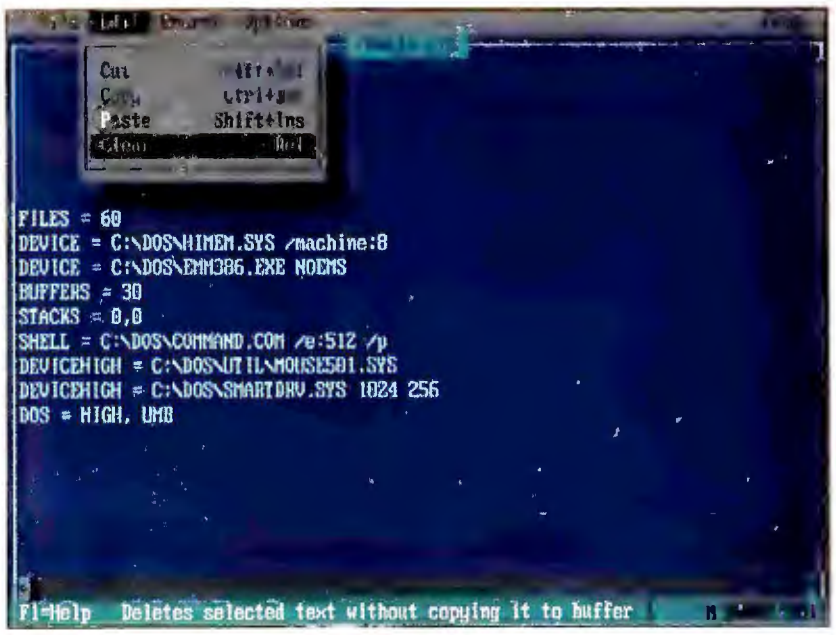
DOS 5.0 Frees Up Memory

The more conventional memory you have free, the more applications and data you can work with at one time. This often means your applications run faster and you work smarter. Even after loading mouse and network drivers, DOS 5.0 can leave 548K of conventional memory free in 286-based systems with extended memory. With 386 and 486 systems, you can move the drivers into memory that's been mapped to high memory addresses, leaving 613K free for your applications and data.

JEFF BERLIN



DOS 5.0's new full-screen editor is a boon to anyone who writes or edits CONFIG.SYS, AUTOEXEC.BAT, and batch files. Shown is a typical DOS 5.0 CONFIG.SYS file for an 80386-based system.

sions of the Phoenix ROM BIOS, a popular BIOS for clones, must be replaced before DOS can do all its memory tricks.

DOS 4.0's installation was as irrevocable as a parachute jump—once started, you couldn't back out. And once you installed 4.0, pesky incompatibilities were likely to send you scrambling after your old DOS disks.

DOS 5.0 takes a more realistic approach. The setup program copies your old DOS files to a backup directory, creates an uninstall disk, then installs DOS 5.0. Should unforeseen trouble force you to revert to your old version, just pop in the uninstall disk and reboot. DOS automatically rubs itself out and restores the previous system. But if all systems are go, a cleanup command deletes the old version and even deletes itself when done. Great stuff, provided you have at least 2.8MB of free disk space for this safety mechanism to work.

After cleanup, DOS 5.0 still takes up a little more than 2MB of your hard disk. As with every previous version, you may opt to install to floppies—still the only option for many laptop owners.

Freeing Up Memory

Once you install DOS 5.0, the first thing you'll want is to free up some conventional memory—and you can do that simply by turning your PC on. (Sorry, if you have an 8088- or 8086-based PC, or if you don't have more than 640K, you lose out on this 5.0 benefit.)When DOS 5.0 boots up, it loads most of itself into high memory, leaving as much as 621K free for applications. Those with memory-hogging applications—take note, *Windows* users—will find they have a little more headroom.

If you have a 386 or 486 machine, you can install DOS's EMM386.SYS expanded memory manager, which enables you to take programs that eat up conventional memory unnecessarily and move them to extended memory. How much you can displace depends on what kind of PC you have and how many devices you've installed (most of us can count on 64K or more). A new CONFIG.SYS command, DEVICEHIGH, enables you to exile device drivers (those small programs that let your PC talk to peripherals and networks). A new AUTOEXEC.BAT command, LOADHIGH, lets you relocate

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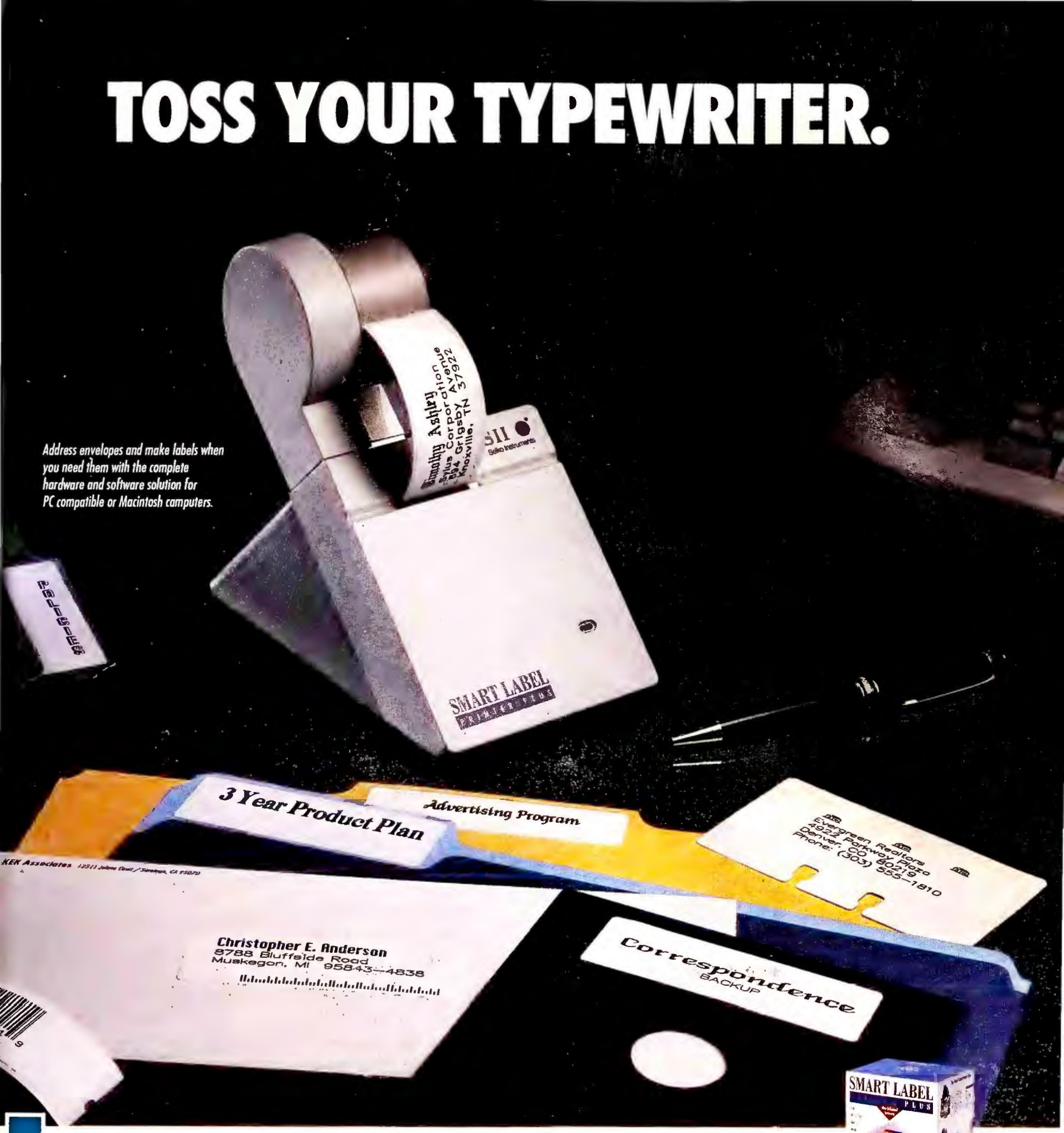

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pop-up utilities, disk caching programs, and various other small memory-resident applications.

Networked users will likely make the best use of this new capability. If you're hooked to a network and you've tried to load an application that requires 640K of memory, you're probably familiar with the 'too little memory' message. With DOS 5.0, those frustrating days are over.

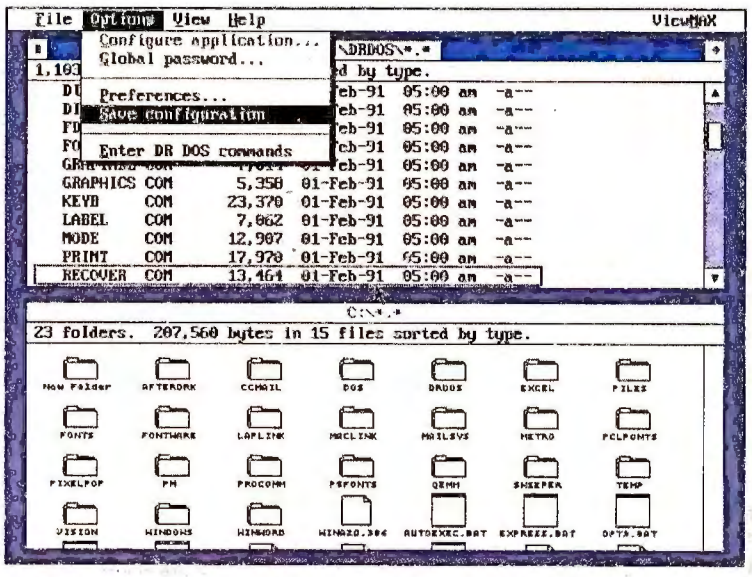
A New Shell Game

Unlike DOS 4.0's shell, which modeled itself after OS/2's Presentation Manager, DOS 5.0 slyly emulates the reigning graphical user interface. Like *Windows'* File Manager, the shell presents a graphic directory tree in one window and a sorted list of files for the current directory in another. You can view two pairs of tree/list windows at a time—handy for comparing the contents of two directories—or display one pair along with the shell's program window. The program window lists programs ready for launching; you can use a mouse to double-click on one to start it up. You can also add and delete programs and groups of programs in the program window.

Here's where the task switcher kicks in. Choose *Enable Task Swapper* in the shell's Options menu, and another window, Active Task List, appears. Now when you start a new application, you can switch back to the shell via the standard *Windows* <Ctrl>-<Esc> shortcut, and <Alt>-<Tab> cycles through loaded applications.

DOS 5.0's application juggling may resemble *Windows'*, but there's an important difference. Unlike *Windows*, DOS 5.0 completely suspends swapped-out programs.

DR DOS 5.0—Prophet in the Wilderness



DR DOS 5.0's shell behaves much like MS-DOS 5.0's but makes better use of icons in file and directory listings.

MS-DOS 5.0 brings users good news, but most of its features have been available since last summer in Digital Research's $199 DR DOS 5.0. In fact, DOS 5.0's feature list and $100 upgrade price are custom tailored to take the wind out of DR DOS's sails. Sensing the challenge, Digital Research offered owners of any DOS version a $79 DR DOS 5.0 upgrade during March, April, and May of this year. As we went to press, the company was considering extending the promotional price.

Like DOS 5.0, DR DOS frees conventional memory on 80286-based or more powerful PCs by moving most of the operating system up to the High Memory Area (HMA) in extended memory, leaving more than 620K of conventional memory free. Likewise, 386 and 486 users can move drivers and memory-resident programs out of the bottom 640K using the bundled MemoryMax memory management utility.

DR DOS's ViewMax shell program combines file management and program launching in a graphical display based on Digital Research's *GEM* environment but lacks DOS's task switcher. Most of DOS 5.0's other key features are here as well, including full-screen text editing, on-line command help and command recall, and large disk partitions.

But Microsoft didn't clone all of DR DOS's goodies. Perhaps most interesting is the system's custom CONFIG.SYS processing at boot-up. Users can be prompted to respond yes or no to the question 'Load this driver?' By contrast, DOS 5.0 users who need to change CONFIG.SYS settings to accommodate different software must still endure the more complex process of maintaining separate versions of the file, then copying and renaming them before rebooting. In addition, DR DOS lets you password-protect files and directories, and comes with a built-in file transfer utility.

SNAPSHOT

DR DOS 5.0

Before there was MS-DOS 5.0, DR DOS 5.0 offered most of the same features—and more.

KEY FEATURES

- Memory manager liberates up to 620K of conventional memory
- Graphical application and file management shell
- Full-screen text editor
- Command recall and on-line help
- Interactive CONFIG.SYS processing
- File transfer utility

AVAILABILITY

Immediate

PRICING

$199

Digital Research
70 Garden Ct.
Box DRI
Monterey, CA 93942
800/274-4374,
408/646-6248

Reader service no. 758

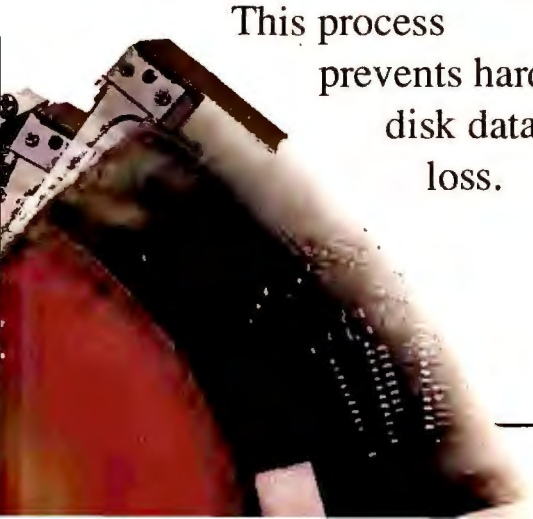
Hard Disks Die.

Hard disk manufacturers want us to believe that hard disk technology is absolutely reliable ... but experience teaches otherwise. We depend upon data storage to be flawless, but hard disk technology isn't. Surface defects, head alignment drift, and low-level format aging cause hard disks to fail.

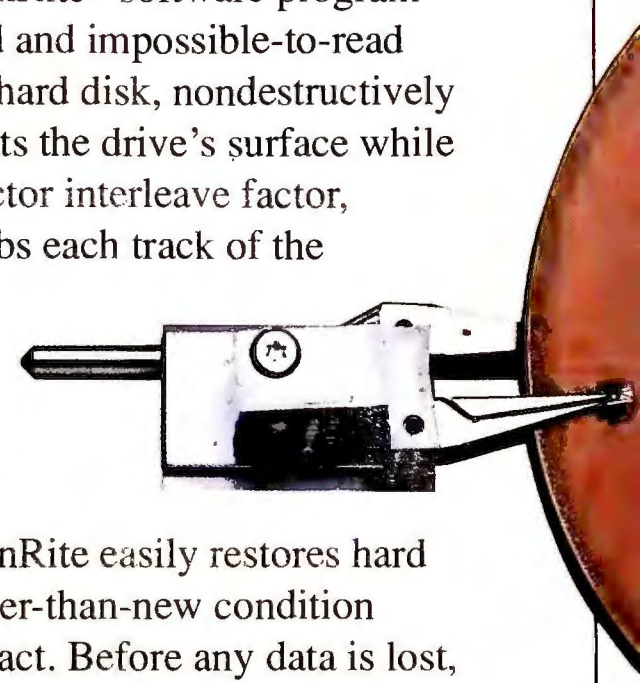
A hard disk drive's low-level format fades with use. The drive's read/write heads lose their delicate alignment and move away from the original low-level format information. These new data track locations intersect unseen surface defects that were once harmlessly located between tracks. DOS's chilling "Abort, Retry, or Fail ?" message inevitably results. Precious data is soon lost.

If left unchecked, data storage becomes more an act of hope and faith than one of science.

A return to science. The problem is known and understood, and the solution is clear. While a drive's data can still be read, the drive must be given a new, realigned and strong low-level format. Then all current surface defects must be located and managed. This process prevents hard disk data loss.



An act of prevention. Gibson Research Corporation's SpinRite™ software program reads hard-to-read and impossible-to-read data from a DOS hard disk, nondestructively low-level reformats the drive's surface while optimizing the sector interleave factor, analyzes and scrubs each track of the drive for surface defects, and relocates any endangered data to safety. SpinRite easily restores hard disk drives to better-than-new condition with their data intact. Before any data is lost, SpinRite detects that a drive is "softening" then determines and eliminates the cause. SpinRite readily recovers data that the system cannot read.



SpinRite won Byte Magazine's prestigious Award of Distinction and continues to win computer industry praise and acclaim. It has proven itself to be effective in preventing hard disk failure. SpinRite will work for you.

SpinRite II features a detailed technical log, as well as support for DOS 4 and large device driver partitions. It is available immediately from local software retailers or directly from Gibson Research with a 30-day satisfaction guarantee.

Suggested retail price: $89.

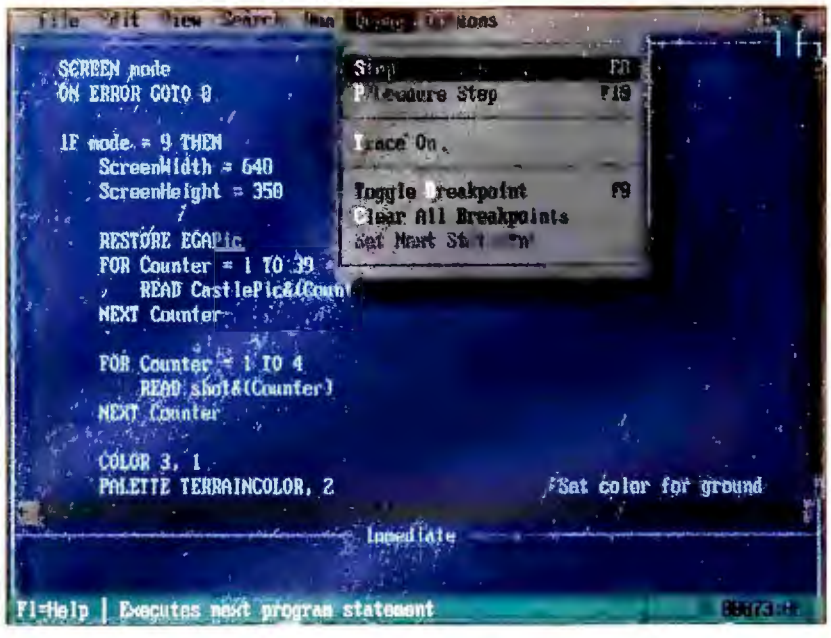
To receive additional literature or to purchase SpinRite II, call toll-free:

(800) 736-0637.

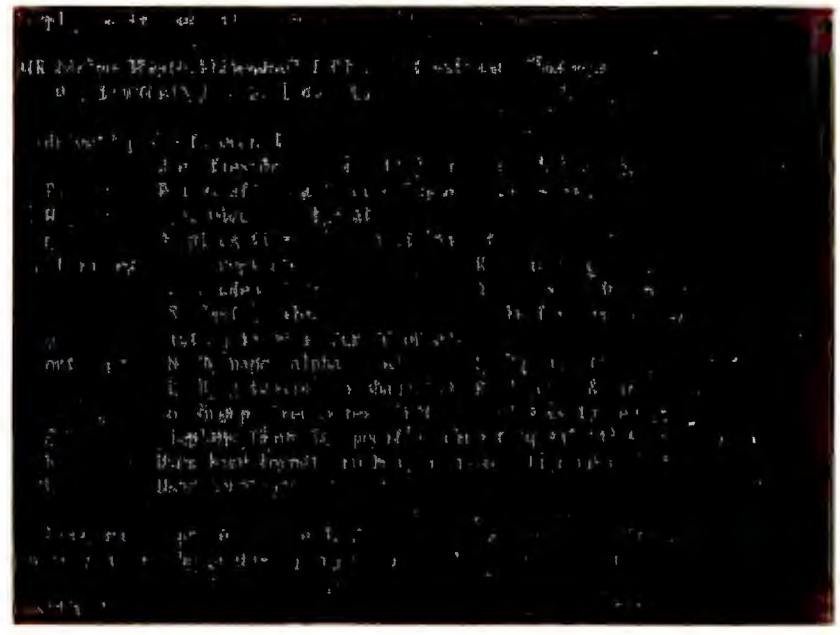
SpinRite II.

A return to science.
An act of prevention.

Circle 103 on reader service card



QBASIC's full-screen editor, built-in debugger, and updated language add up to a vast improvement over GW BASIC. Most older programs will run within the new interpreter without a hitch.



Typing 'help' followed by a DOS command displays an on-line reference to usage, like this one. The command at the bottom of the screen also triggers the help system.

A Bundle of Extras

Two of DOS 5.0's most impressive new additions share similar interfaces. The EDIT text editor (a vast improvement over EDLIN) and QBASIC (an interpreter-only version of Microsoft's *QuickBASIC*) both use the text-based interface familiar to *Microsoft Works* users, complete with mouse support and pulldown menus.

QBASIC is a great leap forward from GW BASIC (which was previously sold separately). QBASIC runs the old interpreter's programs with few exceptions, but line numbers, GOTOs, and GOSUBs are no longer necessary. And QBASIC also includes most of the features that are common to more modern programming languages.

DOS 5.0's undelete, quick format, and unformat utilities have been licensed from Cen-

Eeeek!

New APPLAUSE II™ version 1.5 is the easiest way to create spectacular business graphics. And the free Microsoft Mouse inside each box (a $125 value) makes it even easier and faster. Because

the APPLAUSE II "windows-like" interface was designed for the mouse.

tral Point Software and are essentially the same as those utilities in *PC Tools* (for a review of *PC Tools Deluxe 6.0*, see "Hard Disk Defenders" in this issue). Now when you accidentally zap a file, you won't have to scurry around the office to find the techie who has a file recovery program.

Beyond the Shell

At long last, once you exit the shell, you can edit entries on the good old command line using the cursor keys. And thanks to the new DOSKEY program, you can scroll through the last ten DOS commands issued. Even better, DOSKEY makes it possible for you to store command strings as hot key macros—a faster-executing alternative to small batch files.

Finally, if you can't remember how to make any of DOS's new or old commands work, just enter **help**. A listing of all user commands and a brief description of what each of them does appears on screen. Entering **help** followed by the command name, or entering the command name followed by **/?**, displays a complete description of the command along with directions for using any associated switches or parameters.

Just two months short of its tenth anniversary, the world's biggest-selling computer operating system has demonstrated that the rumors of its demise have been greatly exaggerated. Never has an upgrade offered so many improvements in a single package. DOS 5.0 should prove a classic vintage.

Scott Spanbauer is a contributing editor for PC World *who lives in Barnet, Vermont.*

POWER TIP NO. 189

Nice Moves in Windows 3.0

Here is a quick primer on using *Windows 3.0's* File Manager for moving and copying files. First, open two directory windows, one containing the source file and one containing the target directory. To move a file to a different directory on the same drive, select the file's name, hold the left mouse button down, and drag the file icon into the target directory. The original file icon disappears to indicate that when you release the mouse button, File Manager will move the file. To move a file to a different drive, hold down the <Alt> key while dragging. To copy a file to another directory on the same drive, hold down the <Ctrl> key while dragging. To copy a file to a directory on a different drive, simply drag it into the new directory.

Tom Swan
Contributing Editor

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Which means you can do bar, pie, line or word harts—or draw—simply by pointing and clicking. Create 35mm slides, overheads, hard copy or on-screen presentations. In black and white or in your hoice of 3.6 million colors.

InfoWorld says APPLAUSE II is "easier to work with than either Harvard Graphics or Freelance lus, and faster than the Windows-based prod-

checker, full LAN capability, 700 pieces of clip art, and much more. Including an all-new RunTime that lets you show screenshows to colleagues who don't have APPLAUSE II.

Call 1-800-437-4329 ext. 1311 now for a free demo disk* and the name of your nearest dealer. Current users can call 1-800-2ASHTON to upgrade to APPLAUSE II version 1.5 for just $50.**

cts." And *PC Magazine* says APPLAUSE II has a fluidity and ease-of-use not found in either Harvard Graphics or Freelance Plus."

Version 1.5 adds an 80,000-word spelling

But mouse supplies are limited, so act now. If you miss out on this very special opportunity, it's going to gnaw at you.

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Project Scheduler 5™

The #1 power planner the competition didn't plan on.

REPORT CARD — INFO WORLD

Mainstream Project Management Software

	(InfoWorld weightings)	Harvard Project Manager Version 3.02	Instaplan 5000 Version 2.0	Microsoft Project for Windows Version 1.0	Project Scheduler 5 Version 1.0	Superproject Expert Version 1.1	Time Line Version 4.0
Price		$695	$549	$695	$685	$695	$695
Performance							
Features and flexibility	(175)	Satisfactory	Good	Very Good	Excellent	Very Good	Very Good
Rescheduling/resource leveling	(100)	Satisfactory	Satisfactory	Good	Excellent	Very Good	Very Good
Speed	(75)	Satisfactory	Very Good	Excellent	Very Good	Very Good	Satisfactory
Reporting	(100)	Good	Good	Good	Very Good	Very Good	Very Good
Documentation	(75)	Very Good	Good	Very Good	Very Good	Good	Very Good
Ease of learning	(100)	Very Good	Very Good	Very Good	Very Good	Good	Very Good
Ease of use	(125)	Good	Good	Very Good	Excellent	Good	Good
Error handling	(75)	Good	Good	Satisfactory	Very Good	Good	Very Good
Support							
Support policies	(50)	Good	Good	Very Good	Good	Good	Very Good
Technical support	(50)	Very Good	Very Good	Satisfactory	Excellent	Satisfactory	Very Good
Value	(75)	Satisfactory	Good	Very Good	Excellent	Very Good	Very Good
Final scores		**6.0**	**6.4**	**7.1**	**8.7**	**6.8**	**7.1**

Source: *InfoWorld*, November 26, 1990

See how Project Scheduler 5 fits into your plans. Call or write:

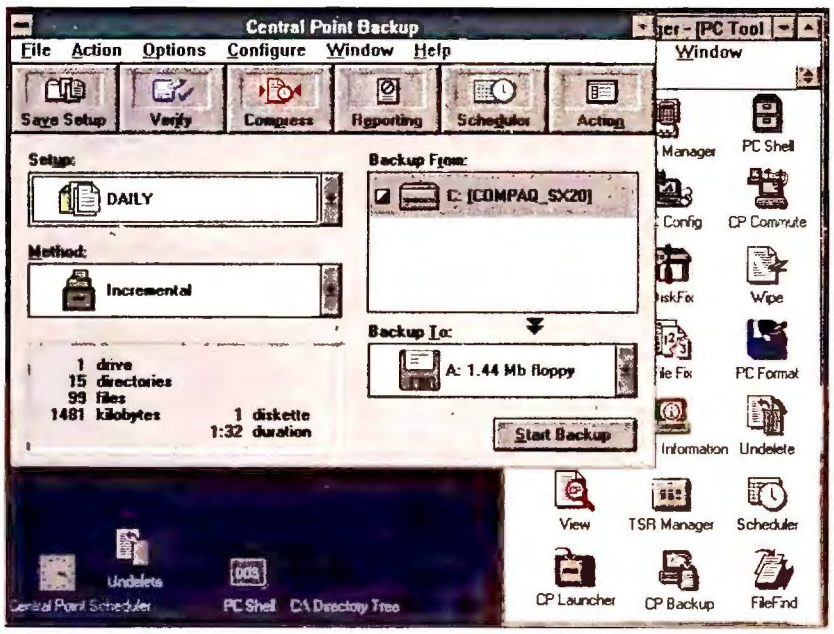
415/570-7700

393 Vintage Park Drive, Suite 140
Foster City, CA 94404

Scitor Corporation

PC Tools and Tools and Tools...

PC Tools 7.0 stuffs its toolbox even fuller, adding Windows support, improved disk utilities, and remote communications.



The Windows version of PC Tools' backup module lets you select backup functions from an uncluttered, easy-to-grasp panel.

Robert Lauriston

Is *PC Tools* a utility library or a DOS shell? A backup utility or a personal information manager? We review version 6.0 three times in this issue alone (see our roundups of backup, disk optimizer, and utility library packages). We could have covered it twice more—as a scheduler and as a DOS shell. With this latest upgrade to its grab bag of productivity utilities, Central Point keeps churning out new features: a programmable menu system to organize applications; a virus scanner to prevent infection; and beefed-up scheduling, disk optimizing, and backup modules. To top it off, you get full *Windows* versions of the backup, scheduler, and undelete modules and *Commute*, a powerful remote-control communications utility. *Commute* alone justifies the $30 price jump to $179.

Binding these treasures together is a new *Quattro*-like interface that uses graphical lines and boxes instead of version 6.0's chunky text and line characters. Mouse control is improved, and windows, menus, and dialog boxes look sharper and more elegant.

PC Tools has adapted well to *Windows*. The backup, scheduler, and file recovery modules, though *Windows* based, can also run under DOS, so it's easy to switch back and forth, say, to restore a *Windows* backup to a non-*Windows* system. In addition, you can launch even full-screen DOS applications from *Windows'* control menu —each application shows up with its own distinctive icon in *Windows'* Program Manager.

Commuter's Special

The biggest addition to *PC Tools'* arsenal is *Commute*, a remote-control communications program that also sells separately for $129. *Commute* lets you control your office PC via modem from your home PC or on-the-road laptop. Two users can also work on the same application at once—useful for training, software troubleshooting, and project collaboration. The users take turns controlling the cursor and chat back and forth through pop-up windows.

Commute appears to be as versatile as industry leaders like *Carbon Copy* and *PCAnywhere*. It automatically translates between video standards when they don't match: For example, it will translate your VGA screen onto a remote caller's EGA screen. *Commute* also works with *Windows* applications, mouse and all. Like most remote packages, it provides network support, letting authorized users reach out over *NetWare* nets to access any LAN workstation running *Commute*. This is useful for administrators, who can use *Commute* to troubleshoot without running all over the office.

Better Backup and Custom Menus

One of *PC Tools 6.0's* major attractions has been its first-class backup utility, and *7.0's* is better still. (It's also sold separately as *Central Point Backup*, which wins a Best Buy in our backup utilities review in this issue.) You can now back up multiple drives in one operation; view date, time, and size when selecting files; and (for backup only) view file contents. An Express mode option presents a simple interface for novices.

PC Tools' DOS shell remains superb. The major addition is a programmable menuing system that lets you customize your work space or shield novices from information overload. To set up custom menus, *PC Tools* scans your hard disk and organizes applications it recognizes into submenus like Spreadsheets or Word Processors. You can easily add your own programs and submenus, and write your own help screen for each menu choice. You can define start-up directories, associate them with file extensions, and define a series of keystrokes that execute automatically as a start-up macro.

Disk Tools and Virus Controls

PC Tools couldn't match *The Norton Utilities* in this month's disk optimizer roundup, but version 7.0 brings it a lot closer. *PC Tools* now has

SNAPSHOT

PC Tools 7.0

There's no moss growing on *PC Tools:* Additions like *Windows* support, remote communications, ond security keep it one of the top volues in PC softwore.

KEY FEATURES

- **Windows utilities**
- **Remote communications**
- **Virus detection**
- **Custom menu system**
- **Low-level format refresh**

AVAILABILITY

Immediote

PRICING

$179, upgrode $49 through July 31; Central Point Bockup 7.0 $129, Centrol Point Commute $129, Centrol Point Anti-Virus $129

Central Point Software
15220 N.W. Greenbrier Pkwy.
Beoverton, OR 97006
800/445-4208,
503/690-8083 (fox)

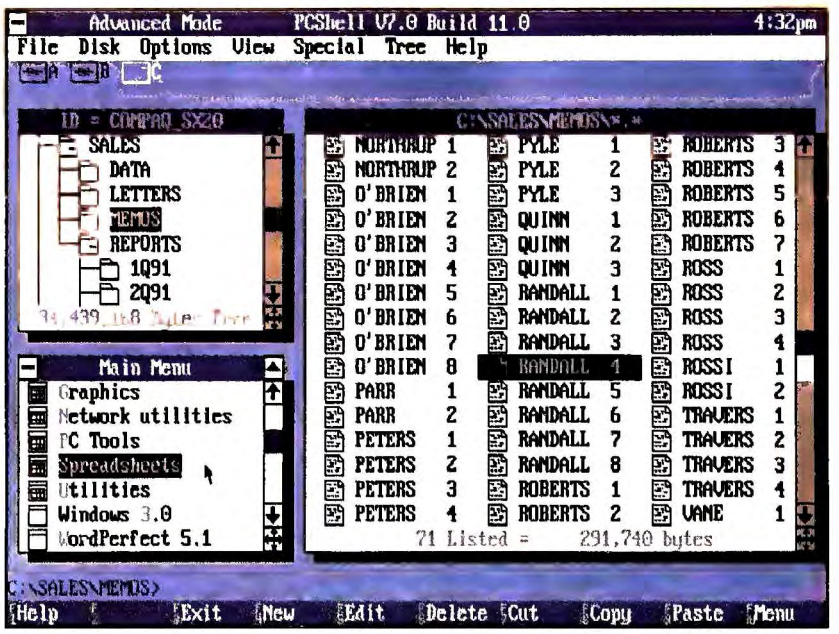
Reader service no. 730

low-level format refresh to keep your hard disk's inner workings healthy, and you can defragment disk space, which opens up free sectors to help *Windows* multitask faster.

File recovery is also improved—before undeleting a file, you can view its contents and see an estimate of its recovery chances. Special tools repair corrupted *1-2-3*, *Symphony*, and *dBASE* files.

Datamon, a new memory-resident utility, adds several security tools. You get a password-protected screen blanker and a *directory lock* that password-encrypts all files in a selected directory. You can also write-protect drives, directories, and files.

With PC virus infections becoming more common, the memory-resident VDefend virus scanner is a timely addition. VDefend scans for hundreds of viruses; to keep current on new viruses, you can download an update file from Central Point's BBS. (For extra protection, the *Commute* and backup utilities prevent transfer of infected files.) *PC Tools'* Disk Fix utility can repair damage caused by some viruses, but removing most infections requires another utility, such as Central Point's own *Anti-Virus* (sold separately).



PC Tools' new menu utility searches your hard disk for applications, and groups them into logical submenus by category.

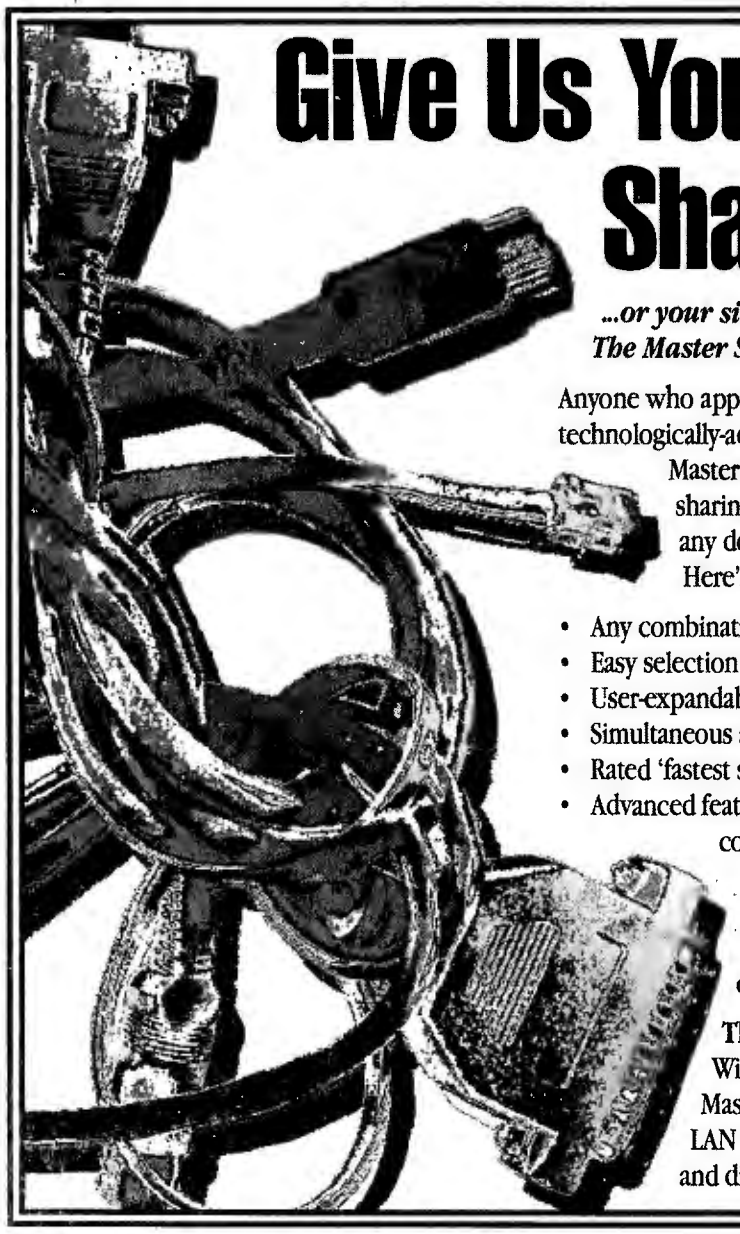
Pretty Printed Schedules

There are few changes to the Desktop bundle, but the memory-resident word processor, outliner, data base, telecommunications, and calculator modules all benefit from the new interface. The scheduler received the most dramatic upgrade: It lets you print appointment calendars to fit popular pocket binders, and like *Sidekick* it offers a limited group-scheduling feature for LAN users. The scheduler, however, still lacks the E-mail links and other advanced features of groupware packages such as *WordPerfect Office*.

Most people won't need or use every trick in *PC Tools'* bag, but it's a rare user who won't benefit from at least one of its utilities. *PC Tools 7.0* looks like it will remain one of the best software values around. There's no other program quite like it. ●

Robert Lauriston is a contributing editor for PC World.

Give Us Your Toughest Peripheral Sharing Problem



...or your simplest! Master Switch, the intelligent data switch from Rose Electronics, can handle it. The Master Switch series is so versatile and sophisticated, peripheral sharing becomes easy.

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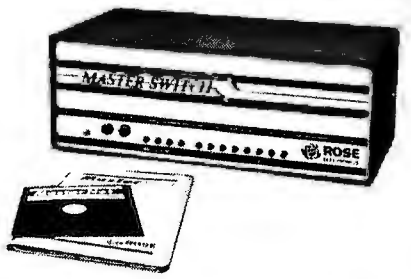

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"THE MOST POWERFUL COMPUTERS ARE THE ONES PEOPLE ACTUALLY USE."

—Apple Computer

First off, let's get one thing straight.

We totally agree with Apple.®

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IF YOU LISTEN TO APPLE, THIS IS THE MOST POWERFUL COMPUTER IN THE WORLD.

But while Apple has taken great strides in making the personal computer more useful, we've gone substantially farther.

Introducing the T2000SX notebook computer.

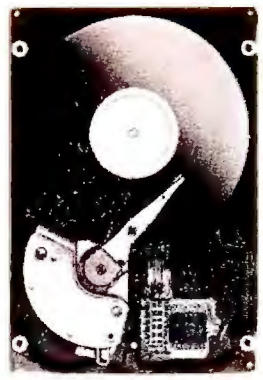
Quite simply, the T2000 SX is a more useful personal computer because it allows you to work how you want to work. When you want to work. And where you want to work.

Painstakingly engineered with you clearly in mind, the T2000SX will help you work more efficiently than ever before.

Virtually every feature you can find on a desktop computer, you will

Our technologically superior battery can be fully recharged in a mere ninety minutes.

find on the T2000SX: An 80386™SX processor with a math coprocessor socket, VGA compatible display, 1 MB (expandable to 9MB) of 80 nsec RAM, a 60 MB hard disk with 19 msec access time and 1.5 MB/sec data transfer rate.



The T2000SX has a 60MB hard disk with 19 msec access time.

But more important than the specs themselves, is the way the T2000SX lets you use them. Which is more often.

Our fluorescent side-lit screen provides even distribution of light. (Actual size.)

Welcome to the next generation in personal computing.

Because the T2000SX can fit easily into a briefcase (it weighs a scant 6.9 pounds), you can take it anywhere you go and use it in more ways than you can imagine.

Need to make revisions to a

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Our internal AutoResume back up battery automatically saves your work if your main battery runs out.

business proposal? The T2000SX gives you the freedom to do it from a train. The client wants an estimate on costs? You can give it to him right then and there—wherever there is.

No more wasting time running back to the office. Because the office is always with you.

But just in case there's something back at the office you still need, you can get back to it with our optional built-in modem. Which supports industry standard error corrections and data compression (CCITT V.42, V.42bis, MNP® 5). It even supports cellular data communications via our optional smart cable adapter.

Our user-installed memory card allows you to add up to 8 MB of memory yourself.

The T2000SX also has a unique feature you won't find on any other computer in the world. It is called AutoResume.

AutoResume: Think of it as a bookmark for your computer.

AutoResume automatically saves whatever you're working on whenever you turn the computer off. And it lets you go directly to the program you were using last when you're ready to start up again. So you don't have to reboot, restart your application and reload your files.

AutoResume also helps save on battery life and it allows you to change batteries without losing an ounce of information.

The T2000SX comes complete with Hypertext on-line documentation.

As for batteries, the T2000SX touts the latest in battery technology —Nickel Hydride. Nickel Hydride delivers 22% more watt-hours per pound than NiCad and it doesn't suffer from memory effect.

In keeping with the Toshiba tradition, the T2000SX also offers superior ergonomics. Like full-size, standard-spaced keys on a keyboard which has a full set of 12 dedicated function and 8 cursor control keys. And a VGA compatible, reversible black on white or white on black high resolution display.

Okay, let's wrap this thing up.

These are just a few of the reasons why we believe the T2000SX is the most useful, and therefore, most powerful computer in the world. And why P.C. Week* Labs said, *"the T2000SX offers performance comparable to the LTE 386s/20, plus many of the design features that have made Toshiba a market leader in portable PCs."* PC WEEK

We invite you to learn more about the T2000SX and Toshiba's best-selling line of portable computers by calling us at **1-800-457-7777** for a complete information kit.

In closing, we'd like to thank you for reading our ad.

We'd also like to thank our friends at Apple for giving us such a wonderful endorsement.

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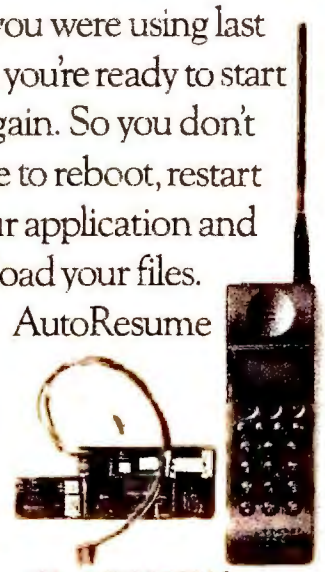

The T2000SX has an optional modem that allows data communications via a cellular phone.

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While others struggle to break into Windows, the #1 Windows database just got better.

If you're moving your database operations to Microsoft® Windows™, you need dependability and experience. You should be looking at Superbase®, the world's best-selling Windows database.

Superbase has all the tools you need to create Windows relational database applications that really work. An intuitive and easy-to-use interface. A superior Form Designer. Powerful procedural and non-procedural tools for application development. Full DDE and DLL support. Network connectivity and WYSIWYG functionality. Even non-programmers can build powerful applications quickly and easily.

And now, Superbase SQL Library lets you connect to multiple SQL databases and servers like Microsoft SQL Server, Gupta's SQL Base®, Oracle® Server and others. Concurrently.

Proven Performance

While other companies scramble to produce their first Windows version, Superbase is celebrating its third year as a Windows database technology. Three years of continual refinement have made the new Version 1.3 the solid, dependable and easy to use product that it is today.

Which is why it is the leading Windows DBMS. Why it is used with confidence by major corporations around the world. Why it was selected by Microsoft and AT&T for some of the largest Defense Department and US Government PC contracts ever awarded. And why hundreds of VARS and systems consultants use it as their database platform of choice for Windows application development.

A Complete System

Superbase is a complete family of products designed to meet a broad range of requirements, from executive use with Superbase 2, to MIS application development with Superbase 4. Not only are these products fully upward-compatible, but applications designed with Superbase 4 can run with Superbase 2 as well as with royalty-free Runtime Systems. Version 1.3's Network Extensions offer state-of-the-art concurrency control on networks, while Superbase SQL Library ensures easy integration with SQL database servers.

Find out why Superbase is the only Windows database that can meet *all* of your Windows database needs.

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Version 3.0 Compatible Product

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Circle 244 on reader service card

486SX Systems: More Bang, Less Bucks

With Intel's new 486SX chip under their hoods, these hot 20-MHz systems promise better performance than a 33-MHz 386—for less money. Is there a catch?

Here are the first six 486SX computers in the known universe. These hot boxes from Acer, ALR, AST, Everex, IBM, and Mitac are fast and cheap.

Michael Goodwin and Karl Koessel

Intel's new 486SX is easily the computing bargain of the year. Preliminary tests indicate that 20-MHz 486SX systems perform significantly faster than 33-MHz 386 systems *and* cost less. Intel is pricing the new chip so low that vendors can sell 486SX machines for hundreds of dollars less than 33-MHz 386 PCs and thousands less than 25-MHz 486DX systems. There's one trade-off: Unlike with the 486DX, you don't get a working built-in math coprocessor.

The 486DX's high cost is due largely to the expensive tests needed to certify the coprocessor—but not every 486 user *needs* a coprocessor. Many of today's prime business applications (like network operating systems) don't get any benefit from a coprocessor, and even those that do (spreadsheet, CAD/CAM, and graphics-intensive programs) may not see more than a moderate increase in speed.

Of course, more and more applications will be tapping the coprocessor—one example being the on-the-fly font generators that will be widespread very soon. So Intel has made sure that buying a 486SX won't paint you into a corner. If you decide later that you need a coprocessor, you can buy the new 487SX for $799—assuming your system has a socket for it.

Most system manufacturers expect the 486SX to be im-

SNAPSHOT

486SX—Price/Performance Breakthrough

Low-cost 20-MHz 486SX systems run today's applications about 10 percent faster than the pricier 386/33s.

AcerPower 486SX

KEY FEATURES

- **Low price, free Windows and mouse, super VGA**

AVAILABILITY

Immediate

PRICING

$4360*

Acer America
401 Charcot Ave.
San Jose, CA 95131
800/733-2237

Reader service no. 674

ALR BusinessVEISA 486ASX Model 80

KEY FEATURES

- **Six EISA slots, 14-inch super-VGA monitor, 49MB RAM capacity, CPU upgrade**

AVAILABILITY

Immediate

PRICING

$4644*

ALR
9401 Jeronimo Ave.
Irvine, CA 92718
800/444-4257

Reader service no. 675

AST Premium II 486SX/20 Model 83V

KEY FEATURES

- **Low price, 80MB RAM capacity, CPU upgrade**

AVAILABILITY

Immediate

PRICING

$4390*

(continues)

(continued)

AST
16215 Alton Pkwy.
P.O. Box 19658
Irvine, CA 92713-9658
714/727-4141,
714/727-9355 (fax)
Reader service no. 676

Everex Tempo 486SX/20

KEY FEATURES
- **Three months free on-site service, 128K cache**

AVAILABILITY
Immediate

PRICING
$4487*

Everex
48431 Milmont Dr.
Fremont, CA 94538
800/821-0806
Reader service no. 677

IBM Model 90 XP 486 SX-0G5

KEY FEATURES
- **Micro Channel, bus-master SCSI controller, XGA graphics, low-emissions monitor**

AVAILABILITY
Immediate

PRICING
$9295*

IBM
Old Orchard Rd.
Armonk, NY 10605
800/426-2468
Reader service no. 678

Mitac Model 4270E

KEY FEATURES
- **Rebate for coprocessor upgrade, 64MB fast RAM capacity, four EISA slots, 64K cache**

AVAILABILITY
Immediate

PRICING
$4405*

American Mitac
410 E. Plumeria Dr.
San Jose, CA 95134
800/648-2287
Reader service no. 679

* Prices ore based on standard configuration of 4MB RAM, 80MB–120MB hard disk, and color VGA monitor.

mensely popular, and since only minor redesign is required to support the chip, firms are crashing through the gates to be first on the market. Here's a look at six fast, affordable systems from the first manufacturers to announce products—all available now. Prices are based on a standard configuration with 4MB of RAM, an 80MB to 120MB hard disk, and a color VGA monitor.

AcerPower 486SX

The $4360 AcerPower 486SX will appeal to businesspeople for whom the lowest price is the highest priority. Although there's no CPU upgrade for this ISA desktop, and you're limited to only four slots and (until 8MB SIMMs are available) 14MB of fast RAM, the motherboard holds a high-resolution 1024 by 768 super-VGA controller, and the system comes with a copy of *Windows* and a mouse. Acer is also releasing the AcerPower 500 (an EISA desktop) and the AcerFrame 1000 (an EISA tower). According to Acer, the latter systems allow CPU upgrades to 50 MHz. Although market research indicates that customers rarely upgrade their CPU, many want the option anyway.

ALR BusinessVEISA 486ASX Model 80

Are you planning to add high-performance 32-bit peripherals like disk arrays? If so, the BusinessVEISA 486ASX Model 80 gives you a lot of room to grow and is priced at a very reasonable $4644—with a 14-inch super-VGA monitor. This computer comes with six EISA slots. You can upgrade video to 1024 by 768 resolution, and the CPU to either a 25-MHz or 33-MHz 486DX. ALR is also introducing three other 486SXs: the low-end ISA-based PowerFlex 486ASX; the higher-priced EISA-based BusinessStation 486ASX with a small footprint, network security features, and built-in super VGA; and the MPS 486ASX, which is similar to the BusinessVEISA 486ASX but has a Micro Channel bus.

AST Premium II 486SX/20 Model 83V

At $4390, AST's Model 83V is among the least expensive routes to 486SX power—at least so far. AST has dropped a fully redesigned 486SX processor board into its ISA-based Premium II to create the Model 83V. You can install up to a whopping 80MB of fast RAM (for OS/2 2.0 or UNIX), and AST's Cupid-32 architecture supports an easy CPU upgrade path to a 33-MHz 486DX processor. The higher-priced Model 83B lets you get to work immediately: It comes with DOS and *Windows* preinstalled, plus mouse and super-VGA monitor.

Everex Tempo 486SX/20

If you wish your personal physician made house calls, you'll appreciate Everex's economy-priced Tempo 486SX/20. It comes with three months of free on-site service, and you can extend the service contract. This $4487 ISA system also sports a 128K cache designed to speed your applications. A higher-priced model, the Step 486SX/20, allows a larger cache, more memory, greater expansion capacity, and a choice of chassis and comes with a year of on-site service. Both models place the 486SX on the motherboard, so you can't upgrade the CPU.

IBM Model 90 XP 486 SX-0G5

If performance and reliability are high on your list and price is no object, IBM's 486SX system is the one for you. It's just like IBM's other Model 90s—except for its new Processor Complex Card. At $9295, this Micro Channel–based system costs twice as much as the others here, but you get a 32-bit bus-master SCSI controller with a 512K disk cache for lightning-fast disk reads and writes; a low-emissions monitor; and built-in XGA for gorgeous graphics. Plus, should you decide you want higher performance, IBM provides a CPU upgrade path to full 486/25 or 486/33 capability.

Mitac Model 4270E

If you decide you need a coprocessor *after* you buy Mitac's low-priced EISA-based Model 4270E, the company will let you change your mind without paying a high price for the privilege. Mitac will install a 487SX—and give you a rebate for the 486SX. The system includes a 1024 by 768 video controller for high-definition graphics, and a 64K cache (upgradable to 256K) for top performance. Can your operating system exploit huge amounts of RAM? The 4270E holds up to 64MB of fast RAM. And while it doesn't permit a CPU upgrade right now, Mitac promises that if and when Intel announces 25-MHz versions of the 486SX and 487SX, its customers will be able to upgrade easily.

A 486SX in Every Pot

The flood of 486SX systems is just beginning—and you can expect to see a wide range of features and innovations as companies try to convince you that *their* box is the one you should take home. If these impressive offerings are any indication, choosing your best buy won't be easy.

Michael Goodwin is an associate editor and Karl Koessel the technical editor for PC World.

For more information about all products in this preview, circle reader service no. 908.

Eye-Stabbing 3-D Charts for Use in Lotus, Excel, Pagemaker and Others.

Make Your Numbers Sing in 3 Dimensions.

Editor's Note:

When I first cracked open the box and started working with 3-D CHARTS TO-GO, I wasn't sure what to expect. I'm a hard-core Lotus user, and frankly, I was intrigued by the prospect of creating THREE-DIMENSIONAL charts for use in my presentations, but c'mon, 3-D charts must be complex to produce... or so I thought.

I began with a bar chart (my favorite). I entered my numbers in the Lotus-like cells on the 3-D CHARTS TO-GO screen and clicked on "bar chart." What happened next was amazing. Instantly, a precisely accurate chart drew itself in dazzling colors right before my eyes — in true 3-D! After my heart rate slowed back to normal, I called up an existing Lotus file to chart some sales figures. (I don't have to exit Lotus to use 3-D CHARTS TO-GO.) Just a couple of clicks and I had a brilliant pie chart with each slice accurate to the penny and with wonderful dimensionality. I was floored! Three-dimensional charts allow me to see complex relationships easily, and I can communicate these relationships with far more impact than with 2-D charts. The third dimension is not just beautiful — it's powerful! And I can print my charts on any Windows-supported printer including HP LaserJets, PostScript language printers, color printers and more — over 150 in all — and I can easily import graphics into my charts to illustrate my ideas.

The 3-D CHARTS TO-GO box was probably the most exciting one I've opened since my copy of Windows 3.0 arrived.

Carl Fiorentino, President, TigerSoftware.

Great for Slide Presentations!

Why settle for two-dimensional charts when you can create explosive 3-D charts in just seconds with 3-D CHARTS TO-GO? This easy-to-use system will produce 3-D Pie, Bar, Area, Text and Line charts instantly, using your existing Excel numbers through its advanced clipboard. The innovative "split-screen" feature allows you to see both the data and the chart together for fast editing — you don't have to flip-flop between two applications. And 3-D CHARTS TO-GO will give you three different chart views: Perspective, Isometric and Oblique.

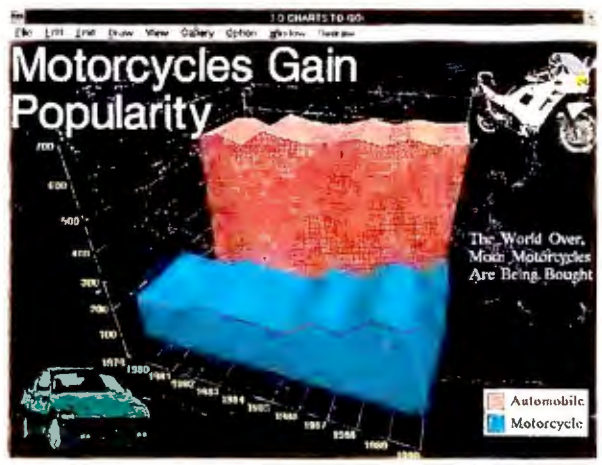
Control Size, Angle, Color, Type and Reproduction Quality.

3-D CHARTS TO-GO allows you to interactively control the size of your charts — so you see the adjustments as you make them! Sizing is as easy as clicking to get the exact size you need. Click again and adjust the viewing distance, click once more and change the rotation angle to add unique perspective to your chart. This rotation-angle control allows enormous flexibility in presenting your charts so that the data is clearly displayed. Quickly select from 17 different chart drawing patterns and 8 foreground and 8 background colors. Want to get crazy? Click to create a host of available special effects on the background and shadows to enhance the three-dimensional effect.

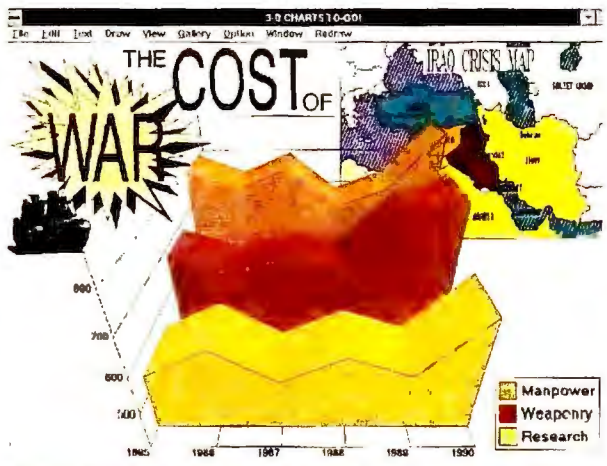
There's more, like the ability to select your choice of chart quality: Draft, Fine Black and White and Fine Color. And 3-D CHARTS TO-GO gives you creative freedom when adding type to your charts. Your chart's title, subtitle, descriptive lines, labels, legend and footnotes can all be individually sized, colored and employ different fonts.

Interface with Lotus, Excel, PageMaker and Others.

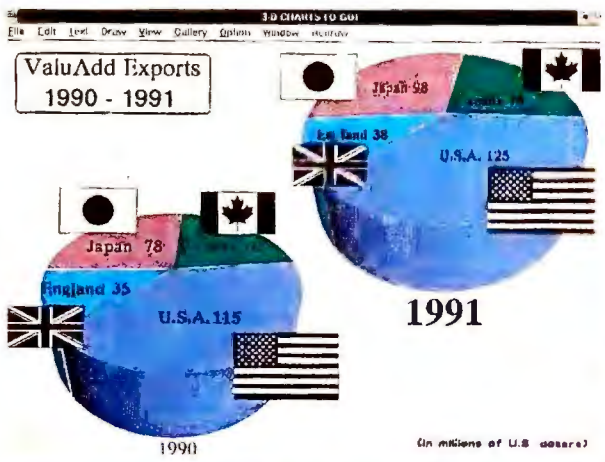
What makes 3-D CHARTS TO-GO even more impressive (and useful) is its ability to use data from Excel (and many other Windows-based applications). You'll quickly export numbers to 3-D CHARTS TO-GO without exiting Excel. You can easily merge up to 10 individual charts, print them together and perform fast, accurate data comparison. If you're a PageMaker user, you can enhance documents containing financial information and grids following the same simple steps. And since 3-D CHARTS TO-GO supports .WMF, .PCX and .BMP file import formats, you can add professionally prepared clip art images to your charts to make them even more visually striking.



Fully featured for presentation graphics. Add text comments and labels, import graphics images, change background colors and effects, and much more!

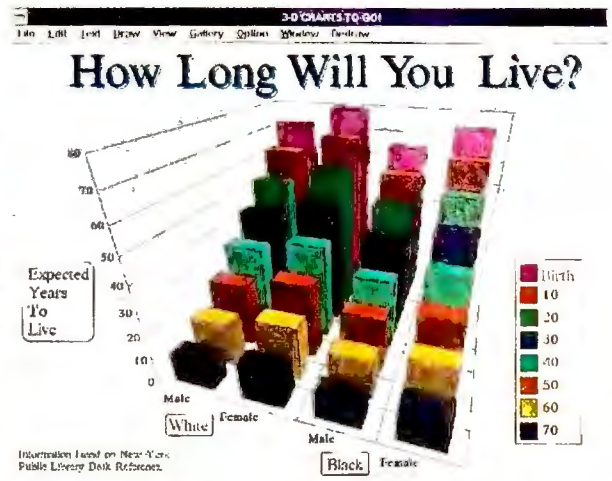


Getting data into 3-D CHARTS TO-GO is a snap. Simply cut and paste from Excel or any application where numbers are kept. Then instantly see your 3-D graph.

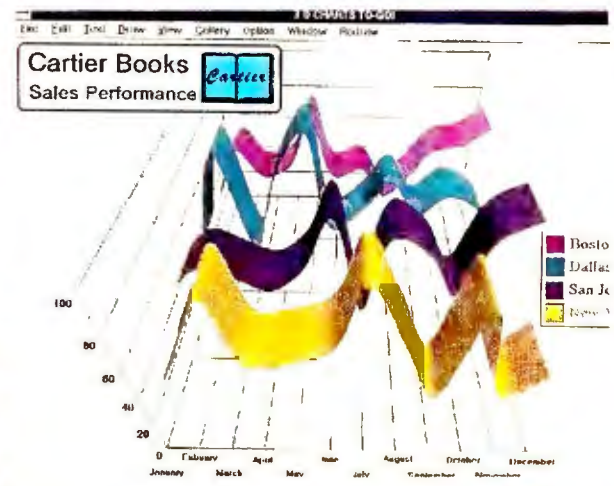


Graphics and colors add even more impact to your charts. Here, graphics are easily inserted over the pie charts to represent countries of the world.

Add backgrounds to your charts. Large type, legends and revisions are a snap.



Complex charts are suddenly simpler and cleaner.



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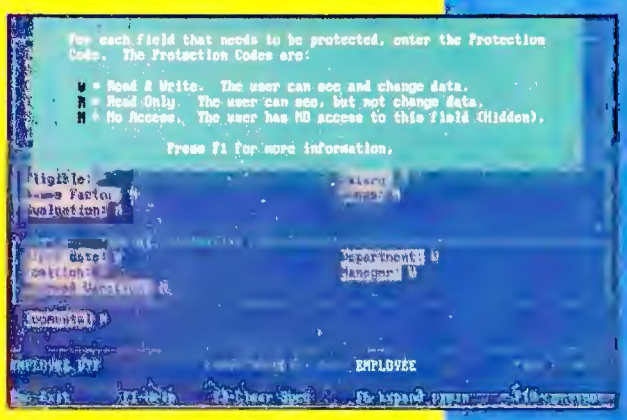

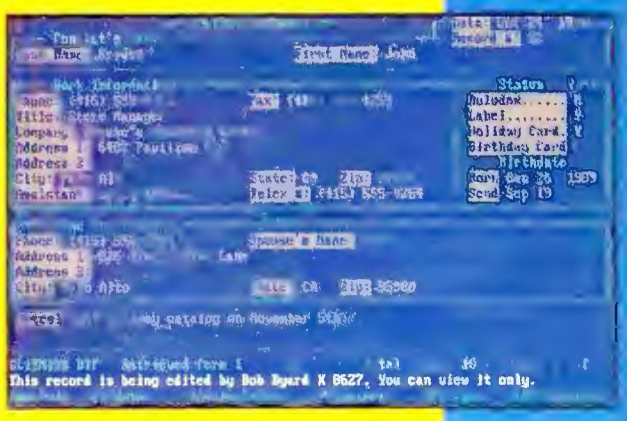

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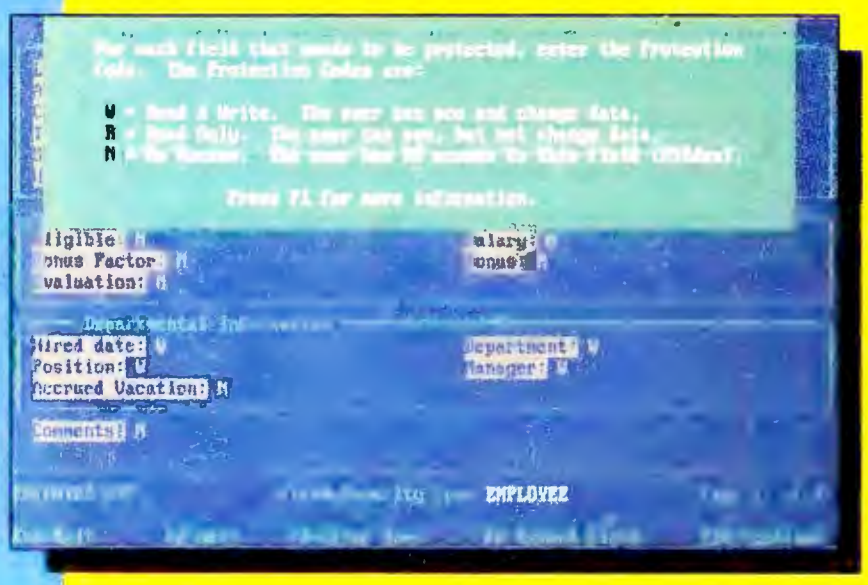

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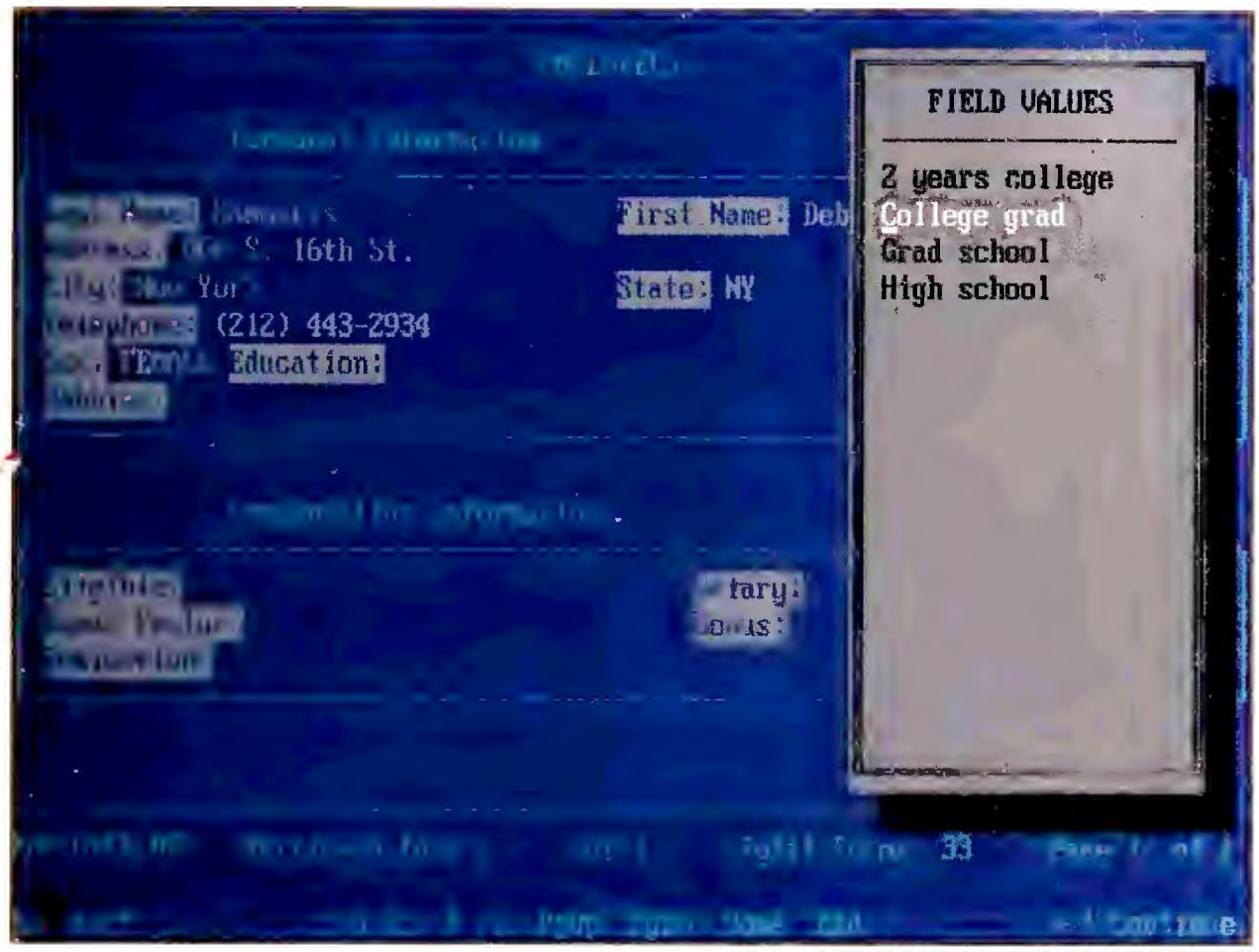
See Other Side for Details

A Livelier Q&A

The latest version of this "executive" data manager adds new fonts for better reports, adds new querying aids, and has the ability to create simple applications.



Q&A 4.0 lets you attach a pop-up list of correct answers to a restricted multiple-choice field, saving both data entry time and the frustration of trying to remember which words are allowed.

Lincoln Spector

Q&A takes a novel approach to data management. The program's unique interface, the Intelligent Assistant, lets you extract the data you need by typing in English-like commands. Moreover, it's the only data manager that includes a word processor as part of the deal—and a top-notch one at that. This package can't offer the power of *dBASE*-class data managers, but most of its audience—casual users who manage personal data bases—can do without such complexity anyway.

Version 4.0 of *Q&A* builds on the program's ease of use and adds a small helping of data management power. The new Intelligent Assistant has its own assistant, the Query Guide, to help you phrase your queries correctly. You can now use a mouse with the program, and both the word processor and the data base report generator benefit from a variety of fonts and page preview. Even better, you can create your own applications, making *Q&A 4.0* a much more practical product for multiple users.

An Even Smarter Assistant

Q&A still lets you query your data in two ways: through the File menu's Search/Update option, and through the Intelligent Assistant. The former is like that of other good data base query systems—to find the records you need, you simply enter the value or range you want to match. For example, to find everyone in your data base who lives in California and makes more than $40,000 a year, you type CA and >40,000 into what looks like a data entry form.

The Intelligent Assistant, however, prefers conversation. You can type an English sentence like "List everyone in California who makes more than $40,000 a year" and hope you've trained the program to understand what you want. If you haven't, you must define words like *everyone* and *California*, whose definitions the program saves for future reference.

The new Query Guide makes using the Intelligent Assistant much easier by showing you what the options are along the way. You could select *Find ...* from a menu, then *the records where ...* from another, and so on, and you'd be sure you were using only terms that *Q&A* already knew. Experienced users will still find Search/Update easier, but the new Query Guide helps *Q&A* do a better job of catering to the casual, "executive" user.

Q&A's querying ease combines nicely with new support for Gupta and Oracle SQL servers, and with proposed links to Microsoft and Sybase's *SQL Server*. Theoretically, you can extract data from a large SQL data base anywhere on the network and then drop that data into a report or save it as a *Q&A* data base. True, not many companies have such SQL data bases now, but there's potential here for giving *Q&A* users access to key company data.

SNAPSHOT

Q&A 4.0

This popular personal data manager receives over 100 improvements, from mouse support to customizable menus to the ability to query SQL data bases.

KEY FEATURES

- **Variable-length fields**
- **Point-and-shoot data entry**
- **Graphic print preview**
- **Customizable menus**

AVAILABILITY

Immediate

PRICING

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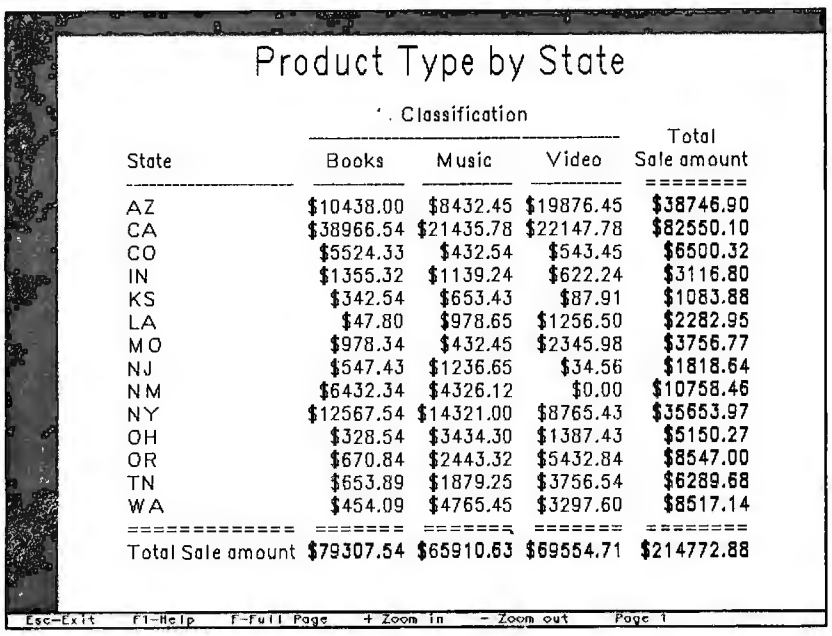

Product Type by State

State	Classification: Books	Music	Video	Total Sale amount
AZ	$10438.00	$8432.45	$19876.45	$38746.90
CA	$38966.54	$21435.78	$22147.78	$82550.10
CO	$5524.33	$432.54	$543.45	$6500.32
IN	$1355.32	$1139.24	$622.24	$3116.80
KS	$342.54	$653.43	$87.91	$1083.88
LA	$47.80	$978.65	$1256.50	$2282.95
MO	$978.34	$432.45	$2345.98	$3756.77
NJ	$547.43	$1236.65	$34.56	$1818.64
NM	$6432.34	$4326.12	$0.00	$10758.46
NY	$12567.54	$14321.00	$8765.43	$35653.97
OH	$328.54	$3434.30	$1387.43	$5150.27
OR	$670.84	$2443.32	$5432.84	$8547.00
TN	$653.89	$1879.25	$3756.54	$6289.68
WA	$454.09	$4765.45	$3297.60	$8517.14
Total Sale amount	$79307.54	$65910.63	$69554.71	$214772.88

Esc-Exit F1-Help F-Full Page + Zoom in - Zoom out Page 1

A graphic display shows you what your printed report will look like before you waste paper. Note how the cross-tab breaks sales totals down by state and product category.

Your Own Q&A

Q&A has always boasted better network support than other light-duty data bases, offering multiple users reliable simultaneous access to the same data. Now, users can perform specific tasks without having to learn *Q&A*, because version 4.0 enables you to develop simple, custom front ends.

Creating customized applications requires simply that you design menus and attach macros to them. For instance, you can create a Mailing List menu with options for adding a name, changing an address, and printing labels. You can also replace an existing *Q&A* menu—even the opening menu—with one of your own.

Menus aren't the only new application tools. For the first time, you can save your method of searching for information. Let's say you must regularly see which customers in Nevada made a purchase in the last 60 days. With earlier versions, you had to tell *Q&A* exactly what to look for every time you needed the information. With *4.0,* you can now save your instructions under a name like "Nev., Last 60 Days" that can be called up easily when needed.

A number of other improvements help make *Q&A* more configurable. For example, you can protect your data at the field level, so only specified users will be able to read—or write to—any given field. Password protection controls access to the ability to customize, an especially important feature for network use.

Controlling the Ins and Outs

Q&A offers several new features to control what you—or multiple users—put into it. For example, you can create fields that accept only from a predetermined list of entries—say, an Education field in a personnel data base that accepts only 'high school', '2 years college', 'college grad', and 'grad school'. With *4.0,* a hot key can pop up a list of choices for point-and-shoot selection.

You can also assign templates to fields, ensuring the right format for data. By giving a Phone field a (999) 999-9999 template, for exam-

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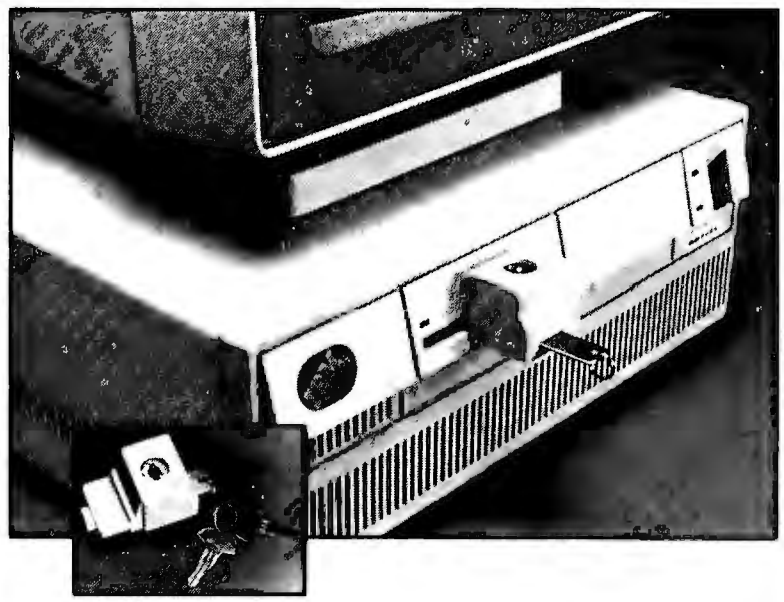

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ple, you can make sure the final result looks like a phone number and save yourself the trouble of typing parentheses and dashes every time you want to add a record.

4.0 accepts a whopping 32K of text in any *Q&A* text field. You can even read ASCII and *Q&A* word-processing documents into the field, which accepts fonts, margins, and other word processing extras. It's as if every text field can serve as a memo field—and for nice-looking memos, at that.

A modest selection of fonts and a new preview mode foster better-looking *Q&A* reports. The *Q&A* word processor is also improved—it finally includes a thesaurus, and it supports scalable fonts. You can see more information on screen as you edit, including tabs, hard returns, and accurate line and page breaks, even for proportional fonts.

If you need a better summary than standard columnar reports offer, *Q&A 4.0* lets you cross-tabulate your data. For example, if you want to see sales totals broken down by state and product category, you could create a cross-tab report that listed total sales for each category in each state, plus all relevant totals. The program gains some relational capability in the form of a new (and fairly complicated) posting procedure.

All told, *Q&A 4.0* benefits from more than 100 improvements. Individually, none of them will knock your socks off. But the comprehensive changes—especially the easier interface, new output features, and ability to generate applications—add up to a much better *Q&A*. ■

Lincoln Spector is a PC World *assistant editor.*

POWER TIP NO. 190

Avoiding Double DOS Prompts

To avoid getting a double DOS prompt after executing a batch file, don't end the file with a hard return; just finish typing the last command without pressing <Enter>, and save the file. If your word processor or ASCII text editor adds a carriage return and linefeed anyway, you can use the COPY command to clip it off. First, use EDLIN or any word processor or text editor that enables you to insert a <Ctrl>-Z after the last character of the last command to mark the file's cutoff point. Save the file. At the DOS prompt, type **copy**, a space, the batch file's name and extension, and then a plus sign and two commas (for example, **copy test.bat+,,**), and press **<Enter>** to pare off the hard return.

Don Nummi, Jr.
Superior, Wisconsin

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Tandy's Talking PC

Tandy's affordable multimedia PC is an all-in-one presentation solution, complete with a stereo audio card and a hot new CD ROM player.

Awesome and easy to set up, the M2500 XL/2's speedy CD ROM drive, hot new Sound Blaster Pro audio board, and multimedia version of Windows can light your presentations on fire.

Russell Glitman

Multimedia looks and sounds great at trade shows: Professionals dazzle you with clips of *Top Gun* roaring in stereo, spliced with animated corporate logos and video shots of products. Imagine if you could harness that power the next time you give a presentation or conduct a training program. Awesome.

But it is also complicated, tricky, expensive, and time-consuming. For most of us, simple overheads are the norm, color slides are considered a stretch, and multimedia remains a mission impossible.

All that may change, however, with Tandy's new Multimedia PC (MPC) line of desktop computers. The family of multimedia MPCs, which should be available late this summer, ranges from the basic 16-MHz 286, to a 386SX, to three 386DX models, including a 33-MHz screamer. These are comprehensive, all-in-one multimedia systems that comply with the multimedia hardware standard set last fall by Microsoft and a group of hardware vendors, including Tandy. They also include Microsoft's newly introduced multimedia extensions to *Windows*, which provide software controls for creating voice and music files and running multimedia peripherals. With the extensions, you can have the sound and fury of future multimedia applications and also run all your current software.

The entry-level 286-based M2500 XL/2, previewed here, will sell for less than $3000 and will include a VGA monitor, 512K of video RAM, 2MB of memory (expandable to 16 MB), a CD ROM drive, and a stereo audio board. You'll also get a 40MB hard drive, two CD ROM disks stuffed with sample multimedia applications, and *Windows* with multimedia extensions. Tandy is also selling a nifty MPC upgrade kit for under $800, but most users will appreciate the M2500's integration—the system is remarkably easy to install, and documentation and help are superb.

Customized Storage and Sound

The secret weapon of the M2500 XL/2 MPC is its speedy CD ROM drive—the CDR-1000—which also sells separately for $400. The CDR-1000 pumps the processor at a sustained rate of 150K per second—double the transfer rate of most CD ROM drives. This rate reduces jerkiness and ensures that sound and video stay in sync.

Under the hood, you'll also find a powerful new audio board, the Sound Blaster Pro from Creative Labs. Compatible with its popular predecessor, the Sound Blaster, the Pro

SNAPSHOT

Tandy M2500 XL/2

This Multimedia PC defines the entry level of multimedia computing. It has a 16-MHz 286, speedy CD ROM drive, audia card, and *Windaws* with multimedia extensions.

KEY FEATURES

- **Fast CD ROM drive**
- **16-bit Sound Blaster Pro audio card**
- **512K video RAM**
- **Easy installation**

AVAILABILITY

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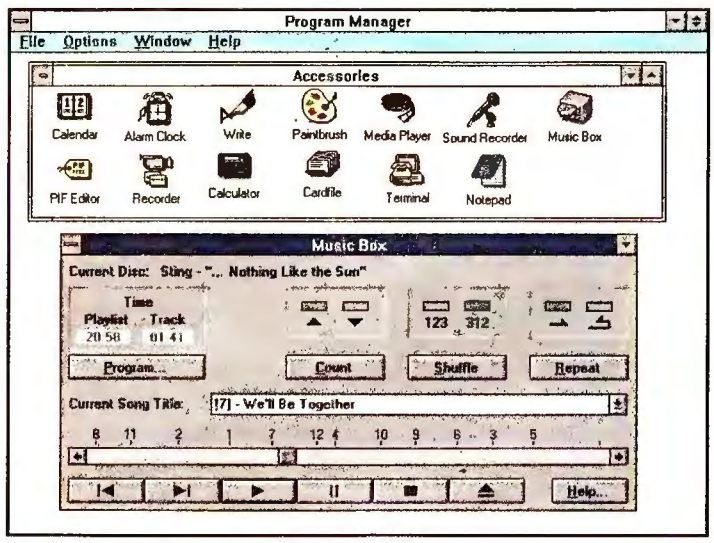

Microsoft's Windows multimedia extensions software, available only with MPC hardware and upgrade kits, offers elegant design, power, and on-line help features. You'll find new icons for playing audio CDs (shown here) as well as recording and controlling multimedia peripheral hardware. New "applets" on the control panel let you handle tasks such as switching display modes or adding device drivers. The new Hyperguide on-line help system provides a CD ROM–based manual with hypertext information retrieval. The result: a printer manual under 100 pages.

offers crisper sound and much improved recording and playback facilities. The broader 16-bit bandwidth lets you record three separate audio tracks: For instance, to re-create a game-winning Super Bowl play, the announcer could talk on one track, the crowd could roar on another, and the linemen could collide on the third.

The Sound Blaster Pro's new audio mixer chip automatically switches input and output, so you don't have to fiddle with receiver settings or speakers when the audio source changes. The MIDI interface lets you use a single plug to hook up both a joystick and a digital musical instrument.

The only catch to this snazzy machine is the relative lack of software. Several sample packages look promising: a sales training and presentation application; a business guide to Japan, complete with spoken pronunciation.

Don't expect Tandy to play this market solo. Numerous vendors, including AT&T and Zenith Data Systems, have promised MPC machines this year, and upgrade kits are available from Headland Technology and MediaVision. Meanwhile, software vendors are rushing to integrate sound—for example, Borland's *Quattro Pro 3.0* includes sound clips.

Multimedia is still young, but this is a strong start. Tandy's Multimedia PC should release multimedia from the chicken-and-egg syndrome that often hobbles the acceptance of new technology. Stroll down to the nearest Radio Shack computer center and take a look.

Russell Glitman is PC World*'s executive editor.*

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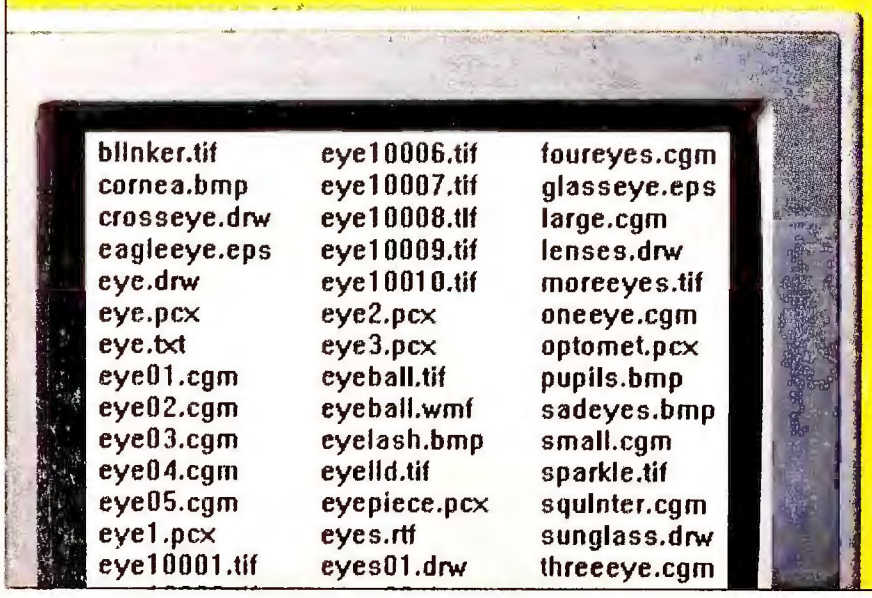

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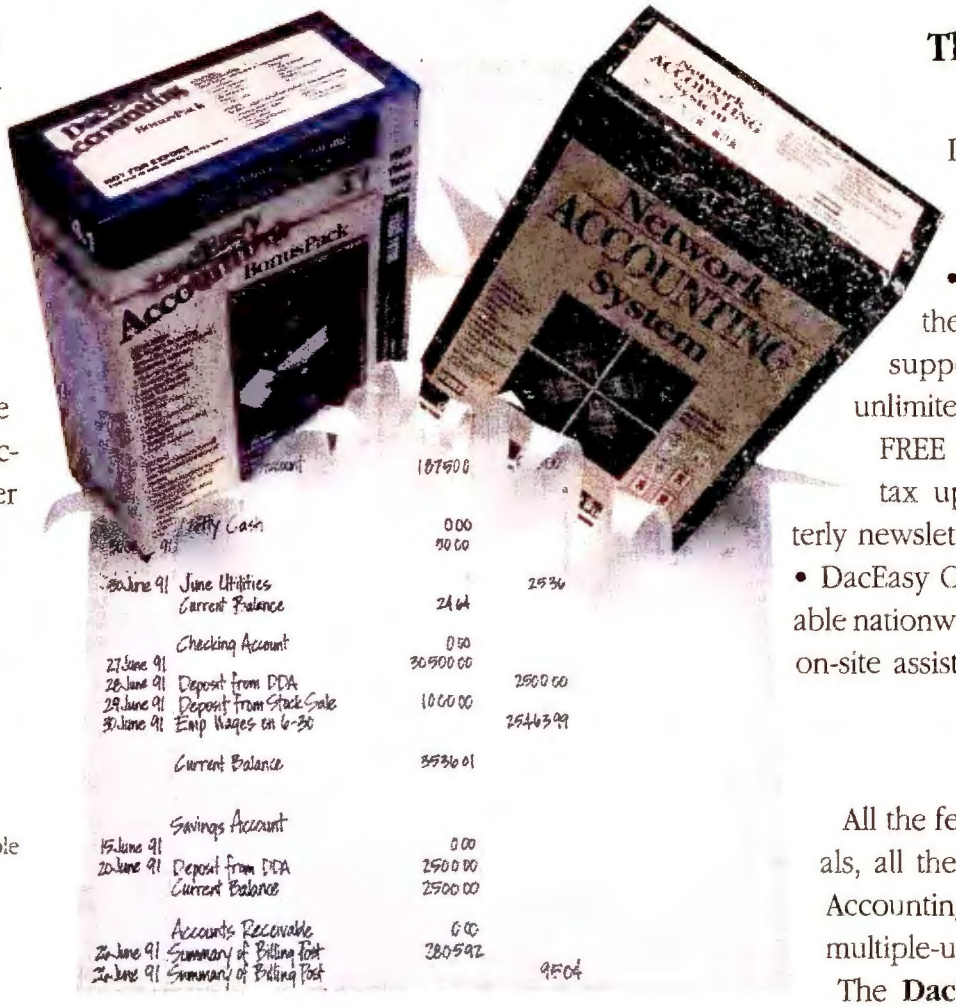

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PRODUCT OUTLOOK

Edited by MIKE HOGAN

HP 95LX

Palm-Sized PC Lets You Catch E-Mail, Spreadsheets

This new pocket-sized computer gives managers on the run a full-powered PC to take down E-mail or even spreadsheets, the latter task made easier by 1-2-3 included in ROM.

If your specialty is giving good meeting or pitching product on the road but you still need to tap into corporate data, there's a new class of PC for you.

Hewlett-Packard's calculator division and Lotus have teamed up on the HP 95LX, a checkbook-sized device that puts the power of a full-fledged PC in the palm of your hand. It lets you download a spreadsheet or data base during a meeting, check E-mail from your hotel room, or dash off a quick memo. For that, Lotus has provided all the Day-Timer-type utilities of a $300 pocket organizer like the Sharp Wizard—a calendar, a phone book, a memo maker, a calculator, even a DOS shell to manage files. But the 95LX CPU has the power of a 286 and is backed by 512K of RAM, so you get more than enough power and room to pull down that spreadsheet. Both DOS 3.22 and *1-2-3* release 2.2 run from ROM, so they take only a sliver of RAM and leave plenty of room for your data. You can upgrade the computer with standard semiconductor-card storage and applications, and it runs for about two months on a pair of AA alkalines.

Not only more powerful and better appointed than the Poquet PC or Atari Portfolio, the 95LX, at 11 ounces and 6.3 by 3.4 by 1 inches, is also lighter and smaller than its closest rivals. The screen is a readable, unlit LCD. The keyboard, while QWERTY, is just as bad as the competition's. The 95LX's suggested list is $699, but you'll also want to spring for a $99 Connectivity Pack if you want to download data to your desktop PC via serial port or connect to phone lines —and you'll need to add a modem. —*Mike Hogan*

IN BRIEF

HP 95LX
A full-powered checkbook-sized PC with 1-2-3 and desktop utilities for busy managers who don't quite need a notebook PC.

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INSIDE PRODUCT OUTLOOK

114 **386/25E, 386/33E, 486/25E** Ingenious design, uncommon attention to detail distinguish AMKLY's modular PCs.

114 **Correct Grammar for Windows** Go beyond word processors and check text in spreadsheets, data bases, and DTP text, too.

116 **JustWrite** Symantec's multitalented *Windows* word processor combines power with ease of use.

116 **Alpha RPL** A do-it-yourself TSR maker.

118 **Freelance Graphics for DOS Release 4.0** Popular presentation graphics package outwits DOS to deliver an outliner, WYSIWYG, and more.

120 **On Target** Project management gets real with Symantec's jargon-free *Windows*-based program.

120 **HP LaserJet Fax** Hewlett-Packard's add-on lets your LaserJet double as a high-quality fax machine.

122 **ToolBook 1.5** *HyperCard*-like tool for *Windows* developers adds speed and programming power.

122 **Macola Accounting Software 5.0** Customize the interface of this newly improved accounting package to fit the way you work.

124 **TranScribe 300** A text-recognition flatbed scanner at a human-scale price.

386/25E, 386/33E, 486/25E

A Finish That Promises You Quality Today and Tomorrow

Sometimes no discussion of a product's parts, no matter how detailed, can convey the true greatness of the whole. AMKLY Systems offers everything you'd want in a high-end desktop. But then, so do plenty of others. AMKLY's art is to put it all together with uncommon forethought and attention to detail.

AMKLY's trio of desktop PC systems has a modular design and includes a lift-out peripheral tray for easy upgrading.

The starting point is modularity. AMKLY's 386/25E, 386/33E, and 486/25E incorporate the same motherboard in the same case with identical memory, drive, and slot options. All have four drive bays, one parallel and one mouse port, two serial ports, and a 101-key keyboard.

AMKLY has replaced the old AT bus with a fast, 32-bit model. You get six open EISA slots—quite a few for a 17-inch-square case. Start with a 25-MHz 386 CPU that has a 3½- or 5¼-inch floppy and 2MB of memory for $3700. The 14-inch AMKLY super-VGA monitor runs $995 and is driven by a 1024 by 768 super-VGA adapter on the motherboard. An IDE connector on the motherboard lets you add one or two 120MB IDE hard drives (at $1095 each) or, if you give up a slot for their controller, two 340MB ESDI or SCSI drives (at $3495 apiece).

You can step the processor card up to a 25-MHz 486 at this writing, and moving on to higher-level processors will be no problem in the future. Using SIMM modules, you can pack up to 16MB of processor-speed memory on those CPU cards and another 96MB of same-speed RAM in the one EISA slot that doubles as a fast memory access.

Upgrades will be easy, given the attention AMKLY paid to case design. Turn two thumbscrews, and the case lifts, rather than slides, off with no tracks to align. Press a tab, and the entire disk drive/power supply assembly lifts out, allowing access to every inch of the motherboard. More important, a clever design makes dropping the assembly back in near-foolproof.

This is where many system makers leave off. But the AMKLY systems are delivered ready to compute with everything you will need, from the toll-free number to on-line hypertext-based manuals for DOS and technical support. In between is a good selection of personal productivity tools accessible via the hypertext environment's linking menus. You also get your choice of DOS 3.3 or 5.0. It all adds up to a computer that, with the right upgrades, won't ever go out of style. —*Mike Hogan*

IN BRIEF

386/25E, 386/33E, 486/25E
These PCs offer superior features today that are easily upgradable tomorrow, thanks to AMKLY's ingenious design

AMKLY Systems, Inc.
60 Technology Dr.
Irvine, CA 92718
800/367-2655,
714/727-9521 (fax)
Reader service no. 647

Correct Grammar for Windows

Checker Works on New File Formats

Wasting no time making good on its promise to bring the benefits of a graphical environment to its word processing customers, WordStar International has built a *Windows* version of the solid spelling/grammar/style checker it acquired with Lifetree Software.

Like its DOS stablemate *Correct Grammar 3.0*, *Correct Grammar for Windows* highlights phrases that contain questionable grammar, spelling, syntax, punctuation, and style and then suggests changes. The suggestions are based upon ten style guides—ranging from fiction to business, informal to academic—that can be customized further to fit any slant you might wish to take.

While *Correct Grammar for Windows* works with all major DOS word processors, it displays a special affinity for those like *Windows Write* and *WordStar Legacy* that share its environment; it can even be installed as a menu option in *Ami*, *Ami Pro*, and *Word for Windows*. Additionally, the *Windows* Clipboard lets you extend your grammar-checking reach beyond word processors. Copy text out of your spreadsheet, data base, or desktop publisher, run a quick check, and copy it back into the original application via the Clipboard (in some applications, nontext data may be altered if it's clipped).

Under *Windows* you needn't worry about losing proportional typefaces or other formatting that *Correct Grammar* finds in your applications.

Correct Grammar for Windows lists for $99, $39 for upgrades. Legitimate users of any WordStar product or a competing grammar checker can purchase *Correct Grammar for Windows* for $49. —*Rex Farrance*

IN BRIEF

Correct Grammar for Windows
This Windows-based grammar/spelling/style checker reaches beyond word processors.

WordStar Writing Tools Group
One Harbor Dr. #111
Sausalito, CA 94965
800/543-3873,
415/332-8780 (fax)
Reader service no. 657

If reading this ad doesn't convince you to buy File Director, perhaps reading this book will.

Even if you're familiar with DOS commands, managing your files can be a slow and tedious task. And if you're working by the book, things can come to a grinding halt.

That's why you need File Director.™

All the basic DOS functions are right at your fingertips with File Director's easy-to-use menu. You can copy, rename, move or delete files. Locate them, search for text strings and more—all with simple point-and-shoot commands. And you can do the same with directories, directory trees, or entire disks.

File Director also lets you do things DOS can't. Like view all the files on your logical drives at once. Scroll through directories and see the actual contents of files in a separate window. Mark files from different directories or drives and perform one-touch commands. Even launch programs from File Director's Applications menu.

To find out more about File Director, call 1-800-873-4384. Buy File Director now and get a free copy of Mace Performance,™ the $69 hard disk optimizer. Just write "DOS Manual" on the registration card and return it to us. This is a limited-time offer, so book yours today.

Fifth Generation Systems, Inc. 10049 N. Reiger Road, Baton Rouge, LA 70809 Technical Supp

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Circle 85 on reader service card

JustWrite

More Features Than Meet the Eye

Software vendors learned long ago that most people ignore most features in any given program. In fact, many users don't want to hear about feature-rich (read feature-laden) software. So in order to convince you that *JustWrite* is easy to use, Symantec feels compelled to downplay the power of its *Windows* executive word processor.

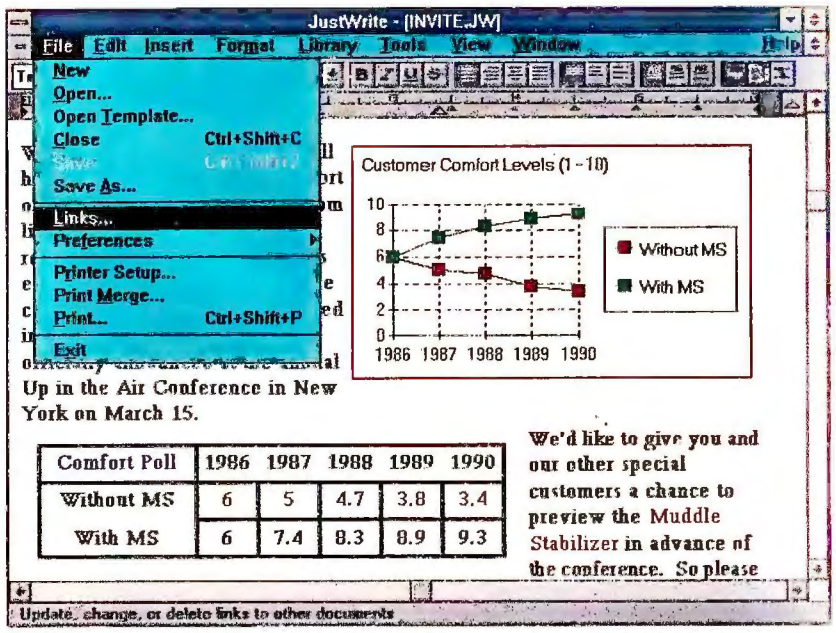
While *JustWrite* is easy to use, it certainly isn't feature-poor. It's a standout with its integrated outliner, powerful mail merge, and ability to detect file formats automatically and convert files on the fly—a potential breakthrough feature that could save a lot of time in the typical nonstandardized office environment.

The only key feature *JustWrite* lacks is macros, an omission that places it a notch or two below *Word for Windows* and *Ami Pro* on the power scale. However, it still ranks a few notches above *ProWrite Plus,* Software Publishing's *Windows* word processor.

Unlike *ProWrite Plus, JustWrite* includes a table editor, an outliner, and a table of contents generator. But it uses only 2.5MB of disk space because it passes up some advanced features that leave most users yawning—things like cross-referencing, kerning, redlining, and math.

JustWrite presents a pleasant, unsurprising *Windows* interface equipped with a customizable ribbon bar full of formatting icons. You get the usual style sheets, spelling checker, and thesaurus, plus a number of editable graphic display modes, from an enlarged view to a full-page preview. There's no text-only draft mode, but Symantec claims *JustWrite* is fast, even in graphics mode, and beta versions show surprising speed.

Following in the tradition of *Q&A,* Symantec put a lot of effort into mail merge. You can incorporate *Q&A* and *dBASE* data base fields into your correspondence and avoid rekeying records; you can even query and sort those data bases from within *JustWrite.* The outliner also is notable. You can expand and contract headings along with their underlying text, and you can apply an outline format to existing text. Despite this long list of advanced features, *JustWrite* is priced just right for an entry-level product at $199. —*Eric Brown*



Easy to use but not feature-poor, JustWrite has the ability to detect file formats automatically and convert files on the fly.

IN BRIEF

JustWrite
This executive Windows word processor gives easy access to advanced features, including automatic file conversion.

Symantec
10201 Torre Ave.
Cupertino, CA
95014-2132
800/441-7234,
408/252-4694 (fax)
Reader service no. 646

Alpha RPL

Do It Yourself With This TSR Maker

In the past, only the very best assembly and C programmers could create memory-resident programs. But with the release of Alpha Software's easy-to-use *Alpha RPL* (resident programming language), you can tackle custom projects such as a special screen grabber that knows where to find the name and address on your data base screen. More ambitiously, you can integrate existing DOS applications by crafting a common menu structure that hides dissimilar interfaces from end users.

The *Alpha RPL* package includes a language, an interpreter, and a development environment. Since the interpreter is memory resident, so are programs created with it. In fact, the *Alpha RPL* language is specifically designed for TSRs; it has commands for recording and playing back keystrokes, capturing screens, and loading one application from within another—all capabilities TSRs frequently need. *Alpha RPL* commands range from those needed for high-level chores such as creating a pop-up menu to those for low-level accessing of CPU registers.

Alpha RPL provides an editor with a built-in syntax parser; an interactive debugger; a collection of programs and subroutines; and on-line help. An application program interface allows programs written in other languages to control *Alpha RPL* and *Alpha RPL* programs. The user interface is an *Alpha RPL* program itself and can be altered easily with the language.

Because *Alpha RPL* is an interpreter and not a compiler, it doesn't produce COM or EXE programs that can be executed from DOS. It retails for $595; limited run-time and mainframe connectivity versions will be available for $995 each. As a TSR, the *Alpha RPL* development package uses about 40K of conventional memory. The memory it takes to run *your* programs will vary. —*Lincoln Spector*

IN BRIEF

Even nonprofessional programmers can quickly create fully functional memory-resident programs with Alpha RPL.

Alpha RPL
Alpha Software
One North Ave.
Burlington, MA 01803
617/229-2924,
617/272-4876 (fax)
Reader service no. 652

Unfortunately, everyone working with your company's data may not be working with your company.

An unsecured PC is an open invitation to trouble. A competitor could steal your most sensitive information. Or a well-meaning employee could accidentally alter or delete important data or leave a virus behind. That's why you need DiskLock.™

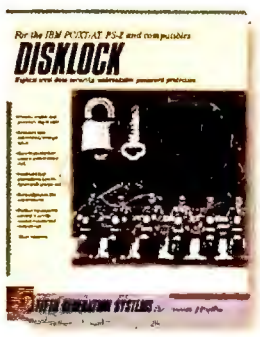
DiskLock doesn't let anyone into your system without entering your password. It automatically locks your drive when you turn off your computer, and you can set it to lock when your PC has been idle for a time you've specified.

And when it locks, it locks. DiskLock lets you choose from three levels of security, including the government standard, DES encryption. That's serious protection.

DiskLock works transparently, so you can work without interruption. You can lock only your drive, or you can lock your drive and individual directories or files. And it automatically records unsuccessful entry attempts.

You won't find better protection for your sensitive data.

To find out more about DiskLock, call 1-800-873-4384. Buy DiskLock now and get a free locking diskette box. Just write "lock box" on the registration card and return it. This is a limited-time offer, so secure one today.



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Technical Support: (504) 291-7283

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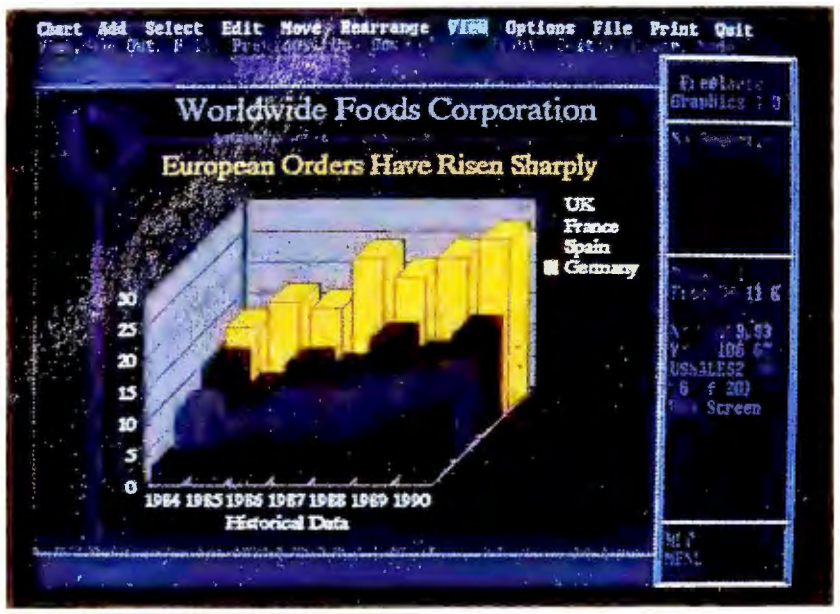
Freelance Graphics for DOS Release 4.0

Freelance Gets Around DOS Limitations



Freelance Graphics gets around DOS's limitations better than most, and longtime users will feel at home with the program's menu bar.

Let's face it: You want your presentation graphics package to let you design like Leonardo, spend like Scrooge, and look like Superman or Wonder Woman. Release 4.0 of Lotus's *Freelance Graphics for DOS* won't transform you, and it doesn't provide the kind of flexibility and direct control over desktop presentations that some *Windows* packages do. But this new release circumvents DOS's constraints to deliver features unique to its class—more integrated presentation management, a high-powered outliner, and WYSIWYG display.

Unlike *Windows* programs, *Freelance Graphics for DOS* saves each of your slides as a separate file, but now it lets you manage the files better as a unified presentation for printing, previewing, or other organizational tasks such as sharing files between presentations. You can set global defaults for graph type, fonts, dingbats, and the like during the creation of a presentation, although post-production editing is on a file-by-file basis.

If you're an established user of *Freelance Graphics for DOS* release 3.01 or of *1-2-3*, you'll feel right at home with the *1-2-3*-like menu bar. You also can use a mouse to resize text and graphics, including 3-D charts that show how multiple sets of data change over time.

Color is somewhat restricted: The product's palette has only 12 primary colors with no gradients. But you can choose any of 90 preset backgrounds from the symbol library and use them in the entire presentation or in any single graphic. You can create hot links between your charts and *1-2-3*, *dBASE*, and ASCII data files, and *Freelance Graphics* will automatically recompose charts as data is updated.

Lotus also gets around DOS by giving you a free customized version of Symantec's *GrandView 2.0*. Select this 20K add-in from the menu, build the outline of your presentation, and the outline will automatically be converted into a series of text charts when you return to *Freelance Graphics*.

One pleasant surprise: What you see on your monitor are the actual colors, gray shades, and fonts that you'll see in your output. Choose HP LaserJet output, and you can work with black, white and gray scales on the screen. If your presentation is destined for slides, you can feel confident that you'll see corresponding colors and typefaces on your VGA monitor. The package comes with Dutch and Swiss Bitstream Speedo fonts.

Freelance Graphics requires DOS 3.0 or a later version, 640K, and a hard disk; it can be a tight fit on a net. The stand-alone version is $495; a network server version is $695, with each node $395. Users of other charting or presentation packages get *Freelance for DOS* for $99 until October.
—Bronwyn Fryer

IN BRIEF

Freelance Graphics for DOS Release 4.0
This leading DOS contender delivers an outliner, more integrated presentations, and WYSIWYG output.
Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
800/343-5414
Reader service no. 651

Professor Windows

Windows Walk-Through Is a Stroll

For all its heralded ease of use, you may find that *Windows 3.0* has some little secrets. And some big ones. That's where *Professor Windows* comes in —the $49.95 training program will walk you through the world of *Windows* quickly and efficiently.

Professor Windows teaches you tasks from within the *Windows* environment. It installs itself right into *Windows 3.0;* simply double-click on the icon in the Program Manager window, and the lesson begins.

You learn about *Windows* by pulling down menus, clicking on icons, and learning definitions of key words and phrases through italicized "hot words," which open up and brief you on the features and benefits of the item with which you're working. More than 1000 instructional screens teach you everything from how to use a mouse to how to install *Windows* on a network.

You can wander, or you can highlight topics on the main tutorial menu—like Program Manager and Advanced Concepts. Spend as long as you like on a lesson, and get only as involved as you want in the various fill-in-the-blank, pop-up–definition, and quick tests. *Professor Windows* checks off the sections you've completed, so that the next time you enter the program, you'll have a full record of what's left to do.
—Cathy Smith

IN BRIEF

Professor Windows
A self-guided tour of Windows 3.0 lets you fill in the gaps in your understanding at your own pace.
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Introducing Fastback Plus 3.0

Users will automatically like it.

You should like it; after all, your suggestions helped design it. But we didn't stop there. After we made improvements you asked for, like a new windows-style interface, we added plenty of others.

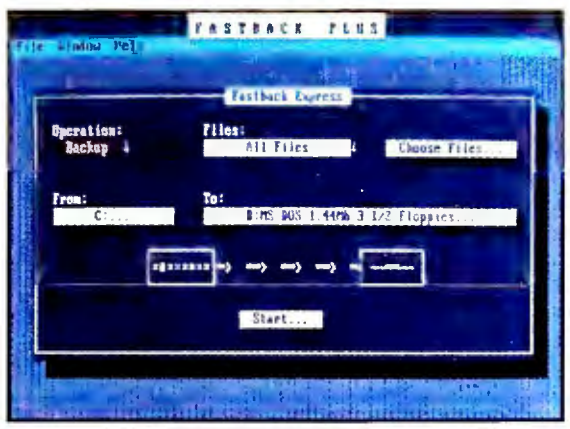
- An archiving feature that erases unwanted files after backup
- Faster backups and restores: up to 10 mb/minute on some PCs (up to 3mb/minute on an average AT)
- Increased data compression to a full 80 percent, 15% more than version 2.1
- Appending incremental backups
- dBase III-compatible history file database lets you search for and restore specific files
- Backup support for "Bindery and Trustee" files on Novell Netware 286/386

And like all Fifth Generation products, Fastback Plus 3.0 is automatically covered by a one-year, money-back guarantee. Upgrade now for only $49 and get FREE overnight delivery*. Just mail or fax the attached reply card with your payment to the address or fax number below. Or call us toll-free. This offer is limited to Fastback or Fastback Plus users with a valid program serial number.

The rest of you will like it because it's automatic.

If you're not backing up regularly, you either don't have the right backup program, or you don't have one at all. Fastback Plus 3.0 solves both problems with an entire program full of time and effort-saving features that make backing up so automatic, you can literally do it in your sleep.

- Scheduler and macro recorder for fully-automated, unattended backups
- Macro editor in plain English instead of DOS commands
- Optional password protection with DES file encryption capability
- New easy-to-use, windows-style interface with Express Menu
- Advanced error correction for recovering data from damaged disks



The new fast, simple Express Menu.

And these are just a few of Fastback Plus 3.0's new features. Now more than ever, there's really no excuse not to back up your data. Because if you don't want to do it, this program will do it for you. Automatically. For more about Fastback Plus 3.0, call the toll-free number below.

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(504) 291-7221 Fax: (504) 291-5453

*U.S. destinations only. Fastback Plus 3.0 will not restore backups made with versions 2.09 or earlier.
dBase III and Novell Netware are the respective trademarks of Ashton-Tate, Inc. and Novell, Inc.

Circle 71 on reader service card

On Target

Project Management in Plain English

Few managers have time to master the strict methodology and confusing jargon of project management. So even when a big project comes along, they still put their faith in a spreadsheet and a personal scheduler. However, neither of these applications is suited for setting up and tracking numerous interrelated tasks. Now, *Windows*-based *On Target* provides simplified, scheduling-oriented project management without jargon.

Like its popular cousin, *Time Line*, the $399 *On Target* tries to lure the casual user into project management with an approachable feature set and slick-looking reports. And thanks to *Windows*, *On Target* goes where *Time Line* has been unable to go, offering a fluid multiple-view screen that lets you interactively play out various scenarios. Select common functions from a ribbon bar full of icons, and use the mouse to stretch and link tasks and connect them to resources. A variety of reports offer font scaling and full control of text formats and color.

On Target includes *Time Line 4.0*'s Quick Start (a simplified outline/spreadsheet view) and Schedule Assistant (an extensive help system of prompts and suggestions). Quick Start lets you get your project moving by picking one of ten typical project templates ranging from a software product rollout to a business plan. If you run into any logical conflicts as you build your project, the Schedule Assistant pops up with recommendations.

Plain English terms help you feel at home. The intimidating *network logic diagram* becomes a "work flow chart," and the daunting *Gantt chart* is demystified as a "time table." Unlike most project packages, *On Target* offers a monthly wall-calendar view that you can print out with shading and multiple fonts.

Under the hood, *On Target* is actually a fairly complete critical path method (CPM) project manager. It can run on a network, and it sneaks some cost and resource management features in on the side. *On Target* lacks some of *Time Line*'s extras, but it presents the scheduling features managers use most. *On Target* requires *Windows 3.0*, DOS 3.0 or a later version, and 2MB of disk space. —*Mark Burgess*

IN BRIEF

On Target
This entry-level program swaps project management jargon for *Windows*' graphical approach, scheduling help, and rich reports.

Symantec
10201 Torre Ave.
Cupertino, CA
95014-2132
800/441-7234,
408/252-4694 (fax)
Reader service no. 649

HP LaserJet Fax

If You've Got the Money, They've Got Better Fax Quality

This peripheral turns your HP LaserJet into a fax machine; you get 300-dpi fax output without sacrificing the utility of your printer.

Trying to read fine detail or penciled notes on a fax is like looking through a glass darkly. The HP LaserJet Fax can bring LaserJet quality to your fax output—but at a price.

This $1895 accessory connects to all HP LaserJet printers, letting them double as high-quality fax machines for sending and receiving hard copy. Instead of those often-muddy, 200-dpi messages on funny-feeling paper, you get always-legible text and graphics over the wire at the LaserJet's 300-dpi resolution and on a wide range of stock.

The unit also has capabilities similar to a fax board's, letting you send files directly from your PC, but without the need for a scanner when you want to send hard copy. The hitch is, like many $500 fax boards, it can only transmit its highest-quality documents between two like devices. Then the LaserJet Fax supports formatting and graphics from TIFF, ASCII, and PCX files as well as PCL4 fonts.

But even with one HP LaserJet Fax, you can receive transmissions from a standard Group III fax or PC-based fax board at 200 dpi and get nicer paper and better-looking output than from thermal fax machines.

It won't compromise the printer's traditional role. If the printer is busy while receiving a fax, the HP fax unit can store about 13 pages of incoming fax (it has a 5-page document feeder). If you want to keep more than 13 pages of fax in memory at once, you'll need to spend another $230 for the optional 1MB board, which allows you to store a fax as long as 60 pages.

Unfortunately, LaserJet Fax software won't let you send a fax from within another DOS application, and it buffers only incoming, not outgoing, faxes, so your PC is frozen while sending. Finally, it can't be shared across a network, and remember, to take full advantage of this product, you'll want at least two for your different offices. Quality costs. —*Bronwyn Fryer*

IN BRIEF

HP LaserJet Fax
This HP LaserJet accessory brings high-quality text and graphics to your faxes, but at a price.

Hewlett-Packard
19310 Pruneridge Ave.
Cupertino, CA 95014
800/752-0900
Reader service no. 648

DOS

stroke stroke stroke
stroke stroke stroke
stroke stroke stroke
stroke stroke stroke
stroke stroke stroke
stroke stroke stroke

Direct Access®

stroke

Here's a hardworking menu program that really lowers your handicap.

Getting into the programs on your hard disk with DOS commands can take longer than a foursome full of beginners. You should be using Direct Access.

All you do is load it and forget it. Direct Access lines up every program on a menu and lets you create custom sub-menus for related programs and other applications.

It's simple.

And it's complete. With features like user-defined screen blanking, password protection, three-level virus detection, mouse support and a unique feature that automatically tracks all time spent on your programs.

A network version is also available. You can even customize the menu with your company logo.

The choice is easy. Keep stroking away with DOS commands. Or play through to your programs with Direct Access.

Call now for complete details, volume discounts and your nearest Direct Access dealer. For a limited time, get Pyro!,™ The Entertaining Screen Saver for the PC, free! Just write "Pyro" on the Direct Access registration card before you return it.

PC Magazine Editor's Choice

Fifth Generation Systems, Inc., 10049 N. Reiger Rd., Baton Rouge, LA 70809 Sales Number (800) 388-0362 Technical Support (504) 291-9953

Circle 70 on reader service card

ToolBook 1.5

Programming Tool Gets Up to Speed

Improvements under the hood let ToolBook and its bundled programs like DateBook write to screen more quickly.

Several *HyperCard*-like environments for *Windows 3.0* have appeared on the scene, but Asymetrix's *ToolBook* has enjoyed the most success. Most users, though, make the same complaint: Even by *Windows* standards, the program is *slow.*

Version 1.5 is a double-barrelled upgrade aimed at *ToolBook* performance and programming aids. Asymetrix has improved the search algorithm as well as the graphics display by drawing images on screen as they are created and storing bit maps directly in hypertext files, where they can be accessed quickly. Beta copies indicate some searches are 28 times faster than they were in version 1.0.

In addition to optimizing their own code, the folks at Asymetrix help you optimize yours with new documentation that includes tips for writing faster programs (did you know that straight lines are displayed faster than curves?).

Other new development tools include context-sensitive help for the programming language, a utility for creating dialog boxes, a list-box object, and an application for building presentations. The separately sold *Author's Resource Kit (ARK)* contains royalty-free run times for *Windows* and OS/2 Presentation Manager, as well as a utility that strips your original source code out of your scripts so you can distribute applications without giving away your trade secrets.

Among other improvements, several graphic formats can be imported directly (including *Windows* metafiles, EPS, and TIFF) although PCX must still come through the Clipboard. And RAM no longer restricts the size of graphic images: Import any image of up to 256 colors that fits on a 14-by-14-inch page.

Even *ToolBook*'s date-book program has been improved. Now it's modular, so instead of having to give it almost your whole screen, you can put up portions in windows against your wallpaper. The date book, with the *ToolBook 1.5* run time, will be available to registered *Windows* users for $10.

ToolBook 1.5 requires *Windows 3.*x and 1.5MB of RAM; 2MB is recommended. The package retails for $395; upgrades from version 1.0 are $75, and the *ARK* retails for $450. —*Lincoln Spector*

IN BRIEF

ToolBook 1.5
Faster graphic displays and more object-oriented programming tips help you build your own Windows applications.
Asymetrix
110 110th Ave. NE #717
Bellevue, WA 98004
800/624-8999,
206/455-3071 (fax)
Reader service no. 650

Macola Accounting Software 5.0

New Interface Heads List of Accountable Improvements

Sporting a new pulldown-menu interface with streamlined commands, version 5.0 of *Macola Accounting Software* is geared toward simplifying the accounting system and making it more customizable.

Macola's old command structure is replaced by a menu grouping that makes access to key functions easier and more straightforward. Each of the opening screens is customizable, and you can whittle menu choices down to only the functions a given user needs.

Version 5.0 supports full-screen editing, and user-defined keyboard macros to speed routine tasks. Note fields have been added to several modules that needed them, and pulldown windows can add explanatory or supporting information in the accounts receivable customer file, the accounts payable vendor file, the inventory management item file, and the employee payroll file.

In the general ledger, the account code field maximum has increased to 15 characters. Also new is support for unlimited budget revisions and prior year comparatives.

Graphing capabilities have been incorporated into several critical modules so you can create bar, column, line, and pie charts for a quick look at financial data. Unfortunately, your graphs are limited to a no-print on-screen display.

Individual modules continue to sell for $795, except for the $895 distribution and $1595 manufacturing modules. Network multiuser systems require the $595 System Manager module. Upgrades from prior versions cost $125 per module. *Macola Accounting Software* version 5.0 requires DOS 3.3 or a later version, 640K of RAM, and a hard disk. —*Roberta Furger*

IN BRIEF

Macola Accounting Software 5.0
A more customizable interface makes the enhancements to every module of this accounting package easier to use.
Macola Inc.
333 E. Center St.
Marion, OH
43301-0485
800/468-0834 ext. 300,
614/382-0239 (fax)
Reader service no. 656

Until now, sharing a printer could cause excessive wear on some of your equipment.

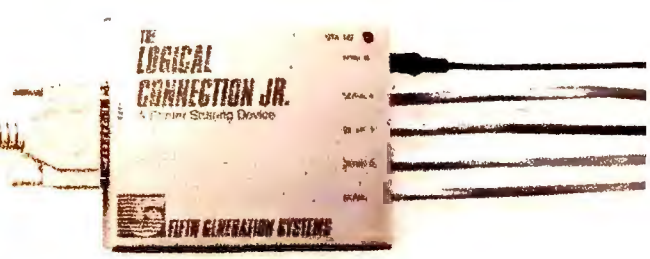
If you're on a sneaker network running between several PCs and one printer, your patience and productivity—among other things—are probably wearing a little thin.

And it could be worse. Major manufacturers report that you may actually damage your laser printer if you use a mechanical switchbox. But now there's The Logical Connection Jr.™

The Logical Connection Jr. safely connects four PCs to a single parallel printer using easy-to-install phone wires.

Working entirely with its own memory, it manages all incoming print jobs simultaneously in the background, freeing your PCs for business while it prints jobs in the order received. And although it runs beautifully without any software, it comes with a powerful utility program that maximizes printing speed. And it does all that for less than $60 per PC.

To find out more about The Logical Connection Jr., call 1-800-388-0362. Buy it, and we'll foot the bill for a free copy of Mace Performance,™ the $69 hard disk optimizer. Just write "sneaker network" on the registration card and return it to us. This is a limited-time offer, so step on it.



Fifth Generation Systems, Inc.
10049 N. Reiger Road, Baton Rouge, LA 70809
Technical Support: (504) 291-7283

Circle 235 on reader service card

TranScribe 300

Scanning Words for Fewer Dollars

Buying a scanner for text recognition tends to put a strain on your budget or your patience. Either you spend thousands on a flatbed scanner and commercial text-recognition program, or you buy a handheld scanner and scan in text half a page at a time, hoping the text comes together correctly. But Abaton's TranScribe 300 flatbed scanner sells for a reasonable $1095, and it can handle office correspondence at a single pass.

The TranScribe scanner is driven by *OmniType*, a *Windows*-based program using the same character-recognition engine as Caere Corporation's banner text-recognition program, *OmniPage*. *OmniType* lacks support for Caere add-ons such as the spelling checker *OmniSpell*. But it does retain *OmniPage*'s lauded speed and accuracy in recognizing any font.

Before you scan, you select a resolution between 72 and 300 dpi, and *OmniType* saves both scanned text and graphics in TIFF format. Once the recognition engine views a scanned image, it can recognize and reproduce regular, underlined, italic, and bold fonts in sizes between 6 and 72 points, highlighting blocks of text for transfer to ASCII or to more than 20 popular file formats, including spreadsheets and data bases. Columns, landscape and portrait orientation, and multipage documents pose no problem.

Not everything is perfect with the setup, however. The software requires a hefty 4MB of RAM—about twice what you need for a minimal *Windows* configuration. It doesn't write or recognize files in PCX, DCX, or proprietary fax formats like its sister program *OmniPage*. Also, the scanner itself is limited to an A4 page size that's only slightly larger than the standard U.S. letter's 8½-by-11 inches. That rules out character recognition on legal documents.

But there's a cunning workaround for this last limitation: With a $495 sheet-feeder, the TranScribe 300 can process larger legal-sized pages. Configured with this optional feeder, it can also process up to 20 pages at a sitting while you're working in another window or taking lunch. For a total of $1600, that's not a bad deal. —*Matthew Lake*

IN BRIEF

TranScribe 300
This text-recognition scanning system combines a low-cost flatbed scanner with Windows character recognition software.

Abaton
48431 Milmont Dr.
Fremont, CA 94538
800/444-5321,
415/683-2226
Reader service no. 655

This desktop unit lets you scan in text and graphics for about half the price of many similarly configured flatbed scanners.

Crystal Accounting, M.Y.O.B.

Low-End Accounting Does Windows

Can *Windows 3.0* simplify accounting for the nonaccountant in a small business? Peachtree Software and Teleware say that their integrated accounting packages, *Crystal Accounting* and *M.Y.O.B.*, prove that it can.

The $495 *Crystal Accounting*, a slightly revamped version of *Bookkeeping by Design* from Accounting by Design, includes six basic accounting modules—general ledger, accounts receivable, accounts payable, invoicing, payroll, and financial reporting. All are networkable out of the box. The number of transactions, customers, vendors, employees, companies, and cash accounts is limited only by the amount of available hard disk space.

Crystal Accounting supports DDE hot links to other *Windows* packages, so a general ledger file can be updated automatically when a two-way link is established with an *Excel 3.0* worksheet or graph. Despite the *Windows* interface, *Crystal Accounting* retains much of the look and feel of traditional DOS-based programs.

M.Y.O.B., a *Windows* remake of Teleware's Macintosh product, takes a different approach: It employs a flowchart metaphor to help you navigate its functions. Although not modular in design, *M.Y.O.B.* includes most standard accounting functions—general ledger, accounts receivable, accounts payable, and inventory—and adds checkbook, card file, and administration functions.

The $249 program allows you to bring in images from other *Windows* packages for sprucing up forms and invoices, but support for hot links to other *Windows* applications must await a future release, as must network multiuser support.

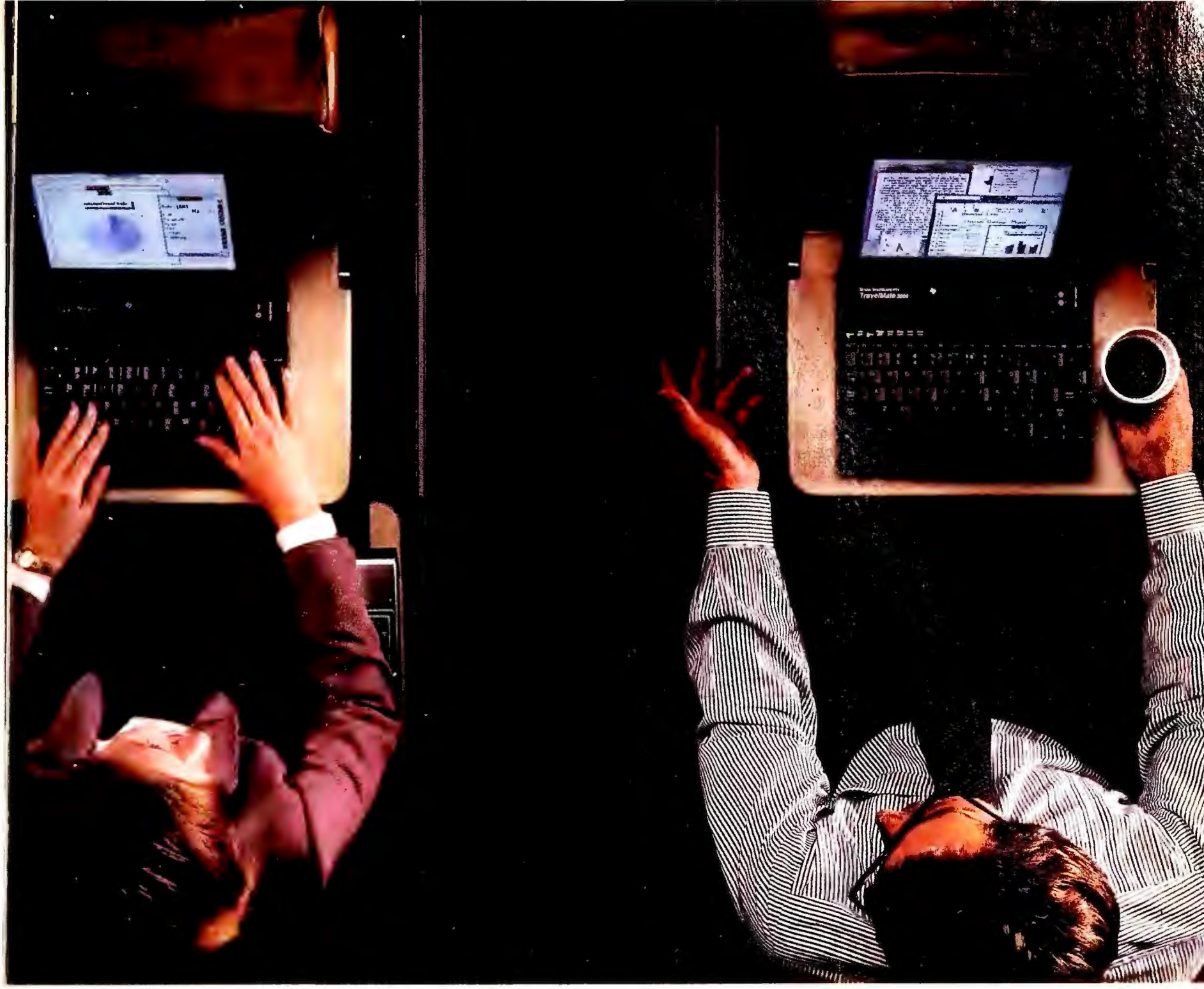
Both *Windows 3.0* programs require at least a 286, a hard disk, 2MB of RAM, and EGA graphics. —*Roberta Furger*

IN BRIEF

Crystal Accounting, M.Y.O.B.
Peachtree Software's modular *Crystal Accounting* program lets you set up hot links to other *Windows* applications, while the flowchart approach of Teleware's *M.Y.O.B* package helps simplify functions.

Peachtree Software
1505 Pavillion Pl.
Norcross, GA 30093
800/247-3224
Reader service no. 658

Teleware
300 Roundhill Dr.
Rockaway, NJ 07866
800/322-6962,
201/586-2200 (fax)
Reader service no. 659



The TI TravelMates. They're making a hit coast to coast.

The new look of power.

Editors across the country are praising the performance, size and weight of the Texas Instruments TravelMate™ 2000 and 3000 notebook computers.

"The TravelMate is as close as you can get to the ultimate portable." – *BYTE*, November 1990.

"Now TI assumes the lead in performance/pound/price measure of a notebook."– *PC Magazine*, December 11, 1990.*

"Not until you hold this computer in your hands do you begin to understand what sets it apart from the pack."– *PC Computing*, December 1990.**

Both TravelMate models are only 8½" x 11" in size, including a hard disk drive, and feature a 10" diagonal VGA display and comfortable full-function keyboard.

With the TM 2000 you get 286™ processing in a computer that's 1.4" thin and 4.4 lbs. light. The TM 3000, meanwhile, packs 20MHz 386™SX power into a mere 1.8" and 5.7 lbs.

Find out how to take the new look of power with you coast to coast. Or wherever your work takes you.

For the name of the dealer nearest you, call 1-800-527-3500.

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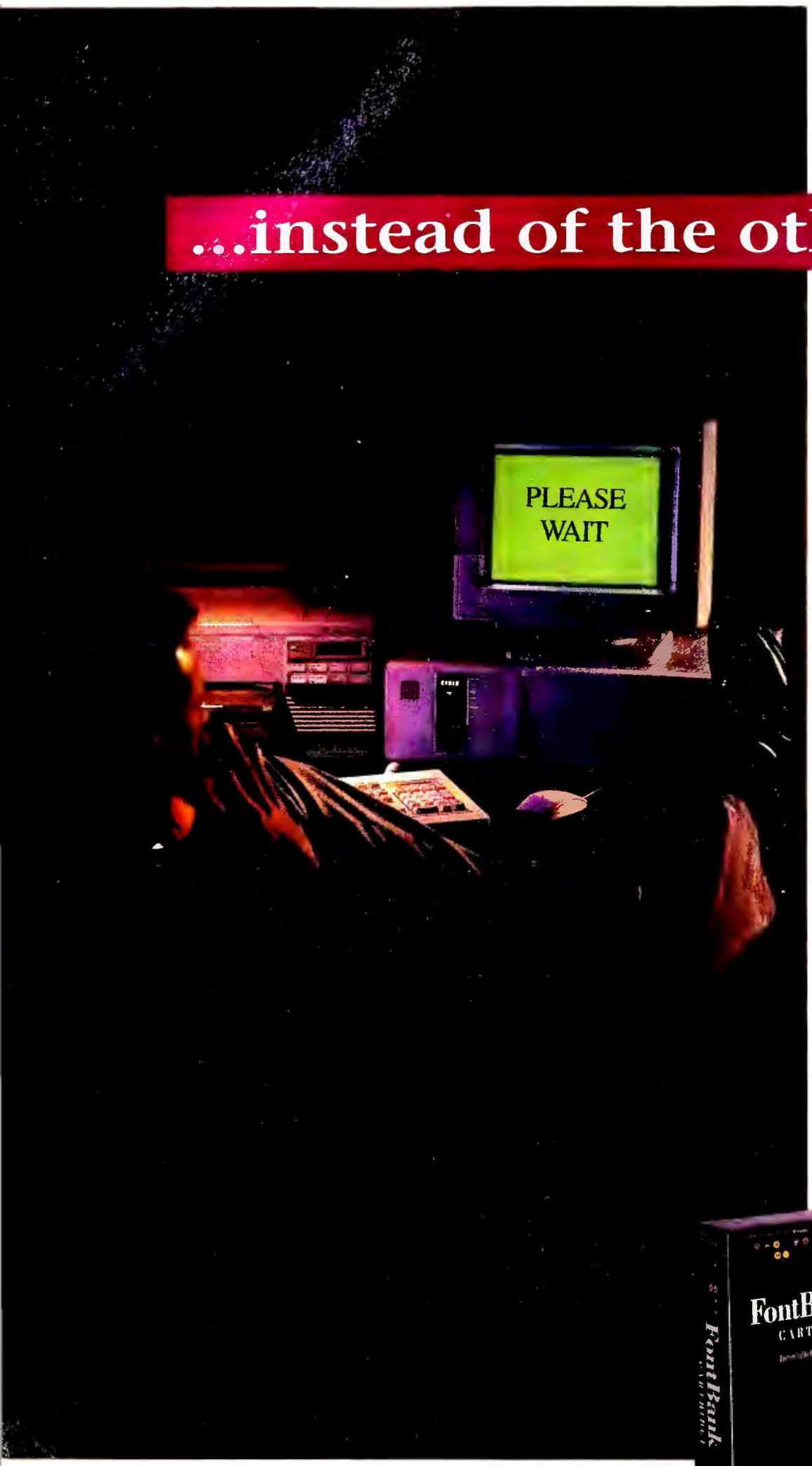
be ready and waiting for you.



A yawn. . . . A long, heavy sigh. Once
again you're ready to print but your soft f
aren't. Because somewhere in the realm
between your computer and LaserJet® prin
they're slowly downloading. So you wait.

...instead of the other way around

At Pacific Data Products we know that
there's only one way to get soft fonts that
easy to use and don't require downloadin
by storing them in a special type of printe
cartridge. That's why we've created the
FontBank Cartridge™ for the HP LaserJet
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The **FontBank Cartridge** contains a br
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one printer and put it in another without
losing fonts. So once you've downloaded
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gram, you'll never need to download agai
And you'll know exactly which fonts are
residing at your printer. No more guessin
No more surprises. Even after the cartridg
has been programmed it's easy to add or
delete fonts as often as you wish.

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LaserJet III, IIID, or IIIP printer you can us
PCL5 scalable fonts. And, we've included
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waiting for you, call your nearest de
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FAX (619) 552-0889.

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UPDATE

New Versions of Your Favorite Products

MapInfo for Windows

This mapping leader's Windows version lets you open a window on dBASE or SQL data or a 1-2-3 or Excel spreadsheet.

Mapping software leader *MapInfo* has gone *Windows* and added filters that let it read popular spreadsheet and data base formats directly without time- or disk-consuming conversion processes. You also can tinker with your *dBASE*, *1-2-3*, *Excel*, ASCII, or even SQL data in one window and see your data selections mapped and remapped in another. The basic $995 program comes with a library of county and state maps, broad ZIP code recognition, state demographic information, and sample street maps. Street maps for counties across the U.S. and beyond are $225 apiece. MapInfo Corp., 200 Broadway, Troy, NY 12180; 800/327-8627, 518/274-0510 (fax).

Reader service no. 660

WordStar Laptop Collection

W*ordStar Laptop Collection* gives you $700 worth of laptop software for $295. Included is a slimmed-down version of *WordStar 6.0* that sacrifices its outliner, graphics, and file conversion modules but includes mail merge, communications, a spelling checker, a thesaurus, comprehensive printer support, and font options. A quick-start disk runs a superslim *WordStar* from a 720KB floppy and 384K of RAM. You also get Campbell Services' *On-Time* calendar/scheduler/to-do list and a trimmed-down version of Traveling Software's *LapLink Special Edition* for laptop-to-desktop file transfers at 115,000 baud (although the cable is not included). *Collection* is available to registered *WordStar* users for $89. WordStar International; 201 Alameda del Prado, Novato, CA 94949; 800/227-5609, 415/883-1629 (fax).

Reader service no. 664

LaserJet IID PCL 5 Upgrade

Now an HP PCL 5 upgrade can turn your LaserJet IID into the equivalent of a LaserJet IIID. The $995 upgrade boosts IID memory to 1MB and provides two memory slots compatible with 1MB and 2MB memory boards (you lose the use of IID memory accessories). You get PCL 5 with Intellifont on-the-fly font-scaling technology, built-in HP-GL/2 vector graphics processing, and HP's exclusive Resolution Enhancement, which makes letters print more clearly. Hewlett-Packard; 1030 N.E. Circle Blvd., Corvallis, OR 97330-4239; 503/750-3850.

Reader service no. 661

ProKey Plus Release 5.1

P*roKey Plus 5.1* adds several capabilities to this longtime macro processing leader, including the ability to launch unattended activities on your PC at regularly scheduled intervals. *ProKey Plus* recognizes more time and date formats, and this character-based program can now display its menus over graphical user interfaces. Upgrades to the $129 program are available for $20 from version 5.0 and $60 from earlier versions. RoseSoft, Inc., P.O. Box 70337, Bellevue, WA 98007; 206/562-0225, 206/562-9846 (fax).

Reader service no. 665

Paradox Engine 2.0, Paradox SQL Link 1.1

P*aradox Engine 2.0* has significantly broadened its horizons and its support of development tools to include not only C but also C++, Pascal, and *Windows* Dynamic Link Libraries. The addition of the last means you can work in any *Windows* development environment and your applications can still link to *Paradox* and enjoy its query-by-example (QBE) interface. Similarly, version 1 of *Paradox SQL Link* adds support for *Sybase SQL Server* to a list that already includes Microsoft's *SQL Server*, *IBM OS/2 Extended Edition*, and *Oracle Server*. Each product retails for $495, and *SQL Link* requires *Paradox*. Borland Int'l, 1800 Green Hills Rd., Scotts Valley, CA 95067; 800/331-0877, 408/439-8088 (fax).

Reader service no. 663

SQZ 2.0

S*QZ 2.0* lets users of *1-2-3 2.2* and *3.*x take full advantage of this popular file-compression utility. *SQZ*-compressed file shrinkage varies, but on the average you can expect worksheets to squeeze into about a third of the usual space. Once you activate the utility, its operations are transparent, except for a slight slowdown when retrieving and saving. A handy stand-alone decompression utility can be copied and sent off with any squeezed files to non-*SQZ* users. Upgrades to the $99 program cost $39. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014-2132; 800/441-7234, 408/253-9600, 408/252-4694 (fax).

Reader service no. 662

For more information about any product, contact the manufacturer or circle the number on the reader service card.

Turn Your PC into a Fax Machine!

Send, Receive and Re-route Faxes — Even Remotely!

Your PC is the perfect fax machine: it connects to a modem, it has powerful printing capabilities and contains plenty of storage space. It allows you to use software that automatically transmits faxes at a certain time, or even to send faxes from a remote computer, like your client's office (fax yourself the report you forgot to bring!). Your PC's print drivers allow you to send crisp, clean facsimile documents right from your desktop or laptop PC. You could preview the document, change fonts, add special effects, transmit at 9600 bps and more. Of course, using your PC would make it much easier to manage and archive your faxed communications. And, using your laser or dot-matrix printer, you can receive faxes ON PLAIN PAPER. All you need is the compact, affordable little board known as Fax96.

Tiger presents the price-busting fax board that has swept the industry, and captured *PC MAGAZINE's* "Editor's Choice" with its flawless reliability record. And Fax96 is fully Group 3 compatible. No other fax board can match Fax96's incredible 99.91% error-free transmission rating. In speed tests, using identical documents, Fax96 delivered a finished facsimile over fourteen seconds ahead of the nearest finisher. Fax96 is fast, because it doesn't have to scan documents before transmitting, so your faxes cost significantly less. And "scanless" document imaging eliminates dirt and transmission "noise" that translate to dots, lines and patterns on the finished fax.

Send, receive, print and manage your faxes — quickly and easily with the award-winning Fax96.

Features:

- Full 9600 BPS Group III compatibility
- Background Receive operation.
- Automatic Transmittal Sheet generation.
- Automatic Redial.
- Automatic Log of sent and received messages
- Compatible with laser and dot-matrix printers.
- Shares your existing phone line.
- Remote control for sending faxes.

Direct Scanner Control.

With your scanner, Fax96 will directly control the scanner and send the image as a fax. Fax96 supports all the popular scanners. If you want to use your own scanner program, simply save the image as a .TIF or .PCX file, then send it from Fax96.

Share One Phone Line.

Don't install another phone line for your fax. Save money with advanced "1-Liner" faxboard. 1-Liner shares your existing phone line, meaning it will automatically recognize and answer another fax machine, or pass a regular voice call to your telephone answering machine.

Fax It Fancy.

Big letters, small letter, in the typeface of this paragraph, or maybe the typeface used in the headline — you can fax fancy with "Faxography" software. Really create an effect at the other end with professional and impressive faxes.

FRECOM

Fax96

HQ6240 **Fax96 board w/software**	**$195.00**
HQ6250 **1-Liner board w/software**	**$295.00**
HQ6260 **Faxography Software**	**$99.00**

PC, MS-DOS 2.1 or higher, 512 KB RAM, hard disk.

If You Bill Your Time

Easily Prevent Billable Time from "Slipping through the Cracks."

Do you know which jobs are the most profitable and which ones are a complete waste of time? Do you know which clients have outstanding accounts receivable? Are you billing all of the time you're entitled to or do billable hours "slip through the cracks?" For people who bill for their time, tracking it may be the toughest job of all. Many professionals, including architects, law firms, designers, CPAs, ad agencies, engineers, repair services, project managers and others are turning to the software system designed specifically to calculate and report all time spent on each job.

Timeslips® III is fast, easy, flexible time and expense recording along with a complete set of financial and productivity analysis tools. It's so simple to use, it practically runs itself, and features a pop-up timer function that can be accessed anytime — from within any application.

Different clients require different bills. With Timeslips III you have the power of custom billing.

- Have a client on the phone? Press *TSTimer's* hot key to track time and jot down notes.
- Returning from a business trip? Just type in your expenses.
- Spend hours writing an analysis? Tell *Timeslips III* who is paying for it.
- Want to manipulate your *Timeslips III* data? Export it to Lotus 1-2-3 or word processors.
- Need to know who's billing the most hours this month? *Timeslips III* knows.

The Time and Billing Software of Choice.

Timeslips III lets you record, analyze, and bill both time and expenses with ease and complete accuracy. In fact, many customers report up to a 25% increase in billable time once they have installed Timeslips III.

Track 250 activities, for as many as 250 people, working on 128 projects per client — with a maximum of 3,400 clients.

- Detail services by activity, expense, project, or matter with complete descriptions.
- Automate your invoice preparation with convenient macros.
- Include several types of flat fees, such as absolute, minimum, maximum or base.
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- Include dates, previous balances, aged receivables, employee initials, customized messages on your bills.

FREE BONUS!

Timeslips III Speller™ — FREE!

Prevent Spelling Errors in Bills and Reports.

TSSpeller is an electronic spell-checker tailored specifically for use with *Timeslips III* time/expense-tracking and billing software. Depending on how you choose to work with it, *TSSpeller* can:

- monitor your keystrokes and report an apparent spelling error or "typo" immediately;
- check a field/block of text after entering it;
- scan all your slips (or a subset) before printing.

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HQ3300-5 **Timeslips III** 5¼"	**$239.95**
HQ3300-3 **Timeslips III** 3½"	**$239.95**
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IBM PC, XT, AT, PS/2, compatibles with 384K.

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t's easy to see why FormTool is the best-selling forms package in the world. It's the fastest, asiest way to create, edit, manage and print cus-om forms for immediate information gathering.

The ability to quickly gather data and put it to ork is critical to corporate information flow. ormTool's "Intelligent Line Drawing" and its ardware compatibility make it an indispensable ol for businesses of any size. That's why Form-ool has found a home in well over half of the For-ne 500 list, along with thousands of educational stitutions, government agencies, hospitals and nancial organizations around the world. They've iscovered FormTool's productive power.

Unlike its competitors, FormTool doesn't re-uire additional memory, a graphics card, color isplay, mouse or scanner. It runs beautifully on nything from an XT to a 486. FormTool now sup-orts hundreds of dot-matrix, letter-quality, daisy-heel, thermal as well as Hewlett-Packard rinters, and new support for PostScript lasers.

Draw Forms Fast.

FormTool streamlines the PC's ability to draw orms. Lines of any weight, boxes of any size, grids f any complexity and more can be quickly drawn vith just a few keystrokes. If a grid isn't quite ight, one keystroke re-draws it to meet your exact pecifications, then displays it on the screen with our WYSIWYG display. Zoom in to see a close-up of our form, then zoom out for the full page view. If ou spot a problem, quickly make the revision, preview it again — then print it.

This preview capability combines the advan-ages of a graphics-based, on-screen display with ext-based, lightning-fast processing times and nakes FormTool even easier to use — enhancing reativity and accuracy in the design process.

FormTool's ability to make instant revisions to your forms gives you the flexibility to create ex-actly the proper form to meet the requirements of your work flow. And FormTool is so simple to use, it's ideal for users of any experience level.

No other forms package delivers the productive drawing power of FormTool.

Enter Text in Seconds.

To handle text, FormTool contains a forms-oriented word proc-essor that allows you to move quickly through the form inserting captions, instructions, word-wrapped text and special symbols, and characters. FormTool will enter your text into position automat-ically.

An All New Forms Manager.

And FormTool Gold contains an all new Forms Manager that makes organizing, retrieving and ar-chiving forms faster and more efficient. Includes a built-in backup and restore, the ability to instantly view forms from a list on your screen and a new set of fea-tures that allow you t o "move," "copy," or "de-l e t e" f o r m s from the F o r m s Manager.

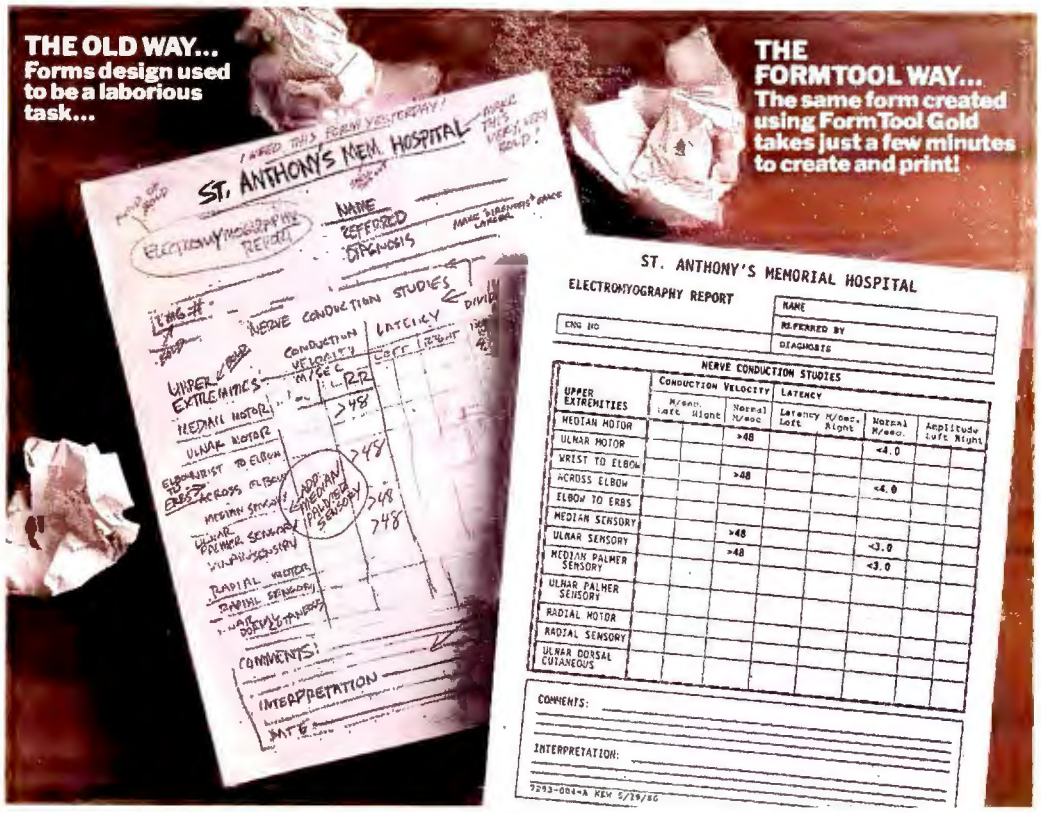
Form-T o o l ' s F o r m s Manager also in-c l u d e s hard disk directory support, allowing you to s t o r e f o r m s anywhere — or you can as-semble form sets in just seconds using the sleek new menu system. There's an all-new automatic "Backup and Restore," a new "View Form" feature — even an innovative directory system for fast, effi-cient archival.

► ***Horizontal And Vertical Line Drawing.***
All you have to do is position the cursor where you want to draw a line. Then hit one key, and FormTool will automatically draw the line.

► ***Any Type Style.***
Choose from italic, underlined, bold, bold italic, superscript, subscript and user defined styles.

► ***Large Letters.***
You can select large letters, and even oversize letters up to one inch tall.

► ***Line Width.***
Just specify single, double, or bold lines, and FormTool will draw them. You can also switch be-tween single, double and bold lines with one keystroke.



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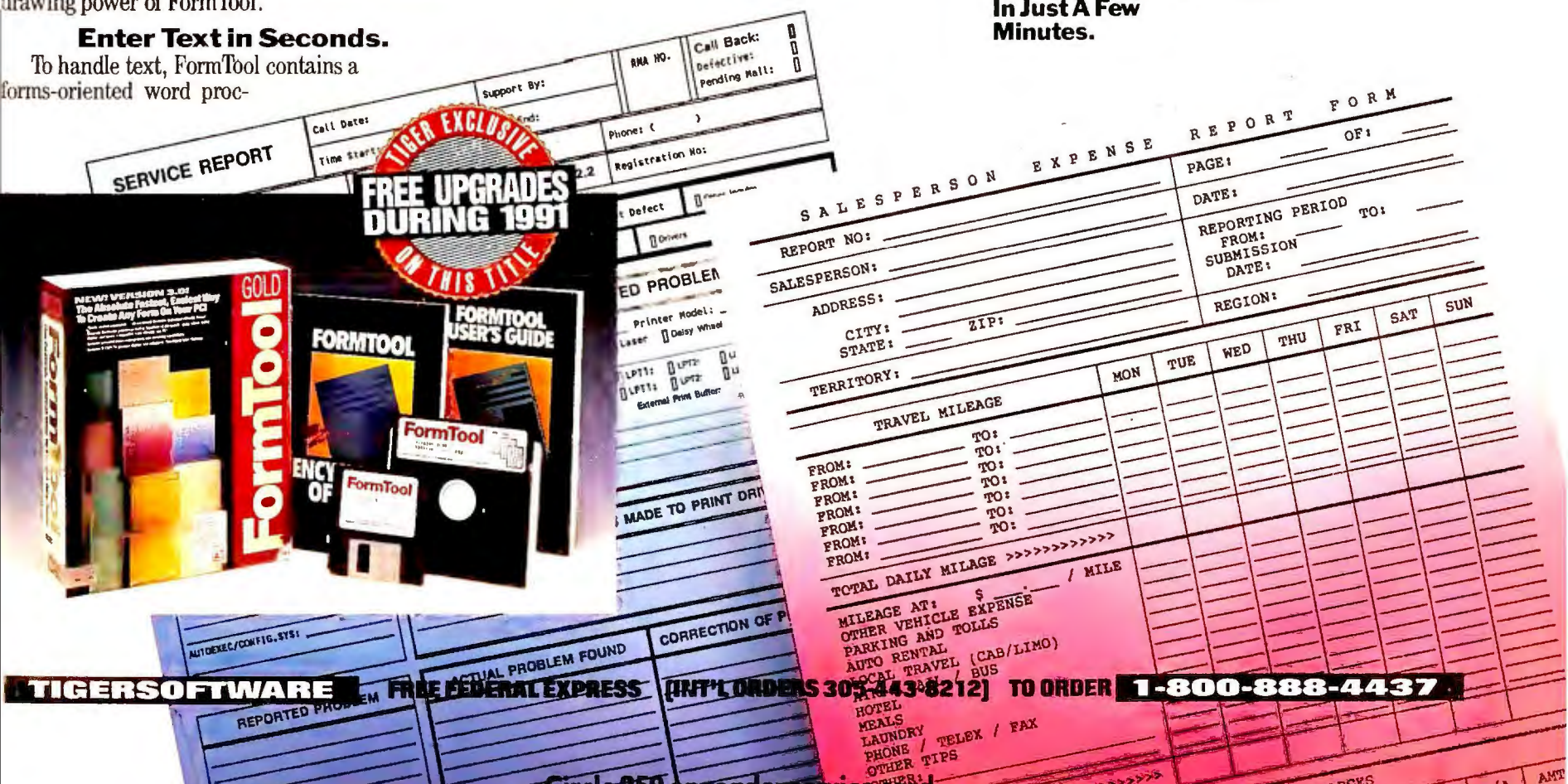
FORMTOOL GOLD

HQ1020 **FormTool 3.0** 5¼" & 3½" **$79.00**
IBM PC, XT, AT, PS/2 or compatibles with 265K. Floppy or hard disk, supports all color or monochrome monitors with or without graphics cards and virtually all dot-matrix printers, daisywheel and laser printer.

Create Forms Like These In Just A Few Minutes.



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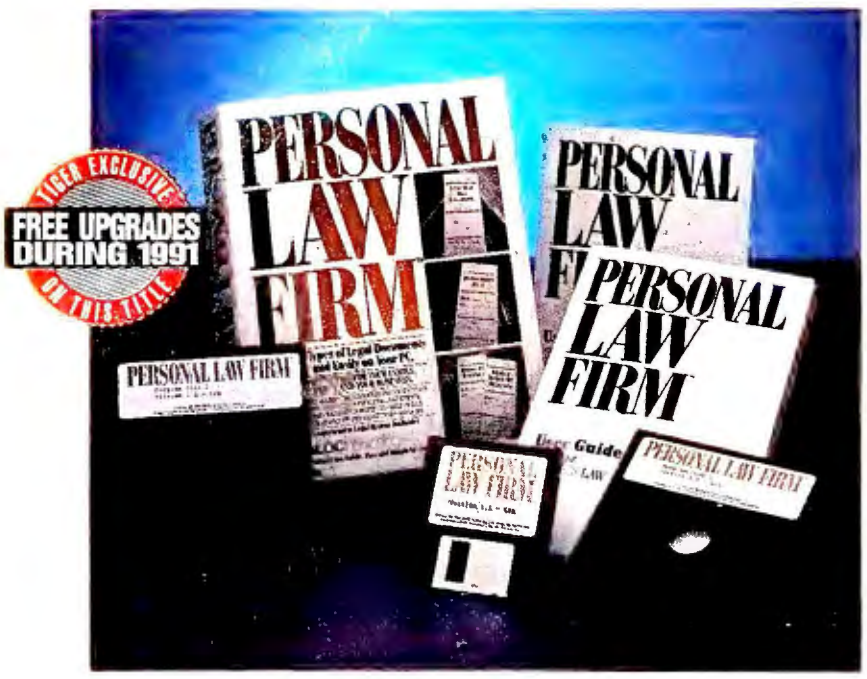
Create Dozens of Legal Documents for Home and Business.

Binding Legal Documents To Protect Your Family, Business and Property.

By simply typing answers to questions on your screen, Personal Law Firm actually "writes" binding legal documents customized to your specific situation and ready to sign. From wills to maintenance agreements; work for hire agreements to warranty documents; promissory notes and commercial leases to demand letters, Personal Law Firm gets your agreements in writing fast.

With over 500 pages of concise, informative documentation and reference, Personal Law Firm is the most comprehensive legal package available today. Just select the type of document from the Main Menu. There's plenty of background material about each document you prepare, along with explanations of the applicable laws that govern them.



The Importance Of A Will.

It's a nightmare you hope never happens. An untimely accident or illness leaves your family without a breadwinner — and without a will. In such cases, the state immediately moves in to divide your estate as it sees fit, with no regard for your wishes. Your survivors will face a long, uphill battle to reclaim what a will would have granted them instantly upon your death, without question.

Yet, 3 out of 4 people every year die without one.

Perhaps you feel that in the event of an illness or accident that leaves you completely dependent on life support, it should not be prolonged. You can create a Living Will to state in writing your wishes under specific circumstances.

Personal Law Firm covers virtually any everyday personal or business legal situation. For example, a restaurant owner from Chicago recently wrote us to relate this situation: A customer raved about his family recipe "Sauce Katrina" served at his restaurant, and asked for the recipe. Several months later, the restaurant's chef ran across "Sauce Katrina" bottled and for sale at the local epicurian shop with a label bearing the exact ingredients and the customer's name. A demand letter went out the next day from the restaurant owner to the customer asking sales of the sauce be stopped. The customer agreed. With no legal fees and no further misunderstanding.

To protect yourself against these unforeseen problems, you must get all agreements you enter into *in writing*. Personal Law Firm is the fastest, most inexpensive way to provide that protection.

Personal Law Firm Includes:

- Last Will and Testament
- Living Will
- Residential Lease
- Power of Attorney
- Living Together Agreements
- Prenuptial Agreements
- Postnuptial Agreements
- Marital Settlement Agreements
- Child Guardianship Consent Form
- Commercial Real Estate Lease
- Work for Hire Agreement
- Maintenance Agreement
- Personal Guarantee
- Release of Lien
- Promissory Note
- Trade Secret Protection
- License of Intellectual Property
- Assignment of Intellectual Property
- Bill of Sale
- Warranty Agreement
- Software Escrow Agreement
- Letter of Offer to Purchase
- Demand Letter
- Rejection of Goods Letter
- Termination of Contract
- Notice of Contract Breach
- Notice of Contract Assignment

BLOCPublishing

Personal Law Firm

HQ1050 **Law Firm** 5¼" & 3½" **$99.95**

System Requirements. IBM PC, XT, AT, PS/2 and compatibles with 256K, one floppy, a hard disk and DOS 2.1 or greater. It requires an 80-character display (color or monochrome) and will support virtually any printer.

Connect Computers Without Expensive LANs

LANs are great. You can share printers, modems, faxes, and other expensive accessories, have E-Mail for inter-office memos, even transfer files from other computers. But unfortunately you pay the price — both for the original purchase and the high cost of specialized support. You become a slave of LAN expert support forever thereafter.

But now there's a solution! Join 100,000 corporate power-users, and the U.S. and Canadian governments with the Systemizer® solution. You'll do all the things a LAN can do mentioned above — at a fraction of the cost — with NO special expertise needed to install or use it.

There's a Systemizer solution available for any computer — PCs, MACs, and others — plus the perfect future-benefit of connecting to full-blown LANs (like Novell), minis, and even mainframes. You'll never outgrow the Systemizer solution.

Start with the Systemizer SC — a card that plugs into any PC. Buy one for each PC and you'll reap the benefits of connected computers. Wiring isn't a problem either. Plain phone wire is all it takes. Expand when you're ready with other Systemizer components and you'll have the best of both worlds — an inexpensive and easy solution now, and an investment to build on in the future.

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PC, XT, AT, compatibles, hard disk, uses 27K RAM.

Automatically Turn On Your PC When You Call It By Modem!

Compatible with ALL Remote Control and Communications Software.

Occasionally, we'll run across a product that's so well conceived, so desperately needed, we simply can't say enough about its importance to today's computing environment. Remote Power On/Off is just such an innovation.

Remote Power On/Off detects incoming calls and turns on the power for the PC, modem, printer and other peripherals that are plugged into its four outlets.

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It Takes Software AND Hardware for Total Protection.

Viruses — if you're part of a LAN computer system, connect up to bulletin boards, or simply use floppy diskettes (who doesn't?), then you could be a victim. Don't be a statistic! Protect and immunize yourself with PC-cillin — the absolute best anti-viral system that protects like nothing else can. Here's why...

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PC-cillin is the only anti-viral product that provides software and hardware protection against malicious viruses. Your computer's vital information is safely stored in the external memory of the PC-cillin Immunizer Box. The Immunizer Box plugs into your parallel port, between your computer and your printer, so it is totally isolated. It is impossible for a virus to get at it. If one of the 'new generation' intelligent viruses gets by all the other numerous traps, PC-cillin still has its reserved, totally isolated, external memory backup. PC-cillin also does a regular self-check to ensure it remains free from virus infection. If the self-check indicates an infection, a clean copy of the PC-cillin file is generated.

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PC-cillin

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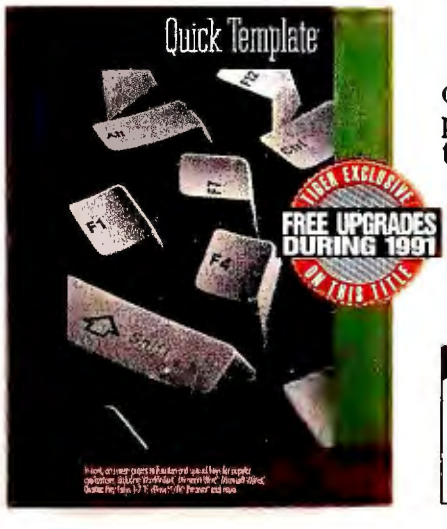

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Make Your PC Run up to 60 Times Faster!

Unleash Your System's Hidden Potential for Blistering Speed!

Trapped deep within the architecture of your computer lies an enormous untapped potential for speed. Unfortunately, this vast resource has been neglected because no one could devise a way to unleash it. Until now.

FAST! is the brilliant caching system that actually increases the speed of your computer by up to 60 times! Simple to install, a snap to use, this software solution can make a stock XT outrun a full-blown 386! In tests, we loaded a 386 with FAST! and we almost blew the doors off the lab!

How Can It Be Possible?

How can a software package have such a shattering impact on my computer? Although the authors are keeping the secret to themselves, they have shared information about where the slowdowns are within your system, where the speed is trapped and what has to be done to harness it.

They do tell us specifically, that the biggest system slowdown for your system is waiting for disk reads. When you use an application, you use it in "chunks" of various sizes, depending on the functions you are performing. Sure, you load it all at once, but it's used in bits and pieces. Your system must read back and forth, searching for these chunks of programs as they are needed by the application.

A Perfectly Logical Solution...

One of the keys to the FAST! design is the addition of "intuitive logic" to the technique of caching, so your system actually anticipates what your CPU will be seeking and reads the information directly from the hard disk (or floppy) into a special buffer created within your RAM. This information is, in reality, retrieved before the system asks for it!

As a result, your CPU simply spends no time waiting for disk reads, so processing can be done as fast as the system is capable — faster than you've ever seen it! The more disk intensive the application is, the more dramatic the increase in speed can be achieved using FAST! Database, spreadsheet and complex CAD systems, word processing, data transfer and more will achieve maximum response with FAST!

FAST! is also good for your system. By reducing the chaotic searches for data on your hard disk, it actually extends its life, reducing the damaging effects of constant wear. It's good for your software applications because they'll run leaner and faster, so you'll be more productive.

FAST! Under Windows 3.0!

Charles Bermant, author of The Windows 3.0 Comparison, wrote "One solution (to the speed problem) is to replace Windows' disk cache, SMARTDRV.SYS, with another cache. One such program, FAST!, has made my recent Windows life a lot easier. FAST! makes everything appear faster."

On a standard Drive Evaluation Comparison test, FAST! increased performance over 1700% — and 550% over Windows' caching software!

With FAST! vs. Without FAST!

Data Transfer Rates In Kilobytes Per Second

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FAST! will run on the IBM PC, XT, AT, PS/2 and compatibles with 128K RAM and DOS 2.1 or greater. Supports fixed or floppy disk systems, and supports conventional, expanded or extended memory.

Avoid Hard Disk "Heart Attack."

Fragmentation is Inevitable and Fatal!

When your hard disk was new, it ran lean and swift, retrieving files in just a few seconds. But as you added programs and files, your hard disk became fat and sluggish. The fact is a fragmented, "dirty" hard disk can take up to 100 seconds to retrieve a file that used to take 10 seconds — ***that's 10 times slower!***

The problem? Fragmentation kills hard disk performance. It causes excessive head movement across the media, creating bad spots throughout the drive. It's aggravating and dangerous! A fragmented hard disk, left unmaintained, is almost certain to crash. That means major data loss. Disk Optimizer 4.0's sleek, *easy-to-use menu system* makes hard disk maintenance simple.

Why Optimize?

Simply everyone who owns a hard disk, and relies on the speed and convenience it gives them. But unfortunately, DOS is doing its best to slow hard disks — by breaking files up into pieces. Storing different chunks in different places. As a result, loading is slower. Sorting is slower. Everything takes longer because your hard disk has to chase around picking up and laying down pieces of your file.

After un-fragmenting with Disk Optimizer, a file that once occupied 20 different sectors in 20 different locations is now in one contiguous piece. The next time your drive reads it, there's just one place it has to look.

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When You Buy Disk Optimizer
A $49.95 Value!

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Disk Optimizer

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Runs on IBM PC and compatibles. Supports DOS 2.1 and above.

Open and Run 12 Programs at Once!

Imagine switching programs on your computer as quickly and easily as you change channels on your TV! No more 10 step routines just to exit one program to work in another. Just switch and you're in your spreadsheet for work on the budget, switch you're in your word processor to zip off a memo, switch over to your database to add items to your mailing list, and then just switch back to your spreadsheet — to the exact spot you left off!

Software Carousel Release 5.0 allows you to load up to 12 programs when you begin work and simply switch between them all day long, or load several sessions of the same program, each with a different file, and snap back and forth to work on several spreadsheets, reports, letters — anything you need — all at once.

Not everyone will want Software Carousel to work exactly the same. There are a number of convenient ways to configure Software Carousel to suit everybody's needs and tastes.

New Print'n' Run.

Print 'n' Run works by directing printer output from any application running in a Software Carousel partition into a configurable pool of Software Carousel memory. Print 'n' Run, simultaneously sends the output to the printer as fast as the printer can take it.

NEW! 5.0 Features.

New Personal Message Center lets users write and display messages on screen and automatically stack programs at a particular time of day.

And new SNIP 'N' SNAP is a powerful cut and paste facility that enables users to transfer text or numerical information from an application or file running in one Software Carousel work area to another.

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How RightWriter Knows When Your Writing is Wrong.

RightWriter proofreads your documents using two artificial intelligence (AI) technologies called parsing and expert systems. Each technology has a separate, unique function, but together they rely on one another to identify parts of sentences and to locate errors.

Parsing performs the critical function of sentence dissection. It first identifies sentences' individual parts, breaking each sentence into major phrases and looking for both dependent and independent clauses. Parsing goes further by identifying the subject and predicate of each clause and noting the word's part of speech. This technology, for example, can tell the difference between "can" used as a noun and as a verb.

The expert system relies on the parser to break down the sentences so it can determine their accuracy. RightWriter's expert system examines your writing, judges the accuracy, and suggests improvements without your making any specific query.

Now Runs From Within Eight Word Processors.

RightWriter's interface works within eight word processors: WordPerfect, LetterPerfect, Microsoft Word, WordStar, Professional Write, Q&A, Q&A Write and MultiMate Advantage II.

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HQ3430-5 **For WordPerfect 5.0 & 5.1** 5¼"	$89.95
HQ3430-3 **For WordPerfect 5.0 & 5.1** 3½"	$89.95
HQ3440-5 **For Lotus 1-2-3** 5¼"	$89.95
HQ3440-3 **For Lotus 1-2-3** 3½"	$89.95

System Requirements: IBM PC, XT, AT, PS/2. Wordperfect requires 640K; Lotus requires 512K. Lotus 1-2-3 Ver. 2.2 w/3.1 available 1st quarter '91.

Automatically Turn Ideas into Diagrams...

Faster, More Impactful Communication.

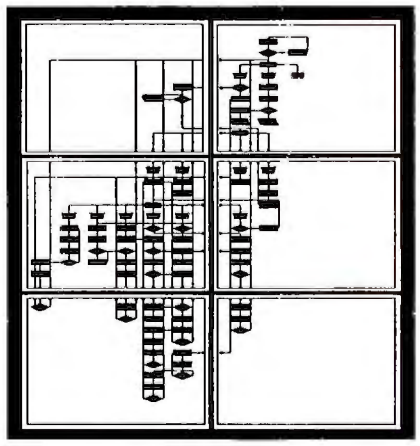
How do you convey to a client how projects flow in your company? How can you ensure new employees really understand the procedure for using a purchase order, or when to use express shipping? With allCLEAR, your thoughts are instantly expressed as pictures — accurate, presentation-quality tree and flowcharts. All created without any preplanning or drawing on your part.

A Milestone in Communication.

There is no other product we've seen that can help managers and others within organizations to clearly explain corporate policy, structure and procedures like allCLEAR. We've found allCLEAR extremely useful here at Tiger for helping with customer service problems and providing technical assistance. The fact is, this is a powerful tool for communicating precisely how to accomplish any procedure-based task.

Here's How allCLEAR Does It...

Using the built-in text editor, or your favorite word processor (or any text or Lotus 1-2-3 file) you give allCLEAR a plain English description of any organization or procedure you can imagine. With the addition of a few punctuation marks, allCLEAR now understands the underlying relationships. The result is clear, unmistakable — visual — communication.



Multi-page charts are no problem for allCLEAR. Enter text, or import it from your word processor and see it on the screen.

CLEAR SOFTWARE, INC.

allCLEAR

HQ3070 **allCLEAR** 5¼" & 3½" $299.95

System Requirements: IBM XT, AT, PS/2 and compatibles; 640K memory; DOS 3.0 or later; hard disk; CGA, EGA, VGA, Hercules, or compatible; any dot-matrix, HP LaserJet, HP DeskJet, Canon, or PostScript printer.

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How Do You Fill In Pre-Printed Forms?

Eliminate One Of The Office's Most Time-Consuming, Tedious Tasks.

Are you still filling in insurance forms, legal and tax forms, government forms, invoices, medical and Federal Express forms by hand? Or struggling through the trial-and-error nightmare of using a typewriter? The fact is, filling in pre-printed forms is a classic example of inefficiency, with a high margin for error. The PC can be a great assistant in filling in forms, and FormFiller 3.0 is the premier forms fill-in software for even the most complex multi-page, multi-part, and double-sided forms.

FormFiller 3.0 actually synchronizes your computer printer (a critical first step), to locate blanks and place information on the form with pinpoint-precise accuracy, and it works with virtually any dot-matrix, daisywheel or laser printer.

This powerful software streamlines data entry with a host of on-screen guides and error-checking features. These features not only speed the process, but virtually eliminate errors as well — errors that can be very costly. Along with FormFiller 3.0's extensive data validation features there's plenty of fully context-sensitive help available for any function.

With FormFiller 3.0, you can decide the order in which the blanks should be filled in, give certain areas color codes for fast visual recognition, include non-printable notes to instruct data entry, "lock" certain information into the form so it won't have to be manually entered each time the form is filled out. You can also quickly set up FormFiller 3.0 to import and automatically fill-in forms directly from your database, and "batch print" your forms.

The system doesn't stop there. It contains a complete set of financial and mathematical functions that you can easily assign to particular blanks to perform a specific calculation whenever value is entered. Or you can automatically perform a series of calculations on a series of numbers. For example, you could quickly instruct FormFiller 3.0 to calculate the extended prices of all items listed on an invoice, total them, deduct a discount, figure and deduct taxes and calculate the final total. There are over 40 math functions in all, including amortization, interest, present and future values, depreciation, percentages — dozens of others!

There's more! FormFiller 3.0 includes a unique "Look-up" feature that stores pieces of information and automatically places them into position with just a menu selection. Part numbers, shipping and billing addresses, names, phone numbers, account numbers, payment terms and hundreds of other details can be organized and stored and retrieved anytime — without looking for them or retyping them. In addition, FormFiller 3.0 allows you to control exactly HOW the data is to appear and be printed. For example, negative numbers can be entered and automatically appear and print in parentheses. Enter a series of 10 digits into a specific field and FormFiller 3.0 displays them as an area code and telephone number, or make the data entered into certain spaces on the form automatically print bold.

This all means that a form that may have taken fifteen or twenty minutes to fully complete (possibly containing errors), now may require as little as one minute to fully complete, including a check for errors and omissions.

FormFiller 3.0 can, in fact, slash the fill-in time required for any form by as much as 80 percent. By

creating a "master template" of the form, FormFiller 3.0 can match any spacing, even if the spacing changes throughout the form or is inconsistent from blank to blank.

BONUS!

FREE QUICK TEMPLATE When you buy FormFiller!

Quick Template is the perfect replacement for your lost plastic templates. Pop up a list of every special key from within FormFiller. *A $49.95 value!*

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FormFiller 3.0

HQ1200 **FormFiller 3.0** 5¼" & 3½" **$149.95**

IBM PC, XT, AT, PS/2 or compatibles with 512K, DOS 2.0 or greater and one floppy drive and a hard disk. Supports virtually all printers. Includes "The FormFiller Sampler"— sample templates, user guide and help cards.

The World at Your Fingertips.

Complete Atlas On Disk.

This innovative program brings the entire globe to your computer screen, combining a complete atlas, almanac and world fact book into one exciting, informative package. You'll have instant access to over 240 fully detailed, EGA/VGA color maps along with a vast database of useful international information. You'll explore the geography, people, government and economy of any nation on Earth, including such details as climates, population, language, labor force, military strength, industry, highways and more.

Indispensible Guide and Reference Tool.

World Atlas is an ideal reference tool for travelers, educators, business people, librarians and students. With just a couple of keystrokes any bit of data is on your screen.

You don't need to learn lengthy commands. Just point to a country on any index map, click — the desired map appears instantly. From there, simply select specific information and statistical maps for individual countries from sleek, drop-down menus. You can easily print customized reports mixing maps and text — even export maps to desktop publishing programs.

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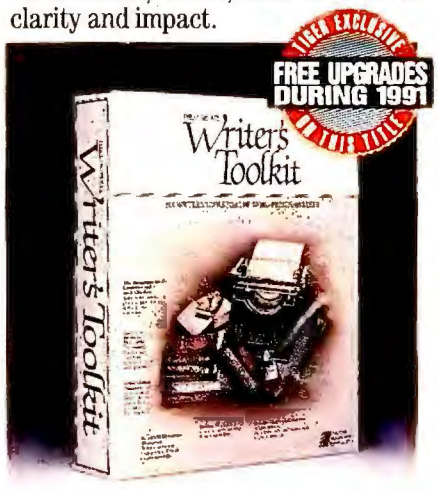

Let's take a look at the individual components of the system:

The American Heritage Electronic Dictionary. The preferred dictionary in the United States. This extensive volume provides definitions for over 115,000 words and word forms. Also provides anagrams and spelling correction.

Roget's II Electronic Thesaurus. A complete, electronic version of the premier publication of its kind, featuring over 500,000 synonyms for 42,000 words. Simply pop it up from within your word processor.

The Concise Columbia Dictionary of Quotations. Just hot-key to a treasury of over 6000 bits of wisdom.

Houghton Mifflin's Abbreviation Program. Look up the proper abbreviation (or expansion) for hundreds of common and not-so-common terms.

The Written Word III — Principles of Grammar & Style. The prestigious publisher Houghton Mifflin provides this on-line reference book of grammar and style rules. Includes sample business letters and resumes, a proofreading guide and more.

The Houghton Mifflin CorrecText Grammar and Style Checker. Use this sophisticated grammar and style checker to flag and correct your grammar, punctuation, spelling and style errors.

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TimeSheet Professional®'s features and functions are extremely easy to use and understand. Designed around a weekly view of projects, each user simply selects the project they're working on and enters the time. Handle time the way you wish. Turn the automatic Timer on and off, enter time directly on the timesheets, or instantly add and subtract time. Expenses are tracked just as easy. Up pops a window for easy entry of expenses. And you'll always see a week's worth of work — including total time per day and total time per project.

The Project Manager instantly and easily sees the information he needs. Customized reports can be created in a spreadsheet-style format, so they are easy to understand. Choose between detailed or summary data.

Week-At-A-Glance TimeSheet.

Unique electronic time sheet lets you and your workgroup easily record time for projects, activities, clients, etc.

- Use week-at-a-glance time sheet for quick data entry
- Record time three different ways — directly on the time sheet, using from/to format and with stopwatch timer
- Track project details with pop-up note editor
- Monitor project and client expenses
- View time spent totals by day and week
- Print time sheets with signature blocks for management approval

Summary Report Simplifies Project Analysis.

The Summary Report simplifies analysis of time utilization in project-based workgroups and professional practices.

- Consolidate workgroup activity from multiple employees
- Easily identify projects ahead of or behind schedule
- Report work activity by budget-vs-actual and percentage-of-completion
- Develop time and resource project budgets
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- Customize your report using familiar spreadsheet format
- Spreadsheet-style summary reports with individualized criteria using a variety of mathematical calculations.

Detail Report Delivers with Full Flexibility.

The Detail Report lets you review project details, notes and expenses. Organize and report data in the manner most meaningful to you.

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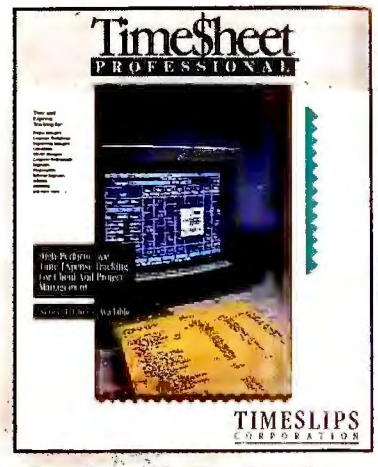

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Beat Postal Rate Increases & Easily Manage Your Mail List!

Maximize the Performance and Minimize the Cost of Everything You Mail.

With a sharp increase in postal rates for several categories of mailed materials coming in early 1991, FastPak Mail can save you money the very first time you use it. FastPak Mail automatically eliminates duplicates from your lists (nothing does that right out of the box, if at all), quickly handles zip-code sorting (a real money-saver), imports names from existing databases (like dBASE, for example) and allows you to perform sophisticated (and very selective) mail-merge with no problem at all. FastPak Mail allows you to print labels of virtually any shape or size, print customized envelopes, post cards, rotary index cards, clear labels and more. And it can handle up to 64,000 names!

Easy to Learn and Use.

FastPak Mail is great for beginners, yet contains all the power and functionality that the advanced users demands. And when you consider the time and money that FastPak Mail save you — from the one-man operation to the Fortune 500 vice president — it's one software title you'll use often!

More than just a list manager, smarter that just a label printing program, FastPak Mail is the complete mail and customer list tracking system, designed to keep your mailings cost-effective and timely.

Direct Mail Superstar.

FastPak Mail was designed by direct mail pros. It contains all the power and functionality of systems in use at large direct mail houses — at a fraction of the cost. Without the tools that FastPak Mail puts at your fingertips, you'll spend a lot more than you need to (and substantially reduce profits) on your mailings.

Ready To Print Lists and Labels.

FastPak Mail will support virtually any label made — by any manufacturer. Choose from predefined formats available from the menu, or quickly create your own format to fit your particular needs.

Print labels 1, 2, 3 and 4 across in dozens of sizes and shapes. FastPak Mail supports all popular continuous feed label brands.

Print all of this and more... labels (any configuration), return address labels, envelopes, rotary index cards, clear adhesive labels, file folder labels, shipping labels, packing labels and dozens more — anything you can put a name and address on. Just select the type you need from the list of built-in formats and they're done!

Easily Merge Information.

FastPak Mail will allow you to easily merge names and addresses into the body of any letter. You can quickly produce custom mailings to selected lists — even merge information into the body of a letter.

And if you have existing lists stored in other applications, they can be quickly and accurately converted for use in FastPak Mail for powerful merges with easy set-up.

Sorting, Printing & Preparation.

FastPak Mail simplifies bulk mail by streamlining the entire process. It is the only product that can sort to virtually any specification, and all sorting is done to achieve the least possible cost.

Addresses Express Shipping, Airbills, UPS C.O.D. Labels.

You can use FastPak Mail to finish up mailing chores by addressing Federal Express airbills, U.S. Post Office Express Mail airbills — even UPS C.O.D. labels. The pre-designed templates for these forms are available from the menu and will support virtually any printer.

FastPak Mail will also print shipping labels using a pre-defined format — or create your own.

BLOCPublishing

FastPak Mail

HQ1170 **FastPak Mail** 5¼" & 3½" **$79.95**
IBM PC, XT, AT, PS/2 and compatibles with 256K. Supports hundreds of dot matrix or laser printers.

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Throughout the history of mankind, the heavens have captured the imaginations of thinkers and scientists. In 1609, Galileo perfected his telescope's lenses and saw for the first time Jupiter's four moons. In 1671, Sir Issac Newton created the revolutionary reflecting telescope and a new age of astronomy was ushered in. Today, NASA probes and enormous land-based observatories provide a broad understanding of our universe.

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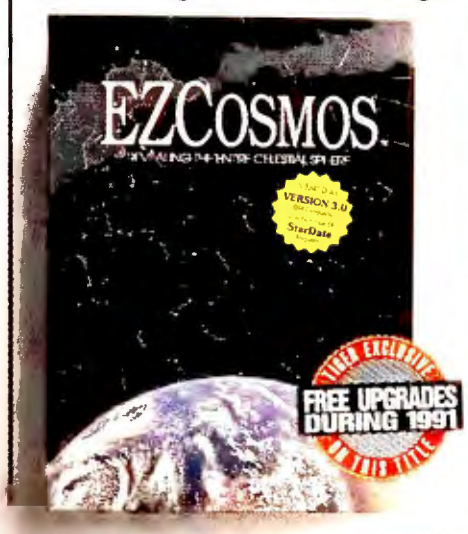
Now you can have the astronomical knowledge of the centuries right on your PC with new EZCosmos. Whether you're a casual observer, aspiring stargazer, or professional astronomer, you'll find EZCosmos an exciting and complete reference tool.

Using its unique SkyPlot feature, EZCosmos will quickly display the entire celestial sphere for any date, time and location you specify from 4000 B.C. to A.D. 10,000. You can select from a host of unusual celestial events, like the upcoming solar eclipse as seen from Hilo, Hawaii, which will occur on July 11, 1991. Or select from 1,100 cities around the globe and instantly see what the sky looks like at any time. Great for the entire family, and a wonderful eduational tool for students.



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Or imagine simply scanning text from printed pages, magazines and books — no more re-keying!

The Marstek hand scanners deliver unmatched resolution for precise character recognition regardless of the type style or size and even include free optical character recognition (OCR) software to turn the scanned text into ASCII — ready to use in your word processing or desktop publishing application.

And the whole system is ready to run right out of the box. The installation is fast and easy, the technology is simply amazing.

The Marstek Family Of Mice.

The Marstek Mice are designed for higher performance. They're 100% Microsoft compatible and impeccably accurate — but they come with a surprisingly modest price tag. We tested the Marstek Mice (E22 and P93 models) for accuracy and speed against other leading nameplates, and it equalled or outperformed the Microsoft Mouse, Logitech's Series 9, and several others. The secret is in the outer shell design and durable construction. You'll notice a silkier movement and an increased feeling of control the very first time you use it. The Marstek E22 and P93 also feature buttons with firm, clean clicks. A far cry from the "mushy" buttons you find on other mice, great for fast, rapid-fire computing.

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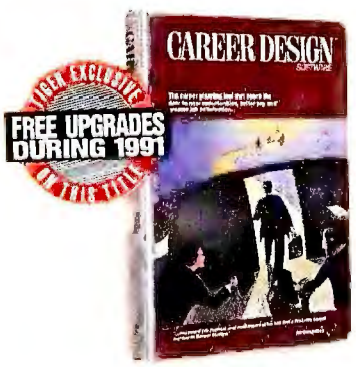
One of the hardest tasks any adult faces is looking for a new job. Whether you're just out of college, returning to the work force, laid off, fired or just looking for a new job, the whole situation is fraught with anxiety and stress.



Career Design will help you design the perfect career move. Using a multi-phase approach that focuses you in the right direction every step of the way, Career Design always gives you the help you need.

More than just a resume-writing program, Career Design gives you control of your career direction.

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With Career Design, you'll get help answering the three important questions: "Who Am I?," "What Do I Want?," and "How Do I Get There?." These answers determine the direction you should go and Career Design helps you get there.

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"I was dazzled by its thoroughness and ease of use. I would definitely recommend it to anyone who is even remotely considering a career move," says Joyce Lain Kennedy, careers columist, Los Angeles Times Syndicate.

Career Design
Software

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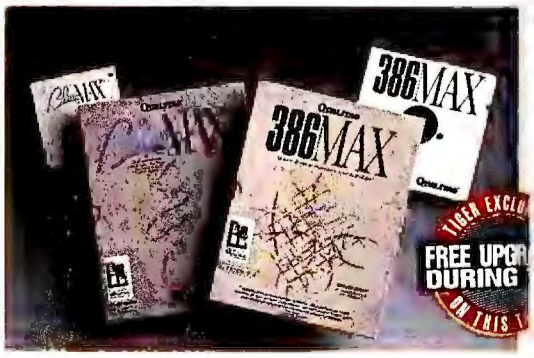

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With 386MAX your Windows applications get all the memory your system has to offer — *plus* any programs you run out of Windows (from DOS) get the Expanded Memory they need! You get the best of both worlds! You can even run pop-up utilities reliably in Windows — thanks to a special feature of 386MAX that allows many TSRs to appear more than once in multiple windows!

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The *only* memory manager designed specifically for 386 PS/2 — BlueMAX does everything 386MAX does, plus uses proprietary technology to recover 80k more memory than any other memory manager.

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The Word Processor That Lets You Get the Most Out of Windows.

For Pages That Need Drama and Flair.

When you made the decision to run Windows 3.0, you experienced the wonder of the Graphical User Interface. The fact is, there's only one Windows-based word processor that truly exploits the beauty of this remarkable operating system. Ami Pro.

Ami Pro was designed for Windows 3.0 from the ground up. It combines all of the features you counted on in your character-based word processor and combines a complete set of tools found only in desktop publishing applications.

More than word processing, more than desktop publishing, Ami Pro makes the best use of the powerful WYSIWYG environment and brings your documents to a new level of sophistication — and ironically, we found it much easier to use than Microsoft Word for Windows. Ami Pro's extremely intuitive nature makes it fast and fun to use.

View your documents as you edit them, including all text, headers, footers and footnotes. Use Ami Pro's "frames" (which can contain text for page-within-page formats) to pick-up-and-place graphics easily and position them precisely within the page. You'll see it right on-screen as you work!

Why Run Windows 3.0 if You Don't Make Use of Its Power?

Whether you're an executive who types only occasionally, or a heavy user who demands a long list of specialized features, you'll achieve impressive results with Windows 3.0 and Ami Pro. Occasional users are out of the chute faster because Ami Pro is easier to learn and use.

Heavy users enjoy features they can't find anywhere else, like tables that allow you to perform math, automatically create charts and graphs (easily import data for charts from spreadsheets with 12 styles to choose from), draw, employ its Dynamic Data Exchange capabilities with other Windows applications and even create documents using its powerful style sheets. You can't do this with any other word processor under Windows. Why not use all the power that you paid for when you bought Windows 3.0 in the first place?

Have You Always Found Mixing Text and Graphics Difficult?

Who hasn't? But you'll actually have fun doing it with Ami Pro. Today, with most businesspeople drowning in paper, your documents need the snap that graphics provide. But you've always had to wrestle with different formats, complex import commands and then work for hours to position your images neatly within your text.

Ami Pro takes a far more enlightened approach. It includes a set of style guides that you can use to quickly put together ads, multi-column newsletters, brochures, letters, reports, presentations and even your everyday correspondence.

With Ami Pro's graphics handling features (and using its "frames" described above), inserting graphics is just a mouse-click away — in exact position, exactly the way you want them. No other word processor or desktop publisher under any platform makes it as easy for you to look good in print.

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A Better-Than-Windows File Manager; Create Custom Menu Selections!

File Organizer

In case you haven't noticed, Windows 3.0 isn't a FULLY graphical interface. But there is a true, fully icon-based system for manipulating files and programs in Windows 3.0. File Organizer actually replaces Windows' Program Manager and File Manager with a vivid, easy-to-navigate interface very similar to the Macintosh operating system.

In fact, File Organizer has file folders like the Mac; icons to represent programs, data files, printers and drives like the Mac — it even has a trash can like the Mac. It makes everything you do fast, easy and fun — the clumsy File Manager and Program Manager are replaced with one, single (and beautiful) interface!

BatchWorks allows you to quickly and easily create keyboard macros that automate repeated tasks in the Windows 3.0 environment. You can assign macros as menu commands in any or all Windows applications. BatchWorks records macros and batch files by learning keystrokes. It's easy and it saves time.

The BatchWorks scripting language provides a robust collection of easy-to-access commands that can help you develop complex automation applications in just a few minutes.

BatchWorks

Only BatchWorks can give you the powerful tools — harnessed in a simple-to-use format — to totally automate all the features contained within the Windows programs you're running. Why can't this be done in Windows? The answer is simple. The Windows environment simply isn't capable enough to handle it.

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In addition to all the fabulous features of Corel Draw! 2.0, you get over 3500 *extra* professional, color clipart images! Not just your average clipart, this is from ArtRight — a leader in the art business. PC Mag recently awarded ArtRight their Editor's Choice Award after reviewing lots of clipart (including Arts & Letters).

This same clipart alone (without Corel Draw!) is still sold on diskette for $1192 and takes up 43 diskettes. But you can have it on a single CD for a fraction of the cost. And as a bonus — your CD clipart is not compressed, meaning it will load up to 10 times faster than the diskette version!

NEC CD Reader

Why settle for an off-brand when you can have the best? The NEC CDR-36 is the latest release in a long line of proven CD Readers. Tried and true, this sleek new CD Reader will welcome you into the world of CDs. You'll soon fall in love with the vast amounts of information CDs place at your fingertips. Perhaps next you'll add an entire encyclopedia on a single CD to your library — or maybe all the phone books in the U.S. (Think about the mailing and telemarketing possibilities!)

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The Marstek M800W also includes: Image-In Scan & Paint, Image-In Plus, Image-In Read and Image-In Vert (an $1100 value), for fine tuning your scanned images as well as providing a toolbox of sophisticated image manipulation features. Perfect for desktop publishing applications, as well as the new breed of Windows word processors, the Marstek M800W is extremely flexible, featuring advanced "yellow/green" scanning lights to capture the finest details — even from originals the size of a postage stamp! And the M800W's special Inverse Scanning capability creates a wide variety of special effects.

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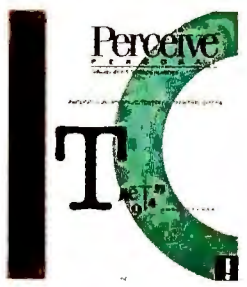

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If You Work with Images, DoDOT Is a MUST!

DoDOT Starts Where Paint Programs Leave Off.

I work with images and screen captures all day long, and DoDOT is one of my vital tools. I do the graphic images here at TigerSoftware. DoDOT is the only application I've found that can capture a Windows screen with all 256 colors. DoDOT gives me the file conversions I need to handle anyone's image, no matter what format it's in.

If you work with images like me, you know the barrier you hit when you hear, "Sorry, but I can only take TIFF files." Or how about getting images from a Mac to your DOS machine? This is when I load DoDOT. DoDOT can open, convert, and save in a multitude of valuable formats. For the Mac, the PC, in or out of Windows, I count on DoDOT.

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It's fun to work in Windows, and it's even more fun when you can capture what you see on the screen to use in your paint program, word processor, or just to print. DoDOT will capture the entire screen, any window, or a specific area you define — and then save it in your favorite format.

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REVIEW

Data Management:

Up Close and Personal

Managing a data base—even a fairly complicated one—doesn't have to involve programming. These eight personal data managers make it easier to extract the data you need.

Richard Scoville

Is your Rolodex an out-of-date tangle of dog-eared business cards? Do you keep client histories stored in your word processor, where sorting them is as easy as training a cat? Is your *1-2-3* worksheet so choked with data that you take a coffee break while it loads? If you must keep track of people, purchases, inventory, or other information, you need a data manager. You probably already know that, but you're reluctant to buy one—who can spare two years in a monastery learning dBASE programming?

Luckily, managing data doesn't require a hair shirt anymore. Today, you can buy a personal data manager that's relatively easy to set up and put to use. Thanks to menu-driven interfaces, query tools that zero in on the data you need, and versatile report writers, personal data managers can handle a variety of common tasks, including mailing list and contact management, and even light-duty departmental accounting. And if your personal data manager is compatible with the more powerful data base management system (DBMS) shared by your work group or company, you can use it as an easy front end for the bigger program.

Of the eight personal data managers reviewed here, several proved to be good values. But there was only one Best Buy: Microrim's *Personal R:base* offers powerful relational capabilities, low price, and an interface that's so smooth, you may even *enjoy* managing data.

The Price and Payoff of Personal Freedom

Because they lack programming languages, personal data managers aren't fit for large-scale, work group data processing. Moreover, easy as these programs are, they're still more difficult to use than an application created by a crack developer with a programmable data base like *dBASE IV*, *FoxPro*, or *Paradox* (see "Double-Duty Data Managers" in our May 1991 issue).

So why go with a personal data manager at all? First, the personal programs are simpler to use than the big ones, and because it's your own data base, you can set one up any way you like, improving productivity. Second,

ANDREA WISNEWSKI

Buying Smart: Easy Data Base Power

Whether you need a mailing list, a contact file, or a department budget, there's nothing like a personal data manager—if it's easy to learn and use. When the going gets tough, you'll need relational skills and good form-making and reporting tools.

EASE OF USE

Getting up and running fast is important, but so are easy solutions to more complex jobs. Look for logically designed menus and a minimum of cryptic terms.

RELATIONAL SKILLS

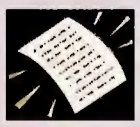
Almost any sort of data base improves if it's relational. Consider a contact list: If you have multiple contacts in the same company, do you want to type in the same address for each one? And if the company moves, do you want to update each record? Without relational skills, that's what you face.

With relational *lookups,* when you type in a new contact, you can have the program "look up" the correct address and copy it to the contact file. You don't have to keep typing the address, but updating it is still a hassle.

If your program offers *many-to-one* links, each time you bring up a contact, the program can show you the address from the company file.

And if your program supports *one-to-many* links, you can also bring up a company and see all of your contacts there.

Entering relational data is tricky, since records in two linked files must share some common data. The best programs must make sure, as you enter data in one table, that matching data exists in a related one (called *lookup-table validation*). The ability to enter and edit data in two related tables at once lets you enter a name and address together.



DATA TYPES AND FORMS

How you structure data and control its input is the heart and soul of a data manager. Look for a data manager that can screen out duplicate entries, limit answers to few choices (Mr., Mrs., Ms.), and keep numeric and date entries within a predetermined range. Forms that let you pick values from another file speed up data entry.

Useful information is more than just names, numbers, and dates. To attach notes or pictures—employee photos, for instance—to your data, you'll need variable-length memo and image fields.

No data exists on an island—your program should support the file format your companywide data base uses, preferably with direct reads and writes rather than conversions.

QUERIES

Queries are the tools for getting just the information you need out of your data base. A query by example (QBE) tool helps make complex queries easy—you pick the fields you wish to display, create calculated fields and relations, and enter search criteria (State = NY). Press a button, and your answer appears.

You should be able to select the fields to display in your queries, including relational and calculated fields; use substrings (so that a search for plumb will find *Acme Plumbing*); and handle complex queries, like finding customers who spent over $20,000 last year and live in Utah or Texas. Some data managers can perform phonetic searches, so that a search for *Baker* will also find *Bakker.* You'll also want to be able to save queries for reuse.

REPORTS

The easiest way to design reports is with a band-oriented report writer in which horizontal strips represent headers, records, subtotals, footers, and so on. Also, you should be able to easily add calculated and relational lookup fields to your report.

The ability to turn your data into graphs and cross-tabs (which total data by category) will help you and your co-workers interpret the data. A word processor built into your data manager will let you do merge letters in one quick step. Finally, full font support helps to create visually exciting reports.

PERFORMANCE

You want a DBMS that won't choke on large files—the faster the better.

MULTIUSER SKILLS

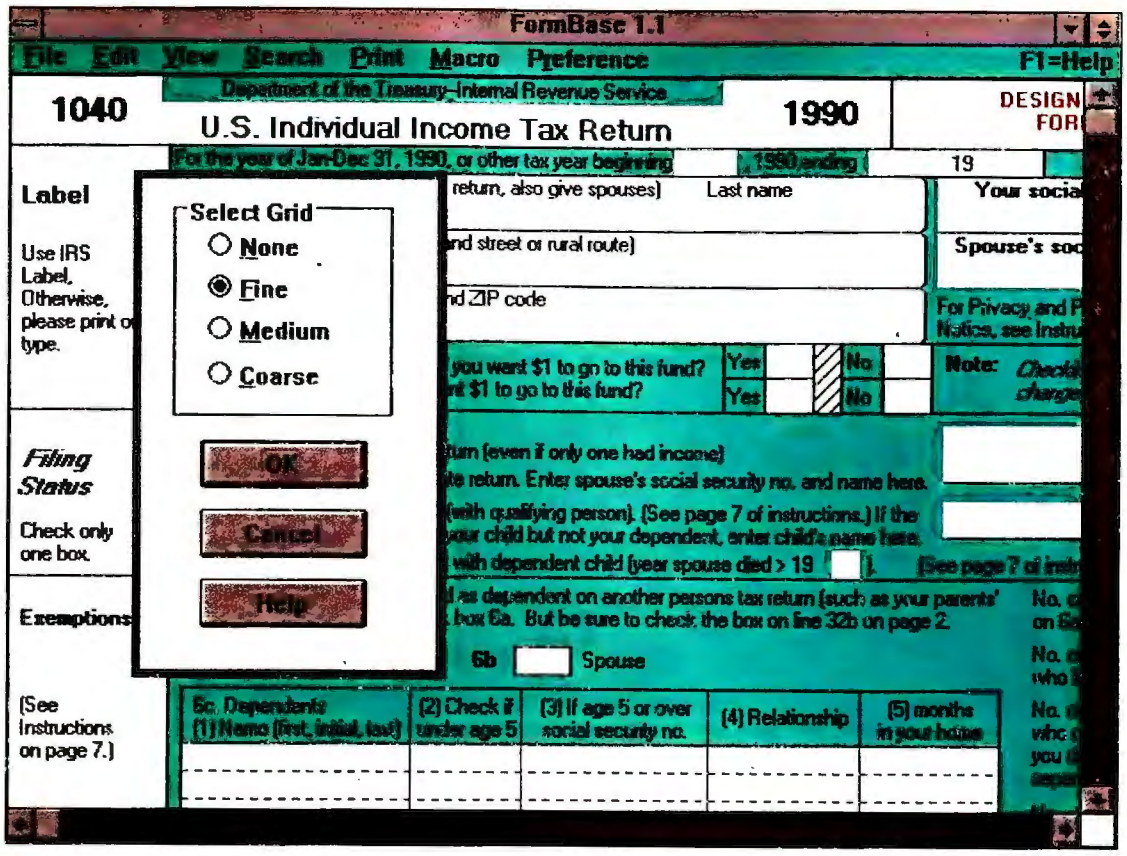
As a general rule, these are not the best programs for multiple users, but a small work group may find one useful. If you choose this route, demand both automatic file and record locking to make sure that you and someone else aren't rewriting the same data at the same time, canceling one another's work. The ability to password protect your files against prying eyes is also useful.

they are cheaper, generally one-quarter to one-half the price of a programmable DBMS. As long as your data management needs are modest, and only you (and possibly four or five co-workers) will be using the program, it makes sense to avoid the costs and delays of programming.

Instant data management, thanks in part to a short learning curve, is the main idea. But a personal data manager should be both easy to learn and easy to use when the going gets rough. Many programs that start out like a dream turn into nightmares when you try to print a nonstandard report.

One key to ease of use is a program's level of *relational skills*. Without the ability to tie data in one file to data in another, even a seemingly simple task like maintaining a mailing list can become tedious and error prone. If you have multiple contacts at the same company, for instance, you'd have to enter the full address for each of them. If the company moved, you'd have to update each address separately. If you can relate your files, however, you can keep your contacts in one place, your company addresses in another, and still see a contact's name and address together on one screen. With a programmable DBMS, you can take such relational skills for granted—but not all personal data management packages provide this kind of power.

A data manager is worthless if you can't get the right kind of data into it, or if you can't find and report on that data, so look for a program that accepts a wide selection of data types (text, numbers, dates, memos—maybe even pictures). Your data manager should also have good data entry forms, versatile queries, a flexible report writer, and data validation that lets you set rules about the data that can be entered into a field. If you plan to use the program with a small work group, you'll also want to consider whether several people can use it on a LAN simultaneously. You won't find the sort of multiuser capabilities here that you would with a programmable DBMS, but since these DBMS's are *personal*, you probably won't need those features.



Formbase's innovative Windows interface lets you design spectacular reports, like this faithful representation of an old favorite.

Alpha Four 1.1

PROS: dBASE compatibility, strong relational skills, excellent data validation, superb report writer

CONS: Fairly slow, expensive

Alpha Four is a great tool for anyone who has worked with *dBASE* or its clones and is looking for an easier way to handle data. Not only does the program use *dBASE*'s DBF file format, but *Alpha*'s queries and calculations use a familiar dBASE-like syntax. If your company uses *dBASE* and you use *Alpha Four*, you can easily share data and switch between programs.

You can't do everything with *Alpha* that a good programmer can do with *dBASE IV* or *FoxPro*, but you can do much more without programming than you could with either of those products. You can easily relate files and set validation to trap errors in data entry. The first-rate band-oriented report writer —whose screen is divided into horizontal "bands" for headers, summaries, and so on—makes it easy to see, while you work, how the report will look.

Alpha is advanced for a personal data manager. If you lack dBASE experience, setting up calculations and filter expressions (which screen out data) will be challenging at first. *Alpha* shines, however, at complex reports and queries, where certain "easier" programs can make you pull your hair.

At $549, *Alpha Four* is the most expensive package reviewed, and it's no speed demon. But it's a very good value, especially if you can't escape from the dBASE world.

Formbase 1.1

PROS: Fancy forms, good relational skills

CONS: Hard to create standard data base reports

Setting up a data base in *Windows*-based *Formbase* is like creating a form on a piece of paper—you can see what you're doing, but your options are limited. If you're new to data management, you may find *Formbase*'s graphical form-oriented approach appealing, but if you're used to conventional data managers, *Formbase* will leave you scratch-

FEATURES EVALUATION

A Complete Manager for Personal Data

Our Best Buy, Personal R:base, has just about everything you need to relate one data table to another, catch data-entry errors, and easily find the information you're looking for.

● Yes
○ No
◒ Deficient

	Alpha Four 1.1	Formbase 1.1	PC File 5.0	Personal R:base 1.0	Professional File 2.02	Q&A 3.0	Reflex 2.0	Superbase 2 1.21
Standard features								
List price	$549	$495	$130	$200	$299	$349	$250	$345
Mause suppart	○	●	●	●	○	○	●	●
Relational skills								
Laakups fram anather table	●	●	●	●	●	●	○	●
Many-to-ane links	●	●	●	●	○	○	○	●
One-ta-many links	●	●	○	●	○	○	○	●
Edit related tables together	○	●	○	●	○	○	○	●
Laakup-table validatians	●	○	○	●	●	○	○	●
Pasts data fram related table	●	○	○	●	○	●	○	●
Data types and forms								
Image fields	○	●	○	●	○	○	○	●
Memo fields	●	●	●	●	●	○	●	●
Reads/writes DBF files	●	◒[1]	●	●	◒[2]	◒[1]	◒[1]	◒[2]
Pick value fram laakup table	●	●	○	●	○	○	○	●
Displays multiple raws fram detail table	○	●	○	●	○	●	○	○
Screens aut duplicate field entries	●	○	○	●	●	●	○	●
Calculated fields	●	○	●	●	○	●	●	●
Auto-incrementing fields	●	●	●	●	○	●	●	●
Checks data against range ar list	●	●	○	●	●	●	◒[3]	●
Custom menus	●	○	○	●	●	○	○	○
Queries								
Query by example	○	○	○	●	◒[4]	○	○	○
Save queries far reuse	●	○	○	●	●	○	●	●
Calculated fields in queries	●	○	◒[5]	●	○	○	●	○
Camplex criteria[6]	●	●	●	●	○	○	●	●
Phonetic searches	●	○	●	●	○	●	○	●
Reports								
Band-ariented report writer	●	○	◒[7]	●	○	○	●	○
Calculated fields	●	●	●	●	●	●	●	○
Cross-tabs	○	○	○	◒[8]	●	○	●	○
Graphic charts	○	○	●	●	○	○	●	○
Ward pracessor	●	●	●	●	○	●	●	●
Multiuser capabilities								
Autamatic recard lacking	○	○	●	●	○	●	○	●
Autamatic file lacking	○	●	●	●	○	●	○	●
				BEST BUY				

[1] Imports and exports DBF files but daesn't read them directly.
[2] Reads DBFs directly but must import file for writing.
[3] Must create separate, calculated field.
[4] Cannot select answer fields.
[5] Can use in search criteria but can't display as part of query results.
[6] For example, (X and Y) or Z.
[7] Nat all report features are available interactively in report writer.
[8] Displays on screen only.

ing your head. The program doesn't even let you index your data; you can't keep two sort orders—say, name and ZIP code—of the same file handy for quick reference.

In most data managers, a form is a data entry screen. In *Formbase*, when you design a form, you're creating the actual fields that will hold your data, a report design, *and* an entry screen—which saves a lot of time.

Formbase's WYSIWYG displays and extensive formatting options let you easily create spectacular forms and reports, complete with multiple fonts, shading, and lines. You can even store and print images, such as diagrams and scanned photos, making *Formbase* a good choice for a parts catalog or a personnel data base. But standard data base reports are a challenge. Producing a list with group subtotals—a simple task in *Alpha Four*—is a not-so-excellent adventure here.

Data management convention and *Formbase* also clash when it comes to queries. The program couldn't run two of our tests, because you can't define indexes, nor can you search for substrings that aren't complete words. The latter means that you'll need tighter control over how data is entered to extract the data you need.

Formbase is a different kind of data manager, one that appeals to those most comfortable using a forms interface—and who are willing to trade some querying power for the privilege. If you're willing to make that exchange, and if you need to store graphics closely coupled to data, *Formbase* will stand you in good stead.

PC-File 5.0

PROS: Low price, dBASE compatibility, business graphics

CONS: Few relational skills, inflexible reports, patchwork menu structure

PC-File has long held a niche as one of the cheapest data managers around. But as the prices of other relational packages drop, *PC-File*'s weaknesses stand out.

The program is friendly to a fault, often guessing what you want to do next. Too bad it frequently guesses wrong—when you switch to a new directory, for instance, *PC-File* opens the first data file it finds and prompts you to pick a field to index. Helpful? Not if you want to create a new file. Elsewhere, the interface seems unnecessarily clumsy: Adding or deleting a field, for example, requires a tedious process of first "cloning" your data file, and then copying data to the clone.

PC-File's report writer proves that band orientation doesn't guarantee ease or flexibility. The only way to insert conditional fields and other moderately complex elements is to edit instructions in a separate file.

PC-File has several things going for it—built-in business graphics, network support, native dBASE mode, and a low price ($130). But other programs do the same things better, and some of them don't cost much more. Version 6.0 should be out by the time you read this, offering a mousable, pulldown-menu interface and a few new options, but version 5.0 is only a fair value.

It's easy to find what you want with Personal R:base's query-by-example system. Here, a relational query that draws information from three related tables saves the results as a table.

Personal R:base 1.0

BEST BUY

PROS: Easy interface, excellent relational skills, flexible queries, low price

CONS: No network support

A little brother to Microrim's programmable, networkable *R:base 3.1*, *Personal R:base* comes with a well-organized interface, the best relational skills in the roundup, good data entry validation, and flexible queries and reports. Add an aggressive $200 list price, and you get a Best Buy.

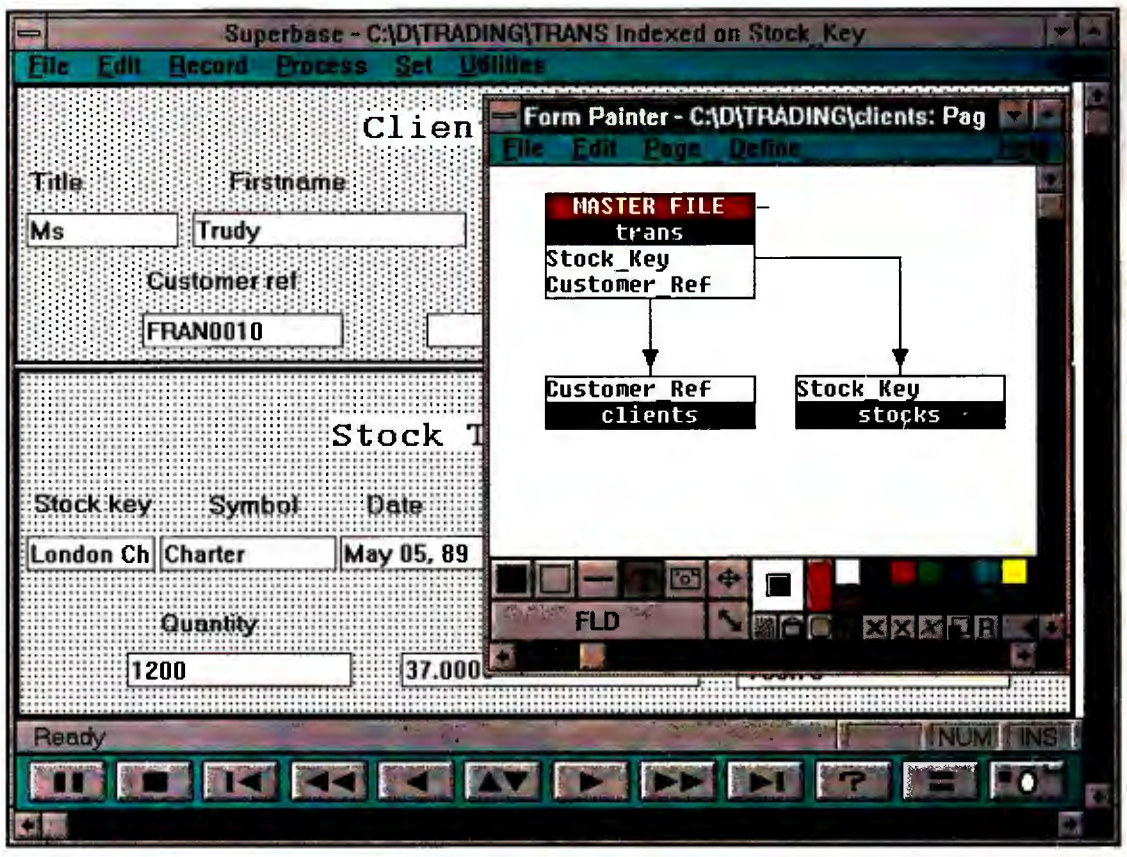
Personal R:base's interface has more than mouse support, pulldown menus, and extensive on-line help going for it—you can quickly find out how to do easy tasks, and the program gently guides you through the more complex ones. The rough spots are minor—for instance, changing directories is complicated.

Personal R:base's relational skills are tops; you can easily relate data in just about any way you can think of. *Personal R:base* handles relations differently than the other programs reviewed here: Rather than linking separate files, you relate multiple tables

within a single file. This forces you to consider your relational design up front, so you avoid problems later.

Personal R:base is, at its heart, *R:base 3.1* without a programming language or network support. If your office uses *R:base,* you can easily query and report on its data and even run single-user *R:base* applications. *Personal R:base* comes with five prebuilt applications, including a capable appointment calendar and address book.

Personal R:base is a superb value. With its easy interface, powerful tools, and low price, this program wins its Best Buy hands down.



Superbase uses a VCR-like push-button approach to browsing a data file. Its Form Painter (inset) lets you design fancy forms and link flat files into a relational design.

Professional File 2.02

PROS: Easy for beginners, good performance

CONS: Few relational skills, awkward reports and queries

Thanks to *Professional File*'s overlapping pop-up menus and extensive help system, you can set up a data base and start typing data into it within minutes of installing the program. You'll be up and running in no time. But as tasks get more demanding, that jog may turn into an uphill battle. To create a calculated field, for example—say, a Net Pay field that subtracts deductions from gross pay—you'd have to assign abbreviated tags to the Deductions and Gross Pay fields, then use those tags in the calculations, and keep track of a name and a tag for each field.

Expect trial and error with *Professional File*'s report writer. All but the simplest reports require that you enter obscure codes in obscure places. Since there's no band orientation, you have to wait while the program prints your report to the screen before you can see if you're on the right track. Queries are easy—just tell the program what records to find and start it searching—but you can't use complex criteria or select which fields to display. On the plus side, you can create data entry forms that will catch many mistakes.

If your needs are simple, *Professional File* should fit the bill. But even here, other programs should fit it better.

Q&A 3.0

PROS: Great mail merge, easy for beginners, fastest in roundup, good network support

CONS: Limited relational skills, awkward queries and reports

Q&A invented the "executive" data manager. With virtually no training, you can run simple queries in plain English using *Q&A*'s front end, the Intelligent Assistant. In addition, this is the only data manager around that comes with its own word processor, a nice combo for sending custom form letters to mailing lists.

You have to "train" the Intelligent Assistant to understand the key words people will use in queries—and even then, the English-like queries must conform to a syntax. Users with any kind of data management experience will quickly switch to the program's alternative query interface. The latter is quite similar to that of *Professional File*—you'll have no trouble getting started, but try to move beyond simple jobs, and frustration may set in. In *Professional File,* you can at least refer to a field's abbreviation before using it in a calculation; with *Q&A,* you assign numbers, so you'll have to remember whether 4 is your client's name, ZIP code, or food preference.

Q&A's report writer is powerful, but it's more difficult than *Professional File*'s. Without a band orientation, you can't see what you're doing as you do it. But if mail merge is your main concern, the first-rate word processor will make up for the report writer's shortcomings. It's good enough to be sold separately—in fact it is, as *Q&A Write.*

Among its other virtues, *Q&A* is the most networkable program in the roundup. When multiple users access the same file at the same time, the program remains dependable—and it doesn't require a special version.

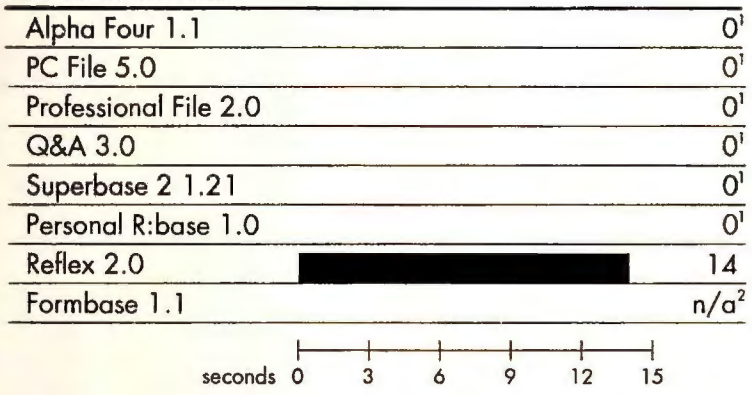
Version 4.0 should be out by the time you read this, adding mouse support, new relational features, and other improvements (see "A Livelier Q&A" in this issue). The version reviewed here isn't the best choice for complex applications such as accounting, but it's a sweet deal if data and word processing go

Q&A's Performance Proves Dependable

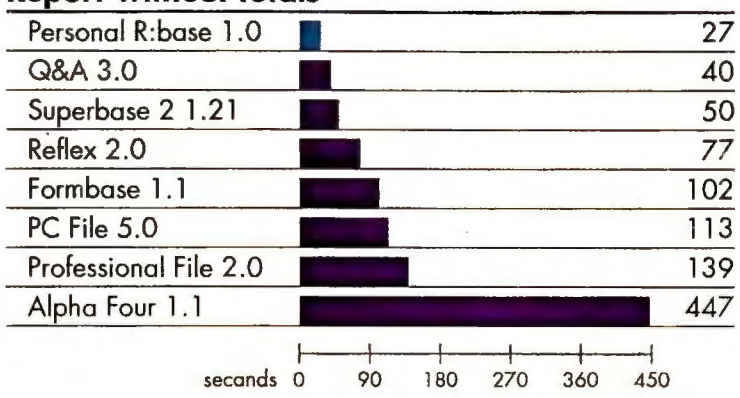
It came in first in only one test—and that was a six-way tie—but Q&A wins the speed race overall by doing reasonably well every time.

Best Buy

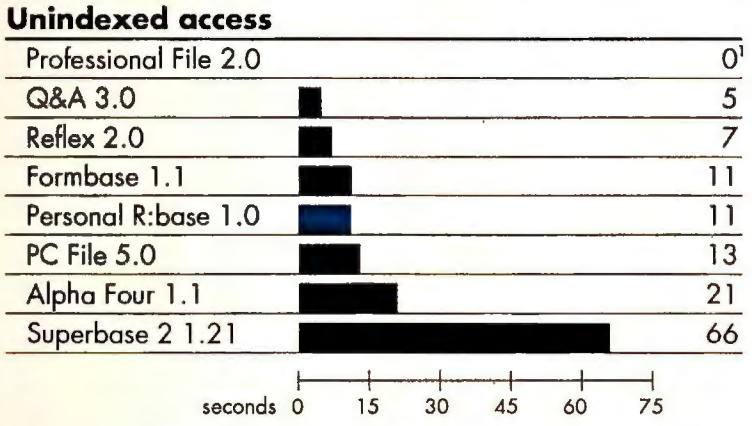
Indexed access



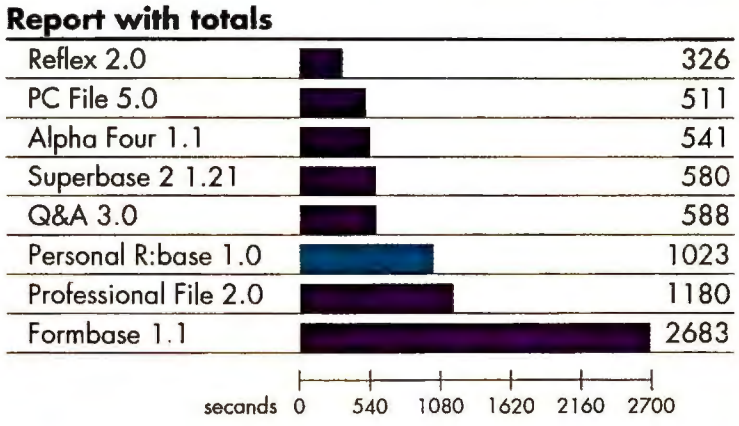
Report without totals



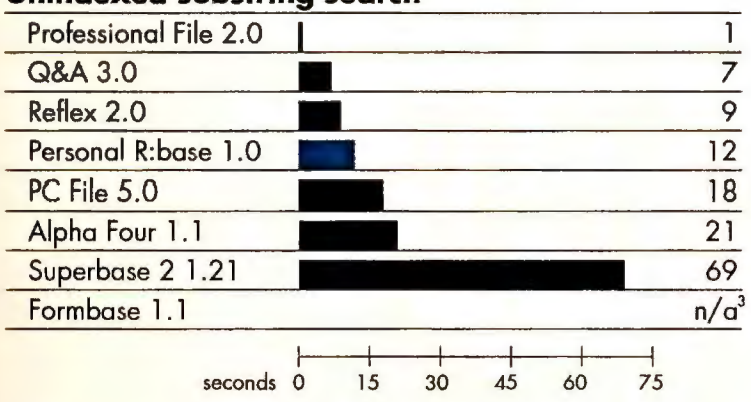
Unindexed access



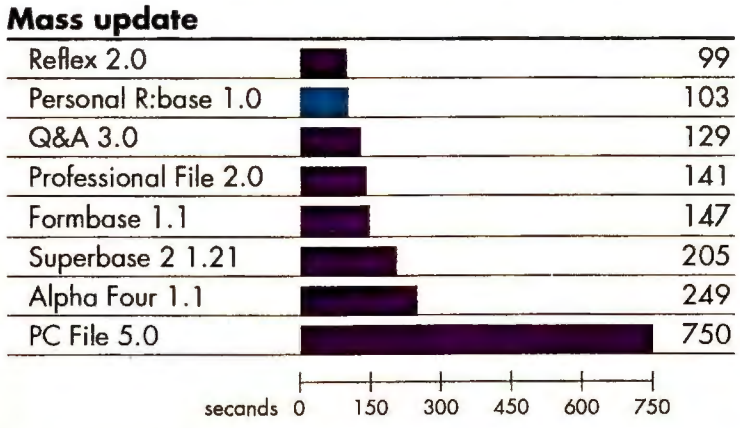
Report with totals



Unindexed substring search



Mass update



[1] Elapsed time was too short to measure.
[2] Formbase does not index.
[3] Formbase searches for substrings only if they contain words or if a trailing wild card is used.

Methodology
We performed all tests on a 20-MHz Compaq Deskpro 386/20e with 2MB RAM and a 110MB IDE hard disk. We set up a 19-field data base of video inventory with the first field indexed. The data base contained 10,000 records. All reports were printed to a file.

Indexed access
We search the indexed video ID field for a specific video number.

Unindexed access
We search the unindexed title field for a specific title.

Unindexed substring search
We search the title field for a portion of a title.

Report without totals
We generate a report listing the contents of seven fields from the record of every science fiction video in stock. The content of the category field is used as the reporting criterion but is not included in the report.

Report with totals
We generate a report listing the contents of seven fields of all the records in the data base by category, with subtotals and a final total calculated on the price field.

Mass update
We search the entire data base for records containing a specific rating and update the records found with a changed rating.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

EXECUTIVE SUMMARY

Personal R:base—Good for the Long Haul

Other programs are easier out of the box, but Personal R:base remains easy as your needs grow.

A personal data base manager doesn't have to be simple, just easy. **Personal R:base** wins the Best Buy by virtue of its intuitive interface, full relational capabilities, terrific form and report generators, and powerful query by example.

	Alpha Four 1.1	Formbase 1.1	PC-File 5.0	Personal R:base 1.0	Professional File 2.02	Q&A 3.0	Reflex 2.0	Superbase 2 1.21
Ease of use	Good	Good	Foir	Excellent	Good	Good	Excellent	Foir
Relational skills	Good	Good	Foir	Excellent	Fair	Foir	Poor	Excellent
Data types and forms	Excellent	Good	Foir	Excellent	Fair	Good	Foir	Good
Queries	Good	Poor	Foir	Excellent	Foir	Foir	Good	Good
Reports	Excellent	Good	Foir	Excellent	Fair	Good	Excellent	Foir
Performance	Fair	Foir	Foir	Good	Good	Excellent	Good	Foir
Multiuser skills	Foir	Good	Excellent	Poor	Foir	Excellent	Poor	Excellent
Overall value	Good	Good	Foir	Excellent	Foir	Good	Good	Good
				BEST BUY				
Reader service no.	666	667	668	669	670	671	672	673

How we rate programming-optional data managers

We rate these programs based an infarmatian in the Features Evaluatian and the PC World Test Report, cambined with aur apinians af the products' averall quality.

Ease of use considers how easy the programs are ta wark with, both when you're new to them and after yau're experienced. An Excellent rating requires lagical menus that a navice can navigate with ease, and a minimum af cryptic function and cade names. Extra credit is given far mause suppart.

Relational skills scores haw well—and haw safely—yau can use data simultaneausly fram mare than one table ar file. To receive an Excellent rating, a program must affer one-to-many links, allaw laakup-table validatian, and let yau edit multiple related tables at ance.

Data types and forms looks at the types of data you can use and the farms available ta enter the data. An Excellent requires mema fields, import and expart af WK1 files, the ability to directly read and write DBF files, and full data validation.

Queries considers haw easy it is ta find the information you need. Ta win an Excellent, a pragram must affer a query-by-example feature, let you place calculated fields inta queries, save queries for reuse, and sart ar index by camplex criterio.

Reports laaks at haw easy it is to get your data anta paper in an easy-to-read and pleasing layout. Ta earn an Excellent, a pragram must affer a band-oriented repart writer that supparts calculated fields and lets yau define relatians. Extra credit is given far crass-tab reparts, graphics, ar a built-in ward pracessar.

Performance ratings are derived fram standard deviatian analysis af benchmark results, with extra weight given ta the Indexed Access test.

Multiuser skills considers how well these pragrams wark an a netwark. To win an Excellent, a pragram must have automatic file and recard lacking and allaw yau ta password pratect a file.

Overall value is averaged fram all af the abave criteria, with special emphasis placed an ease af use and relatianal skills.

hand in hand or if you need the Intelligent Assistant's ability to cater to naive users.

Reflex 2.0

PROS: Easy interface, great reports, superb graphics

CONS: No relational ability

If you want to massage data with top analytical, reporting, and graphics tools, look no further. Since it imports data from Borland's *Paradox* (whose own reporting skills are unexceptional), *Reflex* makes a handy report writer if your data is in *Paradox*.

Pulldown, mousable menus make *Reflex* easy to use. You can view data many ways—thanks to *Reflex*'s split-screen ability—even two ways at once. For instance, you could list sales on half the screen and show a cross-tab report of sales per rep on the other half. The program also has a spreadsheet-quality graphics module.

But *Reflex*'s lack of even the simplest validation or relational capabilities makes it inappropriate—when used alone—for most data base tasks. The thought of keeping accounting or group scheduling data exclusively in *Reflex* is frightening.

Reflex's band-oriented report generator is the best in the roundup, with excellent control over page layout. You get numerous spreadsheetlike tools, including a function that reads a value in the previous record. This lets you calculate, for instance, the duration between successive events, useful for tracking sales or donations.

Reflex isn't recommended as your office's only data manager. But because reports are a top priority for most

ZEOS

ZEOS®

Simply the best notebook you can buy.

Take it from the experts:

F10
Esc
Tab
Caps Lock
Shift
Ctrl
Alt
Fn

A few expert opinions:

"There's a new king of the hill–the ZEOS Notebook..." – PC Magazine, Editor's Choice

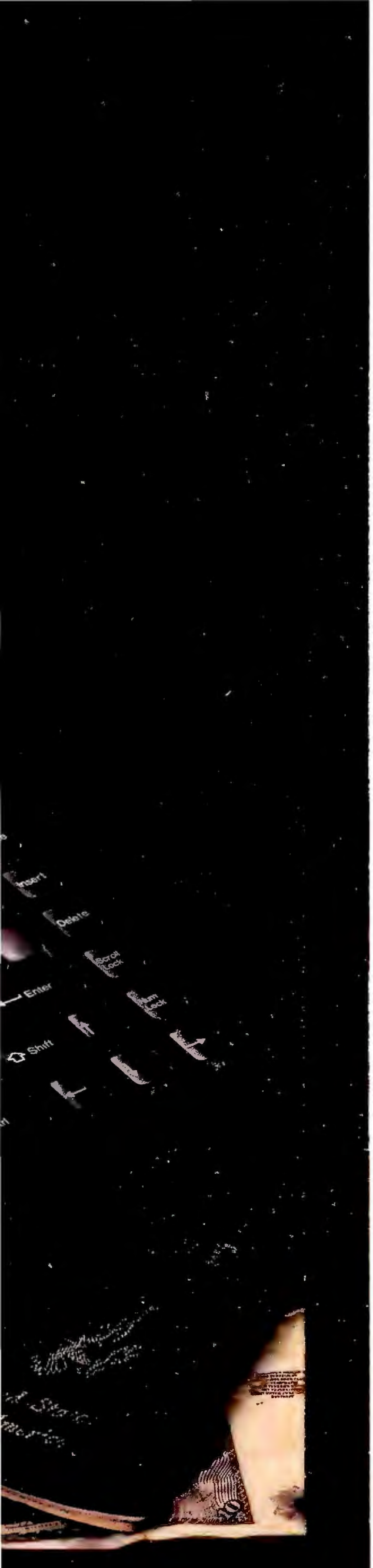
"ZEOS' Notebook...it's the one to buy..." – PC World Best Buy *"The ZEOS Notebook...a clear winner...why settle for less?"* – Byte

"This notebook is a steal." – InfoWorld *"The ZEOS beats the Compaq."* – PC Computing

"The ZEOS Notebook...delivers astonishing value...sensational." – Portable Office *"An outstanding value."* – PC Week

Outstanding Indeed!

And The Price?



PC MAGAZINE EDITOR'S CHOICE

PC WORLD BEST BUY

"THE HOTTEST DEAL ON THE NOTEBOOK MARKET"
—PC MAGAZINE, EDITOR'S CHOICE

Light Load

"King of the Hill... Sensational... The best price-performer... Astonishing value ...A steal... The number one contender..." We couldn't have said it better ourselves. Winner of PC Magazine's Editor's Choice Award and PC World's Best Buy Award, the experts love the ZEOS Notebook. And you'll love it too. At only $1995 for our '286 version and $2295 for our new 386SX, you simply can't find a better notebook anywhere!

As PC Magazine said, the ZEOS Notebook "offers a top notch combination of power, weight, features and price..." And you can pick your power! Choose our '286 version or go for the incredible new ZEOS '386SX. Combine either with our high speed hard disk, built in 1.44MB floppy drive, VGA and more—you've got the greatest notebook going at any price!

INCREDIBLE DESKTOP FEATURES IN A NOTEBOOK.

In fact, it's really like owning a full featured desktop that you can take with you anywhere! Look closely at the details. Like our crisp 10" VGA display. The ultimate in sparkling clarity, it features advanced fluorescent backlighting for vivid VGA graphics. Then, the drives.

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9 ZEOS International, Ltd., 530 5th Avenue, N.W., St. Paul, MN 55112 USA.

The ZEOS Guide to the Perfect Notebook:

PROCESSOR: PC Magazine recommends a '286 or '386SX processor pointing out that "8086- and 8088-based portables have only half to a third of the computing power of a 286." That's why ZEOS offers you your choice, '286 or 386SX! More power for you. After all it's just like a 6.5 pound desktop!

DRIVES: *Two drives, built in!* A whisper quiet high speed 20 Megabyte hard disk *plus* a 1.44 Megabyte 3.5 inch floppy. Remember, with a built in floppy drive you don't need to fool around with strange interfaces to load and transfer files.

VIDEO: ZEOS raises the ante to VGA! We're talking about bright and crisp VGA displayed on one of the largest notebook screens in the industry. The display also features advanced fluorescent backlighting, 32 grey scales and 640 x 480 resolution. Plus, it can be adjusted to any position over a 135° angle and features easily adjustable brightness and contrast controls. Easy viewing under virtually any lighting conditions. You can connect to an external VGA color monitor too!

GREAT BATTERY FEATURES: Every battery feature you want. You can plug your notebook in and "quick charge" the battery in less than one hour or you can "trickle charge" while in use. Plus, your battery easily snaps out allowing the quick installation of an optional replacement battery. It's great to be able to carry a light weight spare for those especially long trips. An optional battery charger stand is available as well.

INTELLIGENT POWER MANAGEMENT: Your new ZEOS notebook features an intelligent programmable power management system if you wish to use it. Based on the length of time since your last keystroke, you may reduce CPU speed, display screen backlighting etc. Full power is immediately restored at the stroke of any key. The system even knows *not* to use the power management system when you are operating on AC power!

CHECK IT OUT!

Now, you can take desktop computing power anywhere! Your ZEOS notebook has many features of obvious importance. Also, there are a number of features that are subtle yet critical to your ultimate satisfaction. We'll go over them here one by one. We think you'll agree your new ZEOS Notebook is the one for you!

SYSTEMS STATUS AT A GLANCE: Yes, monitor eight key system components at a glance! We've equipped your new notebook with eight LED indicators which monitor disk access, keyboard functions and power status. There is even an audible alarm which may be programmed to inform you of a low battery condition and to let you know if the cover is closed with the power on. Now that's one smart notebook!

DESKTOP KEYBOARD FEATURES: We're talking 82 full size keys with full 101-key emulation. And the keyboard isn't squeezed either. The distance between the "Q" key and the "[" (left bracket) key measures 7.5 inches, just as PC Magazine suggests. The keys are of standard size, plus touch typists will love our full 3.5mm keystroke. Type for hours and love it!

CONNECTIVITY AND I/O: Keeping in touch is easy when you order our internal 2400 baud MNP Class 5 modem. Simply plug in the phone line and dial away. How about I/O ports? Many notebooks don't have them and if they do they're often non-standard. But your ZEOS notebook has *industry standard I/O*—serial, parallel and VGA. Just like your desktop!

FCC & UL APPROVALS: Your new ZEOS notebook features both FCC Class B and UL approvals. We've also met CSA and VDE requirements too, just for good measure. Quality and reliability.

WATCH THE DETAILS TOO: Like memory expandability. One Meg comes standard, you can also order a total of 3 or 5MB as a factory option. And lots of other details. Like a recessed power-on reset button, a soft carrying handle, built in speaker and more. You're going to love it! And there's no reason to wait.

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ZEOS IS THE LEADER

10 Good Reasons To Buy From ZEOS®

Reason #1
"Overall Excellence."

As *PC Magazine* said "Price is always a consideration. So are benchmark test results. But both factors can be deceiving, which is why we consider them in the context of other aspects that will make the difference months and years down the road."

These are the attributes which *PC Magazine* used in awarding ZEOS the coveted Editor's Choice, not once but *seven* times. And "Overall Excellence" are the very words *PC Magazine* used in describing ZEOS systems comparing them to all others.

Reason #2
Dazzling Performance.

In one recent '386 review, *PC Magazine* awarded ZEOS Editor's Choice. "The ZEOS '386 blows away every other computer... a smart choice" is what they said. And in another recent review, *Government Computer News* said the ZEOS 33MHz '386 is "arguably the fastest MS-DOS and OS/2 micro in the world."

Dazzling Performance is built into every ZEOS system. It's a key component of ZEOS Overall Excellence.

Reason #3
Exceptional Quality.

PC Resource Magazine put it this way, "ZEOS... provides quality comparable with IBM or Compaq and does so for about 70% of the price." ZEOS uses only the very best components. And every system is fully tested and burned-in right in our own labs.

Reason #4
Value.

InfoWorld says, "We find the ZEOS '386 an excellent value. Speed: Excellent. Compatibility: Excellent. Value: Excellent." *Personal Computing* said, "ZEOS...is the best value we've come across...its performance is right up there with the slickest, most expensive PCs you can buy."

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Reason #5
Warranties and Guarantees.

ZEOS believes in its products. That's why we offer each and every customer our 30 Day Absolute Satisfaction Money Back Guarantee, no questions asked. Plus, our One Full Year Limited Warranty and Express Parts Replacement Policy. Optional On Site Service is available too. Call for details.

Reason #6
24 Hour Toll Free Technical and Sales Support.

At ZEOS, the customer is #1. That's why we invented 24 Hour a Day Tech Support. For *your* convenience. If you buy a product from us we feel we should be there to help, any time of the day or night. Give us a call Toll Free! 800-423-5891. Anytime!

Reason #7
Experience.

Almost unique in the mail order computer industry, ZEOS maintains its own chip level Research and Development staff. In addition to Systems Manufacturing, we also operate our own Board Level Manufacturing facility.

ZEOS has been involved in Research and Development since our incorporation back in 1981. Our strong and experienced Research, Manufacturing and Technical Staff translates into superior factory direct computer systems for you.

Reason #8
A Sterling Reputation.

In magazine after magazine and review after review ZEOS systems are cited for Overall Excellence, for Excellent Value, as the Right Choice and so on. All of this is flattering but the most important thing is this: What do our customers think? Frankly, they love us. The systems and the support. That means more to us than anything.

Reason #9
Easy to Buy.

ZEOS systems are easy to buy. You can pick up the phone any time of the day or night and order your new ZEOS computer. And we accept MasterCard, Visa, Discover, American Express, and Corporate Purchase Orders from Fortune 1000 Companies, Colleges, Universities and Governments. Complete Leasing Programs are available as well.

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people, *Reflex* is a good value. It may not be your cleanup hitter, but it's a great utility player, filling in behind *Paradox.*

Superbase 2 1.21

PROS: Very relational, great queries

CONS: Limited reporting, steep learning curve

If you work in *Windows* and want a more conventional personal data manager than *Formbase, Superbase 2* is your only choice. The low-end version of *Superbase 4, Superbase 2* is fully relational and does terrific queries—but novices need not apply.

When *Superbase* exploits the *Windows* interface, it does so superficially. You can move through your data via on-screen VCR-like buttons—cute, but no more intuitive than pressing <Page Down>. More important, basic tasks aren't enhanced by the interface. With *Formbase,* for instance, you can add validation to a field from inside your form simply by double-clicking on it. With *Superbase,* you can't validate a field from inside a form.

Superbase queries are close to excellent—you can select which fields to display and use complex criteria to find the right records. You can easily turn queries into reports, although there's nothing as visually intuitive as a band-oriented screen to set them up on. You can make use of WYSIWYG fonts and other *Windows* benefits when printing forms, but you have little control over the look of more relational, query-based reports.

If your company is already using *Superbase 4, Superbase 2* will make a good companion for it. In fact, you can run *Superbase 4* applications on *Superbase 2*—a good way to save money. *Superbase 2*'s relational capabilities make it a good value for those *Windows* users who need more power than *Formbase* has to offer.

The Final Report

There's little ambiguity here: *Personal R:base* is the best personal data manager around. There are several other good values, led by *Alpha Four*—a superb personal adjunct to dBASE work groups—but no equals.

Even with the smoothest of these programs, data management is still challenging. One day, someone will invent a data manager that will read your mind and set up the relational system you need. Until then, *Personal R:base* is the best product you'll find. ◆

Richard Scoville is a PC World *contributing editor.*

For more information about all products in this article, circle reader service no. 907.

WHERE TO BUY

Alpha Four 1.1
Alpha Software Corp.
1 North Ave.
Burlington, MA 01803
617/229-2924
LIST PRICE: $549
REQUIREMENTS: 512K, DOS 2.0 or later version, two floppy drives
TECHNICAL SUPPORT: 60 days free, M–F 9:15–7; extended support plans from $59 to $150, single support call $20 per 30 minutes
OTHER SUPPORT: fax, BBS
Reader service no. 666

Formbase 1.1
Ventura Software, Inc.
15175 Innovation Dr.
San Diego, CA 92128
800/822-8221
LIST PRICE: $495
REQUIREMENTS: 640K (1.6MB recommended) for 286 systems, 2.6MB for 386 systems, Windows 2.1 or 3.0, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 6–5; support via 900 number $15 per call
OTHER SUPPORT: CompuServe, BBS
Reader service no. 667

PC File 5.0
ButtonWare
P.O. Box 96058
Bellevue, WA
98009-4469
800/528-8866
LIST PRICE: $149.95
REQUIREMENTS: 640K, DOS 3.0 or later version (3.1 or later for LAN), hard disk
TECHNICAL SUPPORT: unlimited, for current version and 60 days after upgrade, additional support via 900 number ($1 per minute after first minute) M–F 8–5
OTHER SUPPORT: fax, BBS
Reader service no. 668

Personal R:base 1.0
Microrim, Inc.
15395 S.E. 30th Pl.
Bellevue, WA 98007
206/649-9500
LIST PRICE: $199.95
REQUIREMENTS: 512K, DOS 3.1 or later version, hard disk
TECHNICAL SUPPORT: 30 days free, toll number, M–F 7–5, extended support $255 per year, support via 900 number $2 per minute
OTHER SUPPORT: unlimited 24-hour automated help recordings, BBS
Reader service no. 669

Professional File 2.02
Software Publishing Corporation
P.O. Box 7210
1901 Landings Dr.
Mountain View, CA
94039-7210
415/962-8910
LIST PRICE: $299
REQUIREMENTS: 512K, DOS 2.0 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 8–4
OTHER SUPPORT: fax
Reader service no. 670

Q&A 3.0
Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014
800/441-7234,
408/252-4694 (fax)
LIST PRICE: $349
REQUIREMENTS: 512K RAM (640K recommended), DOS 2.0 or later version (3.1 required for network use), hard disk recommended
TECHNICAL SUPPORT: unlimited, toll number, M–F 6–5
OTHER SUPPORT: BBS
Reader service no. 671

Reflex 2.0
Borland Int'l Inc.
1800 Green Hills Rd.
Scotts Valley, CA
95066-0001
800/331-0877,
408/439-9103 (fax)
LIST PRICE: $249.95
REQUIREMENTS: 512K (640K recommended), DOS 2.0 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 6–5
OTHER SUPPORT: CompuServe, BIX, GEnie
Reader service no. 672

Superbase 2 1.21
Precision Software
8404 Sterling St.
Irving, TX 75063
800/562-9909
LIST PRICE: $345
REQUIREMENTS: 640K, Windows 2.1 or 3.0, hard disk
TECHNICAL SUPPORT: 90 days free, then $75 per year, toll number, M–F 8:30–5:30
OTHER SUPPORT: fax, CompuServe
Reader service no. 673

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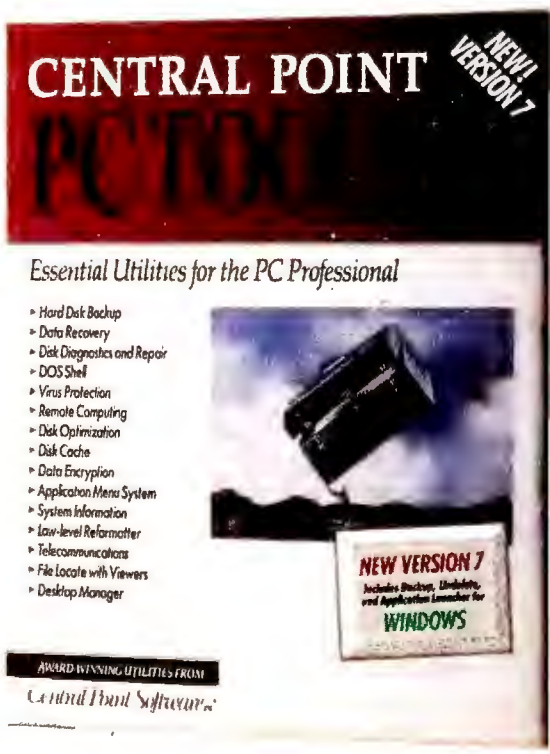

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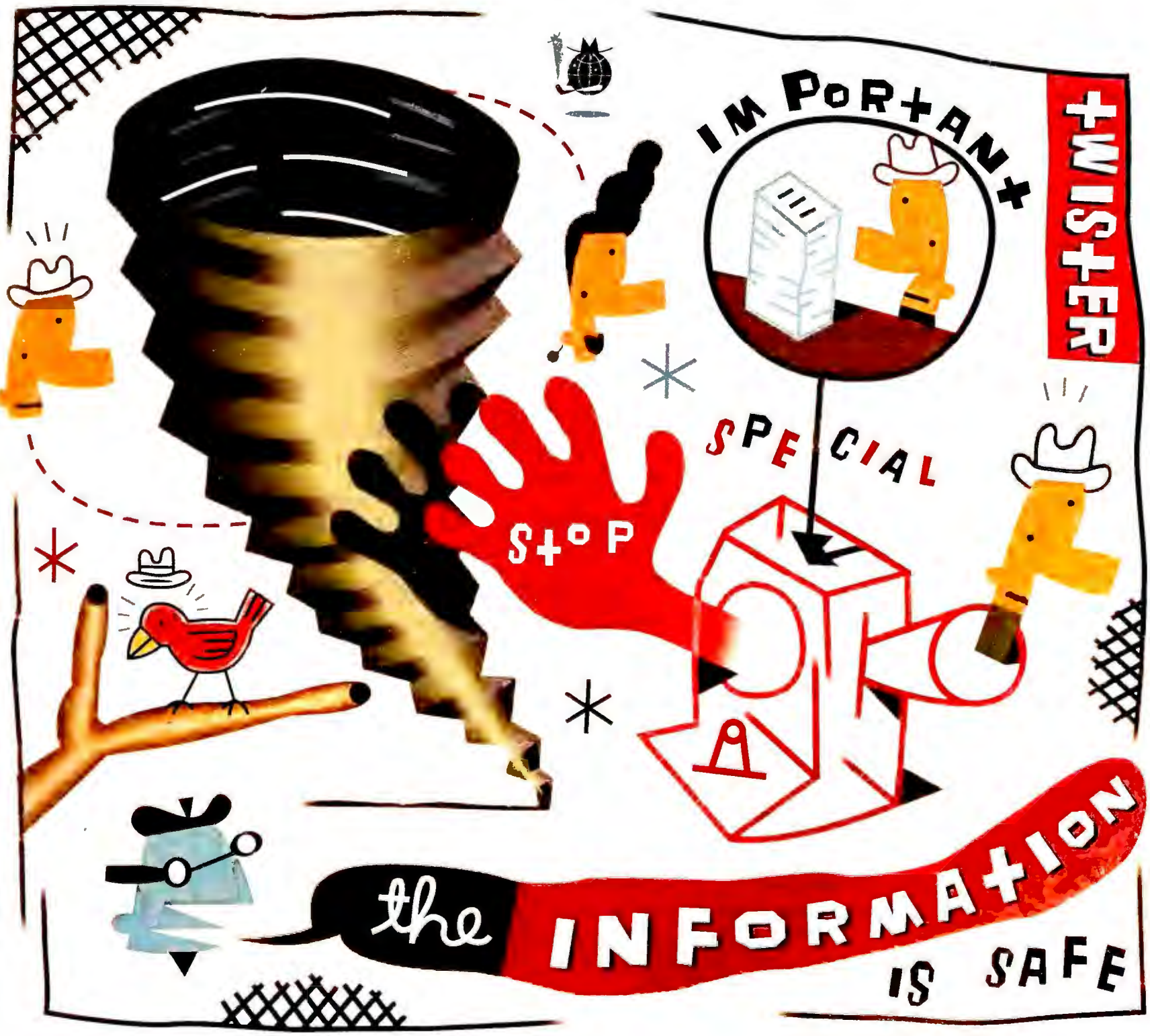
Hard Disk Defenders

Choose a hard disk optimizer to ward off data catastrophe and boost performance. If disaster strikes anyway, libraries like Mace, Norton, and PC Tools can save the day.

John Lewis



When your precious data is at stake, there's nothing wrong with a belt-and-suspenders approach: Sure, you should take every measure to prevent data loss —but be prepared for disaster anyway. This means you need to get *and use* one of the six disk optimizers reviewed here to keep your hard disk running right, and keep a utilities library around to recover accidentally deleted files. Three of the six optimizers reviewed here are part of utility libraries, so you may be able to get everything you need in one package.

What can a good disk optimizer do for you? Three critical things: Defrag your files, test for surface defects, and refresh the low-level format. If you include let you sleep easier, that makes four.

- *Defragmentation* speeds disk performance by consolidating (defragmenting) the file data that DOS scatters across a hard disk. This also minimizes disk wear and tear, helping your hard disk last longer.
- *Surface testing* scours your disk to find and lock out flawed areas that can garble data.
- *Low-level format* rewrites the magnetic tracks on your disk, preventing data loss. Disk optimizers can also speed disk performance by testing and resetting *interleave*—the number of sectors the hard disk head skips when reading from and writing to the disk.

So much for disaster prevention. But, as you may have noticed, we live in an imperfect universe—one where catastrophe can creep in on huge Godzilla feet despite your best intentions. When the worst happens, a good utility library can be your best friend, thanks to features like data recovery, file management, and productivity tools.

You can prevent most disk disasters with one product: The Norton Utilities.

- *Data recovery* lets you undelete files you have accidentally erased or lost to hard disk errors. You should also be able to recover entire directories or an accidentally formatted hard disk.
- *File management utilities* speed your work and help prevent mistakes. All the libraries reviewed offer file encryption for extra data security, and the ability to search your disk for files or text strings. Two of them include a DOS shell so you can avoid the command line completely while tagging groups of files for deletion, copying, and so on. *PC Tools* even throws in a backup module (see "No-Sweat Backup Software" in this issue).
- *Productivity utilities* range from appointment calendars to calculators. You may already have some of these handy items, but if you don't, they're compelling reasons to buy.

In this review we'll start with a comparison of six top optimizers, then present a grand finale that covers the "big three" libraries: *Mace, Norton,* and *PC Tools.*

Fortunately, you should be able to forestall or prevent most disk disasters with just one product: *The Norton Utilities 5.0.* This time-honored disk wizard takes Best Buys in both Optimizer *and* Library categories, delivering up-to-date features with an interface that makes you *want* to use them every day.

WHERE TO BUY

Mace Utilities 1990
Fifth Generation Systems
10049 N. Reiger Rd.
Baton Rouge, LA
70809-4562
800/873-4384
LIST PRICE: $149
REQUIREMENTS: 256K RAM, DOS 2.1 or later version
TECHNICAL SUPPORT: toll-free number, 24 hours a day, every day except major holidays
OTHER SUPPORT: in-house BBS, CompuServe forum, fax
Reader service no. 693

The Norton Utilities 5.0
Symantec Corp.
10201 Torre Ave.
Cupertino, CA
95014-2132
800/441-7234,
408/252-4694 (fax)
LIST PRICE: $179
REQUIREMENTS: 512K RAM, DOS 2.0 or later version
TECHNICAL SUPPORT: toll number, M–F, 7–5
OTHER SUPPORT: in-house BBS, CompuServe forum
Reader service no. 694

Optune 1.3
Gazelle Systems
42 N. University Ave.
#10
Provo, UT 84601
800/233-0383
LIST PRICE: $99.95
REQUIREMENTS: 256K RAM, DOS 2.0 or later version
TECHNICAL SUPPORT: toll-free number, M–F 8–6
OTHER SUPPORT: in-house BBS, E-mail access via CompuServe and MCI Mail
Reader service no. 695

PC-Kwik Power Disk 1.04
Multisoft Corp.
15100 S.W. Koll Pkwy.
Beaverton, OR 97006
800/274-5945,
503/646-8267 (fax)
LIST PRICE: $79.95
REQUIREMENTS: 384K RAM, DOS 2.0 or later version
TECHNICAL SUPPORT: toll-free number, M–F, 8–5
OTHER SUPPORT: CompuServe BBS
Reader service no. 696

PC Tools Deluxe 6.0
Central Point Software Inc.
15220 N.W. Greenbrier Parkway
#200
Beaverton, OR 97006
800/445-4208
LIST PRICE: $149
REQUIREMENTS: 512K RAM, DOS 3.0 or later version
TECHNICAL SUPPORT: toll number, M–F 6–5
OTHER SUPPORT: BBS
Reader service no. 697

SpinRite II
Gibson Research Corp.
22991 La Cadena
Laguna Hills, CA
92653
800/736-0637
LIST PRICE: $89
REQUIREMENTS: 384K RAM, DOS 2.1 or later version
TECHNICAL SUPPORT: toll number, M–F 8–5
OTHER SUPPORT: in-house BBS
Reader service no. 698

For more information about all products listed here, circle reader service no. 912.

An Ounce of Prevention: Six Disk Optimizers

Stop trouble before it starts with a full suite of optimizing and testing routines. Only Norton and Optune do it all.

A good disk optimizer keeps your hard disk happy three ways: with defragging, surface testing, and low-level format refresh. Unfortunately, only two of the six optimizers—*The Norton Utilities* and *Optune*—touch all these bases.

Defragging can improve disk performance by as much as 30 percent—but our tests reveal no significant difference between the degree of speedup delivered by different products. However, there are variations in how long the defragging process takes. And because "quick" defragging (consolidating file data but leaving spaces between files) offers nearly as much performance benefit as the more time-consuming "full" defrag, we've rated performance based on quick defrag.

Our test center discovered notable differences in the accuracy of surface testing. Most products let you choose between a fast mode (in which disk sectors are read-only, or where read/write tests are limited to a few simple patterns) and slower, tougher test modes in which complex patterns are written and then read over and over to make sure that the data is accurate. Only *SpinRite II* found all the bad sectors every time, even in its fastest mode, with *Norton*'s Calibrate a close second. Some products *never* found all the bad sectors no matter how hard they tried.

Finally, we put these products to the ultimate test: We simulated a power failure by pulling the plug on them—once while they were in the middle of defragging, and again during low-level refreshing. (Don't try this at home, kids!) Some products with "safe" modes preserved disk data flawlessly; others trashed it.

Mace Utilities 1990

PROS: Protects data despite power failure

CONS: Won't refresh low-level format, misses some bad sectors, slow

A full-fledged library, *Mace* offers more than just optimization, but as an optimizer it's something of a disappointment. The program seems designed with techies in mind rather than business users. Many defragging options are available only from the command line, and you can't use a mouse.

Mace lacks essential optimizing features. You can't refresh low-level format, and defragging strategies are limited. Its quick defrag was the slowest in the roundup, and its read-only surface tests failed to find all the bad sectors on our test disk.

On the bright side, while there's no "safe" mode on any of the menus, when we pulled the plug during defragmentation, all the data and directories survived unharmed. Still, *Mace* does only a fair job of surface testing and defragging a disk. If you demand top-drawer optimization, look elsewhere.

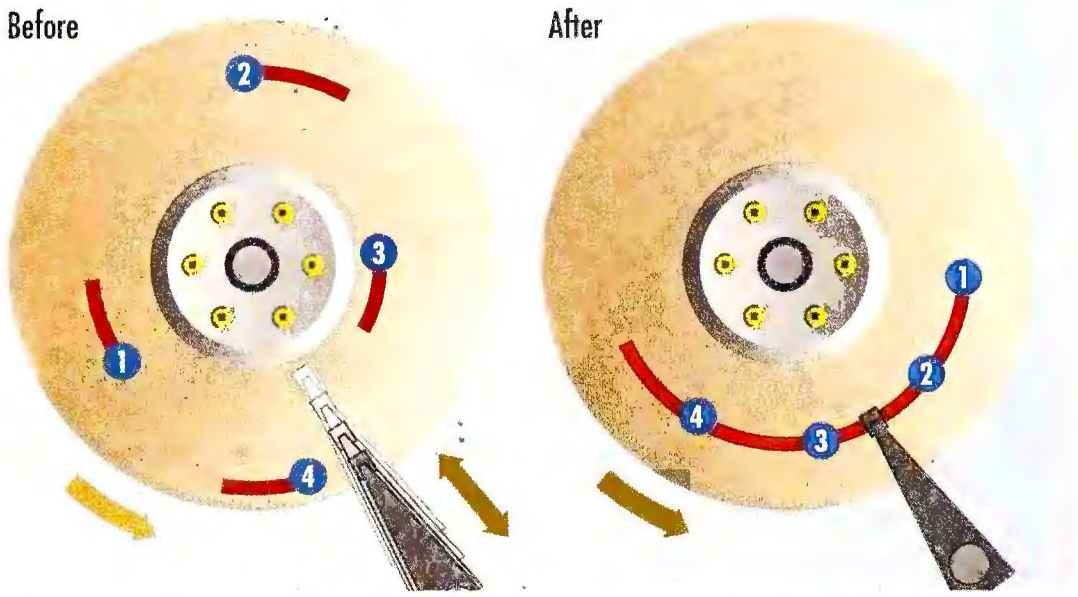
The Norton Utilities 5.0

PROS: Complete feature set, great interface, fast "quick" defrag

CONS: Slow surface tests

Now that *Norton* has added low-level functions, this popular product delivers every essential optimizing feature—with class. Its mouse-ready menus are easy to use and offer extensive context-sensitive help.

How Defragging Speeds Access



In the Before picture, DOS has scattered four segments of a file around the hard disk. To read the entire file into memory, the head must make four separate moves, which takes time and wears the mechanism. In the After illustration, a smart user has employed a defragger to place all four segments contiguously so the head can read the entire file in a single move.

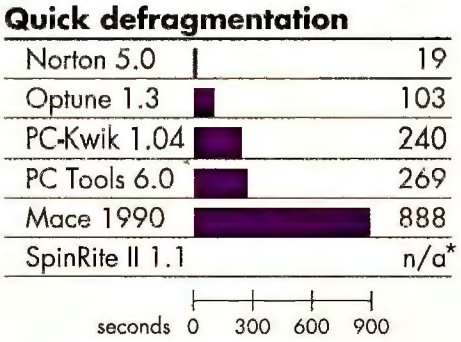
PC WORLD TEST REPORT

Norton Aces "Quick" Defrag

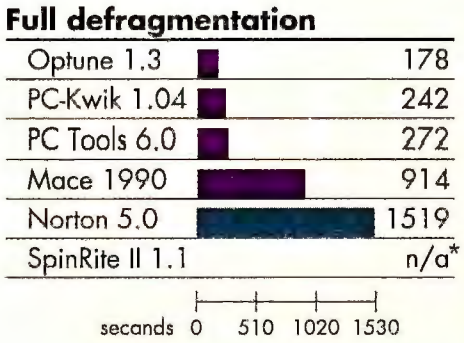
Optune wins in the full defragmentation test, but Norton—with the fastest quick (files-only) defrag—delivers a comparable speed boost.

Best Buy

Quick defragmentation



Full defragmentation



*SpinRite doesn't include a disk optimization feature.

Methodology
We performed on identicol test sequence with all the utilities on an IBM PC AT with a 30MB modified frequency modulation (MFM) encoded Seagate 4038 hard disk and a Western Digital controller.

For our defragmentation tests, we use a batch file to XCOPY 21MB of files and directories to the empty hard disk unfragmented. We delete and add files until we have a highly fragmented disk containing all our original test files and directories. Then we perform a quick defragmentation test, which doesn't move all the files into a pack at the beginning of the disk.

After reformatting the disk, we exactly duplicate its previously fragmented condition. Then we run a full defragmentation, which includes packing all files and moving them to the beginning of the disk.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Norton provides an impressive range of surface tests. The toughest is part of Calibrate, its low-level utility. Calibrate's test routines rated second only to *SpinRite*'s: Although it missed some bad sectors in its lightest test mode, it found all of them in all the other modes. Unfortunately, it runs very slowly.

Speed Disk, the defragger, is as good as you can buy, with five useful defrag strategies and the fastest files-only mode in the roundup. If you don't use *Windows*, this quick "defrag" may well deliver just as much of a performance boost as a full one. A point-and-shoot interface makes it easy to put frequently used files and directories at the front of the disk for faster access.

Norton doesn't include a "safe" menu choice, but apparently it defaults to safe: All attempts to lose data by pulling the plug during disk-write operations ended happily. In total, it adds up to an obvious Best Buy, and that means: Go out and buy it!

Optune 1.3

PROS: Complete feature set; inexpensive; fast; flexible file placement

CONS: Misses bad sectors

Speed is *Optune*'s strong suit—its files-only defragger zoomed past all but *Norton*'s, and its full defragger is actually faster than many optimizers' quick mode. Also, its menu-driven interface is fairly easy to use. But it failed to find all the disk's surface flaws even in its toughest test mode.

The capable defragger is one of the few reviewed products that let you consolidate free space without also defragging files—good for a quick fix so *Windows* will have more contiguous space for its swap file (and thus run faster). *Optune* is also one of a handful that let you place selected files and subdirectories at the front of the disk for a soupçon of extra speed, or at the rear for a longer-lasting defrag. But these last two options are tough to use: You'll need to edit

Optimize for Lean, Mean Hard Disk Access

Defragmentation speeds hard disk performance—and reduces wear. The Norton Utilities, a Best Buy, and Optune offer every defragging option you'll need.

● Yes
○ No
◒ Deficient
n/a = not applicable

	Mace Utilities 1990	The Norton Utilities 5.0	Optune 1.3	PC-Kwik Power Disk 1.04	PC Tools Deluxe 6.0	SprinRite II
Standard features						
Price	$149	$179	$99.95	$79.95	$149	$89
Mouse support	○	●	●[1]	○	●	○
Defragmentation						
Full defrag (files and free space)	●	●	●	●	●	○
Quick defrag (files only)	●	●	●	●	●	○
Space defrag (free space only)	○	●	●	○	○	○
Move selected data to front or back	○	●	●[2]	●[2]	○	○
Evaluate fragmentation	●	●	○	●	●	○
Power failure protection	◒[3]	●[4]	●	●	○	n/a
Surface testing						
Read-only	●	●	●	●	●	○
Read-write	○	●	●	○	○	●
Test controller and RAM	○	●	●	○	○	●
Choice of test difficulty	○	●	●	●	○	●
Restore good tracks	○	●	○	○	○	●
Defeat hard disk error correction	●	●	○	●	○	●
Power failure protection	◒[3]	●[4]	●	●	◒[3]	○
Low-level format						
Nondestructive refresh	○	●	●	○	○	●
Test and reset interleave	○	●	●	○	○	●
Power failure protection	n/a	●[4]	●	n/a	n/a	○
		BEST BUY				

[1] Works reliably with Micrasaft and Logitech mice only.
[2] Requires editing an ASCII file.
[3] No "safe" made provided, but crash tests failed ta damage data.
[4] "Safe" made is default.

a complicated ASCII file.

Optune offers a "safe" mode as a menu choice, and it works perfectly. Pulling the plug while *Optune* was writing to the hard disk screwed up the FAT so badly that it produced a total hard disk failure, but running *Optune*'s Restore utility from a floppy restored the disk completely.

Optune delivers all the optimizing features you need, and at a bargain price. It's a good value, but *Norton* is easier to use and offers more reliable surface testing.

PC-Kwik Power Disk 1.04

PROS: Flexible file placement, low cost

CONS: No low-level functions, won't consolidate free space, misses bad sectors

PC-Kwik Power Disk is an inexpensive defragger that completely neglects low-level formatting and takes only a half-hearted shot at surface testing: Its read-only tests consistently failed to catch all the bad disk sectors. (Version 1.1, which arrived too late for review, adds mouse support but little else.)

Power Disk's defragger offers unique options. For instance, you can leave files fragmented but place them at the back of the disk so the disk as a whole is likelier to *stay* unfragmented, but it requires editing an ASCII file. The "safe" menu mode works fine: When we enabled it and pulled the plug, no data was lost.

Power Disk is a good value if all you want is an easy-to-use defragger, but its lack of low-level features and unimpressive surface testing keep it from ranking with the leaders.

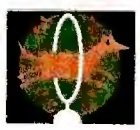
Buying Smart: Optimizers Speed Performance

Optimizers put your disk through a fitness program to prevent trouble. Their single most important function is defragging, followed by surface testing and low-level format refresh.

DEFRAGMENTATION
Defragging a hard disk boosts performance and reduces disk wear. All but one of these products offer a files-only, or "quick," defrag, which speeds disk access by consolidating scattered file segments while ignoring free space between files. This is faster than a "full" defrag, which not only joins files but defrags the free space between them, creating a large, contiguous area of disk space. Lots of open disk space is just what *Windows* needs to write a large, contiguous swap file, making task switching faster. Even if you don't use *Windows,* consolidating space will keep your disk defragged longer: When isolated pockets of free space are eliminated, DOS writes new files contiguously. If you're a *Windows* user, you can benefit from a mode that defrags free space *without* defragging files—since this takes mere seconds. Finally, if you're a hard-core tinkerer, you'll find that the ability to move selected files and directories to the front or back of the disk can deliver marginal performance improvements.

SURFACE TESTING
A surface tester prevents data loss by finding and locking out defects that may have developed since you last formatted your disk. Look for a choice between speedy read-only tests and slower (but tougher) read/write surface testing with a selection of test patterns. A test utility that can disable hardware-based error correction (which causes most disk controllers to overlook some read/write errors) makes the testing tougher—and tougher is better. For the greatest data safety, a surface tester should check system RAM and controller operation before it starts.

LOW-LEVEL FORMAT
Rewriting your hard disk's sector identifiers, which let DOS know where to write data, insures against data loss. Optimizers with low-level capabilities can also boost performance by testing and resetting the interleave your hard disk uses.



PERFORMANCE
This refers to how long the optimizer takes to perform a fast but effective files-only defrag. The faster the utility works, the likelier you are to use it regularly—especially during work hours. (Speed is less important if you can start the defrag at the end of the day and walk away.)

EASE OF USE
Because a mistake can damage your disk, ease of use is important. Look for clear, well-designed menus with context-sensitive help, and mouse support. The utility should tell you how long an operation will take and provide detailed reports on hard disk errors to pass along to a technician or repair person.

A word of warning: Most optimizing operations write to the File Allocation Table (FAT) continuously. If a FAT-write is interrupted, and the FAT is scrambled, DOS can lose your data forever. Hence, if a power failure occurs while these products are writing to your disk, they can damage your data—sometimes irreparably. Back up your disk before you optimize, and look for a "safe" mode on the menu; this mode runs more slowly, but it will protect your data in the event that something goes wrong. If your PC is protected by a UPS (uninterruptible power supply), you can turn safe mode off for faster performance.

PC Tools Deluxe 6.0

PROS: Easy to use, supports a mouse

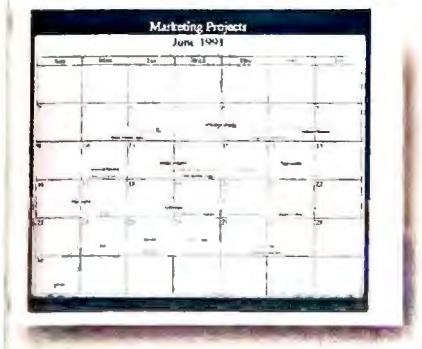
CONS: No low-level functions, misses bad sectors, loses data when power fails

PC Tools deserves its high reputation as a utility library, but as an optimizer it needs a lot of work. It can't handle low-level formatting, its defragger won't consolidate free space or place selected files at the front of the disk, and its read-only surface tests never found *any* of the bad disk sectors.

The menu interface is intuitive, but screen displays are primitive. For instance, during the surface test all you see is a list of incrementing numbers, with no indication of how long you'll have to wait for the test to finish. And while backing up before you use an optimizer is a good idea with any product, it's particularly recommended with *PC Tools.* Not only is there no "safe" mode,

— Coming soon to a department under you. —

NIGHT OF THE LIVING DEADLINES.



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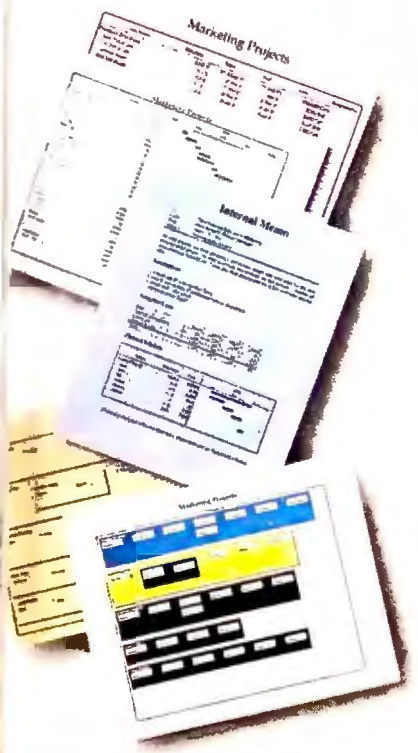

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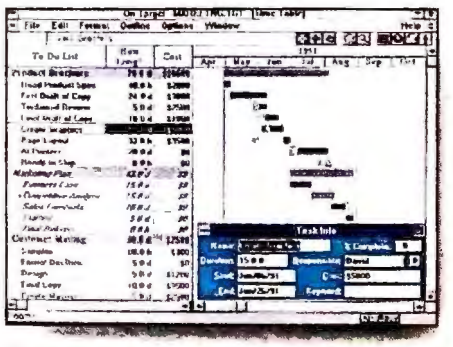

On Target is designed specifically for Windows™ 3.0 Its graphical user interface, familiar spreadsheet format, and full color WYSIWYG graphics make project planning easy

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On Target is the easiest way to keep tabs on virtually all your projects at once. It's the most appropriate way, short of formal "project management," to manage all your schedules and deadlines.

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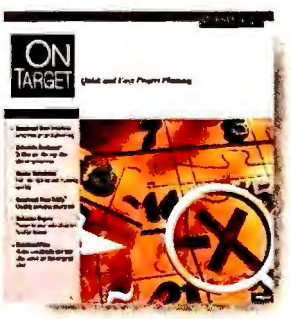

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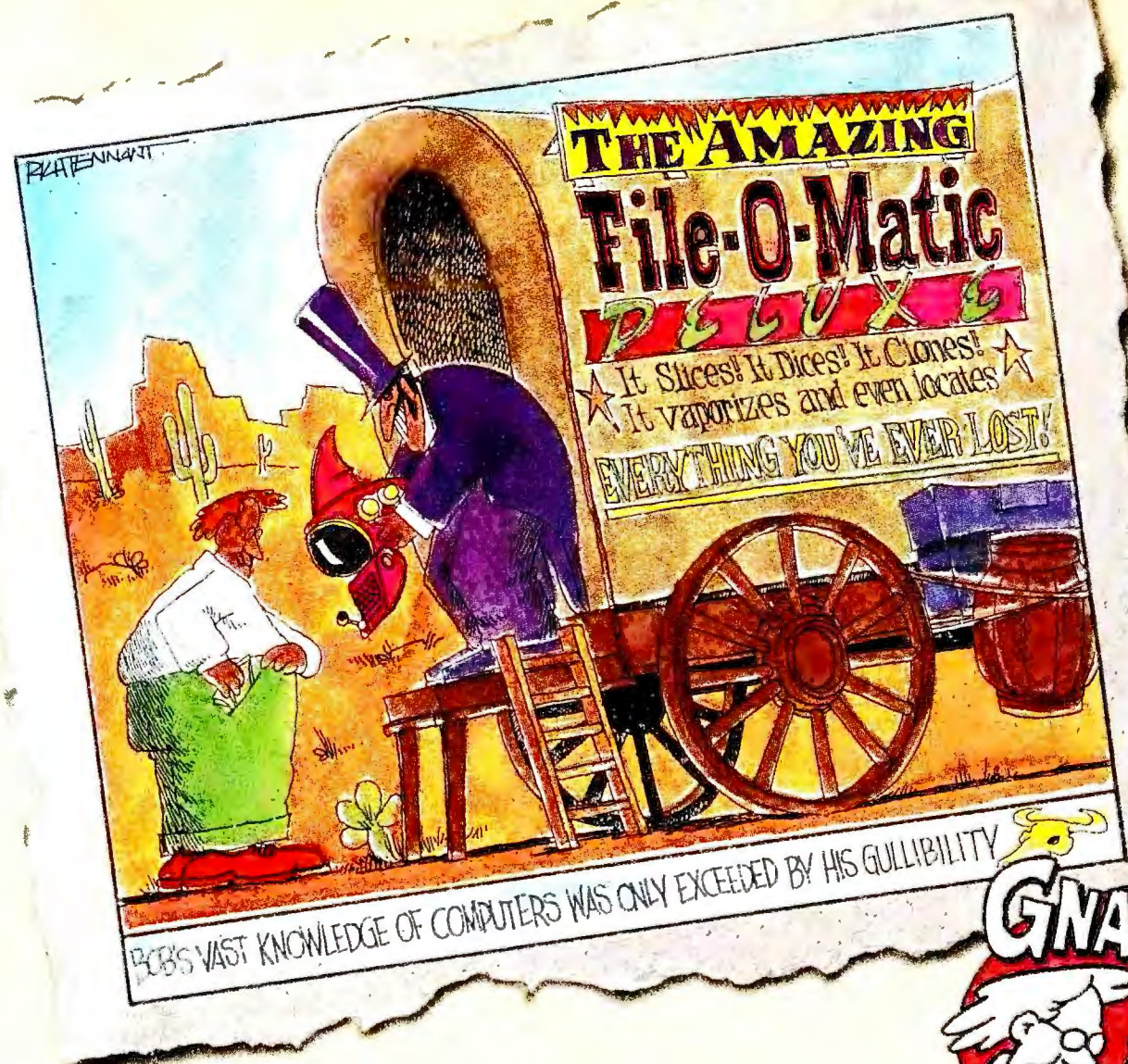

NOW READ WHAT THE REAL EXPERTS SAY ABOUT XTREE.

"It stands alone as the fastest, most imaginative and most capable file manager you can find."

PC Magazine

Some software companies would have you believe their file management packages do everything but make coffee. But nobody's fooling the pros. With its long list of practical, usable features, XTree has been their favorite for years. InfoWorld says, "This comprehensive DOS shell is packed with advanced features that appeal to power users."

Features like an application menu that lets you launch applications right from XTree. And when you're launching applications it shrinks back to 7K. Like an Open File command that makes starting applications and their associated data files as easy as pointing and shooting. Like split screens, so you can view two directories or drives at once. Like text search. And AutoView, so you can browse through files without starting up the application.

Now, there's an even better reason for managing your files with XTree. It's XTreeGold 2.0, with some important new features that make it better and more useful than ever.

Introducing New XTreeGold 2.0. With Simplified Pull-Down Menus, "Un-Delete", And Autobuild Menu Creation.

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You can "un-delete" files that have been accidentally erased.

Create an application menu automatically with Autobuild, which will search your disk for more than 700 popular applications.

View more data files than ever with our newly expanded viewer list.

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In short, the file manager that impressed the pros is more impressive than ever.

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SitBack offer is for a limited time only in specially marked retail packages.

but killing the power during defrag produced over 1MB of lost clusters and caused an entire subdirectory and its files to disappear.

Version 7.0—released too late for review—should help. It appears to fill every major gap (see "PC Tools and Tools and Tools:.." in this issue).

SpinRite II

PROS: Inexpensive; excellent surface tests and low-level features

CONS: No defragger

SpinRite II's hardball read/write surface tests are without peer—they found all the bad sectors on our test disk every time, even at the lightest test setting. So if you already have a good defragger and are merely looking to add surface testing and low-level refresh, this is a great choice.

SpinRite's chief flaw (aside from the lack of a defragger) is its simplistic menu, which lacks mouse support. Less important, but still annoying, the program wastes your time by testing interleave every time—whether you want it to or not.

The product does not offer a "safe" choice on any of its menus, and pulling the plug in midoperation produced a disk boot failure. However, restoring the system files (via DOS's SYS.COM) brought the disk back to life with no apparent data loss.

SpinRite's complete lack of defragmentation features knocks it out of the winner's circle. But if you need surface testing par excellence, it's a great value.

A new upgrade of *SpinRite II,* version 2.0, was released just as we went to press, too late to review. Most of the improvements, like an improved track map, are incremental, but a few are quite impressive. For instance, "dynamic head repositioning" is designed to jiggle the head's position until it can read a marginal sector's data without error.

EXECUTIVE SUMMARY

Two Top Defraggers

Norton, Optune keep disk trouble at arm's length.

Disk optimizers help keep your hard disk as safe and fast as the day yau baught it. Defragging features are the ones you'll use the most, followed by surface testing and low-level farmatting.

Thanks to flexible defragging, taugh testing, salid low-level features, and an easy-to-use interface, **The Norton Utilities** scores a Best Buy. **Optune** is alsa a superb choice if all you need is a law-cost defragger.

	Mace Utilities 1990	The Norton Utilities 5.0	Optune 1.3	PC-Kwik Power Disk 1.04	PC Tools Deluxe 6.0	SpinRite II
Defragmentation	Fair	Excellent	Excellent	Good	Fair	Poor
Surface testing	Fair	Good	Fair	Fair	Poor	Excellent
Low-level format	Poor	Excellent	Excellent	Poor	Poor	Excellent
Performance	Poor	Excellent	Excellent	Fair	Fair	n/a*
Ease of use	Fair	Excellent	Good	Good	Good	Fair
Overall value	Fair	Excellent	Good	Fair	Fair	Good
		BEST BUY				
Reader service no.	693	694	695	696	697	698

*SpinRite II does not perfarm a files-only defragmentotion, required far a Perfarmance roting.

How we rate disk optimizers
We rate these utilities based on information in the Features Evaluatian and PC World Test Report, combined with our opinians af quality, reliability, and user benefit.

Defragmentation is the ability to consolidate the pieces af files and empty space that DOS has scattered araund the hard disk. To win an Excellent rating, a utility must offer files-only and free-space—only defragmentation, plus the ability ta move selected data ta the front of the disk.

Surface testing rates disk diagnastics. An Excellent score requires reliable performance in the lab, plus read/write tests, evaluation of RAM and disk controller, defeat of hardware-based errar correction, and the ability to lock out bad tracks and move endangered data ta a safe location.

Low-level format applies ta features that test and renew tracks on a hard disk. To score an Excellent, a utility must refresh the low-level tracks and test and reset interleave without lasing data.

Performance refers ta the time it takes to perfarm a quick (files-only) defrag. An Excellent score is given to products that rate in the top 20 percent.

Ease of use evaluates the user interface and the quality of documentation. To earn an Excellent, a program must offer well-designed menus and mouse support and tell you at any moment how much ionger a test will run. It should alsa provide detailed information on errors.

Overall value averages all the above criteria, plus price and technical support, with extra weight given to defragmentation.

A Pound of Cure: Three Utility Libraries

Where has all the data gone? After a hard disk disaster, Mace, The Norton Utilities, and PC Tools can usually bring it back. And when the all-clear sounds, you can dig into your library's file management and productivity tools.

For most people, the key feature of any disk library is the ability to save deleted data. And the only way to make sure you can recover *all* your data, no matter what, is to use an *undelete helper,* a utility that records changes in the File Allocation Table (FAT), the index DOS uses to record the locations where files are stored. Once the FAT data is safely stored, the library's undelete utility can use that information to recover your lost files and directories reliably. Not *one* of the libraries we tested was able to undelete all data every time without its helper, but with their helper enabled, all three functioned perfectly.

It's easy to run these helper utilities automatically, either by placing them in your AUTOEXEC.BAT file (so they execute every time you turn on your PC) or by using a TSR that records changes on the fly. But because helpers take time to record a snapshot of the FAT, some users are too impatient to run them. Helper TSRs also use valuable RAM and may conflict with other applications. For these reasons it's important that your undelete utility be able to recover as many files and directories as possible in vanilla mode—without a helper.

Over the years libraries have added a number of related damage control features, such as *unformat,* which is used to recover from an inadvertent DOS format that destroys *all* files and directories on a hard disk. In addition, libraries offer file management features.

Buying Smart: Utility Libraries Rescue Lost Data

Utility libraries come with file management utilities and productivity aids, but the critical benefits are data recovery and optimization. Data recovery can save your bacon if you accidentally erase a file, a directory, or your entire disk.

DATA RECOVERY

All these libraries provide undelete helpers that make undeletion extremely reliable. However, these helpers are not without drawbacks: They slow things down a bit, and if you've changed the deleted file since the last time you ran the helper, you may be out of luck. Also, if they're TSRs, they'll consume precious RAM and may conflict with other applications. So, since you may not always have the time (or extra RAM) to run these helpers, look for the ability to rescue as many deleted files and directories as possible without their use.

To avoid wasting time, look for a table of undelete probabilities that tells you how likely you are to recover a given file. And since many files are better off deleted, look for the option of viewing the contents of a file before undeleting.

EASE OF USE

To make file recovery and management easier, you'll want clear, well-designed menus with context-sensitive help, and mouse support. If all the menus for all the utilities are consistent, the learning curve will flatten considerably.

FILE MANAGEMENT UTILITIES

A capable file manager lets you avoid the difficulty, tedium, and possibility of error that DOS presents. It's safer to pick a command off a menu than to type it in—especially if you're not sure you remember it right. In addition to menu-driven access to basic DOS commands, look for search features (for hunting down files and character strings), file encryption (for protecting private data from industrial spies), and file wipe and disk wipe (for overwriting the data in sensitive files so no undelete utility can read it).

PRODUCTIVITY UTILITIES

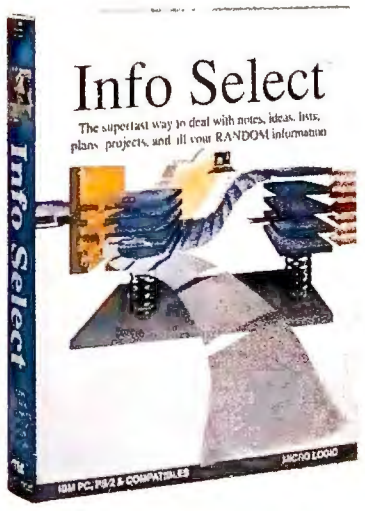
These are the icing on the cake. Their importance depends on whether you already have applications that cover the same ground. We consider a good appointment calendar, an auto-dialer, and a calculator to be the most useful.

How this $149 software will:
1) Improve the way you work and think,
2) Instantly find the info you need, and
3) Help you make brilliant decisions ...

The next generation of TORNADO is here at last!

"the most useful software program I have ever owned."
Steve Gibson, InfoWorld

Surprisingly, there is a whole new world of uses for your computer! You can use your computer to deal with all the countless bits of "random" information scattered across your desk: plans, notes, lists, actions, contacts, ideas,



and much more. INFO SELECT™ will not only give you instant access to this important information ... it will help you make better decisions and see important new relationships. Try INFO SELECT risk-free and discover a whole new dimension of computing.

Photographic memory

INFO SELECT is like having a 'photographic memory' that gives you perfect superfast recall of up to 64,000 items of information.

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When Harry calls you on the phone, you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information.

INFO SELECT is easy to use - yet powerful.

INFO SELECT also includes the world's first "3-D" word processor. You'll be amazed at how it works.

Instead of one window or ten, imagine up to 64,000! The uses are endless.

Are you forgetful?

Were you born with a memory situated squarely on the tip of your tongue? Do you forget things like which day you placed an order or important numbers? If you are forgetful you especially need INFO SELECT - the software that remembers almost everything for you.

Thinking tool

Have you ever worked on a complex project and felt lost? With INFO SELECT you'll group, scan, and cross search through all your notes so fast you'll see the big picture in seconds.

Will I be better off doing this now or that later? Keeping priorities straight can make or break your career or your business. INFO SELECT lets you keep on top of what's hot.

Should you use an east or west coast supplier? To make decisions you need facts. Now you can view the facts any way you like ... as fast as you can think. You'll make the best decisions ever -- and fewer expensive mistakes.

Phone notes

Client info

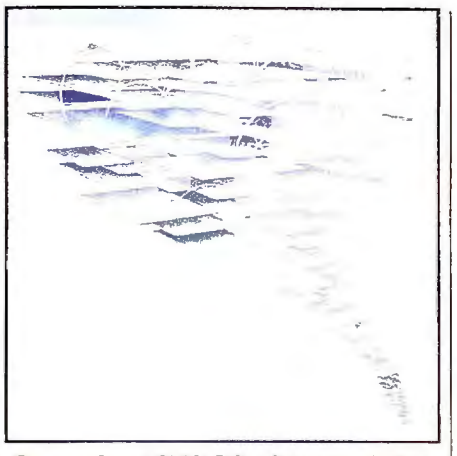
Decisions

Management

The #1 PIM

What's all the fuss about PIMs (Personal Information Mangers)? Simple - you probably have more RANDOM information than any other type and you need a PIM to properly handle this kind of information. The right PIM will save you time and make everything you do go smoothly.

Why is Info Select the #1 PIM? Because Info Select is based on ideas you can identify with - like stacks of paper. And it's free-form too. You won't waste days or weeks learning complex structures. Instead you'll be up and running in minutes. Info Select also does more and costs less than other PIMs.



Owners of our TORNADO software (symbolized by the famous "blue tornado") can trade up to the second-generation Info Select under our special offer. There are over 200 improvements.

Feature packed

INFO SELECT is memory resident (if you choose), so you can quickly jump in from other programs. Info Select windows can hold: notes, plans, lists, facts, letters, contacts, and much more. You can search for a window or a group of windows related by a word or phrase. There are five ways to see overviews; hypertext, a fast sort, and line drawing. Save time with the dialer, date tickler; and searching by text or date ranges.

If you have notes, ideas, contacts or other unorganized RANDOM information, you need Info Select.

Info Select allows you to: add columns of numbers; store data in EMS; use template or free-form windows; import and export files, screens, and databases; move, join, and duplicate windows and much more.

LAN option

The new LAN version allows integrated E-mail, sharing company rolodexes and distributing company policies. You can share any kind of information. It's your first step into the exciting new world of groupware! Ask about the five node LAN starter pack.

Easy power

Info Select is easy to use yet offers the power you need with infobases up to 10 megabytes; text searches up to 700kb/sec; up to 32,000 characters per window; and up to 64,000 windows per infobase. Even better, Info Select can swap down to as little as 7K memory!

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INFO SELECT is based on the pioneering TORNADO™ software PC World called "Excellent, Excellent, Excellent, Excellent" and PC Magazine awarded Editor's Choice - twice. Call about our special trade-up offer.

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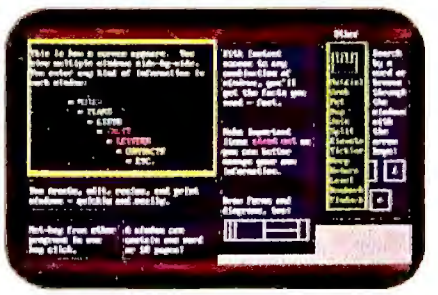
Info Select can do much more than manage all your RANDOM information. Use it to manage business correspondence, sales leads, orders, and client notes. Track facts, plan projects, or interrelate all your ideas. You can catalogue parts, documents, and inventory items. Match buyers and sellers or doctors and patients. Setup an information desk. Edit E-mail. Store notes on magazine articles, software operation techniques, or just names and addresses. Whether you are a lawyer tracking court cases or a zoologist collecting feeding habits you'll find countless uses for Info Select.



Info Select keeps your information in intelligent automatically positioned windows.

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As long as you love us, it's all right. And love us you will. Statistical software from SPSS is designed to work the way you work. By giving you the power to enter, edit, manage, analyze and present data on virtually every type of PC, workstation, minicomputer and mainframe. By giving you better decision-making ability through the most comprehensive set of statistical procedures available. And by giving you a choice of options to meet your specific data analysis needs. So if you're thinking about statistical software, think about flexibility. Because flexibility means value. And when it comes to value, we top the charts.

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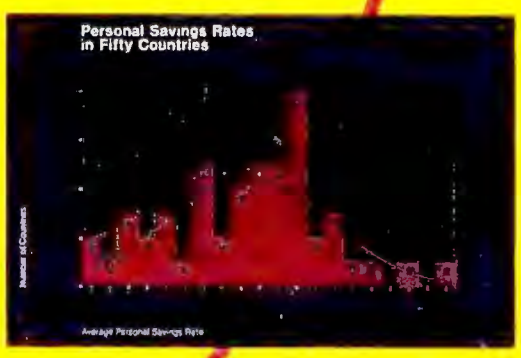

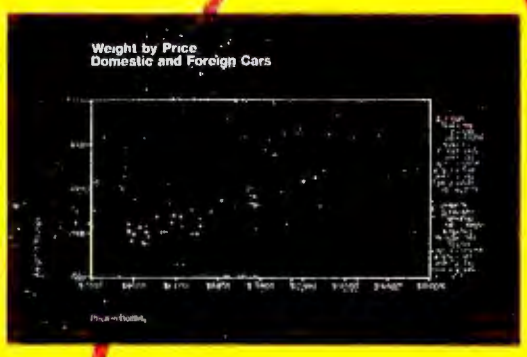

The Statistical Procedures in SPSS give you the power to examine data more thoroughly, revealing patterns that might otherwise go unnoticed. We offer the most in-depth group of statistical procedures available, including univariate and multivariate descriptives, model building, hypothesis testing, clustering and classification, survival analysis, time series and perceptual mapping. No matter what your question, SPSS provides the flexibility to find the answer.

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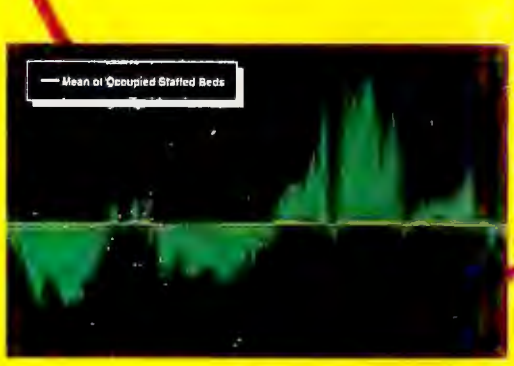

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FEATURES EVALUATION

Bring Me Back My File!

Norton's amazing undelete functions lead the utility libraries pack and win it a Best Buy, but PC Tools provides more file management and productivity utilities.

● Yes
○ No
◒ Deficient

	Mace Utilities 1990	The Norton Utilities 5.0	PC Tools Deluxe 6.0
Standard features			
Price	$149	$179	$149
Menu driven	◒[1]	●	●
Mouse support	○	●	●
Data recovery			
Undelete files	●	●	●
View deleted files	○	●	○
Estimate undelete probability	○	●	○
Unformat hard or floppy disk	●	●	●
Unremove directory	●	●	●
Repair damaged floppy	●	●	●
Diagnose and repair directory structure	●	●	●
Make any disk bootable	○	●	●
File management utilities			
DOS shell	●	○	●
Backup	○	○	●
Prune and graft directories	●	○	●
Sort and rename directories	●	●	●
Search disk for file	●	●	●
Search files for character string	●	●	●
Encrypt and wipe files	●	●	●
Productivity utilities			
Appointment calendar	○	○	●
Auto-dialer	○	○	●
Batch file enhancer	○	●	○
Calculator	○	○	●
Telecommunications	○	○	●
Data manager	○	○	●
Set key-repeat rate	●	●	○
Macros	○	○	●
Timer	○	●	○
		BEST BUY	

[1] Some features must be run from the DOS command line.

If you don't already have a DOS shell (or file manager) like *XtreePro*, you'll probably want one. Shells offer more features than DOS (for example, file searches); they're easier to use when copying, deleting, and otherwise manipulating files; and since they provide menu choices, you can avoid the errors that crop up when you have to type in commands.

Finally, some libraries delve into the personal productivity realm, offering appointment calendars, calculators, and telecommunications packages. If you don't already have these useful tools, their presence in a library could affect your buying decision.

Because we consider data recovery to be the key library service, our Best Buy is *The Norton Utilities*. Its undelete feature is highly reliable, its collection of file management utilities is solid, and its interface is outstanding. *Norton* makes it easy to do the right thing even when you're panicking.

Mace Utilities 1990

PROS: Capable data recovery

CONS: Interface is hard to use

Mace performs fairly well as a data recovery program, and it covers most of the file management bases. Like all the other products reviewed here, it lets you sort and rename directories, search the disk for an elusive file or text string, and encrypt files. But it brings nothing special to the party and gives you only one productivity utility.

Mace's awkward menu won't let you use a mouse, and some utilities (like Vaccine, its antivirus program) must be run from the command line. The program's undelete routine works well if you install and run its undelete helper, but some files could not be recovered in vanilla mode.

Running *Mace* is substantially better than trying to use DOS's DEBUG to recover files (a terrifying thought!), but all told, *Mace* is only a fair value.

The Norton Utilities 5.0

BEST BUY

PROS: World-class undelete, great interface

CONS: Few productivity utilities

Peter Norton invented and marketed the first effective data recovery utility, and the utility library that now bears his name has kept on improving it. As a

EXECUTIVE SUMMARY

Undelete: Key to a Top Library

Norton's top-rated undelete rules the roost.

Utility libraries include file management and productivity aids, but optimization and file and directory recovery are what people buy them for.

Still a winner after all these years, **The Norton Utilities** walks away with the Best Buy. Its advanced undelete functions and outstanding user interface make it a winner. **PC Tools** can't match Norton's undelete, but it's a good choice if you need extras like an appointment calendar or a backup utility.

	Mace Utilities 1990	The Norton Utilities 5.0	PC Tools Deluxe 6.0
Optimization	Fair	Excellent	Fair
Data recovery	Good	Excellent	Good
Ease of use	Fair	Excellent	Good
File management utilities	Good	Good	Excellent
Productivity utilities	Fair	Fair	Excellent
Overall value	Fair	Excellent	Good
		BEST BUY	
Reader service no.	693	694	697

How we rate utility libraries
We rate these utilities based on information in the Features Evaluation and the PC World Test Report, combined with our opinions of quality, reliability, and user benefit.

Optimization See the disk optimizer roundup's Executive Summary.

Data recovery rates the ability to undelete files and directories and recover from an accidental format. An Excellent rating demands successful data recovery in the lab, the ability to view undeleted files in order of probable recovery, and the ability to unformat a hard disk or flappy drive.

Ease of use rates the user interface and the quality of documentation. An Excellent assumes good mouse support and well-designed menus that are consistent throughout the program.

File management utilities let you manipulate and organize files in a variety of ways. To get an Excellent, a library must provide a broad selection of useful utilities, including ones that let you search for files and character strings, sort directories, and encrypt files.

Productivity utilities covers *Sidekick*-like desktop applications. To receive an Excellent, a library must provide a generous assortment of useful utilities, including an auto-dialer, a calculator, and an appointment calendar.

Overall value averages all the above criteria, plus price, with extra weight given to optimization and data recovery.

result, *Norton*'s undelete function is now light-years ahead of its rivals'. Unique features include a table that ranks deleted files in order of probability of successful recovery, and the ability to view the contents of a file before you undelete it—which saves time if you decide it isn't worth retrieving.

The interface is outstanding: Using a mouse, even the most panicky user can quickly salvage lost data. When we used its two undelete helpers, *Norton* succeeded in recovering all data and directories. Even in vanilla mode, we could undelete almost every file and directory. Only one problem arose—a large *dBASE* file was truncated during unerase and could not be used.

Norton lacks both a DOS shell and a backup utility, and you won't find a calendar, a calculator, or other productivity utilities—but it offers a good selection of file management features. Unique utilities include a quartet of timers (handy for tracking on-line or phone charges), DOS color control, cursor size and mouse speed controls, and a batch file enhancer. Its System Information diagnostic utility makes suggestions for speeding performance and produces floods of technical info about your system that you can pass on to a technician.

Norton costs $30 more than its rivals, but it's worth it. Unless you crave *PC Tools'* extra productivity aids, *Norton* is your Best Buy.

PC Tools Deluxe 6.0

PROS: Good shell, lots of productivity utilities

CONS: Directory undelete requires helper

Thanks to its amazing bundle of productivity software, *PC Tools Deluxe 6.0* is hard to resist. But if you want top-notch undelete or optimizing functions, *Norton* is better.

PC Tools' generous grab bag of disk- and file-oriented utilities includes a first-rate DOS shell. The package also offers a full-featured backup utility plus a rich collection of desktop utilities missing from *Mace* and *Norton*—these include an appointment calendar, a calculator, telecommunications software, even a data base. The menu is mouse aware, and while it's not quite as slick as *Norton*'s, it's much more elegant than *Mace*'s.

But in this roundup, undelete is the name of the game—and here *PC Tools* is less than impeccable. With its undelete helper enabled, we had no trouble recovering all files and directories. But without the helper, when we deleted a directory *and* its files, *PC Tools* could not bring them back.

Version 6.0 is a good value as a library, and it appears that version 7.0—received too late for review—will be even better. Optimizing features appear to be improved in the new release, and you can view the contents of deleted files (see "PC Tools and Tools and Tools..." in this issue).

John Lewis is a freelance writer based in New Orleans.

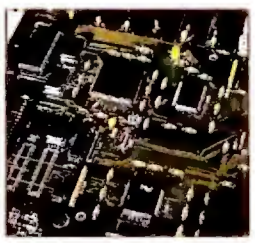
Why FastData?

A personal computer is a large investment; before you oose, we want you to know what to expect when you ırchase a FastData personal computer from FastMicro.

Superior Design.

You get more out of your FastData personal computer because we put more into it. We've been building PC's longer than most of the competition and we put that experience to work for you. We use proven designs that pass our stringent performance requirements and compatibility standards so it will be sure to pass yours.

etter Components.



ıe whole is only as good the sum of its parts; and ıstData systems use ıme of the best parts in e industry. For example, each FastData system ships with a Keytronics keyboard; Keytronics costs a lot more than others, but the quality is worth it.

ur systems use exclusively oshiba floppy drives, the ıdustry leader. Standard ıuipment includes other quality ɔmponents from Western Digital, hoenix, Chips & Technologies, just to ıme a few.

Full Support.

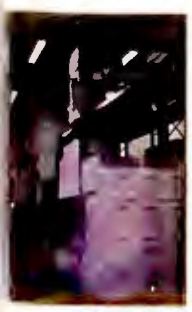
Our team is standing by and ready to make your FastData computer perform to its greatest potential for you. When you buy a FastData computer, you're covered by Toll-Free technical support for life. And since we sell more software than other computer companies, we are uniquely qualified to give the proper support the customer deserves.

Service.

All FastData personal computers come with a full one year warranty, but that's just the start. In the unlikely event your computer is down, it is our goal to get back up and working as quickly as possible - and we back it up with action. Call us toll-free and we'll work with you to determine the problem; if a part breaks, we will send you the replacement part through our FastSHIP program - before the broken part is returned to us - and we'll pay the freight both ways. If our phone support or FastSHIP program can't solve your problem, we will service it on-site to most U.S. locations or replace your computer at no charge. Now that's service.

Selection.

Our face to face retail background has made us never forget that the customer comes first and that a personal computer is just part of a customer's overall needs. That's why FastMicro offers thousands of hardware and software products to enhance your new personal computer. In fact, our competition will probably tell you to call us when you need something to run on their personal computer.



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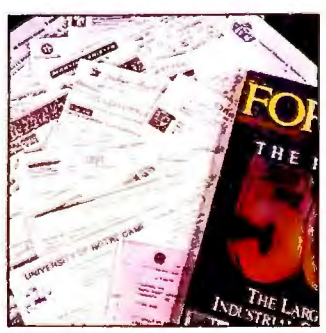

FastData 386 Systems

FastData 386/33 $1999

The fastest 386 processor available combined with a 64K thirty nanosecond memory cache make the FastData 386/33 a power users dream! Included in the base price is a 80 megabyte 20 millisecond hard disk, 1024 by 768 VGA monitor and card, four megabytes of memory, and 5.25" & 3.5" high capacity floppy drives. Plus, should anything ever go wrong with your FastData computer, you are covered by a one-year warrantee with free on-site service or system replacement if we cannot correct the problem with our FastSHIP advance parts replacement program.

Standard Features

- ✓ 33mhz Intel 386-DX processor.
- ✓ 64K high-speed memory cache.
- ✓ 4 megabytes high speed RAM.
- ✓ 80 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Full size (shown) or standard size chassis with keylock and reset buttons.
- ✓ 387-DX coprocessor socket.
- ✓ 230 watt power supply.
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 1mb Video Ram.
- ✓ Clock calendar, parallel port, game port and two serial ports.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion& 5 drive bays.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ DOS 4.01 or 5.0.
- ✓ Windows & Mouse add $99.
- ✓ FCC Class B approved.

386/33	80mb	100mb	200mb	660mb
Mono	$1,699	$1,789	$2,049	$3,469
VGA White	$1,799	$1,889	$2,149	$3,569
VGA Color	$1,949	$2,039	$2,299	$3,719
VGA 1024	$1,999	$2,089	$2,349	$3,769

FastData 386/25 $1799

The optimum combination of features, expandability, and power make the FastData 386/25 an ideal choice for those whose applications demand high speed 32 bit processing and expandability. The value of the 386/25 goes far beyond its price, it comes configured with a full four megabytes of fast RAM, a quick 20 millisecond 80 megabyte hard disk, and maximum VGA displaying 1024 by 768 resolution powered by a high-output 16 bit 1mb VGA board. Also, the FastMicro team will configure your FastData 386 exactly the way you want, without sending you shopping elsewhere.

Standard Features

- ✓ 25mhz Intel 80386-DX.
- ✓ 4 megabytes of high speed RAM.
- ✓ 80 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25"and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis (shown on left) with keylock, speed and reset buttons.
- ✓ 80387-DX coprocessor socket.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 slots & 5 drive bays.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ DOS 4.01 or 5.0.
- ✓ Windows & Mouse add $99.
- ✓ FCC Class B approved.

386/25	40mb	80mb	100mb	200mb
Mono	$1,369	$1,499	$1,589	$1,849
VGA White	$1,469	$1,599	$1,689	$1,949
VGA Color	$1,619	$1,749	$1,839	$2,099
VGA 1024	$1,669	$1,799	$1,889	$2,149

FastData 486/25

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FastData SX Systems

$1599 FastData SX/20

25% faster than a 16mhz SX, the FastData SX/20 adds even greater performance to its 386 multitasking capabilities. Just $200 more than our SX/16, this machine also includes an 80mb hard drive in addition to the super VGA color monitor and 16 bit VGA adaptor, Keytronics keyboard, DOS 4.01 or 5.0, and two floppy drives. The system includes two megabytes of memory and is expandable to eight on the main system board. Remember, when you have questions, need to solve a problem, or want recommendations on products for your system, the FastMicro team is standing by toll-free to provide product support for as long as you own your FastData personal computer.

Standard Features

- ✓ 20mhz Intel 80386-SX processor.
- ✓ 2 megabytes of high speed RAM.
- ✓ 80 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis (shown) with keylock, speed and reset buttons.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ MS-DOS 4.01 or 5.0.
- ✓ FCC Class B approved.

SX/20	40mb	80mb	100mb	200mb
Mono	$1,169	$1,299	$1,389	$1,649
VGA White	$1,269	$1,399	$1,489	$1,749
VGA Color	$1,419	$1,549	$1,639	$1,899
VGA 1024	$1,469	$1,599	$1,689	$1,949

$1399 FastData 386/SX

Combine the benefits of an advanced Intel 386 processor, the value of a 286 and the advantages of FastData and you've got the FastData 386/SX! This machine is the choice of those who want to run today's powerful 386 and multitasking software, like Windows, and also want to run their favorite DOS applications at surprising speeds. We've made our customers favorite options standard: it comes with an ample two megabytes of memory, a high performance 40mb hard drive, and 16 bit super VGA. Compare performance, features, and service and you will find no better SX value. Interested further? Try the FastData 386/SX for 30 days; you have to be happy - if not, we'll take it back.

Standard Features

- ✓ 16mhz Intel 80386-SX processor.
- ✓ 2 megabytes of high speed RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis with keylock, speed and reset buttons (mini desktop shown - add $50).
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and a game port.
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $99.
- ✓ MS-DOS 4.01 or 5.0.
- ✓ FCC Class B approved.

386/SX	40mb	80mb	100mb	200mb
Mono	$1,099	$1,229	$1,319	$1,579
VGA White	$1,199	$1,329	$1,419	$1,679
VGA Color	$1,349	$1,479	$1,569	$1,829
VGA 1024	$1,399	$1,529	$1,619	$1,879

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Colorado DJ-10 40-120mb Int. Tape 239
DJ-20 80-240mb Int. Tape 299
Conner (see FastData IDE controllers at right)
CP3044 40mb IDE 28ms 239
CP3104 100mb IDE 25ms 399
CP3208 200mb IDE 25ms 599

Seagate 89mb AT Kit $349

IDE performance, big 89 megabyte capacity and Seagate quality make this kit a great buy. A 19ms access time and 5 mbps transfer rate assure great performance. Controller, cables and rails are included to make installation fast and easy.

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SX Ext. Tape 40-120mb / 80-250mb 399/499
Micropolis
MC1664 340mb ESDI 14ms 1295
MC1598 1.2gb SCSI 14ms 2695
Plus Development
HardCard IIXL 50 - 52mb 9 ms 16bit 399
HardCard IIXL 105 - 105mb 9 ms 16bit 579

Toshiba 1.44mb Floppy Drive $59

Complete with mounting brackets and installation instructions, this Toshiba works in all true 286 & 386 compatibles. Will also read/write/format 720K 3.5" disks. Rails, add $5.

Seagate
30MB XT Kit ST238 w/ cont 249
40MB AT ST251-1 MFM Drive 229
40MB AT ST157A 28ms IDE Drive 199
80MB AT ST296N SCSI Drive w/adaptor 319
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125MB ST1144A 19ms IDE Drive 399
210MB ST1239A 15ms IDE Drive 699
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Sun Moon Star Ext. CD-ROM Drive Kit 499
Teac
1.2MB 5.25" Floppy 65
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Toshiba 100mb IDE Kit $439

Upgrade your 286 or 386 to IDE technology and Toshiba quality at a FastMicro price. This kit comes with a fast 20ms 105mb drive and built-in 1:1 controller, 16 bit IDE card with dual floppy controller and cables, 5.25" brackets and rails.

Toshiba
360K 5.25" Floppy (Black) 59
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VGA Mono	$849	$999	$1,069	$1,349
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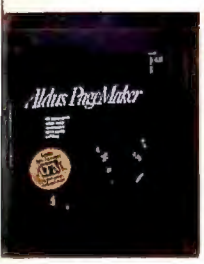

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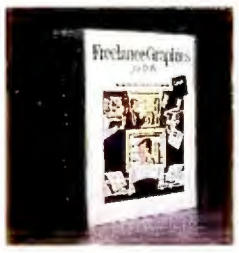

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This special bundle includes the leading Windows applications, Excel, Word and PowerPoint all in one. Excel is the top rated graphical spreadsheet, Word is the best Windows word processor and PowerPoint is the top presentation package. Act now and you will save half the cost if purchased separately.

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- MicroPhone II 199
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- PFS:WindowWorks 109
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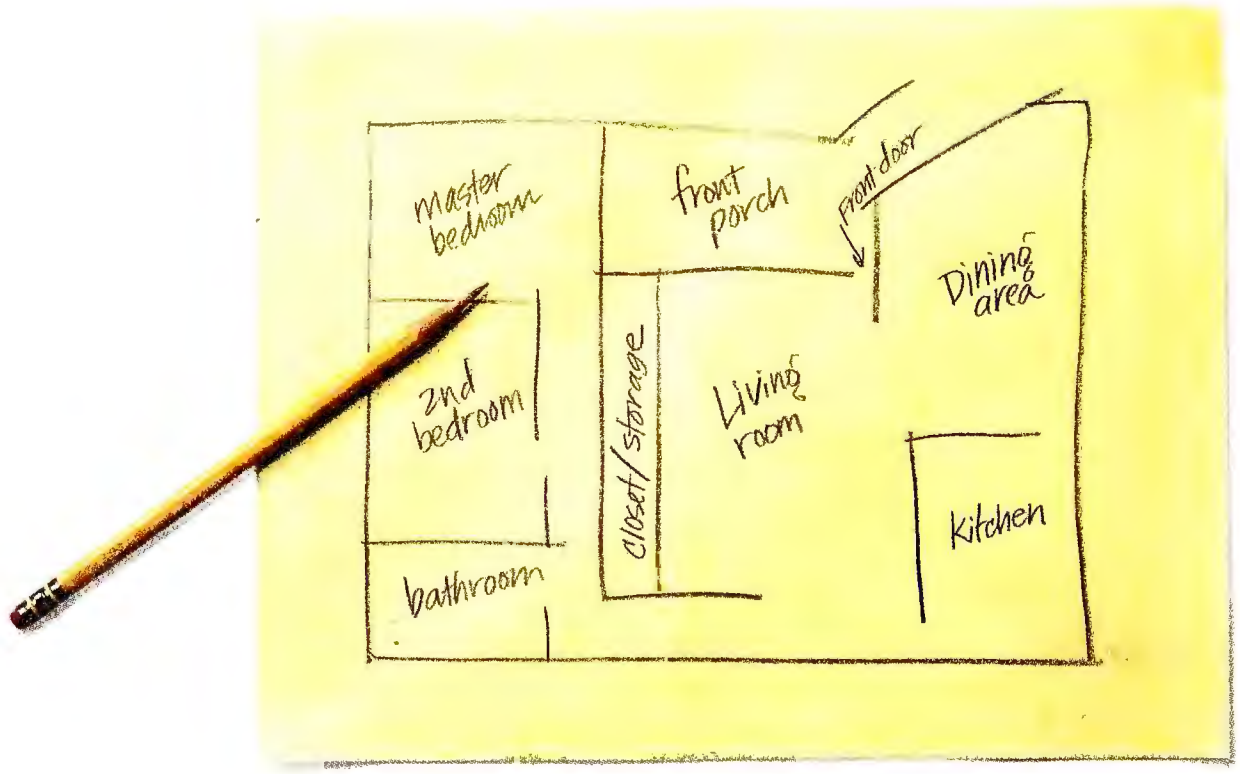

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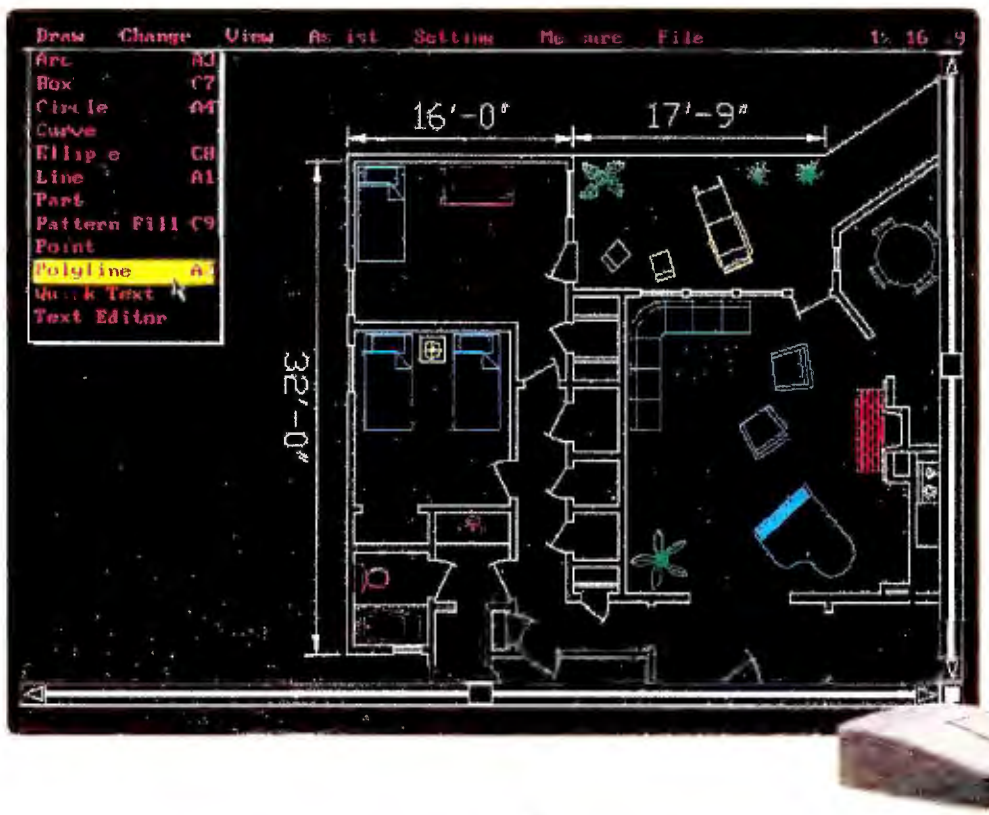

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Circle 99 on reader service card

No-Sweat Backup Software

The choice is yours: Back it up or lose it. With new automated features, these four utilities make backing up your hard disk less of a chore.

David Fogle

MICHAEL KLEIN

It's not a comforting thought, but sooner or later your PC's data will slip away into the night. Name your poison: Lightning strikes, *Windows* crashes, your hard disk dies of old age. Or maybe it's the human factor: An errant keystroke zaps a crucial file, you kick out the power cord, or a co-worker accidentally reformats your hard disk. Your best insurance against such disasters is duplicate data on floppy or tape, up-to-date and ready for quick restoration.

Forget DOS's BACKUP and RESTORE commands—they're too risky, too slow, too cumbersome. They can't detect errors that can creep in during backup, so your data's not as safe, and they don't compress data, so backing up takes longer and requires more floppies. And DOS offers little flexibility in choosing which files to back up or restore.

You're much better off with a commercial backup utility—they're easier to use, more reliable, and well worth the small investment. Many of the latest programs offer such features as error detection and the ability to control tape backup units. Most provide a simplified interface and a treelike display of directories for easy navigation.

To find the best of the backups, we ran four leading

FEATURES EVALUATION

Norton, Central Point: Safe Bets

You can trust your data to our two Best Buys. Both excel at data security and provide solid backup and restore features.

● Yes
○ No
◒ Deficient

	Norton Backup 1.2	PC Fullback+ 2.01	Central Point Backup 6.0	Fastback Plus 2.11
Standard features				
List price	$99	$149	$189	$99
RAM required	512K	512K	330K	512K
Multiple user levels	●	●	●	◒[1]
Scripts	●	●	●	●
Macros	●[2]	●	●	○
Context-sensitive help	●	●	●	●
Mouse support	●	●	◒[3]	○
Data security				
Restores from damaged disk	●	●	◒[4]	◒[4]
Restores from incomplete backup set	●	●	●	●
Compares backup with original	●	●	●	●
Warns before overwriting disk	●	●	●	●
Can warn against replacing newer file	●	●	●	●
Ignores hidden files	●	●	●	●
Can password-protect backup sets	●	○	●	○
Backup options				
Select directories/files from tree display	●	●	●	●
Select files by wild cards	●	●	●	◒[5]
Select files by date range	●	●	●	●
Select files by attribute	●	●	●	○
File list shows size, date, and time	●	●	●	●
Estimates time/number of disks required	●	●	●	●
Data compression	●	●	●	●
Multiple drives in same backup	◒[6]	●	●	◒[6]
Appends incremental backup to same disk	●	○	●	●
Differential backup	●	●	●	◒[7]
Formats disks during backup	●	●	●	●
Backs up to any logical drive	●	●	●	●
Backs up to tape drives	●	○	●	◒[8]
Restore options				
Restore files to different directory	●	●	●	○
Restore subdirectories under new name	●	●	●	○
Select directories/files from tree display	●	●	●	●
Select files by wild card	●	●	●	◒[5]
Select files by date	●	●	●	◒[5]
	BEST BUY		BEST BUY	

[1] Beginner version is a separate program.
[2] Available with PC Tools Deluxe.
[3] Simulates keyboard cursor keys.
[4] Could not always restore from damaged disk.
[5] From DOS command line only.
[6] Can be appended to same backup set but requires separate backup steps.
[7] Not available as a single menu option.
[8] Does not support standard QIC-40 or QIC-80 drives, only select drives from Wang, Everex, ComputerLand, Archive, and Maynard

programs through a tough regimen. Over an extended period, we performed a wide range of daily backups and restores. We also tested each program's ability to restore information from partially erased backup disks, and we backed up data while running the *Stacker, Vskield,* and *DOSKEY* RAM-resident utilities.

After the floppy and tape drives stopped whirring and the dust settled, two Best Buys stood out. *Central Point Backup* is a great bargain, especially if you need to use tape drives, and *Norton Backup* takes the prize if you want to back up data from multiple drives. (To learn more about the basics of backup and the key buying issues, see the sidebar "Buying Smart." For a game plan for keeping your data safe, see the sidebar "Backing Up: The Three-Week Shuffle").

Central Point Backup 6.0

BEST BUY

PROS: Superb error recovery, easy to use, supports tape drives

CONS: Can't back up multiple drives in one step

Top reliability, intuitive operation, and support for many popular tape drives make the $99 *Central Point Backup* a Best Buy. And for only $50 more, you can pick up Central Point Software's *PC Tools Deluxe,* an all-around utility package that includes the backup power of *Central Point Backup* along with file management, hard disk tools, scheduling, and more. (See "Hard Disk Defenders" for a look at *PC Tools'* other talents.)

Central Point Backup's elegant mouse-optional interface conveniently keeps most functions on a single screen. Using the treelike display, it's easy to select files and subdirectories for inclusion or exclusion. Unlike its rivals, *Central Point* imposes no limit on the number of files you can exclude manually, so it's easier to back up just the files you want. The program's unique method of displaying each backup set under a

Buying Smart: The Keys to Buying Backup

The whole point of backing up is to be able to retrieve your data if your hard disk fails. It's no surprise, then, that data security is the key backup buying issue. Ease of use is second—if a program is too complex, you won't back up as frequently as you should.

DATA SECURITY

Your backups should be accurate and restorable even if your backup disks are badly damaged. The program must verify backups after they're recorded to make sure they're readable, compare the backup with the original, and prevent you from unintentionally overwriting previous backup disks or restoring an older file over a newer one.

EASE OF USE

Look for a program that lets you select files easily from an on-screen directory tree. Good on-line help and documentation are also musts. The ability to choose between multiple skill levels keeps novices from issuing dangerous commands and eases the learning curve.

If you typically back up files from the same directories, you'll want to create scripts and macros that do this automatically. Most important are scripts, which let you save the settings for a particular backup task so you don't have to reenter file specifications during every session. Macros let you replay command sequences—for example, to automatically back up your personal network drive after backing up your hard disk, or to automatically compare the backup with the original.

BACKUP OPTIONS

An effective backup strategy demands flexible options. You should be able to choose between full, incremental, and differential backups. A full backup copies every file you select. An incremental backup copies only the files that have changed since the last backup. A differential backup copies all files that have changed since the last *full* backup.

You can combine full backups with either incremental or differential backups to save time and cut down on disks. Most people do a time-consuming full backup once a week or month, appending incremental backups to it every day or week. Some people who update only a small set of files over and over prefer differential backups over incrementals because they can back up less often and use fewer disks. The drawbacks: If you do a differential backup every day, it will take longer, and if you do one every week, you won't be able to go back and target a particular version of a file to restore. If you work with a wide variety of files, or if restoring specific file versions is crucial, incrementals make a lot more sense.

In a full backup, you should probably include everything—program files as well as your own data. But with incremental or differential backups, you should back up only important data files that have changed. To do this, you'll need to exclude files by date and use wild cards such as *.BAK. If you have a copy-protected program that prohibits you from backing up its hidden files, you'll want to be able to search by file attribute in order to skip them.

All the programs reviewed back up to any logical drive: floppies, another hard disk, a network drive, or removable media. Not all support tape drives, however. Backing up to tape is much faster and easier than backing up to floppies. Although capacious 1.2MB floppies now permit many users to perform incremental backups without switching disks, tape lets you perform *any* type of backup in a single operation—just press a key at the end of the day and walk away. Tape cardridges are also easier to carry and keep track of, an important consideration if you'll be ferrying disks between the office and home (see the sidebar "Backing Up: The Three-Week Shuffle").

Whether you use tape or floppies, it's handy to be able to back up multiple drives in a single operation. For example, this feature lets you back up both C: and D: drives or back up your hard drive and your personal network drive in one fell swoop without having to write a macro.

RESTORE OPTIONS

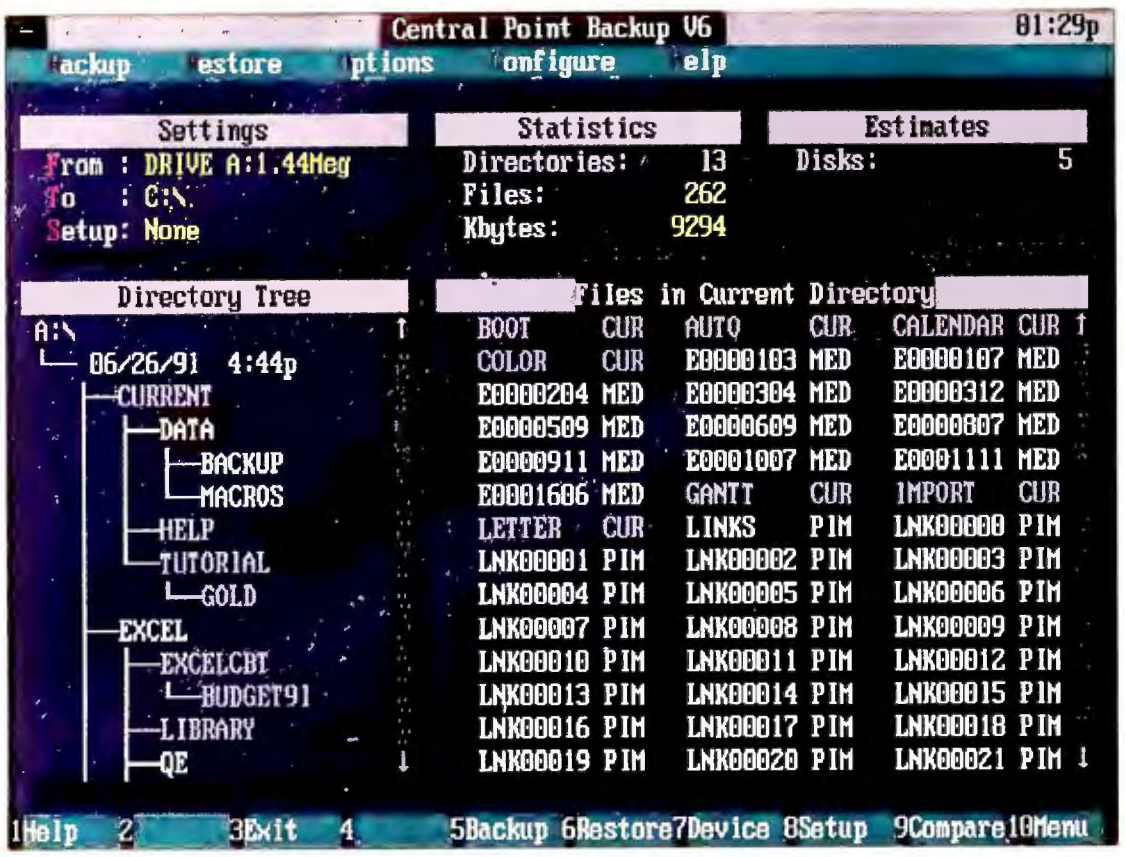
What gets backed up must get backed down—and in its original condition. With luck, you'll never have to use your restore options, but chances are you will.

In addition to the file selection features covered under "Backup Options," look for special restore options that can save you time in getting your system back on line. For example, you should be able to restore only a particular version of a file and overwrite files that already exist on the hard disk. The ability to restore selected data to new locations is helpful if you need to restore data to a hard disk that has a different subdirectory structure.

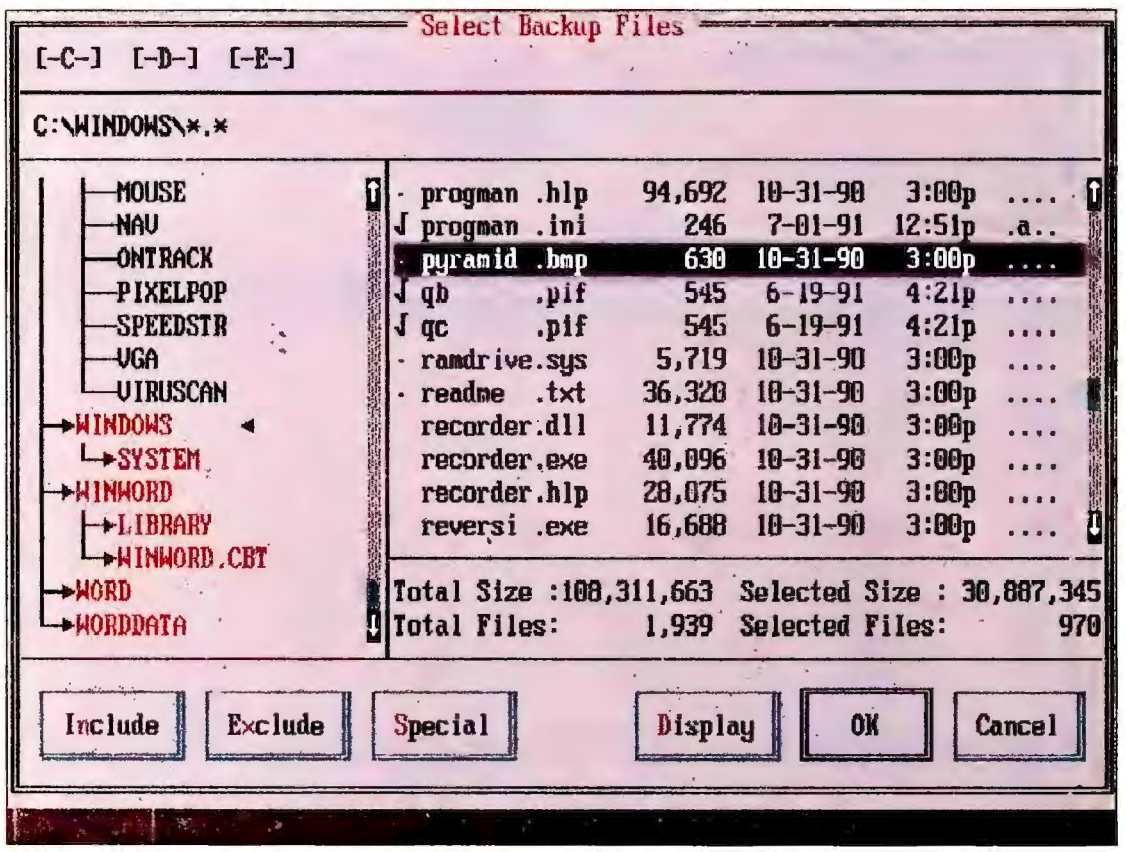
date-marked tree branch makes it easy to revise your list of excluded files to make sure it's up-to-date (see **SCREEN 1**).

Your data is secure with *Central Point Backup.* It came within a hair of beating *Norton Backup* for top honors at restoring data from a partially erased disk.

Flexibility and ease of use make *Central Point* an excellent buy—and it's your only choice if you have a QIC-format tape drive. (To see how the best can get better, turn to "PC Tools and Tools and Tools..." in this issue.)



SCREEN 1: During restore, Central Point Backup uses a dated "phantom subdirectory" to differentiate individual backups within a set (for example, full and incremental backups appended to the same disk). This makes it easy to track down by backup date the files or directories you need.



SCREEN 2: Norton Backup's complete directory tree includes useful indicators to show selected or excluded files. When you exclude files with wild cards, they're marked with dots to distinguish them from manually marked files—helpful when you periodically revise your file exclusion criteria and need to recall why certain files were excluded.

Fastback Plus 2.11

PROS: Tree display

CONS: Fairly difficult to use, can't append incremental backups, no tape support

Old standby *Fastback Plus* has a new version on the way, and not a moment too soon. The current version, *2.11,* has difficulty restoring data from partially erased disks, its interface is out of tune, and it lacks key features such as the ability to append incremental backups. At a steep $189, it's only a fair value.

With *Fastback Plus,* it's too easy to accidentally start a backup or restore—confirmation messages would help. Mouse support is crude: Moving the mouse can send the highlight cycling repeatedly through the menu options.

Fastback Plus lacks a few backup basics. It won't append an incremental backup onto the end of the last backup disk; instead, each demands its own disk. You can select files from a tree display, but you can't see file size or date on this screen.

Version 3.0 should be available by the time you read this. New features such as a revamped pulldown menu interface and better file compression should make *Fastback Plus* a strong contender. But the current version is only a fair value.

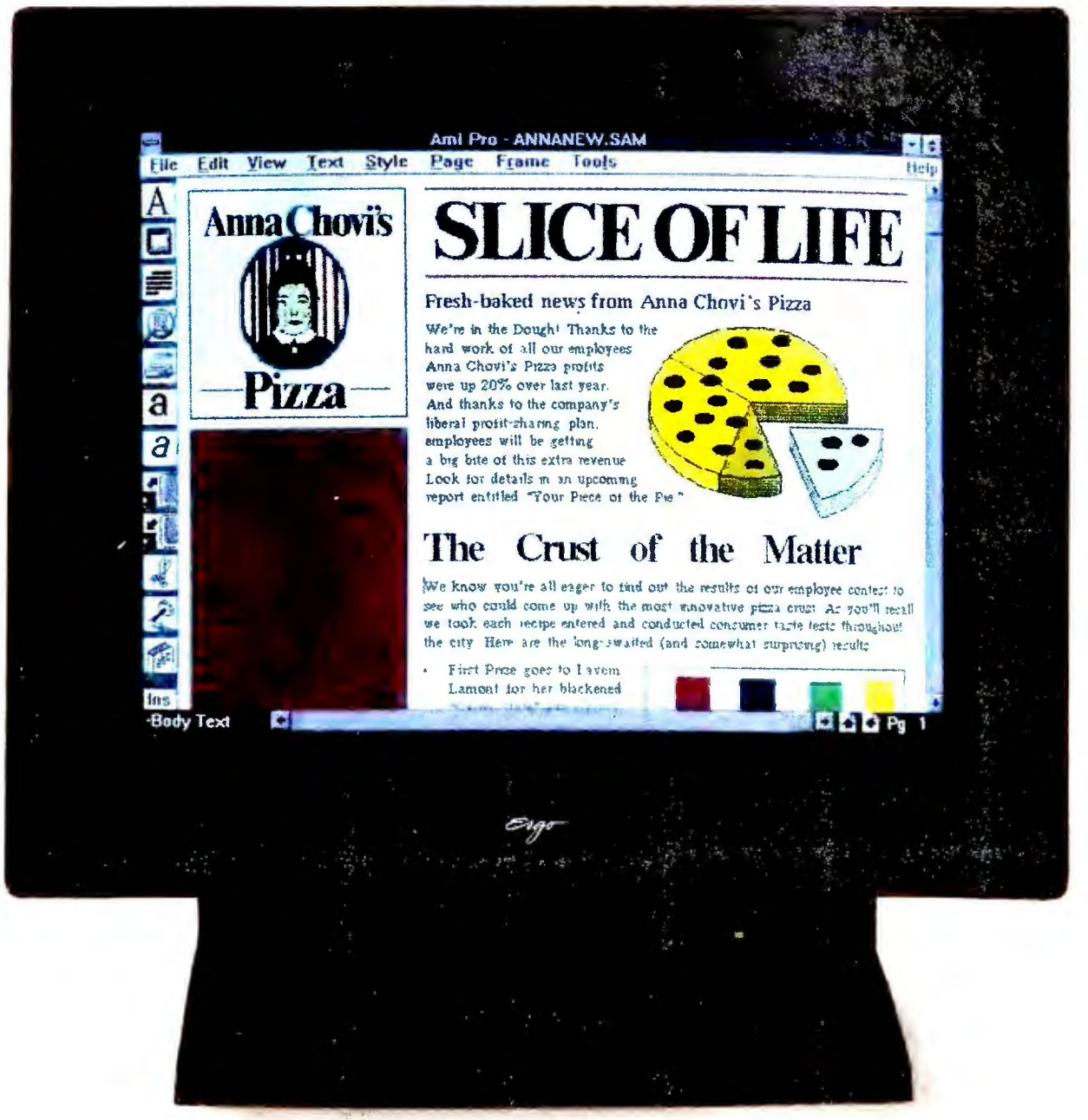
Norton Backup 1.2

PROS: Superior error recovery, easy to use, backs up multiple drives

CONS: No tape support, each incremental backup requires new disk

Symantec's $149 *Norton Backup* combines an impressive set of backup and restore capabilities in an easy-to-use package. Superior data compression reduces the number of disks you need to juggle, and error correction is tops—

Ami Pro lets you put the power of Windows into words.



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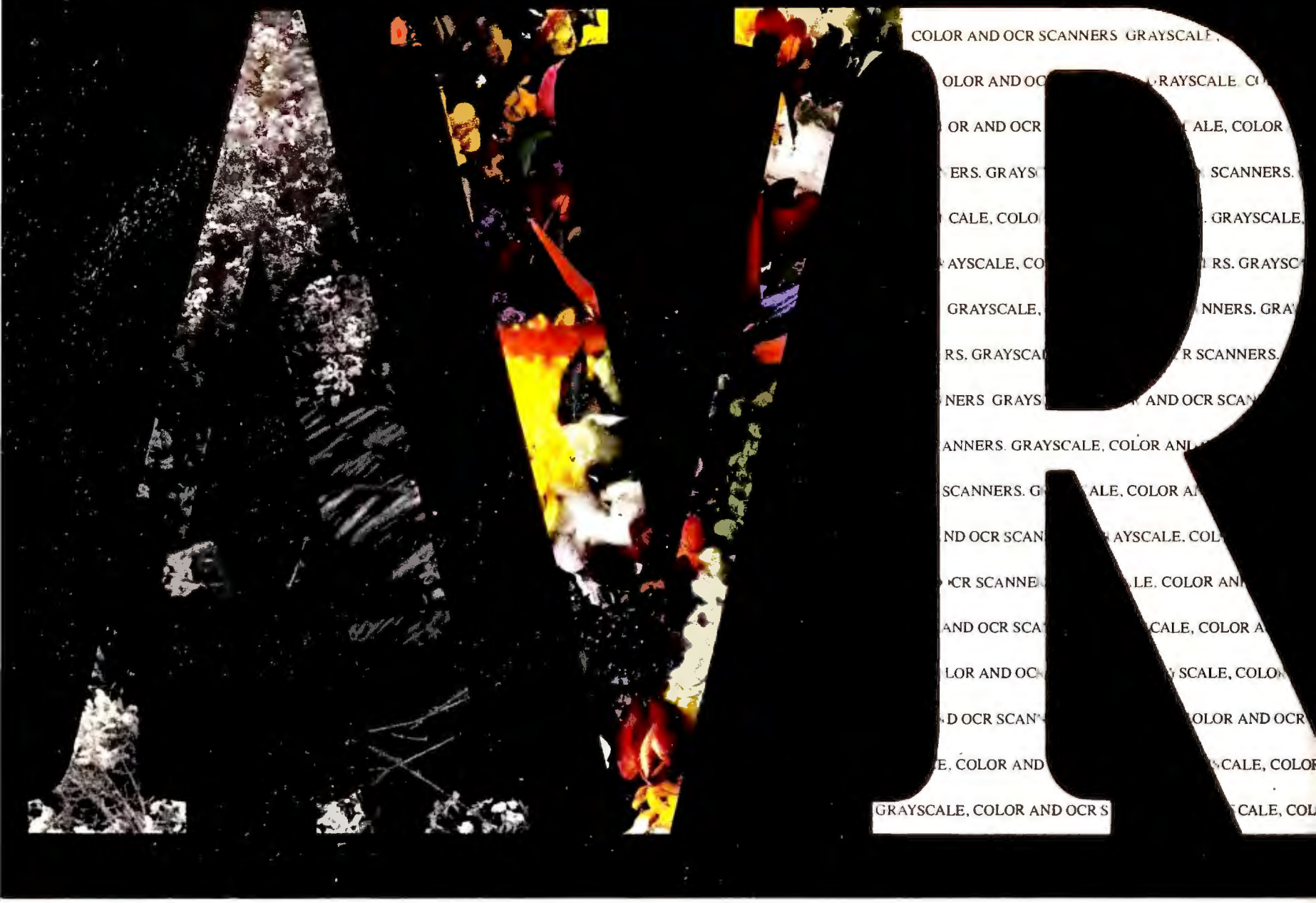

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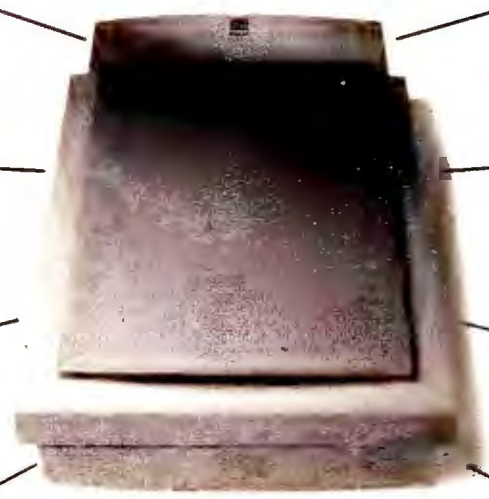

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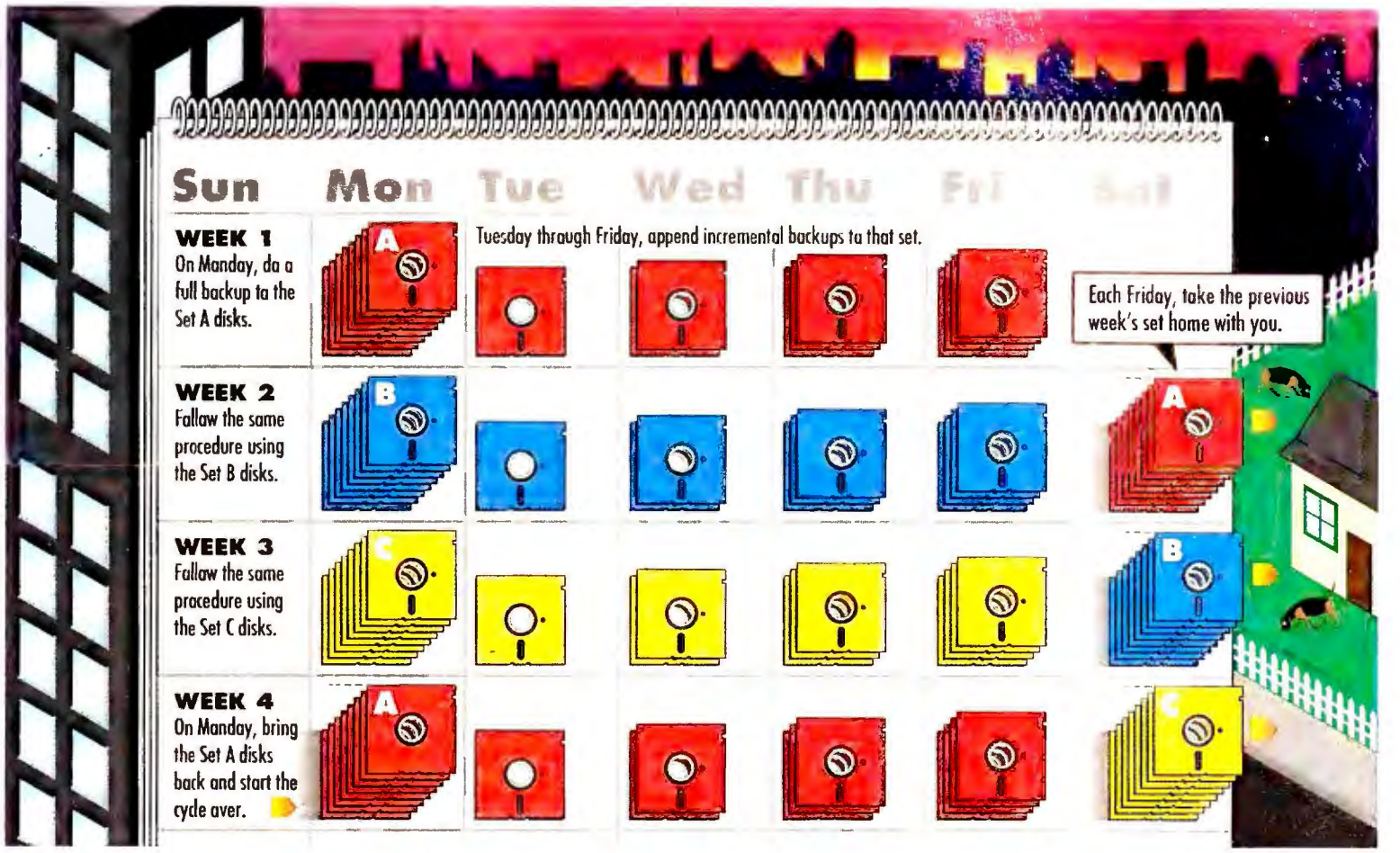
Backing Up: The Three-Week Shuffle



Backing up is essential, but you don't want the job to take any longer than necessary. If you're short on time, you should consider this the minimum: a full backup once a month, and an incremental backup once a week between full backups. But if you really care about your data, we recommend the following backup strategy.

Because lightning may strike while you're backing up, you need at least two complete backup sets, alternating them so you always have one complete copy of your data stored in another location. Unless you have a fireproof safe, it's best to keep a third full backup set at home so you'll always have a full backup, even if both hard and floppy disks are destroyed.

By ferrying three sets of backup disks between work and home, you've always got the previous week's backups on hand in case you need to restore an older version of a file. And you always have a two-week-old set at home in case a real disaster happens. A tape drive makes performing full backups easy, so you may want to use full backups each time instead of incremental backups.

JEFF BERLIN

Norton rated slightly ahead of *Central Point* at recovering data from a partially erased disk. This winning combination gives *Norton Backup* a Best Buy.

Norton Backup's tree directory makes file selection easy (see **SCREEN 2**). Only with *Norton* can you include more than one hard disk in a single operation—helpful if you've got multiple drives, say, both C: and D:. With the other products, you have to write a macro to do this. *Norton*'s one flaw: It can't append incrementals onto the same disk, so you may have to keep track of more disks than you should.

Unless you back up to tape, *Norton* is a Best Buy. It's more convenient than *Central Point* for backing up multiple drives; otherwise the race is close.

PC-Fullbak+ 2.01

PROS: Inexpensive

CONS: No macros, no mouse support, limited backup and restore options

Westlake Data's $99 *PC-Fullbak+* needs a rehaul. It's fairly hard to learn and use, and important backup and restore options are missing. Because you can issue wild cards only from the DOS command line, file exclusion is a difficult, time-consuming exercise, and you must restore files to their original location. Like *Fastback Plus*, *PC-Fullbak+* sometimes failed to restore all data from a partially erased disk.

One of *PC-Fullbak+*'s most severe drawbacks is its failure to display command keys, forcing you to refer constantly to the manual. It's easy to accidentally start an unwanted backup or

(continues)

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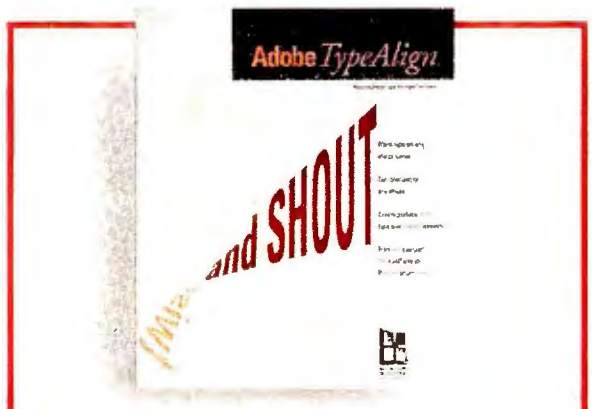

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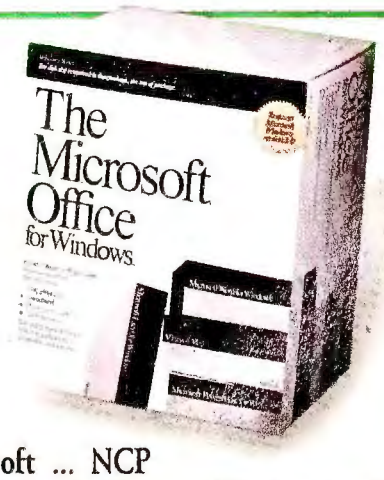

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7781	◉LetterPerfect 1.0	129.
3804	☐WordPerfect 5.1	265.
6685	◉DrawPerfect 1.1	279.

WordStar International ... NCP

6791	☐WordStar Prof. 6.0	199.

XTREE ... NCP

6161	◉XTree Gold 2.0	95.

RECREATIONAL/EDUCATIONAL

Broderbund ... CP

8068	◉Where in the World is Carmen Sandiego Deluxe Edition	52.
5851	◉SimCity	33.
8886	◉SimEarth	45.

Electronic Arts ... NCP

4534	◉Mavis Beacon Teaches Typing *(CP)*	35.
7865	☐PGA Golf	35.

Harvard Associates ... NCP

2324	◧PC Logo 3.0	59.

Microcom ... NCP

6234 ◉ *CarbonCopy Plus 6.0*—All the PC and LAN remote control, file transfer and terminal emulation software package you'll ever need. Supporting: DESQView 386, QEMM-386 and 386MAX ..... **$119.**

Microsoft ... NCP

7881	☐Entertainment Pack for Windows 1.0	29.
2858	☐Flight Simulator 4.0	42.
8270	◉Aircraft and Scenery Designer 1.0	29.

Microsoft Press (Books)

8129	Running Windows *(2nd Edition)*	22.
8136	Running Microsoft Excel	22.

Penton Overseas ... NCP

	◉VocabuLearn/ce Levels I & II (French, Italian, German, Spanish, Russian, Hebrew and Japanese) *each*	35.

Sierra ... CP

8146	◉Quest for Glory II	39.
9466	☐Space Quest IV *(VGA)*	39.
7972	☐King's Quest V *(VGA)*	45.

SirTech. ... CP

8235	☐Bane of the Cosmic Forge	39.

Software Toolworks ... NCP

4659	◉Chessmaster 2100 *(CP)*	35.
7372	☐World Atlas	42.

Spectrum Holobyte ... NCP

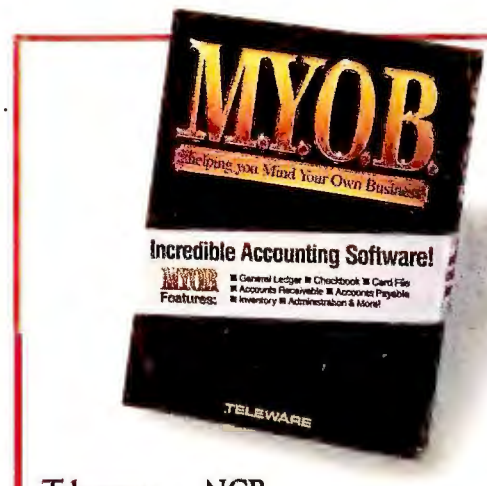
3467	◉Tetris	22.

Stone & Associates ... NCP

5231	◉Phonics Plus 1.1	22.
7564	◉Young Math 2.2	22.

SubLogic ... NCP

6190	☐Air Transport Pilot	39.



Teleware ... NCP

9847 ◉ *M.Y.O.B. for Windows*—Incredible Accounting Software for Windows. M.Y.O.B. contains full-featured G/L, A/R, A/P, Inventory and Card file. The hottest selling program for the Mac is now available for PC users . **$139.**

Toyogo ... NCP

7674	◉Nemesis Go Master 4.7	41.
7676	◉Nemesis Go Master Deluxe 4.7	88.

True BASIC, Inc. ... NCP

	◧Kemeny/Kurtz Math Series *each*	45.

HARDWARE

Warranties listed next to manufacturer.

Acme/SAFE Power Systems ... 2 years

6747	Safe 400S	399.

American Power ... 2 years

7108	Smart UPS 400	339.
7105	Smart UPS 600LS	469.
6811	Back-UPS 360SX	219.
7106	Back-UPS 520ES	329.

AST Research ... 5 years

1299	SixPakPlus 384k C/S/P	179.
8041	SixPak 286 0k	99.

ATI Technologies ... 2 years

9821	VGA Basic *(640 x 480, 16 colors)*	85.
9985	VGA Integra *(1024 x 768, 64 colors)*	129.
9629	VGA Wonder XL *(256K upgradable to 1MB)*	199.
9619	8514/Ultra Graphics Card *(512K) (req. VGA)*	419.
9819	2400etc/e Modem	199.
9620	9600etc/e Modem	499.

Boca Research ... 5 years

7001	BOCARAM/AT PLUS *(0-8 Meg)*	119.
7061	BOCARAM/XT 0K *(0-2 Meg, LIM 4.0)*	99.
6998	I/O Board for AT	59.
6999	I/O Board for Microchannel *(S/S/P)*	109.
8380	BasicVGA *(256K, 640 x 480)*	69.
8381	SuperVGA *(1 Meg, 1024 x 768)*	145.

Bravo Communications ... 2 years

7400	2 Position Laser Compatible Switch Box	109.

Brown-Wagh ... 1 year

8578	Creative Labs Sound Blaster	159.

Canon ... 1 year

7894	BJ-10e Printer with free case *(4.6 lb.)*	329.
7897	BubbleJet Ink Cartridge *(BJ-10e)*	23.
9037	BJ-300 Printer *(80 column)*	549.
9038	BJ-330 Printer *(136 column)*	649.
9828	BubbleJet Ink Cartridge *(BJ-300 & BJ-330)*	26.

CH Products ... 1 year

7801	FlightStick w/Falcon	49.
8119	FlightStick w/Falcon & GameCard III	79.
7345	Rollermouse *(Trackball)* serial 85. *bus*	99.

CoStar ... lifetime

6091	The Organizer *(mobile storage cart)*	199.
7453	The Organizer Jr.	82.

Curtis ... lifetime

9756	Keyboard Space Saver II KS-2	39.
1708	Ruby-Plus SPF-2+	65.
7358	Command Center SPF-4	89.
	Glass Filter Plus *(specify size)* *each*	65.

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Don't stand on ceremony.
(Or, why you should give us a ring.)

Here in the conjugal kingdom of Marlow, NH (pop. 566) we take our vows pretty seriously. In fact, this summer alone, a lucky 7 of our employees are getting hitched. Sure, we know some people think of country weddings as last-minute affairs that only take place thanks to the persuasive power of the proverbial shotgun. But actually, we believe in taking it slow and doing things right the first time. Whether it's baiting the hook or tying the knot.

And regardless of the local mating habits, rest assured that when you buy from us, we'll still love you tomorrow (by which time there's a good chance your order will have arrived). Because when you're a PC Connection customer the honeymoon never ends, the bloom is never off the rose, and, most important of all, the tech support is always free. You'd be hard pressed to find a more perfect union.

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Know what happens to the rice that's thrown after a wedding? Little birdies often eat it and their tiny tummies start to ache. And that's no tweet. To remedy this fowl situation we're sending a wedding-season's supply of premium PC Connection birdseed (with a convenient reusable carrying pouch) to everyone who places an order of $500 or more between now and September 30.

Don't get left at the altar without a supply of PC Connection birdseed. One per customer. Not available outside continential U.S.

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from old magazines.

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221 ☐ *Expanded Memory Manager 386 5.1*–
nds up to 200K of "hidden" memory in
our PC and manages Expanded or Extended
emory. A must-have for memory-hungry
ftware, networks or Windows 3.0 . . . **$65.**

Cyrix Corporation ... 5 years
MATH COPROCESSORS
5 83D87-25 . . . . . 379.
3 83D87-33 . . . . . 459.
7 83S87-16 *(SX compatible)* . . . . . 249.
Datadesk ... 3 years
1 Switchboard . . . . . 175.
Epson ... 2 years
We are an authorized Epson Service Center.
6 FX-850 *(80 col., 264 cps, 9 pin)* . . . . . call
4 FX-1050 *(136 col., 264 cps, 9 pin)* . . . . . call
3 LQ-510 *(80 col., 180 cps, 24 pin)* . . . . . call
0 LQ-850 *(80 col., 264 cps, 24 pin)* . . . . . call
7 LQ-1050 *(136 col., 264 cps, 24 pin)* . . . . . call
4 LX-810 *(80 col., 180 cps, 9 pin)* . . . . . 185.
Everex ... 1 year
8 Tempo LX Notebook *(1 Mb upgr. to 5 Mb)* 2399.
Hauppauge Computer ... 1 year
31 20 MHz 386 Motherboard for PC . . . . . 995.
32 20 MHz 386 Motherboard for XT . . . . . 995.
70 25 MHz 386 Motherboard for AT . . . . . 995.
34 33 MHz 386 Motherboard for AT . . . . . 1399.
Hayes ... 2 years
07 Smartmodem 2400 . . . . . 349.
91 Ultra 96 Modem . . . . . 669.
84 Pocket Edition 2400 . . . . . 129.
Hewlett-Packard ... 1 year
93 LaserJet IIIP *(with toner)* . . . . . 1149.
54 LaserJet III *(with toner)* . . . . . 1699.
Hitachi ... 2 years
92 CM1483M 14" SVGA Monitor *(1024 x 768)* 599.
91 CM2085M 20" SVGA Monitor *(1280 x 1024)* 1995.
Intel ... 5 years
21 2400B MNP Internal Modem . . . . . 199.
19 2400 Baud External Modem . . . . . 179.
20 2400EX MNP Modem . . . . . 229.
80 9600EX Modem . . . . . 549.
46 Inboard 386/PC with 1 Meg . . . . . 495.
36 Above Board Plus 8 2 Meg . . . . . 449.
42 Above Board Plus 8 I/O 2 Meg . . . . . 479.
82 SatisFAXtion *(fax board)* . . . . . 399.
78 SatisFAXtion for Microchannel . . . . . 449.
01 Matched Memory 2 Meg *(PS/2)* . . . . . 139.
03 Matched Memory 4 Meg *(PS/2)* . . . . . 325.
MATH COPROCESSORS
85 80287XL *(16 MHz 80286 CPU's)* . . . . . 199.
50 80387SX *(16 MHz 80386SX CPU's)* . . . . 309.
72 80387-20 *(20 MHz 80386 CPU's)* . . . . . 399.
21 80387-25 *(25 MHz 80386 CPU's)* . . . . . 499.

Kensington Microware ... 1 year
2582 Master Piece Plus . . . . . $99.
7899 Expert Mouse *serial* . 119. 7900 *bus* . 129.
Key tronic ... 3 years
4518 101 Plus Keyboard . . . . . 99.
Kraft ... 5 years
5800 3 button Thunder Joystick . . . . . 29.
5813 Game Card/Thunderstick Bundle. . . . . 55.
7862 TopTrak *(Laptop Trackball)* . . . . . 75.
Logitech ... limited lifetime
6029 Trackman *serial*. . . . 85. 6028 *bus*. . . . 89.
7975 ScanMan 256. . . . . 319.
8694 MouseMan *(serial)* . . . . . 69.
9766 MouseMan *(cordless)*. . . . . 139.
Megahertz ... 5 years
1199 T52CC *(2 Meg) (Toshiba T1000SE/XE)* . . 239.
1193 T324D 2400 Modem *(for Toshiba Laptops)* 129.
1196 T224 2400 Modem *(for Toshiba Laptops)* 129.
1187 T324FM 96/24 Fax Modem *(Toshiba Lptps.)* 299.
Micron Technology ... 2 years
7595 2 Meg Expansion for HP LaserJet IIP or III . . . . . 119.
7012 Memory Upgrade PS/2 70 - 2 Meg. . . . . 149.
Microsoft ... lifetime
7597 Microsoft Mouse . . . . . 89.
2897 Mouse with Paintbrush . . . . . 105.
2898 Mouse with Windows 3.0 . . . . . 149.

Hayes ... 2 years
7391 *Ultra 96 Modem*–Get ultra high modem performance & error control without sacrificing compatiblity. Supports CCITT V.32, V.42bis, Express 96, MNP Level 2-5, & standard 2400/1200/300 bps communications . . **$669.**

MicroSpeed ... 1 year
PC-TRAC Trackball
6007 *serial* . . . . . 75. 6008 *bus* . . . . . 89.
7271 *Inport* . . . . . 79. 6330 *PS/2* . . . . . 79.
Mouse Systems ... lifetime
5997 Trackball *(1 yr. wrnty.) serial*. . 65. *bus*. . 69.
7878 PC Mouse III *(bus or serial)*. . . . . 89.
NEC ... 2 years
9441 CDR36 Portable CD-ROM Drive . . . . . 399.
4799 Multisync 2A *(VGA Monitor)* . . . . . 499.
5085 Multisync 3D Monitor . . . . . 689.
Orchid Technologies ... 4 years
7863 ProDesigner VGA IIS with 1 Meg . . . . . 329.

1-800/243-8088

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Marlow, NH 03456
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Pacific Data Products/Hewlett-Packard
1326 *HP LaserJet III & Pacific Page XL Bundle*–
High-speed PostScript solution! You get the top selling LaserJet III w/the Pacific Page XL accelerator, including 2 Mb of memory, 35 fonts & a money back guarantee (XL board only) . **$2449.**

PC Power & Cooling ... 1 year
REPLACEMENT POWER SUPPLIES
3203 Turbo Cool 200. . . . . 149.
7915 Turbo Cool 300. . . . . 165.
3200 Silencer 150 *(84% noise reduction)*. . . . . 115.
7053 InnerSource 2210 *(power backup)* . . . . . 349.
Pacific Data Products ... lifetime
6779 25 Cartridges in One! *(for LJ II, IIP, III)*. . . 275.
8816 PacificType *(40 PostScript Typefaces for Pacific Page PE 4.0 users)* . . . . . 275.
8975 Complete Font Library *(for LJIII)* . . . . . 275.
Memory upgrade for LaserJet IIP/III:
7055 *2 Meg* . . . . . 149. 7759 *4 Meg* . . . . . 279.
Memory upgrade for LaserJet II/IID:
6838 *2 Meg* . . . . . 249. 6836 *4 Meg* . . . . . 379.
7158 Pacific Page PE 4.0 *(for LJ IIP/III)* . . . . . 379.
6834 Pacific Page with free 2 Meg Memory Board *(for LaserJet II)* . . . . . 379.
9833 Pacific Page XL *(includes high speed accelerator board)* . . . . . 799.
1326 HP LaserJet III w/Pacific Page XL. . . . . 2449.
8090 Pacific Connect 1.25M *(Printer sharing device for HP's)* . . . . . 349.

Intel ... 5 years
80387 Math CoProcessors–Get the most out of your 80386 or 80386SX system. This simple upgrade speeds up the performance of many spreadsheets, database, CAD, graphics and font programs . . . . . **see line listings.**

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A recycler's dream.

Practical Peripherals ... 5 years

3103	2400 Baud Internal Modem	$129.
3102	2400 Baud External Modem	179.
8993	2400 Baud Internal Modem *(V.42 bis)*	169.
8994	2400 Baud External Modem *(V.42 bis)*	209.
4542	2400 Baud Internal Modem for PS/2	229.
8132	PM2400 Pocket Modem	109.
7934	PM9600SA Modem	489

Targus ... lifetime

4900	Lappac 2 Carrying Case *(Horizontal)*	55.
6037	Premier Leather Carrying Case	179.

TheComplete PC ... 2 years

5828	TheComplete Communicator	449.
9758	TheComplete Flatbed Scanner	995
9760	TheComplete Page Scanner with Calera's Word Scan	619.

Toshiba ... 1 year

9893	T2000SX Notebook *(40 Meg)*	call
9894	T1200XE Laptop *(40 Meg)*	call

Tripp Lite ... 2 years

6199	Isobar 4-6 *(4 outlets, 6 ft. cord)*	49.
6200	Isobar 6-6 *(6 outlets, 6 ft. cord)*	59.
9826	BC375 *(375VA Battery Backup)*	219
9312	BC500 *(500VA Battery Backup)*	269.

Video 7 ... 7 years

4931	VRAM II VGA 512k	349

Zoom Telephonics ... 7 years

1307	2400 Baud w/9600 Baud Fax Modem	129
1181	2400 Baud V.42bis Modem	159.

Plus Development ... 2 years
8287 *Hardcard II XL 105 Meg (9 ms)*–Add a super fast 105 Meg hard drive to any 286/386 system. Anyone can install it in minutes. Takes up only one 16 bit slot. New low price ..... $599.

DRIVES

CD Technology ... 1 year

8057	Porta-Drive CD-ROM	649.
8105	Installation Kit for Standard Bus	155.
8106	Installation Kit for Microchannel	249.

Conner Peripherals ... 1 year

8875	CP3044 40 Meg IDE HD *(25 ms)*	325.
8874	CP3184 80 Meg IDE HD *(25 ms)*	499.
8876	CP3104 100 Meg IDE HD *(25 ms)*	549.

IOMEGA ... 1 year

5116	Bernoulli II 44 Meg Internal	829.
7551	Bernoulli II Transportable 44 Meg	929.
5113	44 Meg Cartridge Tripak *(5¼")*	269.
2500	PC2B Controller	209.

Mountain Computer ... 2 years

2917	40-60 Meg Internal Tape Drive	259.
5500	83-152M Internal Tape Drive	629.
5190	DC2000 Pre-formatted Cartridges	ea. 35.
6153	DC2120 Tape Cartridge *(5 pack)*	149.

Pacific Rim ... 1 year

1304	1.2 Meg External *(for any parallel port)*	265.
6602	1.44 Meg External *(for PC/XT/AT)*	239

Plus Development ... 2 years

8304	Hardcard II XL 50 Meg *(9 ms)*	399.
8287	Hardcard II XL 105 Meg *(9 ms)*	599.

Seagate ... 1 year

4554	40 Meg Internal HD ST251-1 (28 ms)	$269.
1321	ST157A 40 Mb IDE Hard Drive	239.
1320	ST1144A 130 Mb IDE Hard Drive	499.

TEAC ... 1 year

4670	1.44 Meg Drive for PC/XT *(3½")*	79.
4326	1.44 Meg Drive for AT *(3½")* with Bastech software	99.
4951	720k Drive for PC/XT *(3½")*	69.
6951	1.2 Meg Drive for AT *(5¼")*	89.

DISKS/MEDIA

Maxell ... lifetime

2789	5¼" MD2-D 360k Disks *(Qty. 10)*	10.
2790	5¼" MD2-D 1.2 Mb Diskettes *(Qty. 10)*	15.
2792	3½" DS/DD 720k Diskettes *(Qty. 10)*	13
2793	3½" DS/HD 1.44Mb Diskettes *(Qty. 10)*	21.

Everex ... 1 year
1348 *Tempo LX Notebook Computer*–16 MHz 80386SX with 1 Meg of Ram upgradable to 5 Meg. 6.9 lbs. including Nicad battery. 1.44 Meg Floppy and 21 Mb IDE hard drive. MS DOS 4.01 Great machine.. $2399.

Canon ... 1 year
7894 *BJ-10e BubbleJet Printer*–Light weight, excellent print quality and a great price make this 4.6 lb. printer a winner. Choice of black or white. Optional sheet feeder ..... $329.

Sony ... lifetime

3291	5¼" DS/DD 360k Disks *(Qty. 10)*	9.
3297	3½" DS/DD 720k Diskettes *(Qty. 10)*	12.
3298	3½" DS/HD 1.44Mb Diskettes *(Qty. 10)*	19.
6148	3½" DS/DD *(3 Pack)*	29.
6375	3½" DS/HD *(3 Pack)*	49.
8185	QD 2040 Tape Cartridge	19

3M ... lifetime

3943	DC 2000 Tape Cartridge	20.
6065	DC 2080 Tape Cartridge	25.
3944	DC 600 Tape Cartridge	29.
5679	DC 6150 Tape Cartridge	29.

MEMORY

6556	256k DRAM *(100 ns, set of 9)*	
5510	1 Meg x 9 SIMMs *(80 nanosecond)*	
5746	1 Meg Chips *(80 ns, set of 9)*	
7813	256k x 4 Chips	

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- All U.S. shipments insured; no additional charge
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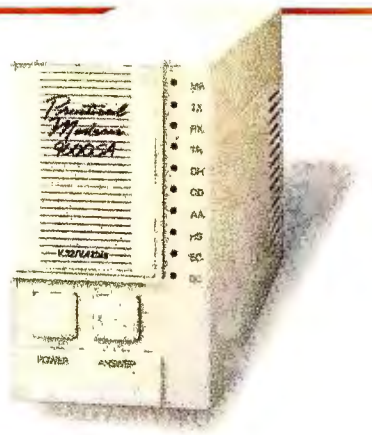
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subje to availability. Prices and promotions subject to chan without notice.
- To order, call us Monday through Friday 8:00 a.m. to 1.00 a.m., or Saturday 9:00 a.m. to 5:30 p.m. Easter Time. You can call our business offices at 603/446-33 Monday through Friday 9:00 a.m. to 5:30 p.m.



Practical Peripherals ... 5 years
7934 *PM9600SA Modem*–Practical Peripherals does it again by making communications affordable with their newest modem featuring the data compression & error correction of 9600bps V.32 & V.42bis operation $489

SHIPPING

Note: Accounts on net terms pay actual shipping

Continental US:

- For heavy hardware items such as printers, monitors, Bernoulli Boxes, etc. pay actual charges. Call for UPS 2nd-Day & Next-Day-Air.
- For all other items, add $3 per order to cover UPS Shipping. For such items, we automatically use Airborne Express at no extra charge if you are more than 2 days from us by UPS ground

Hawaii:

- For monitors, printers, Bernoulli Boxes, computers, hard drives, and power backups, actual UPS Blue charge will be added. For all other items, add $3 per order.

Alaska and outside Continental US:

- Call 603/446-7721 for information.

EXECUTIVE SUMMARY

Norton, Central Point Are Tops

Utilities for easier, more secure hard disk backup.

Backup programs automate the process of saving your data to floppy disk (and with some packages, tape cartridge or cassette), and they let you restore data to your hard disk in case of trouble.

Norton Backup and **Central Point Backup** win Best Buys thanks to capable data security, easy-to-use interfaces, and flexible backup and restore options. **Norton** is your choice if you have multiple drives, and **Central Point** gets the call for tape backup.

	Central Point Backup 6.0	Fastback Plus 2.11	Norton Backup 1.2	PC-Fullbak+ 2.01
Data security	Excellent	Fair	Excellent	Fair
Ease of use	Excellent	Fair	Excellent	Poor
Backup options	Good	Fair	Good	Poor
Restore options	Excellent	Fair	Excellent	Poor
Overall value	Excellent	Fair	Excellent	Poor
	BEST BUY		BEST BUY	
Reader service no.	683	680	681	682

How we rate backup software
We rate backup software based an information in the Features Evaluation, combined with aur opinians of quality, reliability, ease of use, and user benefit.

Data security is crucial—what yau back up must be restored the same way. To win an Excellent rating, a package must recover all data fram a damaged test disk, ignare hidden files, and warn yau if yau're about ta averwrite a disk ar restare an ald version of a file.

Ease of use measures haw intuitive and accessible a program is. Ta win an Excellent rating, a pragram must let you select files from a treelike directary display, pravide detailed an-screen file informatian, and affer scripts ar canfiguratian files far autamating rautine backups. Extra points are given for cantext-sensitive an-line help and multiple user levels.

Backup options are the cantrols you have aver haw and what the pragram backs up. An Excellent rating means the pragram provides flexible file selectian, daes full, incremental, and differential backups, appends incrementals to the last backup set disk, and supports all logical drives. The pragram must also suppart majar tape drives and back up multiple drives in the same backup sessian.

Restore options are the cantrals yau have over haw and what the pragram restores. To earn an Excellent, a program must pravide flexible file selectian and restare yaur hard disk exactly as it was at yaur last backup. In additian, it must let yau restore files ta a new locatian.

Overall value averages all the abave criteria, with emphasis an data security, and factars in price and technical support.

restore, and there's no mouse support.

As Westlake Data representatives admitted, *PC-Fullbak+* doesn't coexist well with some memory-resident utilities—it was the only program to fail our RAM-resident tests. When running *DOSKEY,* which lets you select previously issued DOS commands, pressing <Esc> to abort a backup in progress sometimes resulted in a program freeze and forced a reboot. Disabling *DOSKEY* appeared to clear up the problem.

Although *PC-Fullbak+* is better than DOS's BACKUP and RESTORE commands, it's well below the level of the other products reviewed.

Two Backup Best Buys

There's not much difference between our two Best Buys, *Norton Backup* and *Central Point Backup:* Their reliability and options are similar, and both make backing up easy. If you have to back up multiple drives but have no tape drive, *Norton*'s your best choice. Otherwise, *Central Point*'s tape support and lower price give it the edge.

The next step in backup? *Windows,* of course. Both Best Buys will field *Windows* versions this summer, so you can back up in the background and point and click toward data security.

David Fogle is technical editor for a major computer reseller headquartered in Northern California.

For more information about all products in this article, circle reader service no. 909.

WHERE TO BUY

Central Point Backup 6.0
Central Point Software, Inc.
15220 N.W. Greenbrier Pkwy. #200
Beaverton, OR 97006
800/445-4208
LIST PRICE: $99
REQUIREMENTS: 512K RAM, DOS 3.0 or later version
TECHNICAL SUPPORT: toll number, M–F 6–5
OTHER SUPPORT: BBS, CompuServe forum
Reader service no. 683

Fastback Plus 2.11
Fifth Generation Systems, Inc.
10049 N. Reiger Rd.
Baton Rouge, LA 70809
800/873-4384
LIST PRICE: $189
REQUIREMENTS: 330K RAM, DOS 2.1 or later version
TECHNICAL SUPPORT: 24-hour toll-free number, seven days a week
OTHER SUPPORT: BBS, newsletter
Reader service no. 680

Norton Backup 1.2
Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014
800/441-7234, 800/626-8847
California
LIST PRICE: $149
REQUIREMENTS: 512K RAM, DOS 3.1 or later version
TECHNICAL SUPPORT: toll number, M–F 7–5
OTHER SUPPORT: BBS, customer magazine
Reader service no. 681

PC-Fullbak+ 2.01
Westlake Data Corp.
P.O. Box 1711
Austin, TX 78767
512/328-1041
LIST PRICE: $99
REQUIREMENTS: 512K RAM, DOS 2.0 or later version
TECHNICAL SUPPORT: toll number, M–F 8:30–4:30
OTHER SUPPORT: quarterly newsletter
Reader service no. 682

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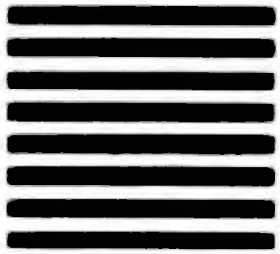

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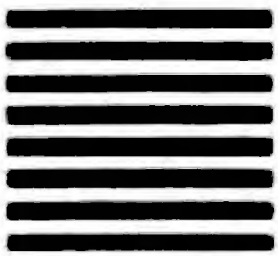

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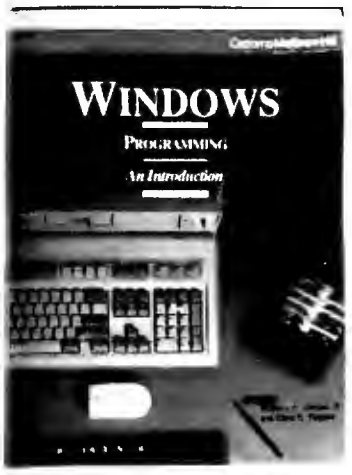

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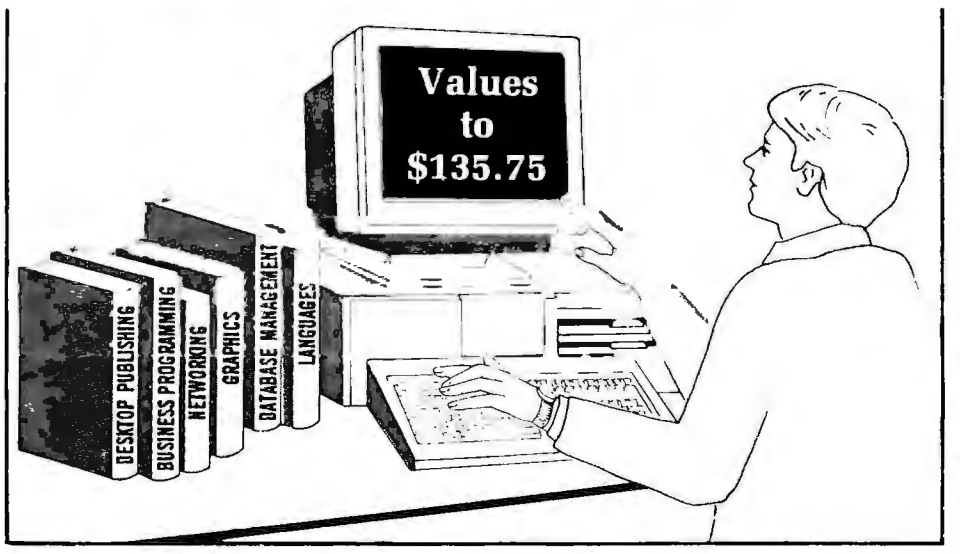

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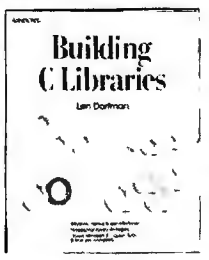

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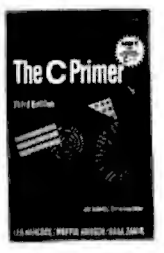

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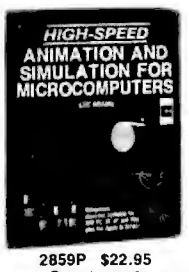

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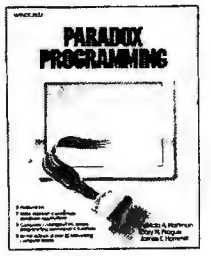

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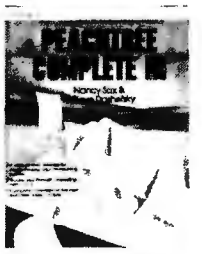

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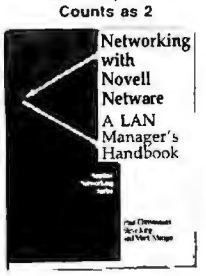

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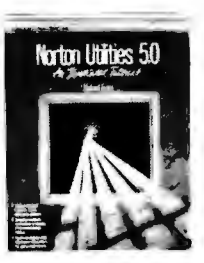

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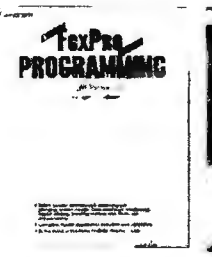

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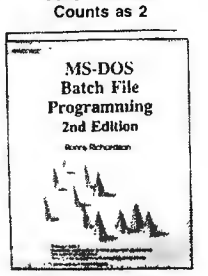

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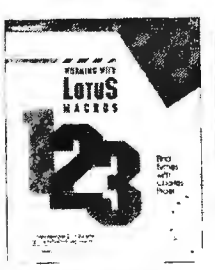

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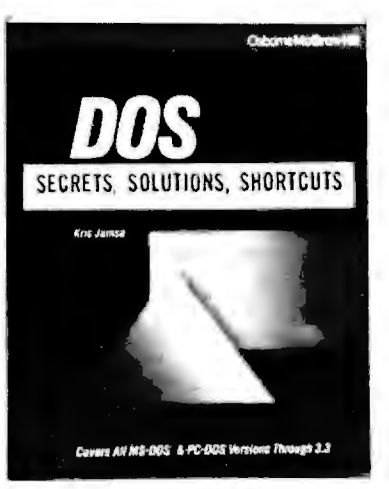

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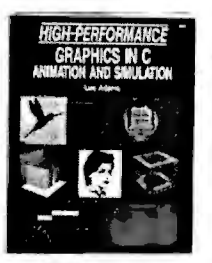

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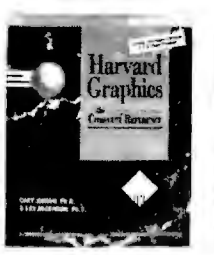

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dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications *without programming*	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
INDUSTRY STANDARDS			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Audits & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced.

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV® version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

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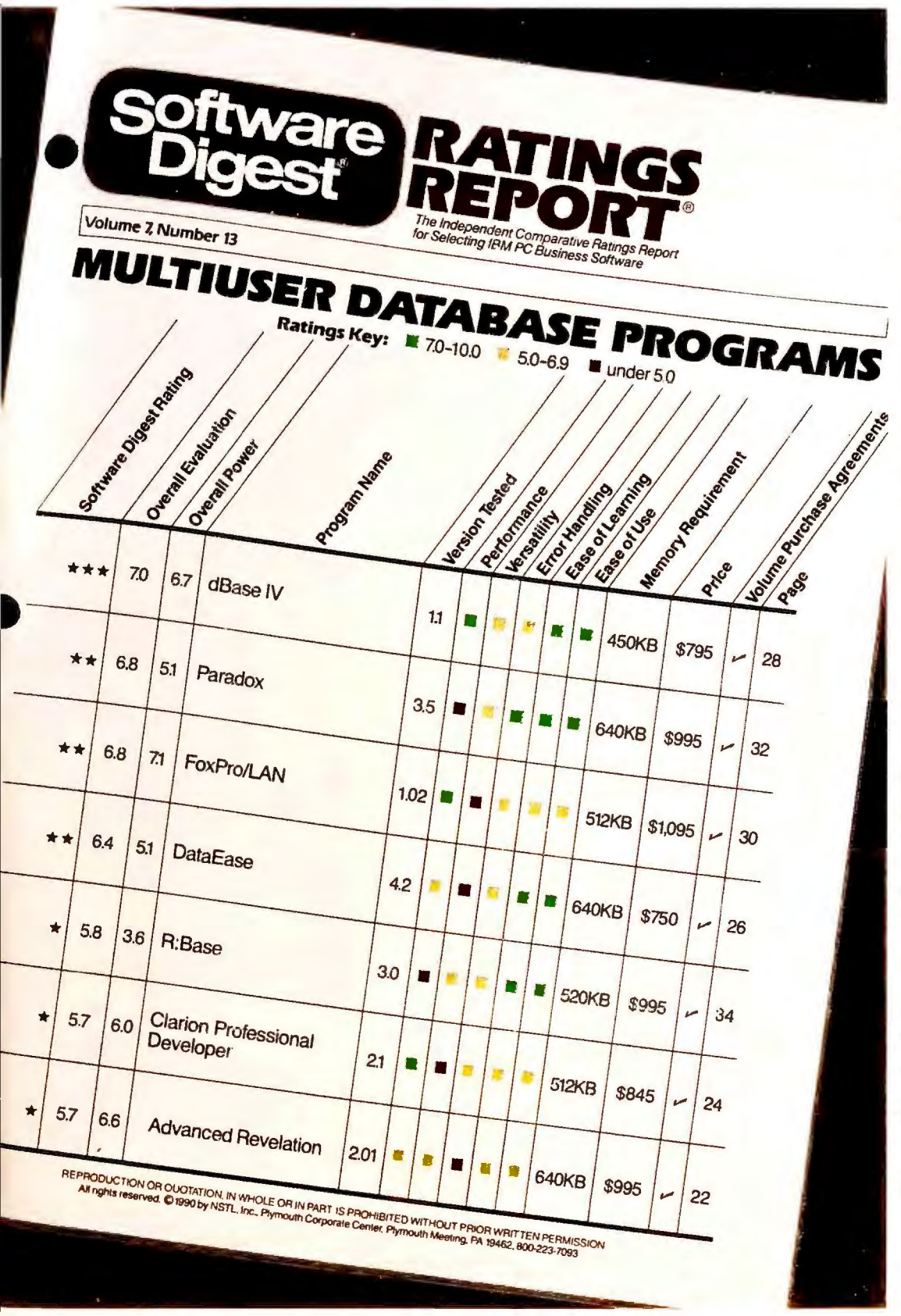
dTruth Comes Out.



Software Digest® RATINGS REPORT®

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Volume 7, Number 13

MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 7.0–10.0 ■ 5.0–6.9 ■ under 5.0

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version Tested	Performance	Versatility	Error Handling	Ease of Learning	Ease of Use	Memory Requirement	Price	Volume Purchase Agreements	Page
★★★	7.0	6.7	dBase IV	1.1	■	■	■	■	■	450KB	$795	✓	28
★★	6.8	5.1	Paradox	3.5	■	■	■	■	■	640KB	$995	✓	32
★★	6.8	7.1	FoxPro/LAN	1.02	■	■	■	■	■	512KB	$1,095	✓	30
★★	6.4	5.1	DataEase	4.2	■	■	■	■	■	640KB	$750	✓	26
★	5.8	3.6	R:Base	3.0	■	■	■	■	■	520KB	$995	✓	34
★	5.7	6.0	Clarion Professional Developer	2.1	■	■	■	■	■	512KB	$845	✓	24
★	5.7	6.6	Advanced Revelation	2.01	■	■	■	■	■	640KB	$995	✓	22

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Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility, and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.

The truth is, no other database can do so much to improve productivity.

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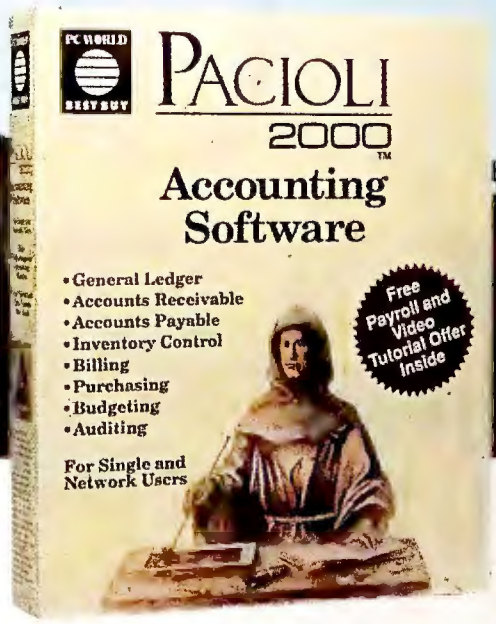

Like more than 100,000 other satisfied customers, Linda and her boss Roger have discovered the many benefits of using our award winning Pacioli 2000 Accounting Software. "It really is easy to use and the customer service is tremendous," says Linda. Roger likes Pacioli 2000 because ". . .it offers everything we need and the cost was hard to believe." In fact, the *New York Times* states that Pacioli 2000 is ". . .the equal of other high end accounting programs in every way but cost."

Pacioli 2000 has been featured on *CNN's Headline News* and *Money Line*. It has also been honored by *PC World* as the "Best Buy" in 1990 and has received *Compute's* CHOICE AWARD for the "Best Financial Software of 1991." This system was designed by J. M. Hurtado, who started the accounting software revolution with DacEasy™ Accounting in 1985. Pacioli 2000 makes managing your business finances easier than you ever thought possible by fully integrating eight modules into one powerful system: General Ledger, Accounts Receivable, Accounts Payable, Inventory Control, Billing, Purchasing, Budgeting and Auditing.

It includes pull-down menus, full mouse support, context-sensitive help, automatic installation, and a file inquiry system that will let you make inquiries or create accounts "on-the-fly" . . .features not usually found in the most expensive accounting packages.

PC Week called Pacioli 2000 ". . .the best software value of the year" and they are right. Pacioli 2000 is also fully networkable, which means one or any number of users can enjoy the same easy-to-use, powerful features with no additional fees. It is ready to perform as multi-user accounting software with file and record locking, multi-level password protection and more.

In addition to being easy to use, Pacioli 2000 is backed by a 90 day money-back guarantee when purchased directly from M-USA. If you are not completely satisfied, simply return the entire package and we will refund your purchase price (less shipping charges). You will also receive FREE technical support for 30 days. If you have any questions while using Pacioli 2000, the answers are as close as your telephone.

And now, there are two great offers included. When you send in your registration card, you can order our new Pacioli 2000 Payroll FREE. You can also order a FREE 2 hour instructional video to help you learn MS-DOS, Basic Accounting and Pacioli 2000. With each offer you pay only for shipping and handling.

The *Computer Buyer's Guide and Handbook* said in the January 1991 issue, " . . Pacioli is one of the all-time great bargains in software." Because it gives them everything they need, Linda and Roger agree. Try it and you'll soon discover that Pacioli 2000 will meet your needs too.

Minimum Hardware Requirements: IBM or compatible computer with 500Kb of free memory available, hard disk, monochrome or color monitor, mouse optional, MS-DOS 2.1 or later for single users (3.1 or later for networks), 132 column dot matrix printer in compressed mode.

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Perfect Forms With Windows

Deluged with paper forms? These four Windows-based form packages can stem the flood—and save you time and money in the process.

Scott Spanbauer

AJIN

It's Monday morning. You arrive at your office not quite ready to confront the horror of last week's unfinished business. Forget about digging through your in-box—piles of supply requests, invoices, purchase orders, expense reports, and other forms cascade onto the chair, tumble to the floor, and loom like vultures from every shelf.

OK, so we're exaggerating. But the office paper glut is a big problem, and the vast majority of it comes from forms. The trouble with forms is they're expensive to store, hard to find in a hurry, and potentially disastrous if lost or destroyed. And for every form that's filled in by hand, you'll have to pay someone to key in the data. Here's a simple solution: electronic form processing.

Part draw package and part data base manager, a form program lets you

Buying Smart: Finding the Right Fit in Forms

If a large part of your business involves tracking, filling out, or wading through oceans of forms, save yourself time, money, and office space by doing it electronically. A good forms package not only lets you design forms, but makes it easy to fill them in on screen or merge them with existing data bases. Here's how to shop for one.

FORM DESIGN

Before you can fill in a form on screen, you have to create it. The package should provide a library of forms that you can customize by adding fonts or graphics, plus design tools for creating forms from scratch. And if you need to create long or complex forms (such as government documents), the ability to create multipage forms is essential.

Standard tools include lines, boxes, circles, and arcs, plus controls for line thickness and shading. You should also be able to add text, set up data fields, and annotate forms with help messages. Top-notch programs supply more complex objects like *combs* (rows or columns of boxes), which can save you time when designing repeating elements. Other advanced features include tools for duplicating objects, aligning them with other objects, and creating groups of objects that you can manipulate as a single unit.

DATA MANAGEMENT

Printing out blank forms is helpful, but you begin to realize substantial benefits from forms packages when you fill them in on line. Top-notch data management tools make data entry easier and more accurate and cut down on the amount of data that needs to be keyed in. Validation features ensure that data matches its field (requiring, for example, five digits for a ZIP code), providing complete, reusable entries. Lookup tables limit users to a list of acceptable field entries, such as Cash, Check, or Credit. Other must-have features are *masking* (formatting such as slashes in a date field), *calculated fields* (which generate field entries based on other fields' values), and *compulsory fields* (which prevent users from omitting key data).

All of the programs let you create simple nonrelational data bases. They also read dBASE DBF files, so you can, for example, create an on-screen invoice that updates your customer data base with each new entry. To make it easier to link specific data to form fields, choose a program that lets you browse the external file structure.

FORM MANAGEMENT

You may have banished the filing cabinets, but you still have to find the forms. Form packages can make it much easier to locate what you want in a hurry—but only if they provide the right management tools. To select the right form quickly, you'll need to be able to tag forms with descriptive titles, not just DOS file name. And you don't want everyone in the office stampeding through your data; look for features like form locking to prevent users from altering forms, plus hidden fields and password protection to screen sensitive data from prying eyes.

PRINTING

Most form programs offer broad support for printers, from dot matrix units to PostScript lasers. More important is how quickly they let you print. The ability to download forms as printer macros can boost laser printing speeds—especially with multiple forms. The best applications let you use cartridge-based and downloaded soft fonts.

EASE OF USE

Creating a form and filling it out should be as painless as possible. A good selection of prefabricated objects ready to accept data helps speed design and saves you extra steps. A quick-start beginner's guide can get you up and running in minutes. If you do get stuck, context-sensitive help is a nice extra.

design, fill in, store, and print electronic forms. By processing forms in electronic format, you get instant access and can avoid the errors and loss of productivity caused by rekeying data. By banishing filing cabinets, you can save precious office space and avoid filing and paper disposal costs. And the ability to merge data from external data bases gives your forms extra power and reach.

Even if you can't quite break the paper-forms habit, the design and print functions of form packages can still pay off. By taking design into your own hands, you can change forms quickly to keep them up-to-date, customize them to your specific needs, and save money otherwise spent on prepackaged forms or a commercial form designer. So even if you're not ready for the paperless office, you can make your paper office run a lot smoother.

Finesse a Form and Fill It

When designing a form, you need to manipulate fonts and graphics on screen and see what the result will look like—a big reason why *Windows* is the best choice for form design. We selected the four top *Windows* form packages for this review, all of which offer editable graphical displays instead of the static previews provided by DOS packages.

No matter how stunning your forms, people won't use them if they're hard to fill in. Most form packages come with fill-in modules, which are also available separately in DOS and *Windows* versions. You'll want to buy the full-fledged package for your form designer and get the cheaper modules for the people who'll be entering the data. A good forms package makes data entry easier with pop-up help screens and multiple-choice lists. And thanks to data validation features that prevent improper entries, your data is more accurate.

You can set up form packages as simple data bases or link them to more powerful relational data managers so they act as data entry front ends. Next year a number of form packages will add relational capabilities of their own,

FEATURES EVALUATION

Forms With Substance: PerForm

Easy form design, powerful data handling, and intelligent form management—PerForm Pro has it all.

● Yes
○ No
◒ Deficient

	FormMaster 1.2	Form Publisher With Fill & File 2.0	JetForm Design 2.2	PerForm Pro Design & Filler
Standard features				
Price	$99	$195	$495	$495
Context-sensitive help	●	●	○	●
Quick-start guide	○	○	○	●
Form design				
Number of standard forms included	19	606	7	118
Multipage forms	○	○	●	●
Imports TIFF and PCX graphics	●	●	●	●
Aligns objects with each other	●	●	○	●
Creates groups of objects	○	●	○	●
Supports scanner	○	●	○	●
Data management				
Calculated fields	◒[1]	●	●	●
Field masking/compulsory fields/ lookup tables	◒[2]	●	●	●
Specify field fill-in order	●	●	●	●
Automatically generates serial numbers	○	●	○	●
Displays data file structure	○	●	●	●
Data file formats read/written				
DBF	○	●	●	●
NDX	○	●	○	●
ASCII	●	●	●	●
Form management				
Long file descriptions	●	●	●	●
Form locking	●	●	●	●
Hides field data/read-only fields	○	●	◒[3]	●
Password protection	◒[4]	○	○	●
Printing				
Supports downloaded and cartridge fonts	●	●	●	●
Downloads forms to printer as macros	○	●	●	●
Printer support				
HP LaserJet Series II/Series III	●	●	●	●
PostScript	●	●	●	●
Epson LQ dot matrix	●	●	◒[5]	●
HP DeskJet	●	●	○	●

BEST BUY

[1] Limited to simple math functions—no Boolean or logarithmic functions.
[2] Limited field marking, no compulsory fields or lookup tables.
[3] Creates read-only fields but cannot hide data on screen.
[4] Passwords not encrypted.
[5] Prints data onto preprinted forms; does not print forms themselves.

EXECUTIVE SUMMARY

A Formidable PerFormer

PerForm Pro takes the pain out of electronic form processing.

Forms software offers a quick cure to the office paper glut. You can design forms on screen, fill them with data, and keep them on disk until you need to print them.

Best Buy **PerForm Pro** gives you everything you'd want from a form package—easy design, solid data handling, and clever form management features. But don't overlook **Form Publisher,** which gives you superb design and data skills for much less.

	FormMaster 1.2	Form Publisher With Fill & File 2.0	JetForm Design 2.2	PerForm Pro Designer and Filler
Form design	Fair	Good	Good	Excellent
Data management	Poor	Excellent	Good	Excellent
Form management	Fair	Good	Fair	Excellent
Printing	Good	Excellent	Good	Excellent
Ease of use	Good	Excellent	Good	Excellent
Price	Excellent	Excellent	Fair	Fair
Overall rating	Fair	Excellent	Good	Excellent
				BEST BUY
Reader service no.	706	707	708	709

How we rate form software
We rate these packages based on information in the Features Evaluation combined with our hands-on evaluatian of quality and ease of use.

Form design rates haw easy it is to modify existing forms and create them from scratch. Ta earn an Excellent, the pragram must include a library of at least 100 modifiable forms, accept bit-mapped graphics, and let you align and group objects. It must also allow you to print multipage forms.

Data management measures the pragram's ability ta accept data fram and link to established data bases. An Excellent program lets yau specify field validatian criteria, masks, campulsory and calculated fields, and fill-in arder. It also must suppart DBF and ASCII files and let you manage recards and view data file structures fram within the pragram for easy field linking.

Form management evaluates how easy it is to store and retrieve form files and control access to data. Excellent farm management means you can assign long file descriptions and sort by a variety of criteria. You must also be able to lock farm designs against change, hide data, and require passwards far access to specific fields.

Printing gauges output options. An Excellent rating means the program supparts dat matrix, ink jet, and laser printers; takes advantage af downloaded and cartridge fonts; and lets you download farms as macras far faster printing.

Ease of use indicates how easily users can get up and running. In addition ta a graphical interface, Excellent programs pravide a healthy selection af prefabricated objects that come ready ta accept data.

Price may be the key factor far same users. An Excellent price for these packages is under $200.

Overall value weighs all of the above criteria, with primary emphasis on form design and data management.

following the lead of Ventura Software's *Formbase,* a true relational data base built around a forms interface. Relational features increase flexibility in updating data from different sources—you could change, say, a supplier address in one file and a part number in another using a single form. (For a review of *Formbase,* see "Data Management: Up Close and Personal" in this issue.)

Among the four *Windows*-based packages we selected, we discovered one Best Buy. *PerForm Pro* combines top-notch design with outstanding data handling and ingenious security features. A solid second-place finisher is the bargain-priced *Form Publisher,* which comes with a tremendous library of predesigned forms.

FormMaster 1.2

PROS: Inexpensive, good text handling

CONS: Minimal data entry controls, cumbersome data integration, limited to one-page forms

FormMaster lets you create attractive forms for a seductive $99 price, but its weak data handling and form management tools pose problems when filling in and retrieving forms. You're limited to single-page designs, so you can't create lengthy insurance or government forms. Consider buying *FormMaster* if you're strapped for cash and your needs are limited to designing and printing blank one-page forms.

To create a form, you select icons from a toolbox, draw objects like lines and boxes on screen, then add shading and text. But you'll have to draw, place, and size the objects one at a time. While you can lasso a group of objects and edit them as one unit, you can't permanently group them—every time you want to change part of the form, you have to reselect each object.

FormMaster's data entry validation tools are minimal—it can add dollar signs to monetary data, and prevent you from entering text in a numerical field. Adding data from an external data base is downright scary. You can feed your forms a steady diet of dBASE DBF or ASCII files, but to save a data file, you must first select all of a form's data fields with the mouse. If you miss a field, that data will be lost when you quit the program.

When it comes to managing forms, *FormMaster* is far too trusting. You can't encrypt files or restrict access to sensitive fields such as those containing salary information. Unlike its rivals, *FormMaster* can't download forms as printer macros, so printing multiple

copies will likely be slower.

If all you need to do is create blank one-page forms, *FormMaster* delivers the goods for a bargain price. But if you want to use electronic forms to enter and massage data, you should look elsewhere.

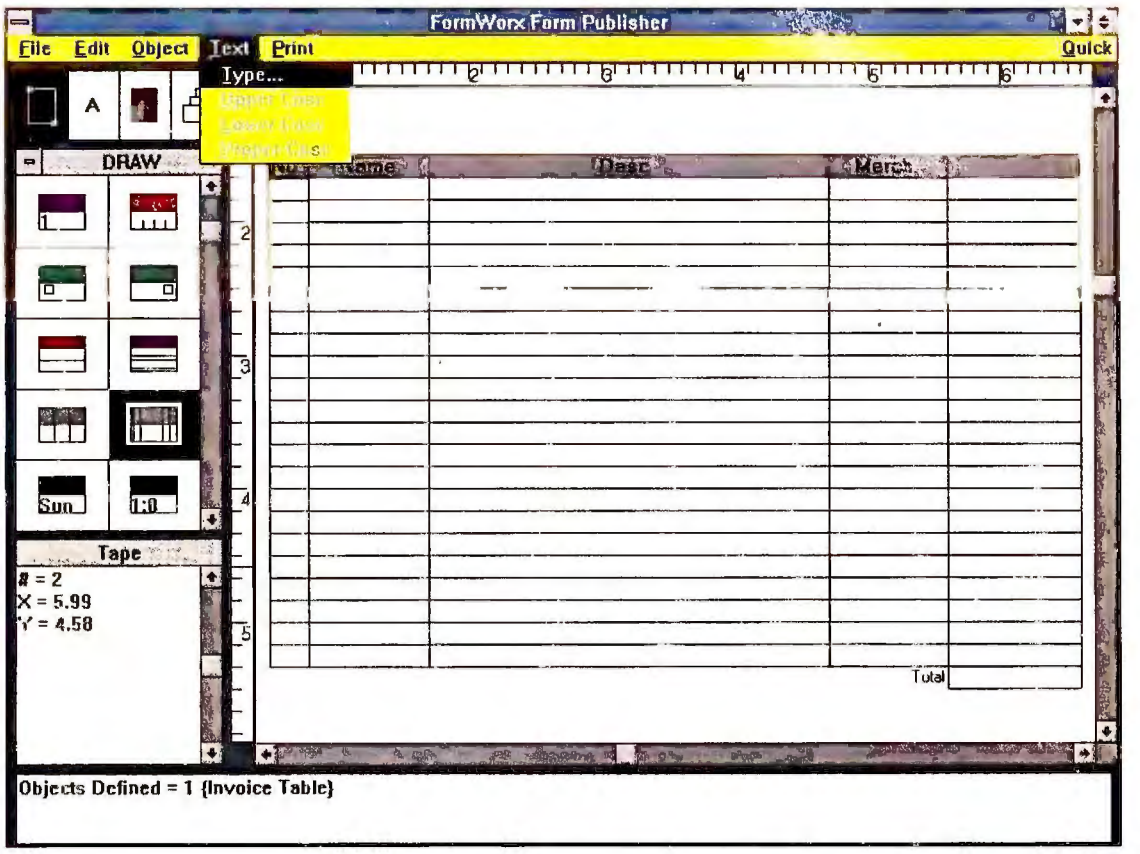
Form Publisher With Fill & File 2.0

PROS: Reasonably priced, huge forms library, top-notch design tools

CONS: No multipage forms

For only $195, FormWorx' *Form Publisher With Fill & File* delivers powerful form design and fill-in modules and a huge library of business and government forms. If you're on a tight budget and don't need multipage forms, *Form Publisher* is a superb value.

Form Publisher makes form creation fast and easy. You can choose from more than 600 ready-made forms, or design your own by piecing together complex prefab objects. For example, you can create an invoice simply by plugging in an entire row-and-column matrix complete with shading, formatted headings, and a Total cell. You can also group objects together and save them in a custom library for reuse in other forms.

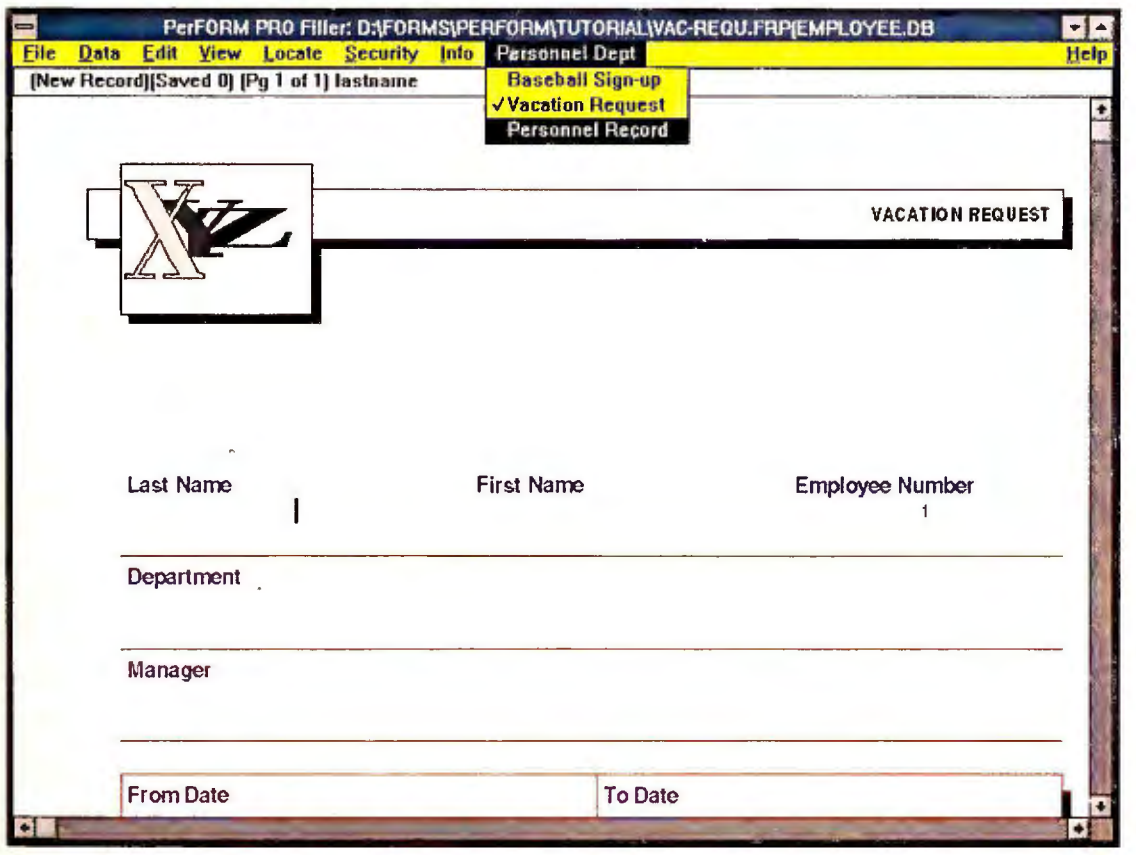


Form Publisher's array of prefabricated objects makes it easy to set up simple forms such as invoices—just select an object from the toolbox (left) and place it on the page.

Form Publisher's full complement of formatting and validation options helps keep your data accurate and your users happy. Integrating external dBASE data is easy—you can sort and view the structure of DBF files, so you won't have to know the field names beforehand.

Need to find a form in a hurry? *Form Publisher* makes it a snap. For each form you can assign a long description, a category field (such as Human Resources), and expiration date.

Overall, *Form Publisher* can't quite match *PerForm,* but it costs less than half as much. If you don't need multipage forms, it's an excellent value.



Perform Pro lets you store related forms (such as personnel records) in "folders," access them via a pulldown menu, and link the fields so that data entered in one form appears in all others.

JetForm Design 2.2

PROS: Multipage forms, good data management

CONS: Expensive, small forms library

The $495 *JetForm Design* boasts some unique LAN printing features and the ability to produce multipage forms. *JetForm* can't match the similarly priced *PerForm* at design and form management, but it's a good value.

JetForm's design tools make it easy to create objects from scratch and place, move, and resize them. It takes longer to design a form, however, because you get only seven standard forms, and there are no prefab objects

E-Mail—The Next Forum for Forms

Form software vendors promise a paperless office, but more often than not, the end result is still a printed copy. That's about to change, according to form developers who are working to link up form processing and E-mail.

"Sending forms just to printers is kind of missing the boat," says Microsoft's MIS PC technology manager Tom Argites. Last year, Argites set out to marry Microsoft's internal E-mail system with JetForm Corporation's *JetForm Filler*. "It's a natural evolution of mail," says Argites.

Linking E-mail to forms can save time as well as paper. Think about how long it takes to get a check approved, written, and mailed at your company. With E-mail forms, you simply choose the right form from a menu within your E-mail package, fill in the blanks, and fire it off to your boss. (Because only the data, not the form itself, traverses the LAN, transmission is instantaneous.) The boss glances at it, signs it electronically with an encrypted password, and sends it to accounting, which cuts the check and mails it the same day.

Commercial E-mail forms applications should appear by year's end, according to JetForm's director of marketing, Barry Gillespie. This fall, the company plans to release an updated *JetForm,* based on the Microsoft experiment, that dovetails with the *Windows* version of *Microsoft Mail.*

Ultimately, Gillespie sees electronic forms extending into electronic data interchange (EDI)—an electronic document standard used by large businesses to conduct on-line transactions with suppliers and customers. The main benefit of EDI is that purchase orders, invoices, and even payments are sent and acknowledged instantly, bypassing slow, expensive mail and messenger services. While the technology is costly, Gillespie thinks EDI will start showing up in products like *JetForm* in about a year.

If E-mail forms sound intriguing, how about forms that think? Reach Software of Sunnyvale, California, plans to add an "intelligent" forms capability to its new *MailMan* E-mail package by year's end. This *Windows*-based work flow product will let users write rule-based macros to route forms based on the contents of fields. For example, you could create a form for a bank's loan office that would route the form to a senior officer if the loan was over a certain amount.

"Business runs on forms," says Reach president Anand Jagannathan, "but current E-mail packages are limited in their ability to handle forms because their text files lack structure." According to Jagannathan, *MailMan* will be further enhanced with *Windows'* Object Linking and Embedding (OLE) technology, which will enable users to click on one field in the form and automatically launch a word processor, and click on another field to launch a spreadsheet.

Soon, perhaps, all applications will revolve around E-mail, and forms will be your window on applications rather than vice versa.

for easy form creation. By the time you read this, JetForm should ship version 2.21, which will automatically trace scanned forms for easier duplication.

JetForm's data manager gives you a full range of field controls. Retrieving forms is easy, but you'll find no security features for limiting access to data.

JetForm's unique printer driver can mimic multipart carbon forms on networked laser printers. For example, you can send one copy to a laser in the shipping department, one to accounting, and one to your local printer. You can also print multipage forms using different paper sizes or orientations.

All told, *JetForm Design* is a capable contender, especially if you have multiple network printers.

PerForm Pro Designer and Filler

BEST BUY

PROS: Easy to use, form linking, airtight security, multipage forms

CONS: Cons: Expensive

We've saved the best for last. *PerForm Pro Designer and Filler* offers the finest combination of power and ease of use, plus the ability to print multipage forms. Despite a premium price of $495, *PerForm Pro* rates a Best Buy.

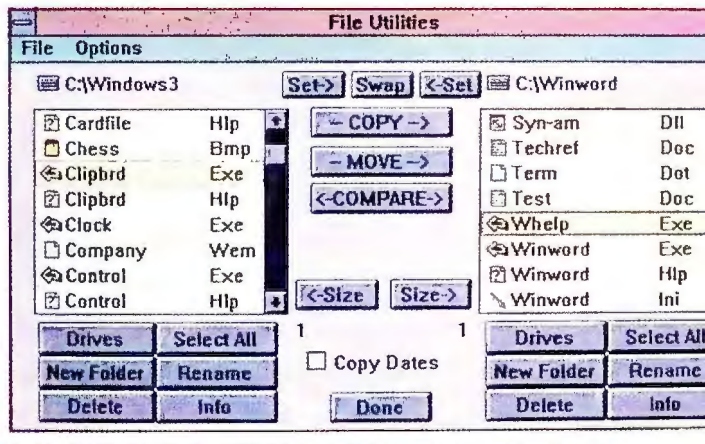
Form design is a breeze. *PerForm*'s "comb" tool draws grids of cells automatically, and you can easily change draw and text attributes.

Finding the right form is a breeze. You can view not only the file name but also a descriptive title with room for 45 characters, the designer's name, a version number, and a longer, scrollable description. Security is top-notch: You can issue electronic *signatures* (randomly generated, encrypted passwords) that prevent unauthorized users from view-

EXPERIENCE

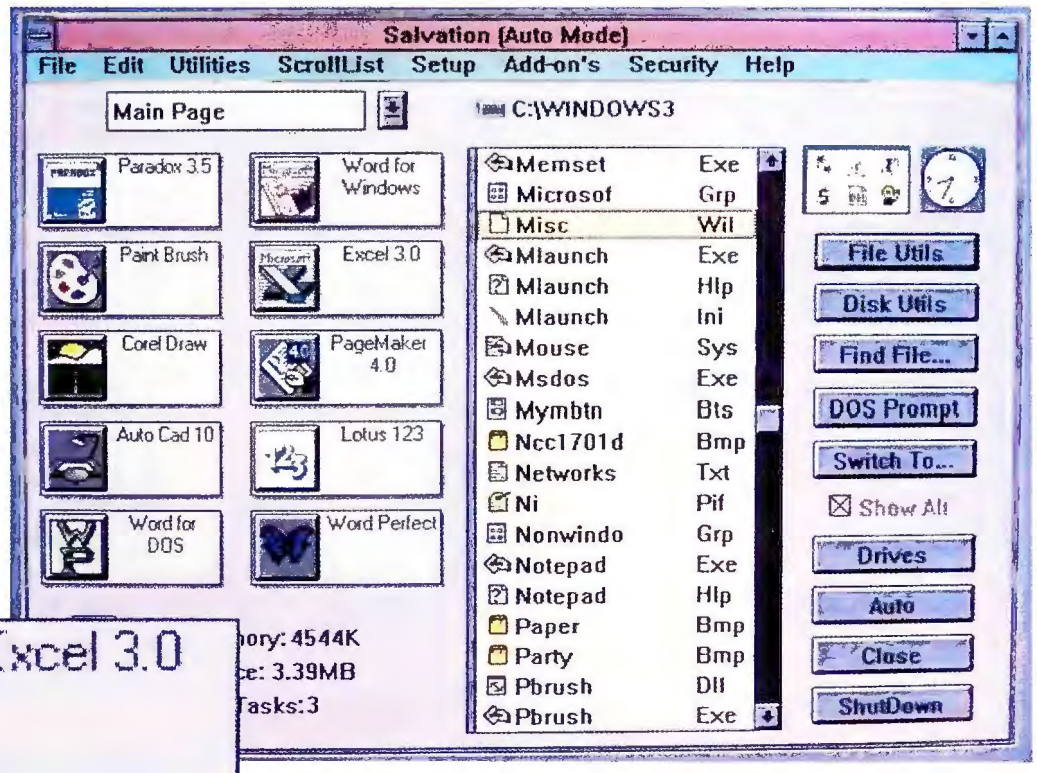
Salvation™

Microsoft® opened your computer with Windows.™ Vitesse opens the door for you with Salvation!

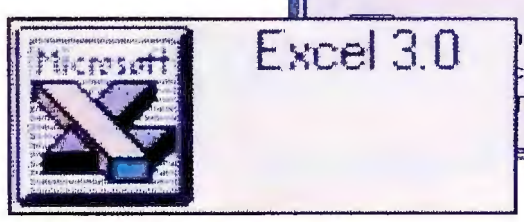


Salvation is the friendliest graphic user interface (GUI) available to Windows users. Replace and integrate most Windows file utilities with Salvation.

Salvation's exclusive BUTTON LAUNCHERS™ offers the ability to easily launch either Windows or DOS applications. You automatically or manually program BUTTON LAUNCHERS™ and add your own personal icon.



Salvation file utilities makes management of all your disks a simple task. You can move copy, delete, rename, or easily create both files and subdirectories. In addition to launching, Salvation automatically handles text and graphics files. Salvation even provides security access to your files.



Salvation's features gives your computer maximum power and the most understandable GUI in the PC environment.

EXPERIENCE SALVATION for only $179.95 (suggested retail)

MICROSOFT WINDOWS.
Version 3.0 Compatible Product

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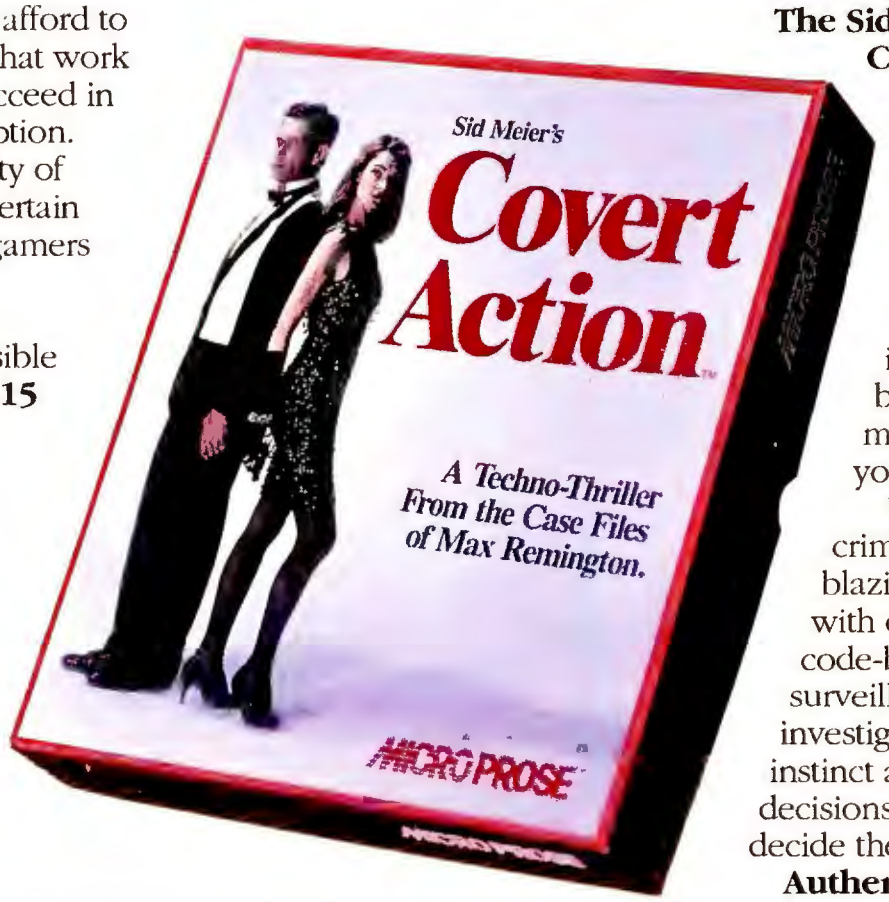
Sid Meier's Latest Game Is Just Like All His Others... Terrific!

Most game designers can't afford to repeat themselves. Formulas that work so well in one game rarely succeed in the next. Sid Meier is an exception. His games, despite the diversity of subject matter, always share certain qualities, qualities computer gamers have grown to love — and demand.

Now, the designer responsible for the award-winning hits **F-15 Strike Eagle, Pirates!, Red Storm Rising, F-19 Stealth Fighter** and 1990's Best Strategy Game*, **Railroad Tycoon**, presents the high-tech, dangerous world of international espionage. Once again the subject is unique; but Sid's "magic touch" remains.



The Sid Meier Checklist For Fun:

Challenge. Crimes are being perpetrated, plots are being hatched. As super-spy Max Remington, you must piece together ambiguous clues leading to a ruthless criminal mastermind. Weeks, even months of intrigue-filled gaming time can be spent finding just one mastermind. *Covert Action* gives you 26 of them to foil.

Versatility. Break into criminal hideouts with guns blazing; or try a subtler approach with delicate wiretaps, brilliant code-breaking and careful, precise surveillance. Mix and match investigative techniques, relying on instinct and experience. You make the decisions, determine the strategy, and decide the tactics.

Authenticity. Use the weapons *real* agents use and follow their procedures. Face the same, real dangers. *Covert Action* is international espionage as it really is.

"It is no exaggeration to say that MicroProse has released the richest treatment of espionage ever put in a computer game. Only the real thing could be more rigorous, and one imagines that it wouldn't be nearly so much fun."
Computer Gaming World • May, 1990

MICROPROSE™
ENTERTAINMENT • SOFTWARE

For IBM-PC/Tandy/compatibles. For the latest information on release dates and availabilities, call MicroProse Customer Service at 301-771-1151, 9 am to 5 pm EST, weekdays. © 1991 MicroProse Software, Inc., 180 Lakefront Drive, Hunt Valley, MD 21030.
* Software Publishers Association

Circle 165 on reader service card

ing or filling certain fields.

PerForm can also play good cop, smoothing data entry with pop-up help messages, data validation, and multiple-choice lookup tables. If you need to fill out several related forms at once—such as tax and personnel records for new employees—*PerForm*'s form-linking feature can be a real time-saver. Simply link forms through a common field (such as the employee's last name) and place them in "folders." When you enter data into one form, all fields shared by other forms in the folder fill in automatically.

PerForm Pro makes creating and managing forms about as simple as it can be. It's a surefire Best Buy.

The Forms Line Here

Business may be built on forms, but many offices become buried *under* them. A good forms package helps you stay on top. Your Best Buy is *PerForm Pro,* but if you're on a tight budget and don't need multipage forms, *Form Publisher* is a good deal.

Form software is evolving into an indispensable part of business communications. It might even bring that mythical beast—the paperless office—one step closer to reality.

Scott Spanbauer is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 913.

Breaking Form With ObjectVision

Let's face it, forms are boring. But vendors are starting to use the form metaphor in novel ways—none of them more exciting than *ObjectVision*. Borland's innovative application development tool lets you create *Windows* applications by constructing a graphical decision tree—there's no real programming involved.

At first glance, the $495 *ObjectVision* looks suspiciously like your average form package. You can lay out forms, view text and graphic elements on screen, and fill in forms manually or link them to data base fields. But that's where the similarities end.

Like Asymetrix's popular *Windows* application generator, *ToolBook, ObjectVision* lets you create stacks of formlike cards to generate custom applications. But with *ObjectVision,* fields are animated by visual decision trees and spreadsheetlike functions rather than hard-to-write scripts. You create and modify trees by pointing and clicking.

For example, you could create a product order form that computed discounts for volume buyers. You could link the Total field to a decision tree that provided a specified markdown for buyers of 100 copies and another for those who bought 1000.

Tree logic is as easy to understand as a flowchart but as powerful as a programming language's IF...THEN...ELSE statements. Best of all, you don't have to learn programming syntax—if you can master a spreadsheet, you should be able to write your own form-based applications.

As the use of graphical interfaces continues to grow, it's only a matter of time before even the most complex applications gain a friendly, visual veneer—and the familiar form interface makes the most logical fit.

WHERE TO BUY

ObjectVision 1.0
Borland Int'l
1800 Green Hills Rd.
P.O. Box 660001
Scotts Valley, CA 95067-0001
800/331-0877
Reader service no. 710

WHERE TO BUY

FormMaster 1.2
Information Integration, Inc.
901 Russell Ave.
Gaithersburg, MD 20879
301/840-8977
LIST PRICE: $99
REQUIREMENTS: 640K RAM, Windows 3.0 or later version, DOS 3.1 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 8:30–5:30
OTHER SUPPORT: none
Reader service no. 706

Form Publisher With Fill & File 2.0
FormWorx Corp.
Reservoir Pl.
1601 Trapelo Rd.
Waltham, MA 02154
800/992-0085
LIST PRICE: $195; fill-in modules—DOS $75, Windows $99
REQUIREMENTS: 1MB RAM, Windows 3.0, DOS 3.1 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 8:30–6
OTHER SUPPORT: none
Reader service no. 707

JetForm Design 2.2
JetForm Corp.
163 Pioneer Dr.
P.O. Box 606
Leominster, MA 01453
800/267-9976
LIST PRICE: $495, DOS and Windows fill-in modules $199
REQUIREMENTS:1MB RAM, Windows 2.03 or later version, DOS 3.0 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 10–6
OTHER SUPPORT: BBS
Reader service no. 708

PerForm Pro Designer and Filler
Delrina Technology
15495 Los Gatos Blvd. #8
Los Gatos, CA 95032
800/268-6082,
LIST PRICE: $495; fill-in module $199
REQUIREMENTS: 1MB RAM, Windows 3.0, DOS 3.1 or later version, hard disk
TECHNICAL SUPPORT: unlimited, toll number, M–F 9–5
OTHER SUPPORT: none
Reader service no. 709

TOUGH ACT TO FOLLOW.

Getting more computer for less money is always a good idea. But with today's tight budgets, it's absolutely ingenious.

Just check out the new Dell® 325P. It has a full 25 MHz 386™ DX CPU for better performance than the SX in the Compaq system. There's an optional 32K RAM cache that can boost performance an additional 20%. And it's backed by a service package that's won *PC Week's* Corporate Satisfaction Poll an unprecedented 8 times.

All for up to $900 less than a Compaq system with a smaller hard drive. Now that should cure your recession depression.

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HOURS: 7 AM-9 PM CT MON-FRI. 8 AM-4 PM CT SAT.
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Finally, a poll with reliable information.

Now a bit more about those 8 Corporate Satisfaction Polls. One poll category we dominated is the one called "reliability"—maybe because Dell computers are designed, built and tested under the same roof. And nothing leaves the building until we're sure everything works like it's supposed to, when it's supposed to.

Then you get up to 30 days to use it.

If you aren't completely satisfied, send it back.

THE DELL 325P 25 MHz 386 SYSTEM
SYSTEM INCLUDES VGA COLOR PLUS MONITOR, 80 MB HARD DRIVE, 2 MB RAM

THE NEW DELL 325P 25 MHz 386 SYSTEM.

Standard Features:

- Intel® 80386 microprocessor running at 25 MHz.
- Page mode interleaved memory architecture.
- Standard 1 MB of RAM,* expandable to 16 MB on the system board.
- Integrated VGA controller with 1024 x 768 support with optional Dell 256K video RAM kit.
- Integrated hard drive and diskette drive interface.
- Optional 32 KB SRAM cache.
- Socket for Intel 80387 math coprocessor.
- 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive.
- 3 full-sized 16-bit AT expansion slots available.
- High-performance IDE 40 MB, 80 MB, 100 MB, 190 MB, and 320 MB hard disk drives.
- 1 parallel port, 2 serial ports, PS/2 compatible mouse port, all integrated.
- 85 watt power supply.
- 12-month On-Site Service Contract.
- Optional i486 microprocessor upgrade card running at 33 MHz.

40 MB VGA Color Plus System $2,299

Price listed includes 1 MB of RAM.* 80, 100, 190 and 320 MB hard drive configurations also available.

*Performance Enhancements: Within the first megabyte memory 96 KB of memory is reserved for use by the system to enhance performance. Can be optionally disabled. All prices and specifications are subject to change without notice. Dell cannot be responsible for errors in typography or photography. †Source: From the Compaq Computer Corporation price list effective 4/16/91. **Payment based on 36-month, open-end lease. °Leasing arranged by Leasing Group, Inc. In Canada and Mexico, configurations and prices may vary. Dell and Dell System are registered trademarks of Dell Computer Corporation. Intel is a registered rademark and 386 and i486 are trademarks of Intel Corporation. Other trademarks and trade names are used to identify the entities claiming the marks and names of their products. Dell Computer Corporation disclaims any

TOUGH ACT TO SWALLOW.

COMPAQ DESKPRO 386s/20 20 MHz 386SX SYSTEM
SYSTEM INCLUDES VGA COLOR MONITOR, 60 MB HARD DRIVE, 2 MB RAM.
ACTUAL DEALER PRICES MAY VARY.

TechFax offers relief for insomniacs.

Say you're pulling an all-nighter and need help. Dell has pioneered a service called TechFax. Anytime, 24 hours a day, you can pick up the phone and call the Dell technical library on our automated TechFax line. Detailed information on your Dell system will be faxed right back to you automatically.

And all this coverage, including a full year of field service, comes at no additional cost.

When your needs change, your computer can too.

Dell offers a number of ways to easily upgrade your system. Including a 33 MHz i486™ processor card to give you the hottest chip on the block. Which means you can get a new computer without getting a new computer.

For sale, for lease, for less.

You can stretch your money even further with the most comprehensive credit, lease◇ and lease-to-buy plans in the industry. So call us. Or talk to someone selling Compaq systems. But be careful not to choke on the price.

We'll return your money, no questions asked.

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But just for the sake of argument, let's suppose something does go wrong with your Dell computer.

Just call the Dell toll-free technical hotline. We solve 90% of all problems, often in 6 minutes or less.

If it can't be solved over the phone, a trained technician will come to your home or office the next business day with the solution in hand.△

But if you just can't wait, don't.

DELL COMPUTER CORPORATION

proprietory interest in trademarks and trade names other than its own. △ Service provided by Xerox Corporation. On-site service may not be available in certain remote locations. Shipping, handling, and applicable sales tax not included in the price. For information on and a copy of Dell's 30-Day Total Satisfaction Guarantee, limited warranty, and Xerox's Service Contract, please write to Dell USA Corporation, 9505 Arboretum Boulevard, Austin, Texas 78759-7299, ATTN: Warranty. ©1991 Dell Computer Corporation. All rights reserved.

Circle 66 on reader service card

POWERHOUSE UTILITIES FOR UNDER $50

Steve Bass

Cancel that bank loan! This omnibus selection of bargain-basement DOS and Windows tools can save you time, hassles, and hard-earned bucks.

It's a ritual, like taking vitamins. Once a day you smack your forehead and grumble, "Why can't my PC do *this?*" Well, chances are it can, thanks to one of the slick—and amazingly cheap—utilities featured in this Buyers' Guide.

To ferret out the latest and greatest utilities in the PC universe, we informally polled readers, user group members and librarians, bulletin board SYSOPS, and the *PC World* staff. We asked, "What utility makes you say, 'Why didn't *I* think of that?'" We rounded out the poll by logging on to popular BBS's and noting the most frequently downloaded programs. The 30 utilities listed here, the cream of the current crop, range from wild *Windows* screen savers to better DOS shells. And they all cost $50 or less.

Many of these lifesavers are single-purpose tools—they undelete files or soup up your mouse—but there are plenty of collections as well. Better yet, many of the packages are shareware—the no-risk, try-before-you-buy software that can be readily downloaded for free from electronic bulletin boards and commercial on-line services such as CompuServe.

Just remember that shareware isn't public domain, and many struggling developers rely on your registering their products to keep their doors open. So when you find a utility you can't live without—and you will—pony up! (Note: List prices for shareware typically reflect registration fee, disk, and manual. Shareware names

ILLUSTRATIONS BY TIM GRAJEK

may be followed by a term in parentheses, such as ZM31.ZIP. This term tells you the name of the compressed file that contains the utility, as you'll find it listed on BBS's.)

Windows Utilities

After Dark for Windows 1.0

Screen savers used to be borrrring. But not anymore. Now from the Mac world comes *After Dark*, a program that not only saves your monitor's phosphors but does it with everything from flying toasters to digital aquariums. *After Dark* comes with more than 35 displays, each more intriguing than the last; you can also create custom messages or images. Another plus: It's the only *Windows* screen saver that works when a DOS application window is active—no mean feat. Berkeley Systems, Inc., 1700 Shattuck Ave., Berkeley, CA 94709; 800/722-5535. List price: $49.95.

Reader service no. 601

Command Post 7.0S

(CP-70S.ZIP)

If you love *Windows* but yearn for DOS batch files and a character-based flavor, pick up *Command Post*. With its powerful batch language, you can create custom menus and dialog boxes, automatically load applications and size windows, and even manipulate WIN.INI and DOS variables on the fly. *7.0S* also includes an improved directory tree, plus a text file browser and built-in screen blanker—two functions missing from *Windows*. Wilson WindowWare, 2701 California Ave. SW #212, Seattle, WA 98116; 800/762-8383. List price: $49.95.

Reader service no. 602

Magic Cursor 3.1

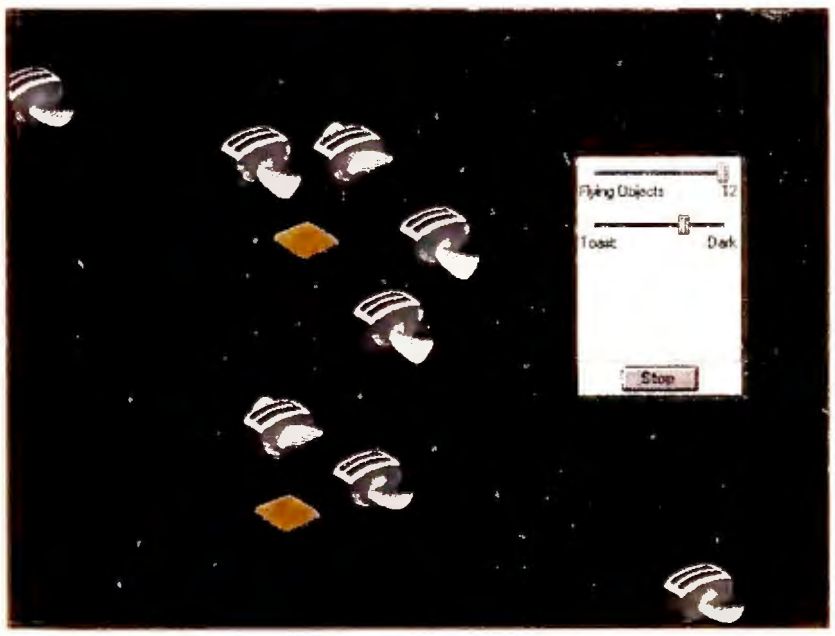
Here's the ultimate in personalizing your *Windows* desktop—tailor-made cursors. *Magic Cursor* comes with 40 cursor types, from cross hairs to pointing fingers. *Magic Cursor* can also enlarge the cursor—a blessing for laptop users. Fanfare Software, 9420 Reseda Blvd. #828, Northridge, CA 91324; 818/886-8787. List price: $49.95.

Reader service no. 603

Right On 1.4

Tired of right and middle mouse buttons that do nothing? With *Right On*, these otherwise vestigial buttons—used alone or in combination with <Shift>, <Alt>, or <Ctrl>—can imitate any key, launch a specific program, or "type" two characters. *Right On* is even context sensitive—you can use different button assignments for different programs or have a button active only in "control" areas, like a dialog box. It's the perfect tool for quickly switching between business applications, like *PageMaker* and um, *Solitaire*. Fanfare Software, 9420 Reseda Blvd. #828, Northridge, CA 91324; 818/886-8787. List price: $49.95.

Reader service no. 604



If you're going to blank your Windows display, do it in style with one of After Dark's whimsical animated images.

Program Manager Relief

You like *Windows 3.0* but want a faster way to start applications? *Launch* is a quick way to load your favorite apps without digging through Program Manager icons or File Manager directories. Once *Launch* is loaded, you can click anywhere on the desktop to pop up a menu of applications, then simply select the one you want.

***Launch* gives you total control over this menu. You can specify which applications appear and even list data files associated with a program.**

Contributing Editor Jesse Berst and Scott Dunn write the Windows Workshop column for PC World.

What's more, your menu can include the *Windows* commands for tiling or cascading windows, arranging icons, getting help, or exiting *Windows*. *Launch* can even replace Program Manager. It's simple yet powerful, and well worth the $25 registration fee. *Launch 1.5*, David Stafford, Kamakura NS Bldg. 4-F, Onaricho 4-16, Kamakura, Kanagawa 248 Japan

MATTHEW McVAY

WinGrab 1.0

(WINGRAB.ZIP)

Need to print an envelope while hip deep in a mess of *Windows* applications? Just pop up *WinGrab*, and it will capture any on-screen address, format it for an envelope, and send it to the printer. You can also manually fill in the blanks for on-the-fly addressing or pull in names from *Windows'* Cardfile utility. *WinGrab* is bundled with its DOS version, *Grab Plus*. Both support PostScript- and LaserJet-compatible printers. Zpay Payroll Systems, Inc., 2526 69th Ave. S, St. Petersburg, FL 33712-5631; 800/468-4188. List price: $49.95.

Reader service no. 605

WinPost 2.0

(WPST20.ZIP)

You've created the formulas, crunched the numbers, and produced the report. Now your boss wants to add one more item—but you *know* you'll never remember it tomorrow. Wouldn't it be great if you could attach an electronic Post-it note to the report? With *WinPost*, you can fasten up to 32 on-screen reminders to a specific application or function, hide them, choose among three sizes, and change their colors. Nobuya Higashiyama, 7337 Chaparral

Rd., Columbus, OH 43235; 614/798-0910. List price: $25.
Reader service no. 606

Zip Manager 3.01

(ZM301.ZIP)

Just because you use *Windows* doesn't mean you have to exit to DOS to manipulate archived files. *Zip Manager* acts as a friendly front end, letting you compress, extract, add, delete, and view files with the *PKZIP, PKUNZIP, ARC-E,* and *LHARC* file compression utilities. *Zip Manager* can be configured to work with your favorite text editor, viewer, and virus detector as well. Moon Valley Software, Inc., 107 E. Paradise Ln., Phoenix, AZ 85022; 602/375-9502. List price: $21.95.
Reader service no. 607

For more information about all products in this section, circle reader service no. 901.

DOS System Utilities

Anarkey

(ANARKEY2.ZIP)

DOS is something of an amnesiac. It can remember and reissue only the last command entered at the DOS prompt. Thankfully, *Anarkey* can instantly retrieve up to the last 500 characters entered at the command line. Press the arrow keys to cycle through the buffer, or type the first 2 characters of the item, and *Anarkey* will find it for you. You can insert commands anywhere on the command line without overwriting characters already present. The abilities to assign multiple commands to a single word and modify environmental variables on the fly make the program indispensable. Moderne Software, P.O. Box 3638, Santa Clara, CA 95055-3638. List price: $25.
Reader service no. 608

Boot.sys

(BOOT127.EXE)

Every application has its idiosyncrasies. One needs expanded memory; another demands FILES=30, not 20. Unfortunately, if you use two or more programs, those quirks mean you have to create an elaborate batch file system to summon the right CONFIG.SYS and AUTOEXEC.BAT combination for each application. Suffer no more. At start-up, *Boot.sys* presents a menu that prompts you to define the system configuration you want. You can create up to 25 different menus and specify different time-outs and defaults for each one. Hans Salvisberg, Froeschmattstr. 40, CH-3018 Bern, Switzerland. List price: $39.
Reader service no. 609

Easy Format 3.20

(EZF32A.ZIP, EZF32B.ZIP)

Formatting disks is downright tedious, but the chore becomes palatable with *Easy Format.* The utility supports any 3½- or 5¼-inch DOS format and can even format 360K floppies in 1.2MB drives. *Easy Format* flags bad disk clusters and can switch back and forth to format floppies in different drives. With *Desqview,* you can even format floppies in the background. Falk Data Systems, 5322 Rockwood Ct., El Paso, TX 79932-2412; 915/584-7670. List price: $35.
Reader service no. 610

PKZMENU

(PKZM104.EXE, PKZ110.ZIP)

Fans of both *PKZIP* and *PKUNZIP,* the ever-popular file compression programs, will delight in *PKZMENU.* Via this program's well-designed pulldown menus, you can whip through zipped files—extracting, viewing, tagging, sorting, and more—and even verify authenticity and scan for viruses. This program will support mice, networks, and *Desqview.* PKWare, Inc., 9025 N. Deerwood Dr., Brown Deer, WI 53223;

Spiffing Up Your Documents

Typographers' Ornaments is ideal for desktop publishers who want to add classy graphics to their documents without investing in an image scanner, drawing program, or huge clip-art library. Available in 12 volumes costing from $35 to $50 each, these traditional nineteenth-century images can be used in newsletters, books, manuals—even reports—to break up text or identify different sections. Each volume contains about 20 images in EPS (Encapsulated PostScript) format; other adornments are available in TIFF format. _Typographers' Ornaments,_ The Underground Grammarian, P.O. Box 203, Glassboro, NJ 08028; 609/589-6477
Reader service no. 640

Contributing Editor Richard Jontz writes The Art of Persuasion *for* PC World.

EDWARD CALDWELL

Worksheets for 1-2-3 Novices

If you're a spreadsheet novice, you've no doubt confronted the intimidating spectacle of a blank worksheet screen. What you need is a model, but the ones you find in the how-to books are too complicated.

The $6 *1-2-3* shareware spreadsheet library available from PC-SIG may be just the jumpstart you've been looking for. It's a collection of basic business templates, including worksheets for bookkeeping, debt management, financial analysis, statistics, and planning. You can use them as is or modify them for your own use.

The spreadsheets will work with any release of *1-2-3,* and they come with a master macro worksheet that helps you retrieve and manipulate the models. *Lotus Financial Worksheets,* Disk No. 304, PC-SIG, 1030D E. Duane Ave., Sunnyvale, CA 94086; 408/730-9291
Reader service no. 644

Contributing Editor Richard Scoville writes the Spreadsheets (A..Z) *column for* PC World.

CHRIS SEWARD

414/354-8699. List price: $26.
Reader service no. 611

Professional Master Key 3.2

(PMK32.ZIP)

Need to retrieve that sales report you accidentally deleted? Download *PMK*, quick. This handy collection of utilities can rescue an erased file from the bit bucket; *PMK* can also delete tenacious read-only hidden files, and completely remove files à la *Norton*'s Wipefile utility. You can access each utility through *PMK*'s main menu or run them as standalone programs. Public Brand Software, P.O. Box 51315, Indianapolis, IN 46251; 800/426-3475, 317/856-7571. List price: $35.
Reader service no. 612

SST 5.28

(SST_52A.ZIP)

The bigger your hard disk, the easier it is for files to hide. Find that needle with *SST*, the successor to the original WHEREIS.COM. Run *SST* from the DOS prompt, and not only perform simple file searches but restrict searches based on file dates, file size, or a range, or look for files within archived files. *SST* can even delete files while searching. For example, **SST CDE:*.BAK "[0-9]" -v** will display, verify, and delete all BAK files on drives C: through E: that contain a number anywhere in their name. The program works across drives and is network compatible. Keith Ledbetter, 4240 Ketcham Dr., Chesterfield, VA 23832; 804/674-0780. List price: $15.
Reader service no. 613

SWAPDOS 1.0

(SWAPDS.COM)

It ain't *Windows*, but if you need to run one application from within another—and conventional RAM is low—*SWAPDOS* is the ticket. The program can swap your current application into expanded or extended memory or to your hard disk so you can run a second application. Just note that it works only with programs that have a Run command, like *1-2-3* or *Microsoft Word*. The package includes program-specific utilities that can run nine TSRs, including *Sidekick Plus* and *PC Tools*, in the same fashion. Innovative Data Concepts, 122 N. York Road #5, Hatboro, PA 19040; 800/926-4551, 215/443-9705. List price: $25.
Reader service no. 614

Trash-It 1.6

(TI16.EXE)

Accidentally deleting files is something everyone does—even power users. But unerase programs usually can't resuscitate a deleted file once you've saved new data to disk. The solution is *Trash-It*, which automatically tucks deleted files into a "trash" subdirectory.

Getting the Goods On Line

Obtaining these utilities is as easy as visiting a software retailer or, for shareware, downloading them from an on-line service or local BBS. We've listed some of the top electronic services across the country—each can be accessed with a 1200- or 2400-bps modem using N-8-1 parameters. If you don't have a modem, try the software distribution firms listed here or a user group's software library.

ON-LINE SERVICES AND BBS'S

Channel 1
Box 338
Cambridge, MA
02238
617/354-8873 (BBS)
Reader service no. 626

CompuServe
CompuServe
Information Service,
Inc.
5000 Arlington Centre
Blvd.
Columbus, OH 43220
800/848-8199,
614/457-0802
Reader service no. 627

Exec-PC
Box 57
Elm Grove, WI 53122
414/789-4210 (BBS)
Reader service no. 628

Executive Network
10 Fisk Pl.
Mt. Vernon, NY 10550
914/667-4567 (BBS)
Reader service no. 629

GEnie
General Electric
Information Services
401 N. Washington St.
Rockville, MD 20850
800/638-9636
Reader service no. 630

HH Info-Net
220 Main St. #5B
New Hartford, CT
06057
203/738-0342 (BBS)
Reader service no. 631

Rusty 'n' Edie's BBS
216/726-2620 (BBS)
Reader service no. 632

For more information about all services in this section, circle reader service no. 905.

SHAREWARE DISTRIBUTORS

EMS
4505 Buckhurst Ct
Olney, MD 20832
301/924-3594
Reader service no. 633

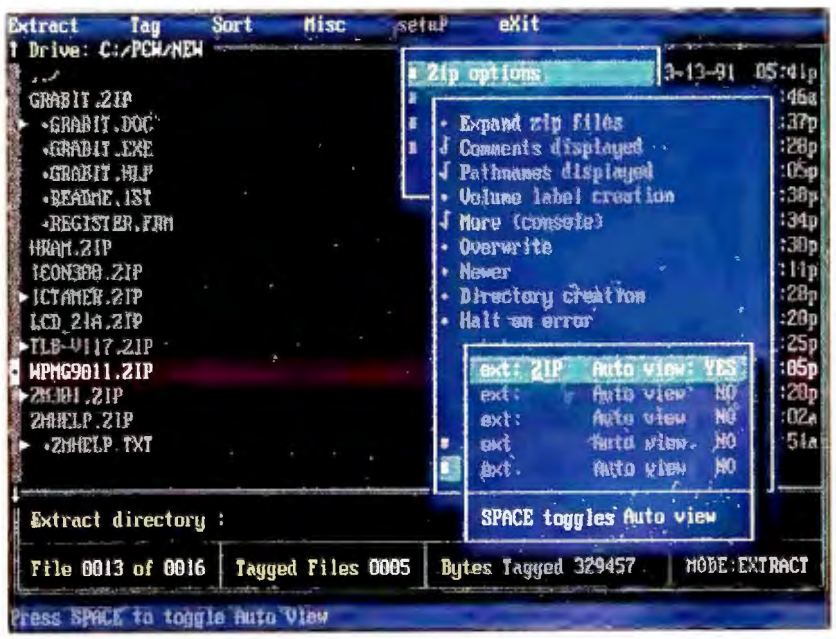
PC-SIG
1030D E. Duane Ave.
Sunnyvale, CA 94086
800/245-6717
Reader service no. 634

Public Brand Software (PBS)
P.O. Box 51315
Indianapolis, IN
46251
800/426-3475,
317/856-7571
Reader service no. 635

Public Software Library (PsL)
P.O. Box 35705
Houston, TX 77235
800/242-4775
Reader service no. 636

Reasonable Solutions
2101 W. Main St.
Medford, OR 97501
503/776-5777
Reader service no. 637

For more information about all services in this section, circle reader service no. 906.



Are you tired of PKZIP's crazy command switches? PKZMENU lets you extract, compress, view, sort, tag, and more from its handy pulldown menus.

This 1K TSR can be customized to exclude BAK or TMP files or to erase the trash directory after a specified number of days. Another $5 buys you *Variety Pak*, nine utilities that include an ingenious tool for highlighting the entire cursor line—a boon for laptop users. RSE, Inc., 1157 57th Dr. SE, Auburn, WA 98002; 206/939-4105. List price: $10.

Reader service no. 615

For more information about all products in this section, circle reader service no. 902.

DOS Shells and File Management

Directory eXtended 2.62

(DX.21P)

Directory eXtended is a file management program that features DOS-like commands with substantially more muscle than their DOS counterparts. For example, you could delete all BAK files on drives C:, D:, and E: with one command. *DX* will search for specific file names and copy them to another disk, prompt you before overwriting files, and even check to see if there's enough room available. Want more? How about the ability to clip off an entire subdirectory and graft it to another drive? *DX* can also search, display, and sort files compressed with *ARC, PKZIP, LHARC,* and other programs. Econo-Soft, P.O. Box 181030, Austin, TX 78718-1030; 800/367-7590, 512/832-1675. List price: $49.95.

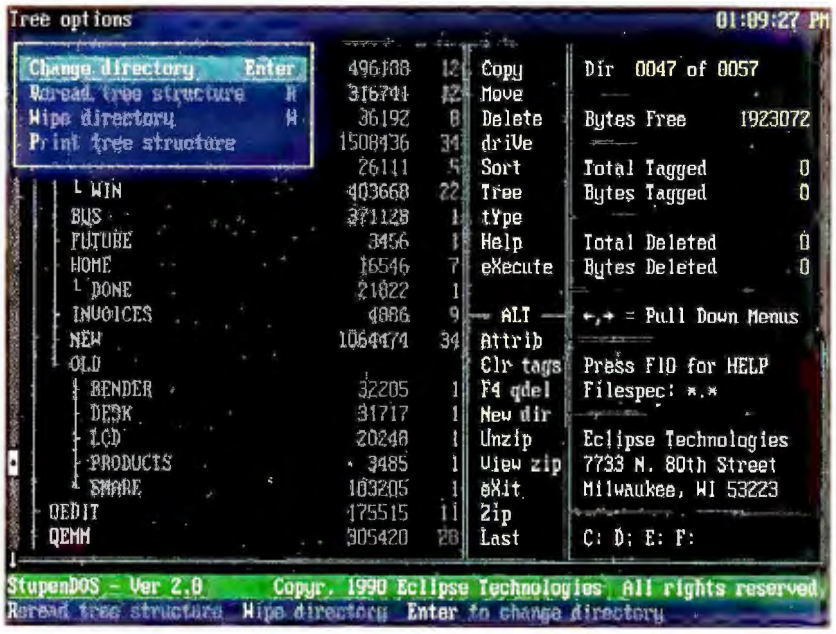
Reader service no. 616

StupenDOS 2.0

(SD-200.EXE)

StupenDOS's power and flexibility make it an all-around favorite DOS shell among the users we polled. You can easily move, tag, copy, remove, and execute files and launch programs via pulldown menus, function keys, cursor, or mouse. As with *Zip Manager*, you can access all *PKZIP* functions via the *StupenDOS* interface. There's also a nifty GIF file viewer. Eclipse Technologies, 7733 N. 80th St., Milwaukee, WI 53223; 414/354-7040. List price: $35.

Reader service no. 617



Do you need to clear-cut a subdirectory? From StupenDOS's flexible directory tree, you can delete files and subdirectories and do a dozen other jobs in addition.

For more information about all products in this section, circle reader service no. 903.

Desktop Organizers

My-Desk 2.7

(MYDESK.ZIP)

If you can spare 7K of RAM and $25, a startlingly powerful text-editor-cum-scheduler can be yours. The editor features search and replace, word wrap, auto-indent, and more. The scheduler can book appointments in any time increments and generate a full monthly calendar that you can modify with the editor. There's also a flexible to-do list, a pop-up calculator, and even a timer feature that can execute tasks unattended. Nelson Software, P.O. Box 35705, Houston, TX 77235-5705; 800/242-4775. List price: $25.

Reader service no. 619

RAMdesk

(RD14A.ZIP, RD14B.ZIP)

It's a floor wax *and* a dessert topping. More precisely, *RAMdesk* is an omnibus pop-up that sports a scheduler, alarms, an electronic Rolodex, work and expense logs, and a calculator. The program really comes alive on networks with its E-mail feature and an electronic version of an office sign-out board. *RAMdesk* is able to integrate with *TickleX*, a scheduler from Integra sold separately. *RAMdesk* uses a measly 7K of RAM and can automatically swap its utilities to disk or expanded memory when you run a program. Integra Computing, P.O. Box 72063, Marietta, GA 30007-2063; 404/973-3586. List price: $50, demo $10.

Reader service no. 620

TickleX

(TX58A.ZIP, TX58B.ZIP, TX58C.ZIP, TX58D.ZIP)

This is a tickler program with a project manager twist. *TickleX* can manage the deadlines of 200 people; track time, income, and expenses; and generate itemized reports, calendars, simple Gantt charts, and time-scheduled reports. As many as 20 memory-resident alarms can be set for a given day, popping up the appropri-

Quick Access to dBASE Files

Looking for a way to get at your data base files any time you need them? While several memory-resident utilities promise hot-key access to *dBASE* files from within other programs, the best of the lot is a $35 shareware gem called *PopDBF*.

You'll find *PopDBF* invaluable if you work with *dBASE* or any file-compatible data base system. You can browse through or view the structure of any *dBASE* file, search for records, add or edit individual records, print records or structures, and perform sundry file housekeeping tasks.

PopDBF is a magnificently designed program with intelligently implemented commands, context-sensitive help, and great-looking screens. *PopDBF 3.7*, Bowen Software, P.O. Box 2134, East Peoria, IL 61611

Reader service no. 641

BLAKE LITTLE

Contributing Editor Steve Cummings writes the Data Basics column for PC World.

ate appointments on screen. If you change the date of an entry, the accompanying reminders change too. Integra Computing, P.O. Box 72063, Marietta, GA 30007-2063; 404/973-3586. List price: $50, demo $10.
Reader service no. 621

For more information about all products in this section, circle reader service no. 904.

Communications

DSZ

(DSZ.ZIP, DSZEXE.ZIP, DSZNEW.ZIP, DSZBG.ZIP)
Want to put some zip into your communications sessions? Add this handy collection of file-transfer protocols to your communications program. The package includes Omen's ZMODEM-90, one of the fastest and most reliable protocols around, along with speedy versions of XMODEM and YMODEM. Two other bonuses: The MobyTurbo function speeds the downloading of ZIP'd and ARC'd files, while Intelligent Crash Recovery lets you resume an interrupted download. Omen Technology Inc., P.O. Box 4681, Portland, OR 97208; 503/621-3406. List price: $20.
Reader service no. 622

Modem Doctor 3.0

(MDR.ZIP)
If you're having trouble getting on line, your modem or serial ports could be ailing. Bypass the waiting room and go straight to the *Modem Doctor*, which probes modem UART registers, RS-232 communication lines, and system interrupts. If the *Doctor* detects problems, it displays advice on screen. You run the program's thorough analysis via simple pulldown menus. Hank Volpe, P.O. Box 43214, Baltimore, MD 21236; 301/256-5767. List price: $19.95.
Reader service no. 623

Printing Utilities

4Print 4.1

(4PR410.ZIP)
4Print is a unique laser printer tool that reformats a text file so you can print four pages on a single sheet of paper—two pages on each side. *4Print* is great for quickly spec'ing layouts, printing books, or simply saving paper. Using your printer's landscape mode and compressed print, the program produces perfect columns of text. The program supports up to four columns of text, centering, headers and footers, page framing and numbering, title pages, and more. *4Print* works with LaserJet and compatible printers and can tap duplexing functions and downloaded fonts. Korenthal Associates, Inc., 230 W. 13th St., New York, NY 10011; 800/527-7647, 212/242-1790. List price: $49.95.
Reader service no. 624

DMP

(DMP205.ZIP, DMPLZH.EXE)
There's nothing more tedious than having a fast computer that must wait for a slow printer. This 15K RAM-resident spooler will capture printer output quickly. *DMP* can store files anywhere—in expanded or extended memory, even on disk. The program can flush the spooler at the touch of a key, and more. DMP Software, 204 E. 2nd Ave. #610, San Mateo, CA 94401; 415/341-2702. List price: $29.
Reader service no. 625

Contributing Editor Steve Bass heads the Pasadena IBM Users Group and is a member of PC World*'s User Group Advisory Board.*

Simplified File Searches

Whether you want to browse a README file or figure out just what's in all those forgotten files on your hard disk, Vernon Buerg's *List* program is the answer—and it's free for personal use. Run *List*, select any DOS file with the cursor keys or mouse, then hit <Enter> to browse through the file. Familiar cursor key commands scroll the text, and you can search for text or mark blocks for printing. *List* includes a simple file manager and lets you drop to DOS or run a program. Other options abound, with on-line help to lead the way. *List 7.5f* (LIST 75F.ZIP), Vernon D. Buerg, 139 White Oak Cir., Petaluma, CA 94952; 707/778-8944 (BBS)
Reader service no. 638

Contributing Editor George Campbell writes the Words Into Print *column for* PC World.

JEFFREY MAY

CompuServe Made Easy

Every newcomer to CompuServe and every casual user of the service should have a copy of *CompuServe Information Manager*. This $24.95 utility provides a pulldown menu interface to CIS that lets you navigate the service's often confounding twists and turns with mouse-clicking ease. The price includes $15 worth of CompuServe connect time. *Information Manager* will automatically log on to the service for you as well as send and receive your mail. It also makes browsing file collections and downloading files terrifically easy.

***Information Manager* has some quirks—it won't capture information to disk in certain areas of the service, for instance. But it will trim the cost of your connect time and limit the service's wear on your nerves. *CompuServe Information Manager*, CompuServe, 5000 Arlington Centre Blvd., P.O. Box 20212, Columbus, OH 43220; 800/848-8199**
Reader service no. 639

Contributing Editor Judy Heim writes The Information Edge *for* PC World.

"RUNS RINGS 'ROUND dBASE" PC Computing

"BEST BUY" PC WORLD

After I struck out with dBASE, Paradox, an nobody, but nobody belie our customer tracking an

...but when I came back that afternoon with a complete, customized Alpha FOUR® application, even Marge was impressed.

At our Monday morning staff meeting, I announced I was going to automate our sales tracking and invoicing system later that day.

Skepticism ran high. "Paul, you promised me an application like that two years ago," said Marge. "You couldn't do it, and neither could that dBASE programmer you hired. It'll never happen!"

On the other side of the room, Tim, a new hire whispered to Richard, "I didn't know the boss was a programmer, too."

"He's not," said Richard. "Couldn't write code to save his life. But he keeps trying because he thinks it's critical to the business."

I'd already tried three times before to program a database: first with dBASE (much too complicated). Then I tried Q&A (not powerful enough). Then I bought Paradox (just like dBASE). All were either too complicated, or not capable enough for our needs.

This time, I was confident. Why? Because I just bought Alpha Four, the relational database for non-programmers like me. I spent 45 minutes over the weekend with Alpha Four's audiocassette tour. So I knew how easy application design with Alpha Four would be, even the first time.

I knew within hours, I'd be able to build a fully relational customer tracking and billing system, complete with custom menus, beautiful screens and extensive help messages for error-free data entry.

And that's exactly what I did. You should have seen Marge's face when the first, perfectly formatted invoice came off the printer.

I DEVELOPED MY APPLICATION IN MINUTES!

I designed my application with Alpha Four's unique "application outliner." It automatically set up a system of menus, sub-menus, and procedures based on the outline I laid out.

MY REPORTS LOOK GREAT

Alpha Four's report writer was even more impressive. I "painted" reports and invoices on-screen. They look exactly like I wanted them to—much better than our old paper forms.

I'LL NEVER KEY IN DATA TWICE AGAIN

I always ran out of power with other simple-to-use databases; they weren't relational. With Alpha Four, I created different databases for customers, invoices and inventory and then related them into a "set," just by drawing on-screen, a diagram of the links between the databases.

Now, we never have to enter the same information more than once. New invoices can be generated for existing customers without having to re-enter their information—we just "look it up" in our customer database.

TOTAL COMPATIBILITY WITH dBASE FILES

And I was delighted that Alpha Four is totally compatible with dBASE .dbf files. Our mailing list went right into the new application without even having to convert the files!

FASTER, MORE ACCURATE DATA ENTRY

Alpha Four has all the features of an advanced database, but they're all simple enough for me to use. When you enter data, you can automatically change the case of letters from lower to upper. You can display data entry templates for formatted fields like phone numbers, or skip over fields when

"EXCELLENT VALUE"
INFO WORLD

"RATED # 1"
WEEK

&A,
d I could automate
illing process myself...

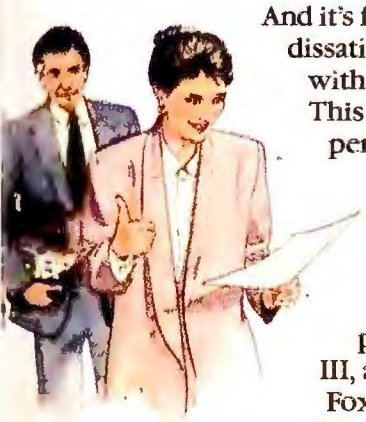
certain conditions are met. Of course, all calculations are performed automatically.

Look-ups are super flexible. Display information from a look-up database in a multi-column window anywhere on the screen. Select from the window and Alpha Four automatically fills in the related information. For example, enter a part number, and have Alpha Four automatically enter the correct description and price.

SAVE $450 WITH THIS AD!
SPECIAL OFFER: $99 UPGRADE FROM YOUR EXISTING DATA MANAGER*

If you already have any database software, integrated package or mail list manager, or if you are currently using your spreadsheet to manage data, you can upgrade to Alpha Four for just $99.

NO RISK OFFER!



And it's fully guaranteed. If you're dissatisfied, return Alpha Four within 60 days for a full refund. This is a limited-time, one-copy-per-organization offer, available from Alpha Software, or through your local dealer.

*Qualifying packages include: programming databases (dBASE® II, III, and IV, Paradox, Clipper,® Foxbase,® Fox Pro,® Revelation, etc.), flat-file databases (Q&A,® PFS:Professional File,® Rapid File,® etc.), integrated packages (Microsoft Works,® PFS:First Choice,® Lotus Works,® etc.), and mailing list managers (Fastpack Mail, etc.) or spreadsheets with databases (Lotus 1-2-3,® Quattro Pro®).
All trademarks are registered with the appropriate companies.

ALPHA SOFTWARE CORPORATION
One North Avenue, Burlington, MA 01803

Circle 38 on reader service card

HOW TO ORDER

Mail the coupon below to Alpha Software or take it to your local dealer to pick up your Alpha Four Upgrade Kit. Remember to bring proof you have an existing qualifying product.*

For **Fastest Service** Call: **1-800-852-5750, Ext. 117** Orders Only Hotline: **1-800-336-6644** Or Fax the order form to: **1-617-272-4876**

In **Canada** Call: **1-800-451-1018, Ext. 117** Or fax your order to: **1-416-365-1024** Or mail coupon to: Alpha Software Corp., 626 King Street, Suite 301, Toronto, Ontario M5V 1M7

Alpha FOUR
$99 Upgrade Offer (SUGGESTED RETAIL $549)

ALPHA SOFTWARE CORPORATION
One North Avenue, Burlington, MA 01803
1-800-852-5750, Ext. 117

YES! Please send me Alpha Four relational database for non-programmers for just $99 (SRP: $549), plus $8.50 shipping and handling. I understand it is fully guaranteed and I may return it within 60 days for a full refund. I have enclosed the cover page of my existing qualifying product* manual (or original diskette).

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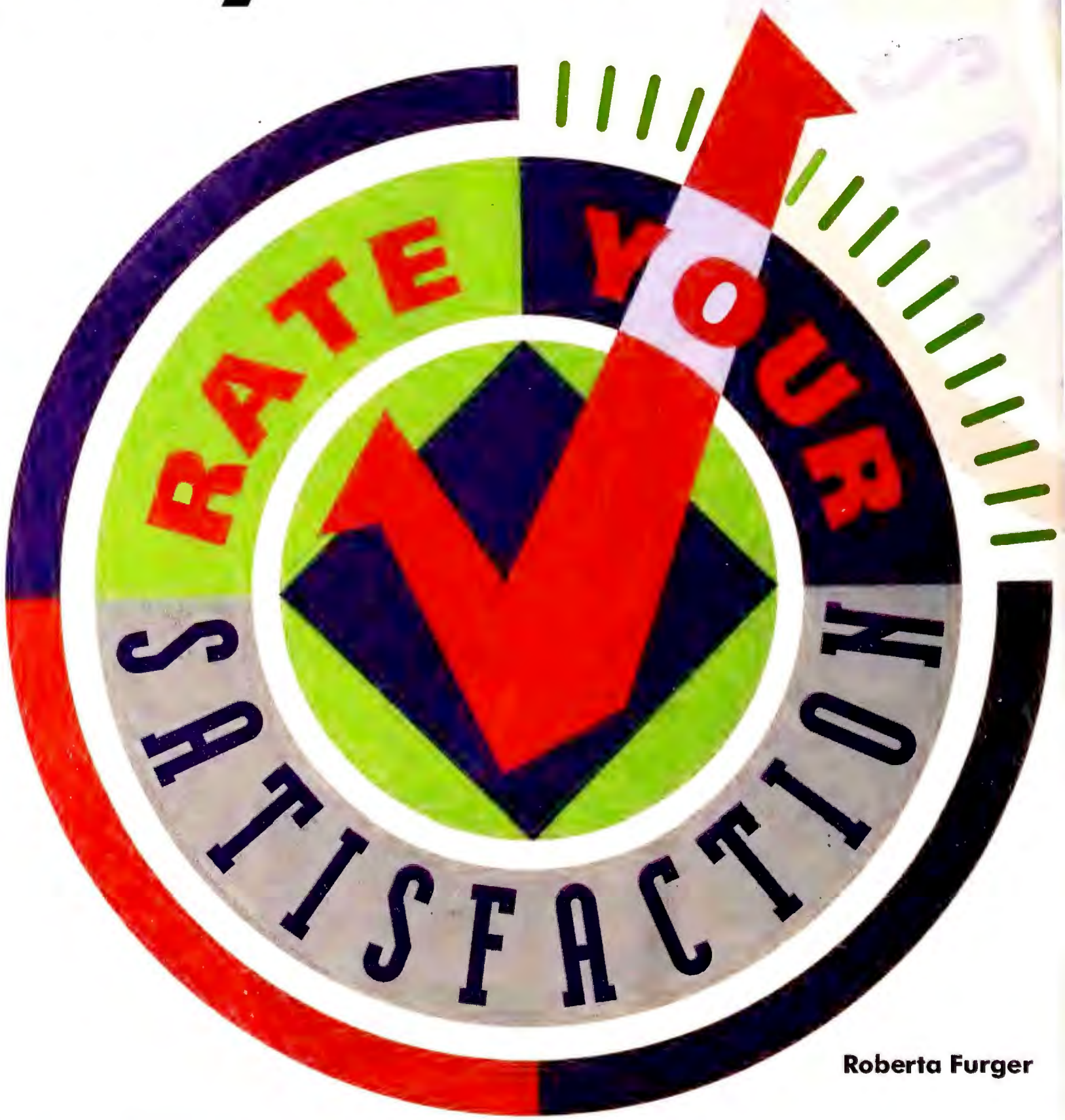
Who's Tops in Utility Libraries?



JAVIER ROMERO

Roberta Furger

PC Tools Deluxe and The Norton Utilities battle it out for first place in the hearts and minds of PC World readers.

What's at the top of your priority list when you're buying PC hardware and software? Wouldn't it be great to know what other PC users think is critical, and find out how much they like the products they selected?

If your answer is yes, you're sure to benefit from a new *PC World* feature designed to put you in touch with the opinions of PC users and decision makers just like yourself.

Each month, we'll poll 250 *PC World* readers involved in using *and* purchasing PC hardware and software. We'll ask them to rate the importance of critical buying issues, assess how well the product they selected meets their expectations, and then answer the really telling question: Would you buy the product again?

Rating the Leaders

This first installment of our new user satisfaction surveys focuses on hard disk utility libraries. (You'll find a review of these packages in this issue.) These products give you all the disaster recovery tools you need, plus several extras, such as disk optimization and file management tools and even productivity aids. Symantec Corporation's *Norton Utilities*—our review's Best Buy in this category—boasts the largest following among readers surveyed. But *PC Tools Deluxe* from Central Point Software isn't far behind, with a scant 4 percent fewer users. *Mace Utilities,* which doesn't have the comprehensive feature set or the market presence of either of its competitors, holds down third place, with only 4 percent of the readers surveyed identifying themselves as *Mace* users.

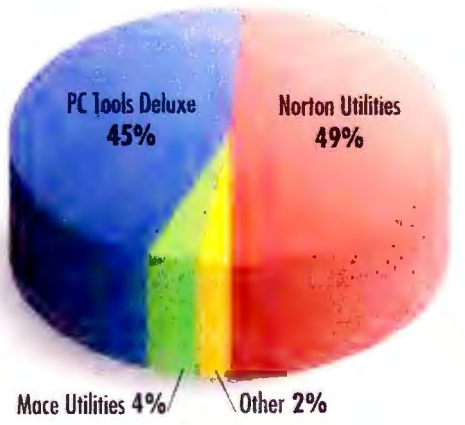
These packages aren't pricey—the most expensive (*Norton Utilities*) retails for $179—but don't let the relatively low prices fool you. Readers are still concerned about getting the most for their money—they rate value as their primary consideration. Overall, data recovery tools, disk diagnostics and repair capabilities, and hard disk optimization tools are the three favorite product features among purchasers surveyed.

"If I Knew Then..."

How many times have you wished for the chance to go back in time after living with a product for a few weeks or months? And if you could, would you make the same choice all over again? That's the question we posed to users of hard disk utility libraries—and we got some revealing answers. Not everyone, it seems, would make the same decision twice. More than one-quarter of the users of *Mace Utilities* aren't sure they'd follow the same path, with 18 percent saying they wouldn't buy the product again and 9 percent undecided. A higher percentage of both *Norton* and *PC Tools* users are content with their choice. Only 7 percent say they'd make a different selection next time around.

NORTON RULES

Installed base among respondents



MOST USERS PLEASED WITH THEIR CHOICE

Overall satisfaction with product, 1=low 5=high

JEFF BERLIN

Norton Utilities boasts the largest installed base among users of hard disk utility libraries, but satisfaction levels vary little among the top products.

VALUE TOPS THE LIST OF CRITICAL BUYING ISSUES...

1=low 5=high

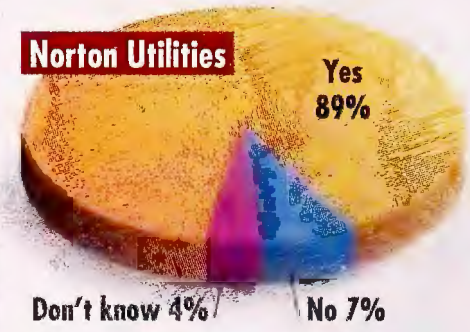
	Overall	Mace Utilities	Norton Utilities	PC Tools Deluxe
Value	4.39	4.27	4.44	4.38
Data recovery	4.01	3.82	4.29	3.72
Disk diagnostics and repair	3.98	3.73	4.21	3.76
Disk optimization	3.94	3.20	3.91	4.06
Reputation of company	3.88	3.64	4.05	3.73
Interface and ease of use	3.87	3.36	3.90	3.91
Service and support	3.74	3.55	3.66	3.83
Price	3.72	3.82	3.75	3.69
Data protection and backup	3.70	2.91	3.43	4.06
Disk- and file-search capabilities	3.16	2.64	3.16	3.20
Disk caching	2.70	2.33	2.58	2.84
Productivity utilities	2.67	2.00	2.58	2.82

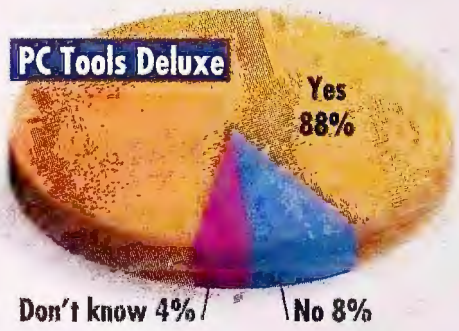
...BUT DATA RECOVERY EARNS HIGHEST SATISFACTION RATING

1=low 5=high

	Overall	Mace Utilities	Norton Utilities	PC Tools Deluxe
Data recovery	4.31	4.50	4.36	4.26
Reputation of company	4.30	3.88	4.33	4.31
Value	4.27	4.00	4.18	4.40
Disk optimization	4.25	4.00	4.32	4.20
Disk diagnostics and repair	4.14	4.14	4.19	4.11
Data protection and backup	4.13	4.00	3.93	4.30
Price	4.09	4.00	4.33	4.31
Service and support	4.01	4.00	4.03	4.02
Disk- and file-search capabilities	4.01	4.00	4.01	4.03
Interface and ease of use	3.96	3.25	3.88	4.10
Productivity utilities	3.79	3.33	3.74	3.84
Disk caching	3.60	4.33	3.40	3.76

WOULD YOU BUY IT AGAIN?





Users of Mace Utilities are the least likely to buy the product again.

The bottom line in deciding whether or not to buy a product again is how well it meets a user's needs overall, according to 35 percent of the readers surveyed. Ease of learning, ease of use, and product reliability also rate high on our readers' priority list.

The number one criticism among users who say they'd make a different choice next time is that a package is too difficult to use—not a surprising criticism, since these packages are most valued for their data recovery features. Most of us are none too calm after wiping a critical file off our hard disk. The last thing we need is a utility whose cumbersome interface or arcane command structure only adds to our frustration.

Roberta Furger is an associate editor for *PC World*.

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I. M. CARROLL

DOS Shells AND Menu Programs

Do you suffer command-line confusion?

Are your directories in disarray?

A DOS shell or a simple menu generator can protect you from DOS and make your hard disk a nicer place to visit.

DOS is not your friend. If you are an occasional or new PC user, learning the commands and syntax is too hard, and if you're a seasoned hard-disk jockey, DOS is simply too clumsy to work with efficiently.

The few lovers of the DOS prompt may argue that batch files, a fistful of DOS commands, and DOS 4.0's SHELL statement are all you need to navigate and manage your hard disk. This may be true, but for less than $200 a DOS shell or a menu generator can let you do the same job better.

Consider what DOS makes you go through just to move a file to another directory. First you carefully type the copy command and the file name, then verify that the copy took place, then delete the original file—three clumsy steps. A shell can do this in one command, without making you type a single word.

Simplifying DOS appeals to all kinds of PC users, and the variety of shells reflects this diversity. Heavy-duty shells such as *Magellan* and *PC Tools* are laden with hard disk navigation and management functions and let you seek out, group, and view files from different applications across any directory on your hard disk. But if you don't use many applications and don't want to spend a lot of time rearranging your hard disk's filing system, a quarter of the features for a quarter of the price may suit you better. If so, look for a simple shell to provide the basics: easy access to DOS commands, application launching, and such functions as creating subdirectories and copying and deleting files.

PC administrators looking for a simple, standardized interface for their department may consider a shell's file management features to be overkill. If you just want to give employees quick access to applications, a menu generator is the solution. Menu generators such as *Automenu* and *Direct Access* provide easy access to programs, files, and some DOS functions. Unlike most shells, menu programs come with security measures: administrator-defined menus that serve up only the programs a user needs, password protection to keep data safe, and an interface that discourages novices from experimentation.

Buying Into the Shell Game

Above all, you'll want a shell that simplifies finding files and using DOS commands. Look for such features as a directory tree, with its intuitive map of your hard disk's filing system, and a strong set of file search options. If you frequently search for files, the ability to save and reuse a search's list criteria for subsequent searches will prove invaluable. Also, with a stack of recently used DOS commands (or their shell versions), you won't have to remember and reselect commands.

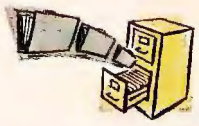
If you use scads of applications for a plethora of projects, you'll need to maintain a tidy hard disk—so look for a shell that provides a wide selection of file management tools. Tagging files so that you can manipulate them as a group speeds spring-cleaning your hard disk by a magnitude. Dealing with whole subdirectories helps in tasks such as archiving by eliminating tedious file selection. And if a shell lets you create a new directory on the fly as you're copying files into it, so much the better.

Launching applications is an important function for shells. Most let you execute programs from a pick list, and some even automatically run an application and load a file when you select a *data* file instead of the relevant EXE or COM file. If you need to key in an extension to the start-up command to run a program in a different mode, you'll appreciate a shell that can copy file names to the DOS prompt.

If you're browsing for data in various files in different formats, loading their respective programs to view them wastes time. To discern a shell's real utility, check its viewing for-

Matthew Lake

MENU PROGRAMS—SIMPLICITY AND SECURITY



MANUFACTURER Product	List price	RAM required	RAM-resident portion	FILE MANAGEMENT AND MENUING FUNCTIONS: Directory tree	Tag files for group functions	File searching	Copy/move directories	Automatic menu generation	Log of file use	PASSWORD PROTECTION: For drives	For directories	For files	Reader service number
THE ALDRIDGE COMPANY PreCursor 4.0	$96	180K	n/a	Y	Y	Y	N	Y	Y	Y	N	Y	715
BLACK OAK COMPUTER SERVICES The Navigator 1.1	$29.95	640K	<1K	N	N	Y	N	N	Y	Y	Y	N	716
BROWN BAG SOFTWARE Power Menu 5.3	$89.95	256K	n/a	Y	Y	Y	Y	Y	Y	Y	Y	Y	717
COMPUTER TYME MarxMenu 2.25	$59.95	385K	n/a	Y	Y	Y	Y	Y	N	Y	Y	Y	718
FIFTH GENERATION SYSTEMS Direct Access 5.0	$99	256K	n/a	N	N	N	N	Y	Y	N	N	N	719
GETC SOFTWARE Lazy Susan Plus 4.1	$119	25K	25K	Y	Y	N	Y	N	Y	Y	Y	Y	720
IMSI MenuDirect Gold	$79.95	320K	5K	Y	Y	Y	Y	Y	Y	Y	Y	Y	721
MAGEE ENTERPRISES Automenu 4.7	$69.95	32K	32K	N	N	N	N	N	N	N	N	N	722
MOUNTAIN STATES CONSULTING MSC-Menu 2.0	$29.95	256K	n/a	N	N	N	N	N	N	N	Y	Y	723
MOUSE SYSTEMS Power Panel 1.0	$69.95	256K	<1K	Y	Y	N	Y	Y	N	Y	Y	Y	724
THREE POINT SOFTWARE Freedom Menu 1.0	$99.95	64K	2K	N	N	Y	N	Y	Y	Y	Y	Y	725
VARTECK PS-Lock 1.03	$195	170K	12K	Y	Y	N	Y	N	Y	Y	Y	Y	726

For more information about all products in this table, circle reader service no. 914.

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Imagine Software
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619/259-1562 (fax)

IMSI
1938 Fourth St.
San Rafael, CA 94901
800/833-4674,
415/454-8901 (fax)

Logitech
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Lotus Development
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Cambridge, MA 02142
617/577-8500

Magee Enterprises, Inc.
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Norcross, GA 30091
404/446-6611,
404/368-0719 (fax)

Micro-Z Company
4 Santa Bella Rd.
Rolling Hills, CA 90274
800/755-3553,
213/544-4058 (fax)

Mountain States Consulting
P.O. Box 20326
Jackson, WY 83001
800/223-9822,
307/733-1442

Mouse Systems Corp.
47505 Seabridge Dr.
Fremont, CA 94538
415/656-1117

M.R.E. Software
P.O. Box 131
Ethelsville, AL 35461
205/658-2611

Northland Multisoft
1501 S. Glendora Ave.
Glendora, CA 91740
818/963-6355

RSE Inc.
1157 57th Dr. SE
Auburn, WA 98002
206/939-4105

Sigma Software Solutions
77 San Antonio Rd. #58
Palo Alto, CA 94303
415/493-8804

SoftLogic Solutions, Inc.
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Manchester, NH 03103
603/644-5555,
603/627-9610 (fax)

SoftShell Systems
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415/571-0622 (fax)

Symantec Corp.
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Three Point Software, Inc.
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201/740-1750,
201/740-9118 (fax)

VSoft Systems, Inc.
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Westlake Data Corp.
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XTree Company
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San Luis Obispo, CA 93401
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Rate Your Windows IQ

Attention Windows users! Drop your mouse, pick up your pen, and flex your mind with this *Windows* IQ test. Then rush your quiz to *PC World*—the first 100 readers to send in correct entries will win a *PC World* Certified Genius pin. We'll also conduct a random drawing from all correct entries received by the deadline and award one first prize: a $500 gift certificate for software. So don't dawdle! Your entry must be postmarked by July 31, 1991.* Look for the answers in the September issue.

GORDON STUDER

To get you rolling, we'll start with an easy one:

1) Which of these WIN.INI commands automatically opens *1-2-3* whenever you start *Windows*?
a) run = 123.exe.
b) run = 123.pif.
c) run = 123.
d) all of the above.

2) UAE stands for
a) Unspecified Attribute Encoding.
b) Unchangeable Algorithm Error.
c) Unrecoverable Application Error.
d) Unexpectedly Arduous Environment.

3) Which keyboard command toggles DOS applications between full-screen and windowed displays under 386 enhanced mode?
a) <Alt>-<Esc>.
b) <Alt>-<Tab>.
c) <Alt>-<Enter>.
d) <Alt>-<Print Screen>.

4) Which feature is not included in a bundled *Windows 3.0* utility?
a) file backup.
b) a clock.
c) an auto-dialer.
d) standard deviation calculation.

5) If you set up a permanent swap file, as opposed to using the temporary one, you ensure that *Windows* will swap to disk as fast as possible under which mode?
a) real mode.
b) standard mode.
c) 386 enhanced mode.
d) all modes.

6) Virtual memory is
a) available only in *Windows'* standard and 386 enhanced modes.
b) a utility program that automatically dials FTD on your wedding anniversary.
c) a 386 enhanced mode feature that provides expanded memory to applications.
d) a technique that uses the hard disk to simulate additional system memory.

7) To ensure that a temporary *Windows* swap file doesn't eat up every last byte of available disk space, which command should you include in the [386Enh] section of SYSTEM.INI?
a) WinSwapFileMax = 1024.
b) MinUserDiskSpace = 1024.
c) MaxPagingFileSize = 1024.
d) PagingDriveFreeSpace = 1024.

8) RAMDrive speeds up *Windows* performance when used to hold
a) temporary swap files.
b) permanent swap files.
c) application "temp" files.
d) all of the above.

9) In 386 enhanced mode, if only two windowed DOS applications are running in the background, each using a PIF file background priority setting of 25, what percent of processor time will another DOS program with a foreground priority of 100 receive when running in the foreground?
a) 57 percent.
b) 66 percent.
c) 75 percent.
d) 100 percent.

10) What is the highest possible Solitaire score for a single game using Vegas scoring?
a) $52.
b) $208.
c) $260.
d) $468.

11) The SmartDrive CONFIG.SYS command DEVICE= SMARTDRV.SYS 1024 256 means
a) create a 1024K RAM drive using 256-byte clusters.
b) create a RAM drive that ranges between 256K and 1024K—depending an available memary—and display an error message if there's less than 256K free.
c) create a 1024K disk cache far use with DOS programs, and reduce the disk cache to 256K when *Windows* starts.
d) create a disk cache far use with *Windows* programs, letting *Windows* set the size anywhere between 256K and 1024K, depending an available memary.

12) *Windows'* Recorder macro utility can't be used for which of the following tasks?
a) switch to a different application.
b) issue commands to a *Windows* program.
c) issue commands to a DOS program.
d) start a continuously running demonstration.

* IDG employees and their families are not eligible.

PC WORLD WINDOWS IQ ENTRY FORM

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SERIOUS FUN WITH PAINT

Looking for a good time? Follow the example of PC World's artists in residence and check out these five paint programs.

STEVE FOX

Sometimes it's hard to live down a reputation. Take the paint program, for instance. Everyone will tell you it's a toy, a silly plaything, unlike its successful sibling, the draw program. Now that's a hard worker, a real tool for artists. But paint? It's just another party animal.

Well, don't believe everything you hear. Desktop publishers the world over have taken paint into their hearts—and offices—and the once-frivolous paint program has gotten serious. That's because using a paint program is the easiest way to edit scanned images. And as more affordable, high-quality scanners hit the market, desktop publishers are scooping them up and using their low-cost paint programs to retouch and edit scanned input and clip art before importing them into documents.

Of course, when paint finishes with its desktop publishing day job, it trades in its jacket and tie for a party hat, and that's when the fun begins. Here at *PC World*, we hate to miss out on fun, so we recruited five members of our art department to set their talents (and mice) loose on five popular low-cost paint programs—*PC Paintbrush IV*, *PC Paintbrush IV Plus*, *ColoRIX VGA Paint*, *DeluxePaint II Enhanced*, and *Splash*. Each of our resident artists took a photograph of herself or himself, scanned it, imported it into one of the five packages, and manipulated or painted it to create a wild self-portrait. (To see how the artists really look, check out the photographs accompanying each creation.)

Just because they're artists, don't assume you have to be. Even if you can't draw a straight line, reworking an existing image with one of these easy-to-learn programs is a piece of cake: You probably won't even have to crack the manual before you'll be merrily working away in 256 colors (or shades of gray). Of course, if you're just out to have fun and you have plenty of time on your hands, you don't have to limit yourself to editing images; you can always use a paint program to create the Mona Lisa from scratch on screen. Better yet, scan Mona in, then use paint to put sunglasses on her—voilà, she's ready for the beach. If this sounds good to you, it's time to buy. Here's what to look for.

If you need to clean up scanned images, you'll want flexible zoom controls, tight control over brightness and gray shades, and the ability to edit gray-scale images pixel by pixel. Equally essential are the abilities to import and export TIFF and PCX files—the industry standards for scanned image and color paint files—without going through a complicated conversion process in a utility. *PC Paintbrush IV Plus*, *ColoRIX*, and *DeluxePaint II Enhanced* and particularly suited to this line of work. But if you're just having fun, who cares about file compatibility? Look for a friendly interface, ease of use, and intuitive tools like the ones in *Splash*, *DeluxePaint II Enhanced*, and *PC Paintbrush IV*.

What about hardware? Well, you need EGA at minimum, and VGA is better. You can use mono VGA to display 16 gray

shades in high resolution, but if you have a multiscan monitor and a super-VGA card, you can take advantage of higher resolution and more colors. With that sort of hardware configuration, you'll be tempted by all three of the professional-grade packages, which support the full 256 colors. However, to effectively use the 256-color modes in *DeluxePaint II Enhanced* at resolutions like 640 by 480, 800 by 600, or 1024 by 768, you'll need expanded memory.

But enough about the technical stuff. The idea here is fun. So we invite you to a private tour of the *PC World* portrait gallery. We're happy to meet you face-to-face.

Steve Fox is the managing editor for PC World.

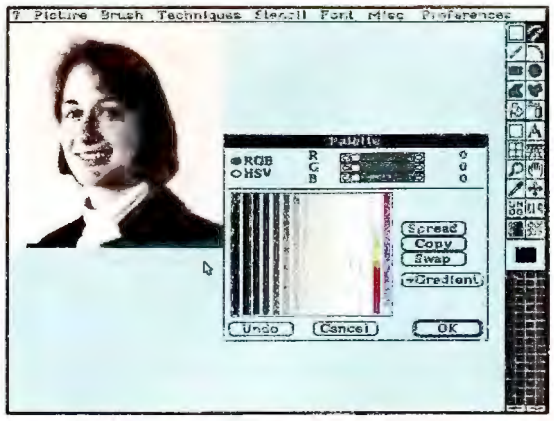
PC Paintbrush IV Plus, with powerful retouching features and numerous fonts, is ideal for desktop publishing. It handles 256 colors at high res and drives many printers and monitors.
PC Paintbrush IV Plus *$199; ZSoft Corp., 450 Franklin Rd. #100, Marietta, GA 30067; 404/428-0008, 404/427-1150 (fax). Reader service no. 818*

"Altering, copying, and pasting various parts of my face, I became fascinated by the personalities that began to emerge on screen."

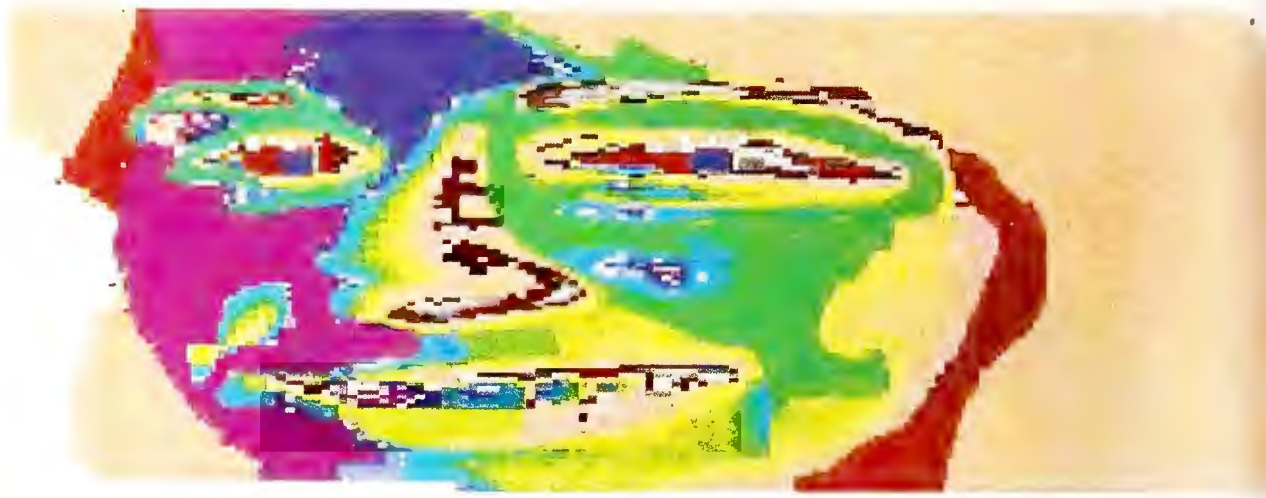
Barbara Adamson
Senior Design Associate

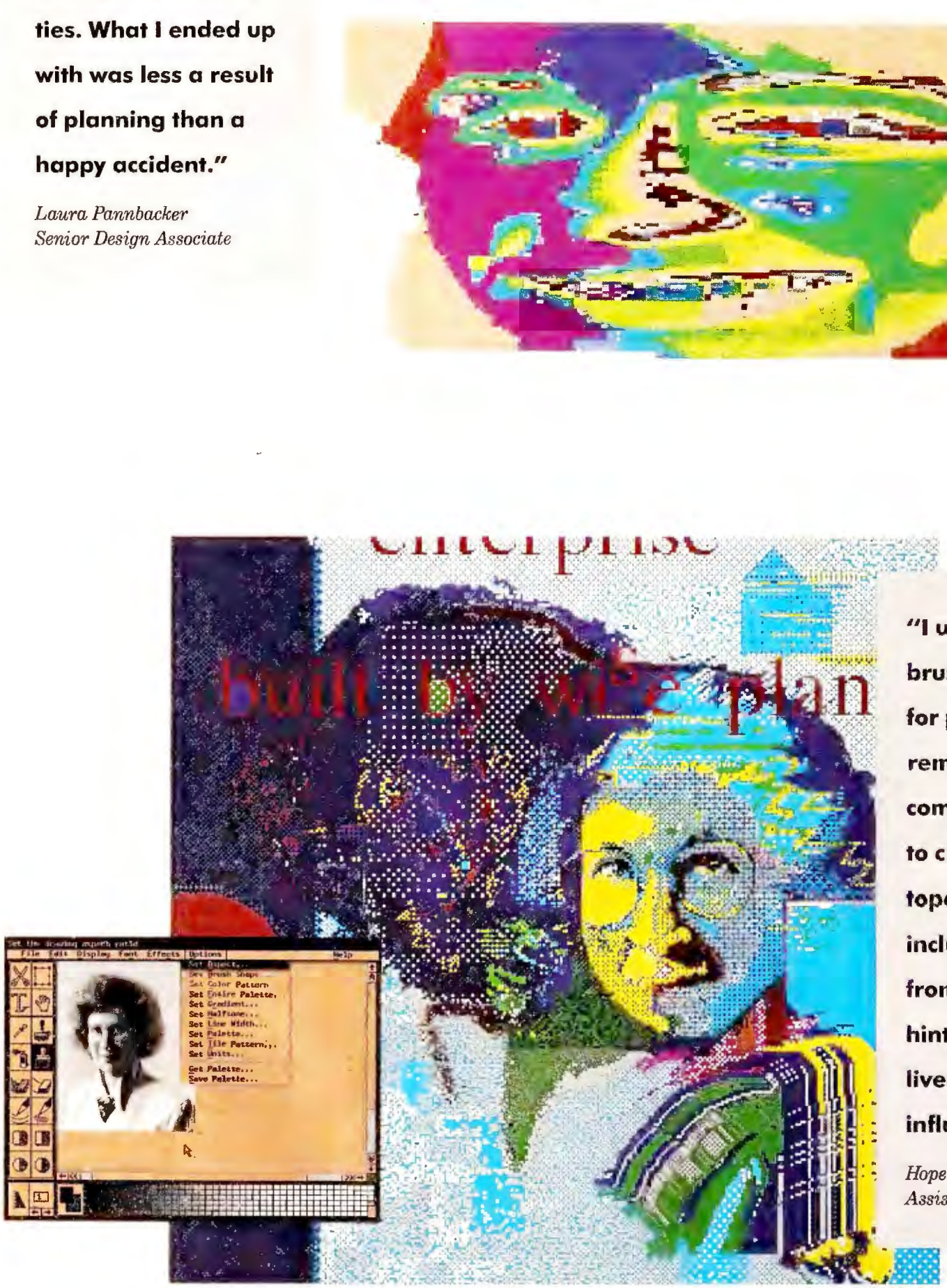
"It wasn't until I gave up slogging through the manual and began playing around that I discovered DeluxePaint's capabilities. What I ended up with was less a result of planning than a happy accident."

Laura Pannbacker
Senior Design Associate



DeluxePaint II Enhanced offers great control over the color palette and special effects, plus highly intuitive tools. It imports PCX files and has a handy utility for converting files from other programs, but performance suffers at higher resolutions using 256 colors.
DeluxePaint II Enhanced *$134.95; Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404; 800/245-4525, 415/570-5137 (fax). Reader service no. 816*

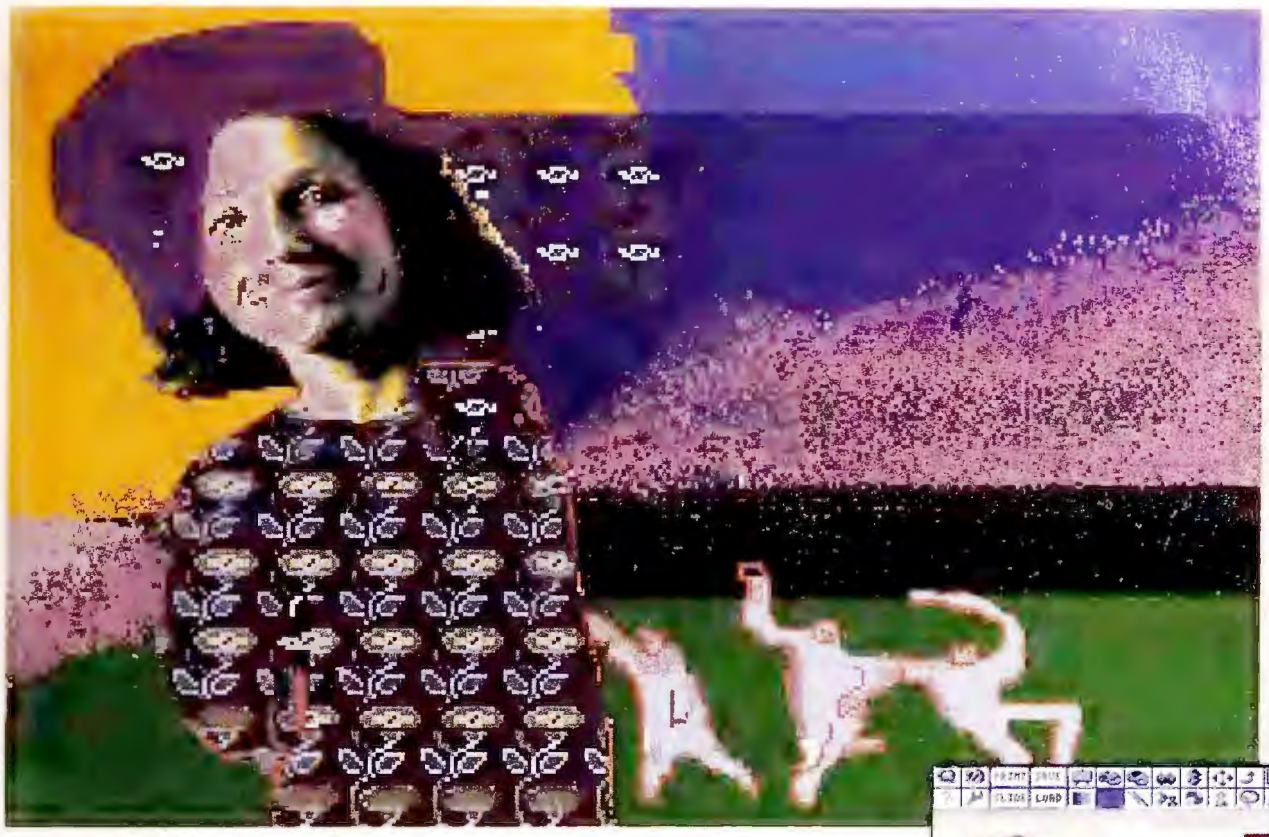




"I used Paintbrush IV's memory for patterns—reminiscent of complex knitting—to create a kind of topographical map. It includes a fragment from Proverbs and hints of places I've lived or been influenced by."

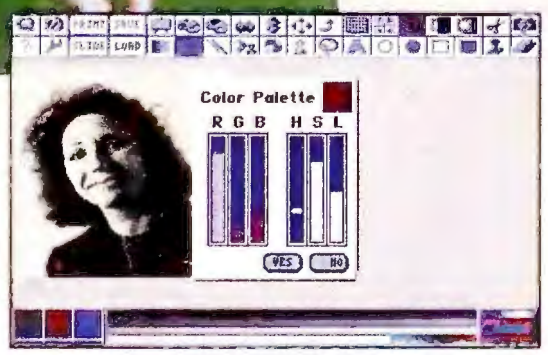
Hope Winslow
Assistant Design Associate

PC Paintbrush IV shares many of IV Plus's traits, including a Windows-like interface and a versatile batch of image-creation and retouching tools. Though it supports 256 colors, it tends to run short on memory when working on large files of more than 16 colors.
PC Paintbrush IV *$99.95; ZSoft Corp. Reader service no. 820*

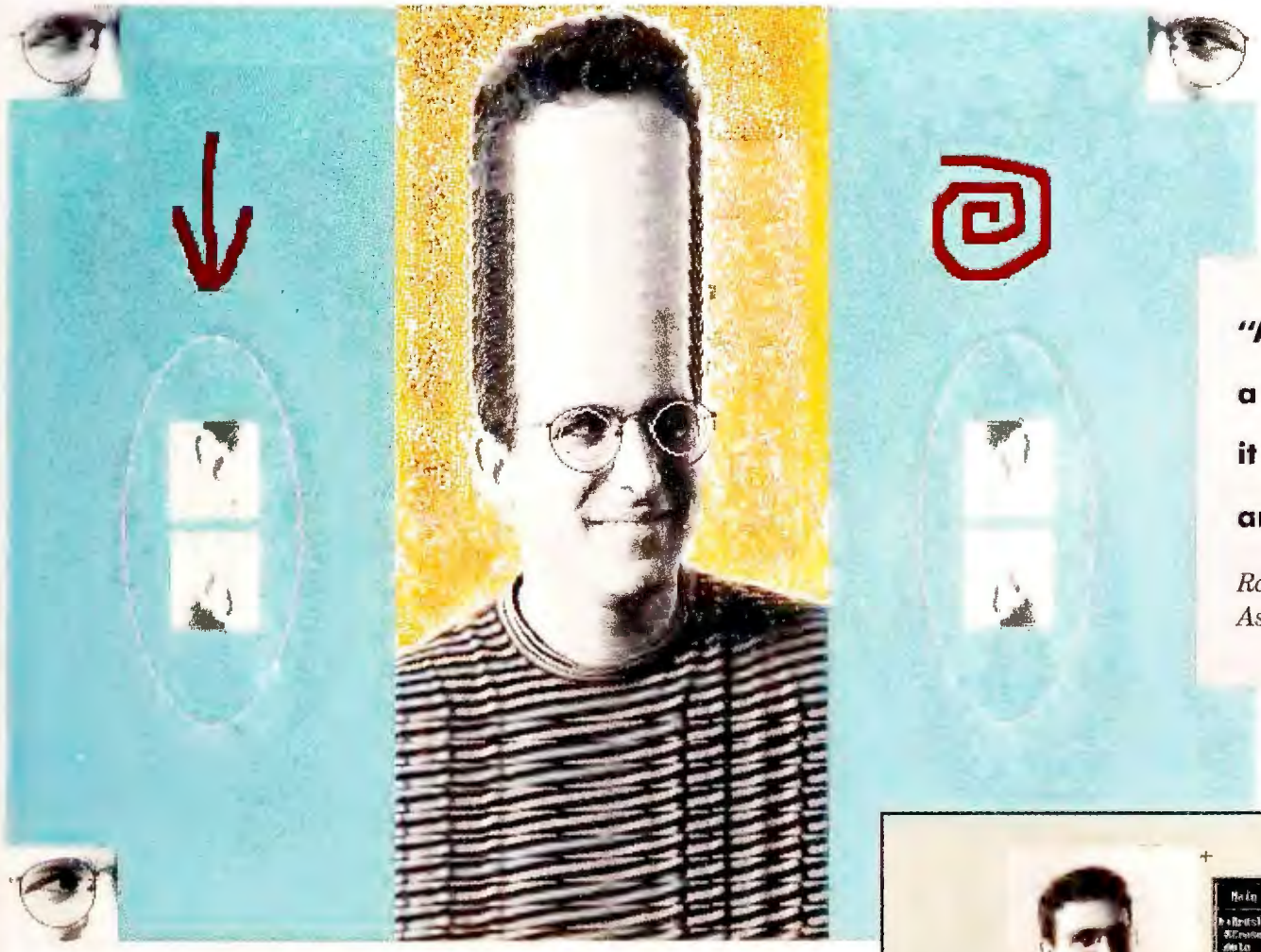


"The name Splash makes sense for this program. It models the way I paint, by splashing broad bands of color onto the canvas. But, like a splash of paint, it's tough to control."

Emily Wollenweber
Designer



Splash compensates for its choppy-looking resolution (a maximum of 256 colors at 320 by 200) with the world's friendliest interface. Pixel-by-pixel editing is simple, and all the tools are intuitive. It produces and reads an obscure file format and has limited printer support.
Splash *$99.95; Spinnaker Software Corp., 201 Broadway, Cambridge, MA 02139; 800/826-0706. Reader service no. 819*



"Although ColoRIX is a powerful program, it sports a particularly arcane interface."

Robert Kanes
Associate Art Director

ColoRIX delivers nearly unlimited graphic control, supports high resolution without expanded or extended memory, and can import or export nearly any file type. The drawback: a menu-based interface that will frighten away all but the bravest.
ColoRIX VGA Paint *$199; RIX SoftWorks, 18552 MacArthur Blvd. . #200, Irvine, CA 92715; 800/345-9059. Reader service no. 817*

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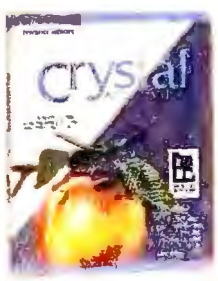

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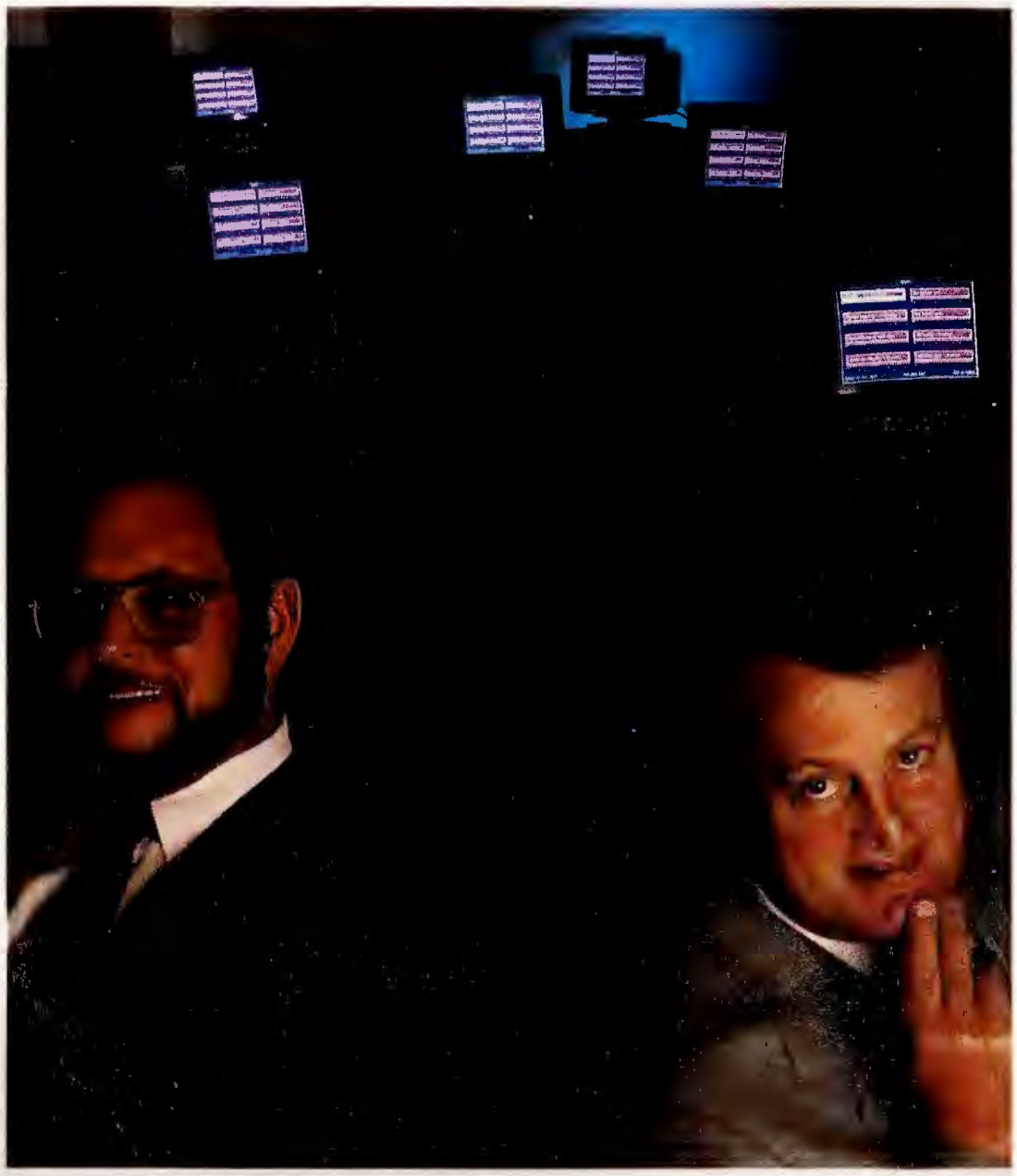
ON SITE:

THE Tamperproof Office

Guarding against security threats requires a strategy involving all levels of users and management. Here's how one company protects its most important asset—data.

It's a security nightmare: You're an executive for a large insurance firm that manages financial and medical information for hundreds of thousands of clients. You come into the office one Monday morning to find that an irate employee has purposely wiped out a number of key client records. It'll take months to sort through the mess and even longer to smooth over the public relations disaster once clients hear the news.



Sun Life's Dave Cavanagh (right) and Keith Parsons are charged with the task of ensuring the security and confidentiality of critical data.

EDWARD GADJEL

That is the type of threat that executives at the Sun Life Assurance Company of Canada, an international insurance company headquartered in Toronto, must protect against. "We are handling other people's confidential information and money," says Senior Microcomputer Security Analyst Keith Parsons, who heads up Sun Life's PC security efforts. The worst thing that could happen, would be for the company to lose its credibility with clients. "The faith of the people who deal with us and believe in our integrity is essential," says Parsons.

Ensuring the security and the confidentiality of critical data, therefore, is a top priority at Sun Life, which has identified several potential security threats: access by unauthorized personnel, the proliferation of computer viruses, and the erasure of key data and system files, either intentionally or unintentionally. Company executives have developed a three-pronged strategy to address these concerns, including locating and recommending software that protects sensitive files from unauthorized access; placing key files on specially classified, secured systems; and educating both users and managers how to better protect the company's computer resources.

ALICE LAPLANTE

THE VULNERABLE PC

Protecting sensitive information was easier before PCs became an integral part of Sun Life's computing strategy. Confidential data was simply stored and processed on the mainframe, where passwords and audit trails are part and parcel of the environment.

But Sun Life is rapidly moving to a distributed computing environment that depends heavily on PCs for local accessing and processing of data. The increased reliance on PCs, while more cost-effective, raises the stakes from a security perspective.

"The PC has an insecure operating system, and there are virtually no technical checks and balances built into DOS," says Dave Cavanagh, director of information security for Sun Life, who manages a staff of six full-time security employees. "Let's face it," adds Parsons, "DOS makes virtually everything stored on a PC very, very vulnerable."

As a result, Sun Life senior executives are much more concerned now about how to protect information than they were five years ago, says Cavanagh. "They want to use smaller systems to be more efficient and more competitive, but they are also aware of the accompanying need for increased security precautions," he notes.

A PC running WordPerfect doesn't run the same risks as a PC on a LAN handling medical records.

To address this concern, Sun Life's security staff recommends a variety of PC-based software tools that help to protect the integrity and security of data. But because PCs are so vulnerable—due to their size, accessibility, and the openness of DOS—this approach is not foolproof.

IDENTIFYING THE RISKS

Consequently, Sun Life is taking an extra step to guarantee the security of the data. The company has begun classifying PCs and LANs based on how they are used, and then ensuring that each class of system or network has an appropriate security plan—from running virus detection software regularly to keeping certain PCs and data under lock and key.

"A PC running *WordPerfect* isn't [the same] security risk as a PC on a LAN that handles payroll information or someone's medical records," explains Parsons. "We're trying to be more cognizant of which PCs are being used for what purpose."

Parsons has developed a three-tiered system for classifying PCs: The highest security level is for systems that can access the most confidential employee, customer, and corporate data, such as payroll and compensation records, client records, and strategic corporate information. The midlevel security classification covers PC systems information and department business plans and budgets—data whose inadvertent loss would be inconvenient, but not a real detriment to the company, says Parsons. "It wouldn't run us out of business the way a high security risk would." Department and personal files receive the lowest security classification.

Once a PC or LAN has received a security classification, Parsons recommends an assortment of products to achieve the right level of security. One component of this protection scheme is *Certus*, a security package from Cleveland-based Certus International, used to set a number of security parameters —including passwords, encrypting schemes, and audit trails—for those PCs or applications deemed most sensitive.

In addition to the software-level protection, Sun Life keeps certain PCs with very sensitive data stored separately from the general-purpose systems. In one case, it takes two employees to actually make changes to any of the most sensitive files: One employee has access to the application used to manipulate the data; the other has access to the raw data itself.

A BALANCING ACT

Classification of systems is no easy task, says Parsons. He and department managers must constantly balance security measures' benefits against the measures' effect on day-to-day business.

Ultimately, it's up to the department manager to decide what security classification and what types of security measures are put in place for each system, particularly since each department foots the bill. "If you have a $1000 asset, the business manager is not going to want to spend $5000 to protect it," says Parsons. But he tries to convince managers that the cost of the hardware and software is far less important than the data itself, since "the impact of losing that data could be devastating."

THE BOTTOM LINE

PROBLEM: Ensuring the accuracy and confidentiality of highly sensitive client information.

SOLUTION: A security management strategy that includes recommending products, classifying systems, and educating users.

BENEFITS: Companywide recognition of security concerns and prevention of major incidents of data loss or corruption.

IDENTIFYING THE RISK

Sun Life of Canada has a three-tiered security classification system for all PCs at its Toronto headquarters to guard against loss and corruption of data.

Low Security

- Department files
- Personal files

Security precautions

- User password and ID needed to access files or log on to PC
- Routine virus scanning

Midlevel Security

PC systems information

- Access codes

Department-level business information

- Budgets
- Business plans

Security precautions

Low security precautions plus

- Multiple passwords needed to access sensitive files
- Department managers needed to access sensitive files
- Department managers must boot up PCs of individual users
- Limited transfer of files and programs

Maximum Security

Employee data

- Payroll and compensation information
- Performance evaluations
- Medical and insurance records

Customer data

- Health insurance and medical records
- Financial and investment information

Corporate data

- Strategic plans
- Competitive information

Security precautions

Low and midlevel security precautions plus

- Encryption of all files
- Physical barriers to accessing PCs and data
- Physical and electronic audit trails of all accesses to sensitive data

CONTROLLING THE THREAT

As with ensuring the confidentiality of information, Cavanagh believes preventive measures are the best defense against viruses. "[Viruses] are a threat, but they're a controllable threat," says Cavanagh, who refuses to take an "alarmist" attitude when he hears about a supposed infection.

The key to controlling the problem is a process he refers to as "change management": Every time a change is introduced into a system—whether it's a new piece of software or data downloaded from a bulletin board—you have a security risk, says Cavanagh. If you manage those changes effectively, you reduce your risk.

"Users and managers have to exercise caution and control," says Cavanagh. "They need to be aware of viruses every time they download something, transfer a file, or install a piece of software—even if it is shrink-wrapped or obtained from a reliable source."

So Sun Life now includes a copy of *ViruScan*, from McAfee Associates, on internal PC update disks that go out to all branch offices and field agents. *ViruScan* automatically scans the system for viruses whenever a user tries to update his or her PC with the upgrade disk. A warning comes up on the screen if a virus is detected.

Although the company has been hit with a few viruses, each incident was confined to a single PC, thanks largely to the control-management philosophy.

BACK TO SCHOOL

The bottom line in controlling any type of security risk, says Parsons, is education—a linchpin of Sun Life's strategy for combating security threats. After all, he notes, most security problems, such as users' erasing files or infecting a PC or LAN via software, are not deliberate and can be prevented with the proper precautions.

"There's no way we can do manual operations such as backing up files or scanning for viruses from a centralized location," says Cavanagh. "We can only try to persuade users that it's in their best interest to use the products [we recommend]."

The education campaign begins with a quarterly newsletter called *InfoGuard*, which Parsons publishes to offer information and advice on how to make PC systems more secure. The publication, which is distributed to all employees, also features excerpts from security-related articles that have appeared in other business and professional publications.

Cavanagh, Parsons, and other security staff members also regularly lead employee seminars at both company headquarters and branch locations to help employees understand what's at stake when tight security measures aren't followed.

IT'S EVERYONE'S BUSINESS

But no security policy will be effective if it's dictated from a centralized department or group, says Cavanagh. A policy handed down from above—without the input and assistance of employees at all levels of the organization—only gets in the way of the company's ability to get the job done.

"Individual offices or departments know their business better than I ever could," agrees Parsons. "I can't tell a manager that a 3-hour computer operation must take 18 hours due to security precautions."

Maintaining tight security is made more difficult by the "personal" nature of desktop computers, says Cavanagh, adding that users are very sensitive to feeling spied upon or watched too closely. But, he adds, the PC—like larger systems—is a corporate asset and must be treated as such.

"Everyone agrees security is essential," says Parsons, "but the question now is, how much security is necessary, and how much is it going to cost the company, both in terms of dollars and in terms of productivity?"

Alice LaPlante is a freelance writer based in Palo Alto, California.

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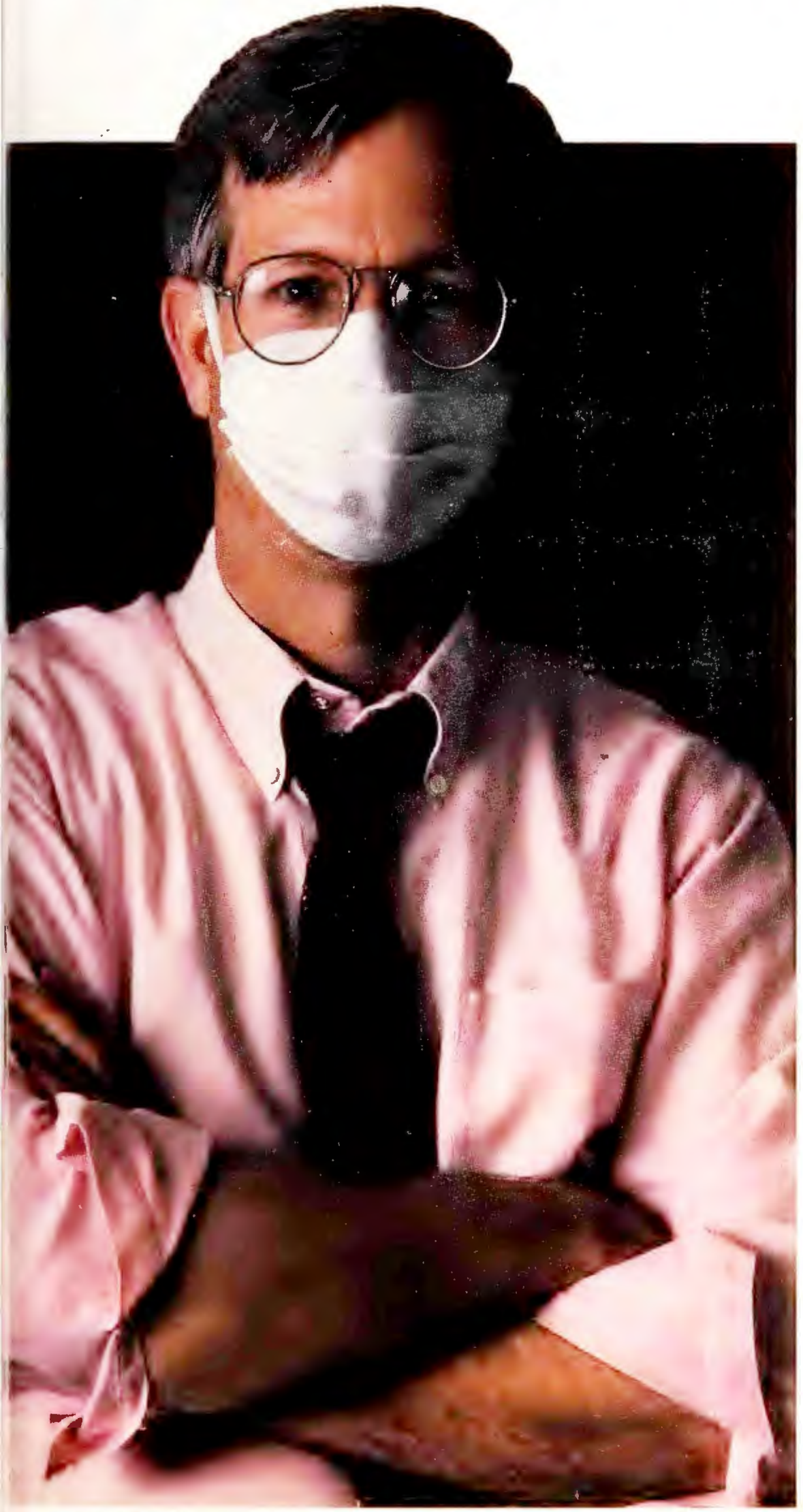

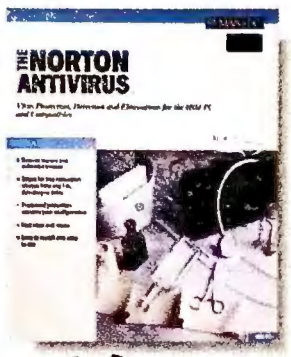

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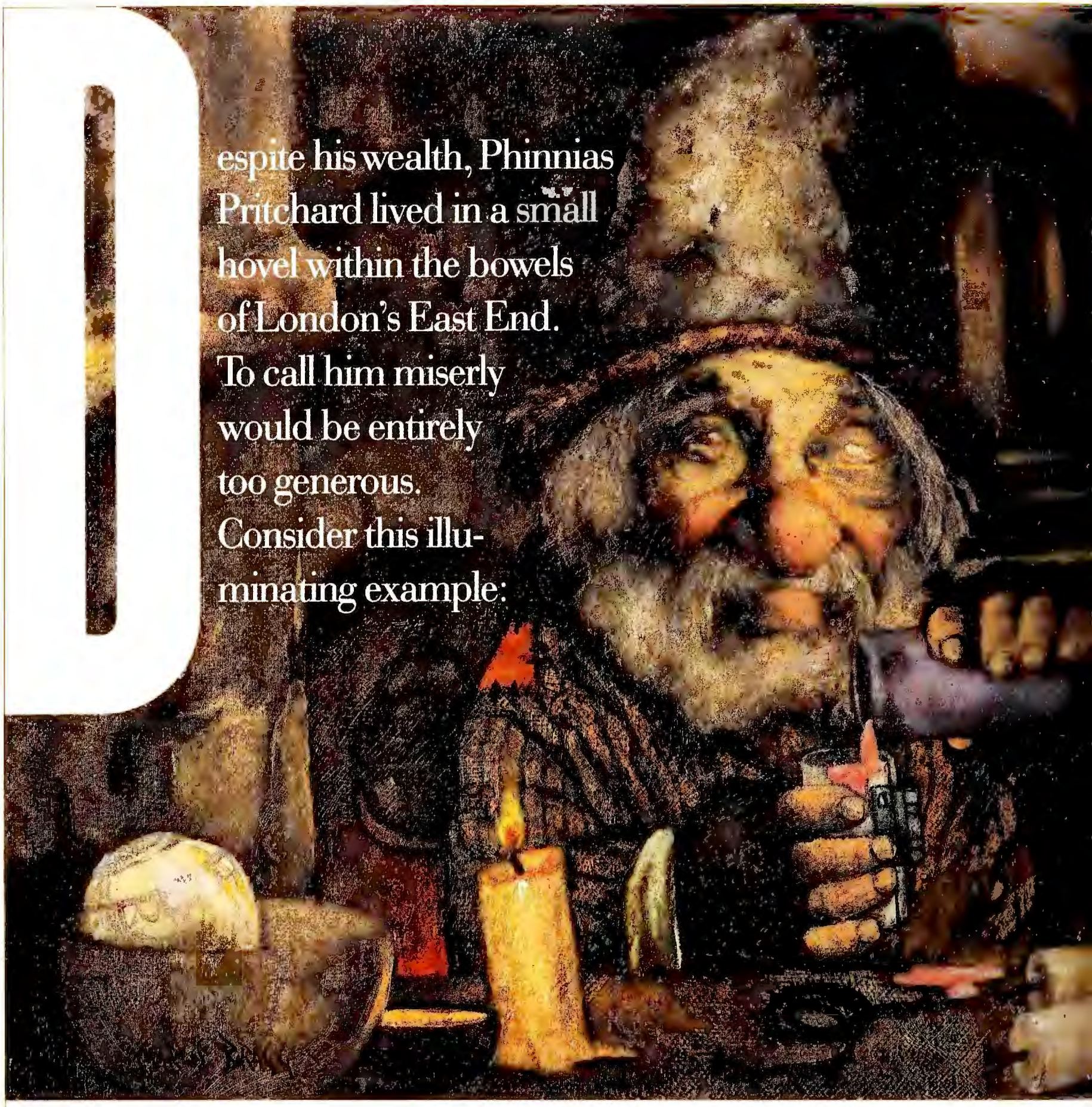

Rather than spend a half penny for new candles like everyone else, Phinnias would make the rounds of local establishments, scrape the tallow drippings from old candleholders into a sack, and later melt the contents to make new candles. On one particularly productive evening he collected six scrapings from a pub, four from a butcher's shop, twelve from a church abbey, eight from a neighborhood inn, ten from a local

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cockfighting hangar and nine from a cobbler's shop. Query: If it takes the remains of seven candles to make one new candle, and if one candle lasts an entire night, how many full nights of light was he able to create from this trip?

Certainly it's hard to quarrel with Mr. Pritchard's motives. Especially in this era of revered recycling. But, one could legitimately question whether he was receiving an adequate return for all the effort he expended. (Though it did yield in excess of seven candles.)

One could also question what all of this has to do with Wyse.

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Because—in the interest of ergonomic reform—we are conducting a sort of recycling effort of our own. From May through August we are paying $50 for any antiquated terminal traded in on a new Wyse WY-150, WY-160, WY-185 or WY-370.

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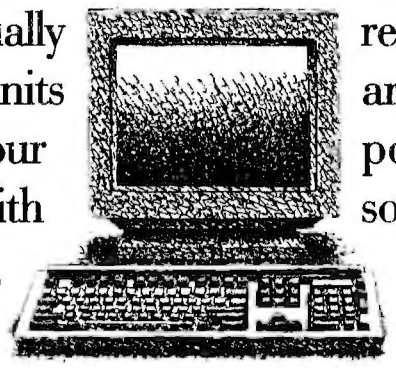

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By now the attentive reader has learned two things: Mr. Pritchard's recycling program netted him more than seven candles and Wyse's recycling program can net purchasers several hundred dollars towards the industry's finest terminals.

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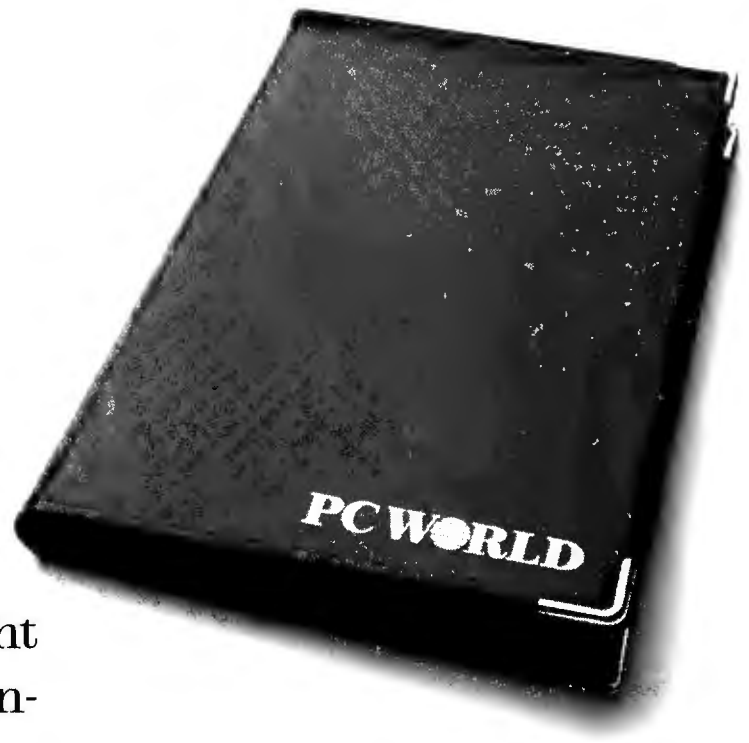

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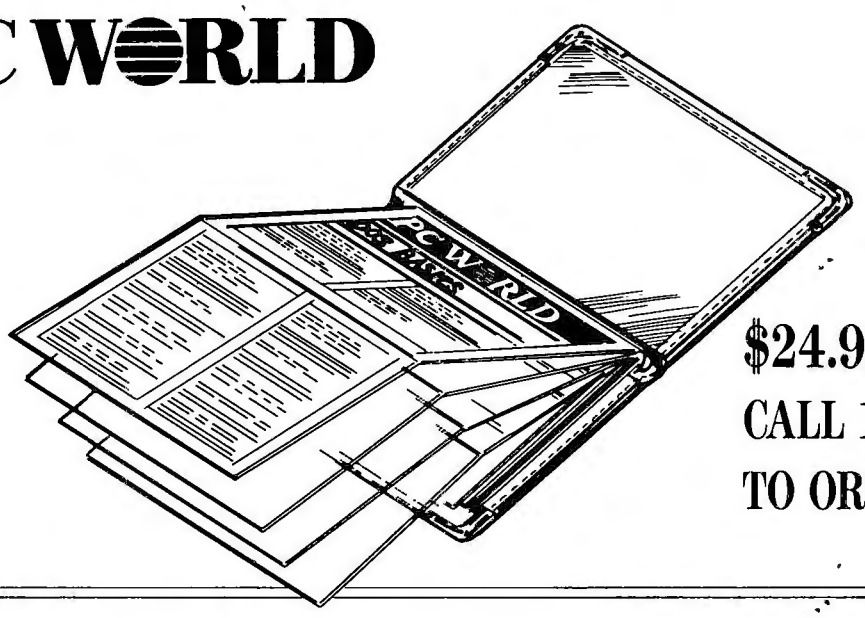

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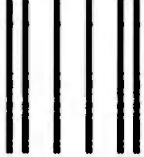

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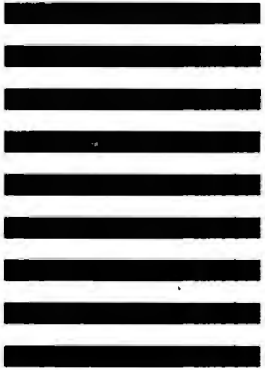

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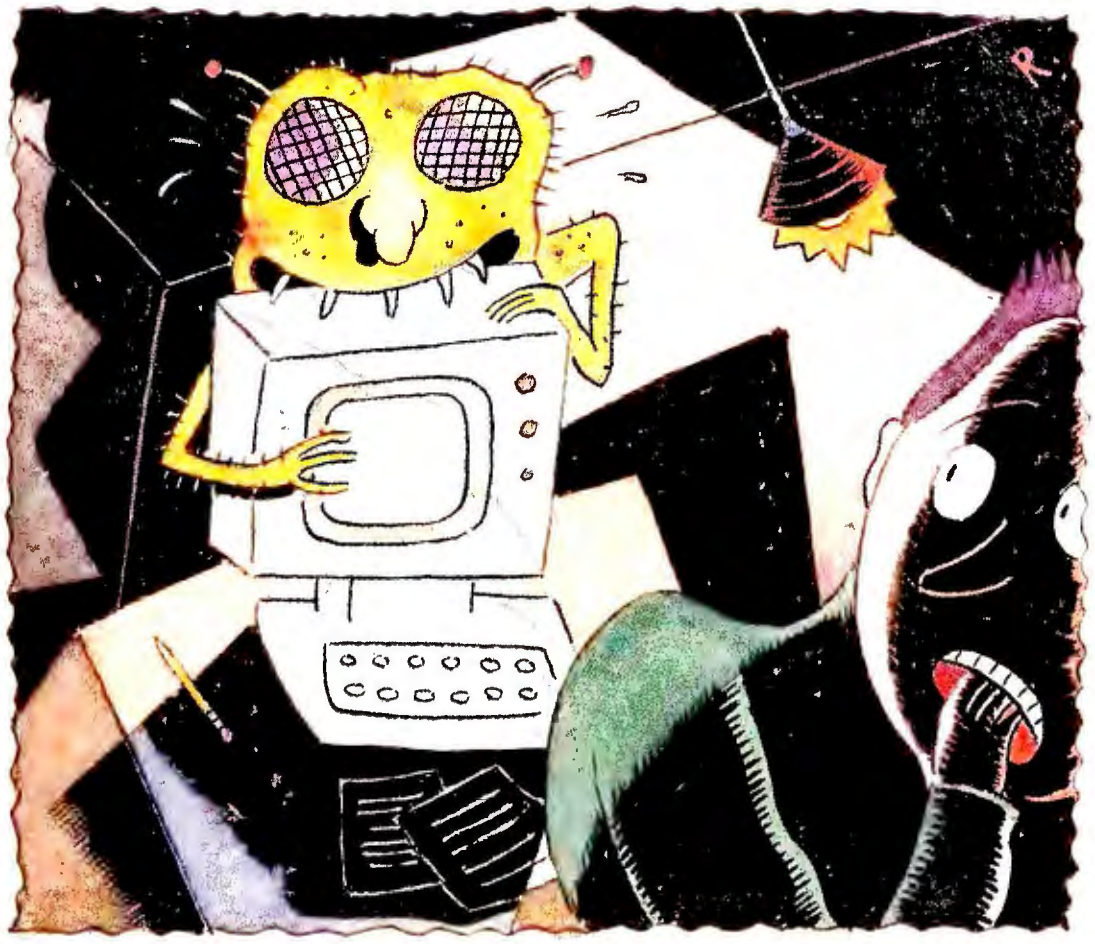
Signature _____

RIRC

Antivirus and Security Products

Inoculate your PC against viruses—and save it from vandalism and common human error.



JUDY HEIM

MARK ROSENTHAL

The aliens can come from anywhere: a foreign floppy disk, a file downloaded from a BBS, a contaminated network. First, they attach themselves to a critical file. Then they replicate and spread through your own system or across your company's network. Before you know it, your PC's doing something odd. A strange black box appears on your monitor. Letters fall like leaves to the bottom of the screen. Or a message flashes at boot-up: 'Your PC is stoned!'

Computer viruses are a real and growing menace, but they're not the only invaders that can wreak havoc on your PC. There are also disgruntled ex-employees, and the occasional naive user who stumbles into a root directory and types 'erase *.*'.

This buyers' guide lists 26 antivirus software programs that use a wide range of strategems to scan files, check the integrity of data, and monitor PC operations for viral intruders. But since virus-fighting programs are only one line of defense, we've also gathered information on 25 PC security products that help keep intruders from entering your system in the first place.

VIRUS FIGHTERS

No antivirus product can guarantee immunity against infection. New or clever viruses can slip past even the best virus fighter. But with the right inoculation, you can vastly reduce the chance of infection.

Virus fighters come in three types, often in one package: scanners, integrity checkers, and monitors; each uses a different method of examining potential virus hideouts. (Those hideouts include data, system, and application files; hard disk boot sectors; the hard disk partition table; and memory.)

Scanning and integrity checking can tell you only if an infection already exists. Scanning programs look over your system for the telltale behaviors or *signatures*, of hundreds of known viruses. It's important that the signature list is up-to-date; most vendors offer periodic signature updates for a fee. (At present, no known viruses can reside in extended or expanded memory, but a forward-looking virus scanner will search those places anyway.)

Rather than hunt for virus signatures, integrity checkers take an algorithmic fingerprint, or *checksum*, of your system's critical files and examine it regularly for any changes a virus may have wrought. The best integrity checkers let you specify files to check, and they examine application files when you load a program. Some programs keep a log of file sizes that you can view for changes. An integrity checker should check itself as well as the notes it keeps on your system.

The only way to actually stop a virus before it plants itself on your hard disk is to install a memory-resident monitor. Monitors block any of a variety of heinous acts characteristic of viruses—

ANTIVIRUS SOFTWARE

Company / Product	List price	SCANS FOR VIRAL SIGNATURES: Data/ system/ application files	Disk boot sector/ partition table	Memory	INTEGRITY CHECKS: Data/ system/ application files	Disk boot sector/ partition table	MONITORS: Memory resident	Detects efforts to bypass DOS	Blocks writes to COM, SYS, BAT, EXE, overlays, and drivers	Blocks changes to boot sector/ partition table	Blocks unauthorized hard disk formats	Blocks low-level hard disk track writes	Blocks virus from becoming memory resident
ABACUS Virus Secure	$95	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
CENTRAL POINT SOFTWARE Central Point Anti-Virus	$129	Y	Y	Y[1]	Y	Y	Y	Y	Y	Y	Y	Y	Y
CERTUS INT'L Certus	$189	Y	Y	Y[1]	Y	Y	Y	Y	N	Y	Y	Y	N
COMMCRYPT Detect Plus	$149	N	N	N	Y	Y	N	N	N	N	N	N	[illegible]
COMNETCO Virusafe	$80	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DIVERSIFIED COMPUTER PRODUCTS & SERVICES PC Doctor	$180	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ELIASHIM MICROCOMPUTER ViruSafe	$80	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ENIGMA LOGIC SafeWord Virus-Safe	$63	N	N	N	Y	Y	Y	N	N	N	N	N	N
FIFTH GENERATION SYSTEMS Mace Vaccine	$99	N	N	N	Y[2]	N	Y	Y	Y[3]	Y	Y	Y	Y
G4 SOFTWARE Virotect Professional	$95	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	N
HUGHES DATA SYSTEMS Virus Check	$40	N	N	N	Y	N	N	N	N	N	N	N	N
IMSI VirusCure Plus	$100	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
INTERNATIONAL SECURITY TECHNOLOGY Virus-Pro	$50	N	N	N	Y	Y	N	N	N	N	N	N	N
INTERPLAY PRODUCTIONS Virus Guard	$15	N	N	N	Y	Y	Y	N	N	N	N	N	N
MICROCOM Virex-PC	$130	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
ONTRACK COMPUTER SYSTEMS Dr. Solomon's Anti-Virus Toolkit	$280	Y	Y	Y[1]	Y	Y	N	N	N	N	N	N	N
PARSONS TECHNOLOGY Virucide	$49	Y	Y	Y[1]	N	N	N	N	N	N	N	N	N
PC GUARDIAN Virus Prevention Plus	$125	Y	Y	Y	Y[2]	Y	Y	Y	Y	Y	Y	Y	N
POP COMPUTER PRODUCTS HardDrive Overlord	$100	Y	Y	Y[1]	Y[2]	Y	Y	Y	Y	Y	Y	Y	Y
RG SOFTWARE SYSTEMS Vi-Spy	$250	Y	Y	Y[1]	Y[2]	Y	Y	N	N	N	N	N	N[4]
SOFTWARE CONCEPTS DESIGN FluShot+	$15	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SYMANTEC Norton AntiVirus	$129	Y	Y	Y[1]	Y	Y	Y	Y	Y[3]	Y	Y	Y	Y
SYSTEMS PERIPHERALS ThunderByte[5]	$149	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
TCP TECHMAR COMPUTER PRODUCTS AntiVirusPlus	$100	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	Y
TREND MICRO DEVICES PCcillin[5]	$139	Y	Y	Y[1]	N	Y	Y	Y	Y[3]	Y	Y	N	Y
WORLDWIDE SOFTWARE Vaccine	$100	Y	Y	N	Y	[6]	Y	Y	Y	Y	Y	Y	Y

[1]Not EMS or extended memory.
[2]Key system files only.
[3]All except BAT.
[4]Only gives warning.
[5]Includes hardware component.
[6]Boot sector only.

Logs suspect activity	Removes virus	Network support	Reader service no.
Y	N	N	761
N	Y	Y	762
Y	Y	Y	763
N	Y	Y	764
Y	Y	Y	765
Y	Y	Y	766
Y	Y	Y	767
Y	N	Y	768
N	N	Y	769
Y	N	Y	770
N	Y	N	771
Y	Y	Y	772
Y	N	Y	773
N	N	N	774
Y	Y	Y	775
Y	Y	Y	776
Y	Y	Y	777
Y	Y	Y	778
N	N	N	779
N	Y	Y	780
N	N	Y	781
Y	Y	Y	782
Y	Y	Y	783
Y	Y	Y	784
N	N	Y	785
Y	Y	Y	786

For more information about all the products in this table, circle reader service no. 916.

including writing to COM and EXE files, device drivers, overlays, and operating system files. They also thwart attempts to deface the hard disk boot sector or partition table. In addition, they prevent reformatting and low-level track writes to the hard disk.

When monitor software detects something fishy, it flashes a warning on the screen or, if commanded, silently blocks the behavior and logs it. Some monitors remove a virus if they find one, and some network-proficient programs warn the administrator when they spot something aberrant on a workstation PC. Look for a monitor that gets into the system at boot-up ahead of DOS (that's when some viruses creep in) and performs a quick integrity check on critical files.

Before you buy any kind of virus-fighting product, find out what kind of help the vendor will give if a virus lays siege to your PC in spite of the product. Will you be put on hold for an hour, or will a company SWAT team spring into action to help recover your mangled data base records?

SECURITY PRODUCTS

By blocking access to your system, security products protect your PC more efficiently and reliably than virus fighters can alone. Key administrative features to look for are the ability to assign different security levels and the ability to password-protect specific files and directories. Some programs even allow you to assign users specific access rights, like read-only access, to designated files or subdirectories.

MARK ROSENTHAL

Other important ways to prevent tampering include the abilities to prevent booting from the floppy drive and to prevent hard disk reformatting. Also look for audit trails, "time-out" (this locks up the PC if no key is pressed for a given length of time), and the ability to "wipe" deleted files so there's no trace of them on the hard disk. If you want files or applications to be scrambled or encrypted after each use, look for a product that encrypts automatically.

Many security products come with hardware for added protection. The add-ons include cards to protect your PC from interference at start-up (from either a user or a virus). Some cards even protect the PC's clock from tampering—something an intruder might do to doctor the audit trail.

THE PEACE-OF-MIND QUOTIENT

Any virus-fighting or security product you purchase should be easy to install, uninstall, and maintain. Packages that let you assign access rights by application or project, for example, are easier to set up and maintain than ones that require you to type in file names until you drop.

Ultimately, your PC can never be too secure; at the same time, security should never get in the way of work. The best PC security regimen accommodates a user's need for comfort while providing an administrator with peace of mind.

(continues)

Judy Heim is a contributing editor for PC World.

WHERE TO BUY

Abacus
5370 52nd St. SE
Grand Rapids, MI
49512
800/451-4319,
616/698-0325 (fax)

Byte Brothers
3602 Lake
Washington Blvd. N
Renton, WA 98056
206/271-9567,
206/227-9702 (fax)

Centel Federal Systems, Inc.
Information Security
Division
11400 Commerce
Park Dr.
Reston, VA 22091
800/843-1132,
703/758-7320 (fax)

Central Point Software
15220 N.W.
Greenbrier Pkwy.
Beaverton, OR 97006
503/690-8090,
503/690-8083 (fax)

Certus Int'l
13110 Shaker Sq.
Cleveland, OH 44120
800/722-8737,
216/752-8188 (fax)

Command Software Systems
1061 E. Indiantown
Rd. #210
Jupiter, FL 33477
800/423-9147,
407/575-3026 (fax)

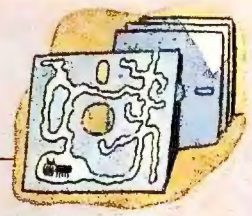
SECURITY PRODUCTS

I = Integrity checks M = Monitors S = Scans

Company Product	List price	Memory required (K)	ADMINISTRATIVE FEATURES: Network support	Windows 3.0 support	Multiple administration levels	Protects individual files/ directories	Operation can be transparent to user	Audit trail	One-time setup on multiple PCs	PROTECTION FEATURES: Prevents hard disk accesss if booted from floppy	Prevents hard disk reformatting	Prevents efforts to bypass DOS	Built-in virus protection
BYTE BROTHERS Computer Lock[1]	$79.95	4	Y	Y	N	N/N	Y	Y[2]	N	N	Y	N	N
CENTEL FEDERAL SYSTEMS PC/Assure[4]	$399	8	Y	Y	Y	Y/Y	Y	Y	Y	Y	Y	Y	I, M
COMMAND SOFTWARE SYSTEMS Security Guardian [1]	$250	15	Y	Y	Y	Y/Y	Y	Y	Y	Y	Y	Y	Y
DATAMEDIA Personal Securecard [4]	$495	14	Y	Y	N	N/N	Y	N	N	Y	Y	Y	N
ENIGMA LOGIC PC-Safe II	$175	6–12	Y	Y	N	N/N	Y	Y	Y	Y	N	N	N
FIFTH GENERATION SYSTEMS DiskLock PC	$189	12	Y	Y	Y	Y/Y	Y	Y	N	Y	Y	Y	N
FISCHER INTERNATIONAL SYSTEMS Watchdog[1]	$295	17–58	Y	Y	N	Y/Y	Y	Y	Y[5]	Y	Y	Y	I, M
G4 SOFTWARE Turboloc	$95	22	Y	N	N	Y/Y	Y	Y	Y	Y	Y	Y	N
GOLDEN BOW SYSTEMS Vlock [4]	$135	60	Y	Y	Y	Y/Y	N	N	N	Y	Y	Y	N
HARCOM SECURITY SYSTEMS PC Watchman	$59	4	Y	Y	N	N/N	Y	N	N	N	Y	N	N
HUGHES DATA SYSTEMS SecurePC	$140	384	Y	Y	Y	Y/Y[6]	Y	Y	Y	Y	Y	Y	I
KINETIC SOFTWARE Access II	$165	17–70	N	N	Y	Y/Y	N	Y	N	Y	Y	Y	M
MICRONYX Triumph[4]	$195	53	Y	N	Y	Y/N	Y	Y	Y	N	N	Y	
PANDA SYSTEMS Dr. Panda Utilities	$40	4	Y	Y	Y	N/N	Y	N	Y[5]	N	Y	Y	I, M
PORAK COMPUTING SERVICES System Manager	$250	64	Y	N	Y	N/N	Y	N	N	N	N	N	N
PYRAMID DEVELOPMENT PC/DACS	$249	4–50	Y	Y	Y	Y/Y	Y	Y	Y	Y	Y	Y	Y[3]
SECURITY MICROSYSTEMS Lockit Extended[1]	$130	9	Y	Y	Y	N/Y	Y	Y	Y	Y	Y	Y	M
SILVER OAK SYSTEMS DiskManagerPC	$100	15	Y	Y	Y	Y/Y	Y	Y	Y	Y	Y	Y	M
SOFTWARE DIRECTIONS Softsafe	$149	50	N	N	Y	Y/Y	Y	Y	N	Y	Y	Y	I
SOPHCO Protec	$295	80	Y	N	Y	Y/Y	N	Y	Y	Y	Y	N	S
SYSTEMS CONSULTING Hands Off the Program	$90	7	Y	Y	Y	Y/Y	Y	Y	N	Y	Y	Y	N
TCP TECHMAR COMPUTER PRODUCTS Disklock-Plus	$190	10–18	N	Y	N	N/Y	Y	N	N	Y	Y	N	N
TGR SOFTWARE SCUA Plus	$250	16	Y	Y	Y	N/Y	Y	Y	Y	Y	Y	Y	I
THUMBSCAN Softboot	$200	2.5–40	Y	Y	Y	N/Y	Y	Y	Y	Y	Y	Y	M
X-LOCK SoftLock	$79–$249	4–32	Y	Y	N	Y/Y	Y	Y	Y	Y	Y	Y	I, M, S

[1] Optional add-on card protects hard disk.
[2] Audits log-ons only.
[3] Only encrypts some DOS files.
[4] Includes hardware component.
[5] All PCs must have identical hard disk file system for group setup.
[6] Extra-cost option.

MARK ROSENTHAL



Protects printers and ports	Time-out at application level	Auto-encryption	Wipes deleted files	Reader service no.
N	N	Y[3]	N	790
Y	Y	Y	Y	791
Y	Y	Y	Y	792
Y	N	N	N	793
N	Y	Y	N	794
N	Y	N	N	795
Y	Y	Y	Y	796
Y	N	N	Y	797
N	N	N	N	798
N	Y	N	N	799
N	Y	Y[6]	Y	800
Y	Y	N	N	801
N	Y	Y	Y	802
N	N	N	N	803
N	Y	N	Y	804
Y	Y	Y[3]	Y	805
N	Y	Y[6]	Y[6]	806
N	Y	Y	N	807
N	Y	Y	Y	808
N	Y	Y	N	809
Y	Y	Y	Y	810
Y	Y	Y[3]	N	811
Y	Y	N	N	812
Y	Y	Y	N	813
Y	Y	N	N	814

For more information about all products in this table, circle reader service no. 917.

Commcrypt, Inc.
10,000 Virginia Manor Rd. #300
Beltsville, MD 20705
301/470-2500,
301/470-2507 (fax)

ComNetco, Inc.
7 Hilltop Rd.
Mendham, NJ 07945
201/543-4060,
201/543-2729 (fax)

Datamedia Corp.
20 Trafalgar Sq.
Nashua, NH 03063
800/362-4636,
603/886-1782 (fax)

Diversified Computer Products & Services, Inc.
P.O. Box 579
Swampscott, MA 01907
617/592-9001

EliaShim MicroComputer
520 W. Hwy 436
Altamonte Springs, FL 32714
800/771-7233,
407/869-1409 (fax)

Enigma Logic, Inc.
2151 Salvio St. #301
Concord, CA 94520
415/827-5707,
415/827-2593 (fax)

Fifth Generation Systems
10049 N. Reiger Rd
Baton Rouge, LA 70809
800/873-4384,
504/295-3268 (fax)

Fischer Int'l Systems Corp.
4073 Merchantile Ave.
Naples, FL 33942
800/237-4510,
813/643-3772 (fax)

g4 Software
2633 Manhattan Beach Blvd.
Redondo Beach, CA 90278
800/486-9552,
213/536-9796 (fax)

Golden Bow Systems
842 E. Washington St., Ste. B
San Diego, CA 92103
800/284-3269,
619/298-9950 (fax)

Harcom Security Systems Corp.
130 William St.
New York, NY 10038
212/766-1802,
212/732-0596 (fax)

Hughes Data Systems, Inc.
319 S.W. Washington
Portland, OR 97204
503/243-1029,
503/223-3667 (fax)

International Microcomputer Software, Inc.
1938 Fourth St.
San Rafael, CA 94901
800/833-4674,
415/454-8901 (fax)

International Security Technology
515 Madison Ave. #3200
New York, NY 10022
212/288-3101,
212/644-6828 (fax)

Interplay Productions
3710 S. Susan #100
Santa Ana, CA 92704
800/969-4263

Kinetic Software
240 Distillery Commons
Louisville, KY 40206
502/583-1679,
502/583-1104 (fax)

Microcom, Inc.
P.O. Box 51489
Durham, NC 27717
919/490-1277,
919/490-6672 (fax)

Micronyx, Inc.
1901 N. Central Expwy.
Richardson, TX 75080
800/634-8786,
214/690-1733 (fax)

Ontrack Computer Systems, Inc.
6321 Bury Dr. #16–19
Eden Prairie, MN 55346
800/752-1333,
612/937-5815 (fax)

Panda Systems
801 Wilson Rd.
Wilmington, DE 19803
302/764-4722,
302/764-6186 (fax)

Parsons Technology
375 Collins Rd. NE
Cedar Rapids, IA 52402
800/223-6925,
319/393-1002 (fax)

PC Guardian
118 Alto St.
San Rafael, CA 94901
800/288-8126,
415/459-1162 (fax)

POP Computer Products, Inc.
P.O. Box 1389
Evergreen, CO 80439
303/674-0200,
303/670-6312 (fax)

Porak Computing Services
2613 Flintridge Dr.
Colorado Springs, CO 80918
719/593-1187,
719/594-6669 (fax)

Pyramid Development Corp.
70 Inwood Rd.
Rocky Hill, CT 06067
203/257-4223,
203/257-4245 (fax)

RG Software Systems, Inc.
6900 E. Camelback Rd. #630
Scottsdale, AZ 85251
602/423-8000,
602/423-8389 (fax)

Security Microsystems
215 Cromwell Ave.
Staten Island, NY 10305-1309
800/345-7390,
718/667-0131 (fax)

Silver Oak Systems
8209 Cedar St.
Silver Spring, MD 20910
301/585-8641,
215/790-0504 (fax)

Software Concepts Design
594 Third Ave.
New York, NY 10016
212/889-6431,
212/889-9730 (fax),
212/889-6438 (BBS)

Software Directions, Inc.
1572 Sussex Tnpk.
Randolph, NJ 07869
800/346-7638,
201/584-7771 (fax)

Sophco, Inc.
P.O. Box 7430
Boulder, CO 80306
800/922-3001,
303/444-1454 (fax)

Symantec Corp.
10201 Torre Ave.
Cupertino, CA 95014-2132
800/441-7234,
408/252-3570 (fax)

Systems Consulting
103 Brilliant Ave.
Pittsburgh, PA 15215
412/781-5280,
412/963-1624 (fax)

Systems Peripherals
134 Newbury St.
Peabody, MA 01960
508/535-6196,
508/535-6191 (fax)

TCP Techmar Computer Products
98-11 Queens Blvd.
Rego Park, NY 11374
800/922-0015,
718/520-0170 (fax)

TGR Software, Inc.
2 Ravinia Dr. #330
Atlanta, GA 30346
404/390-7450,
404/390-7455 (fax)

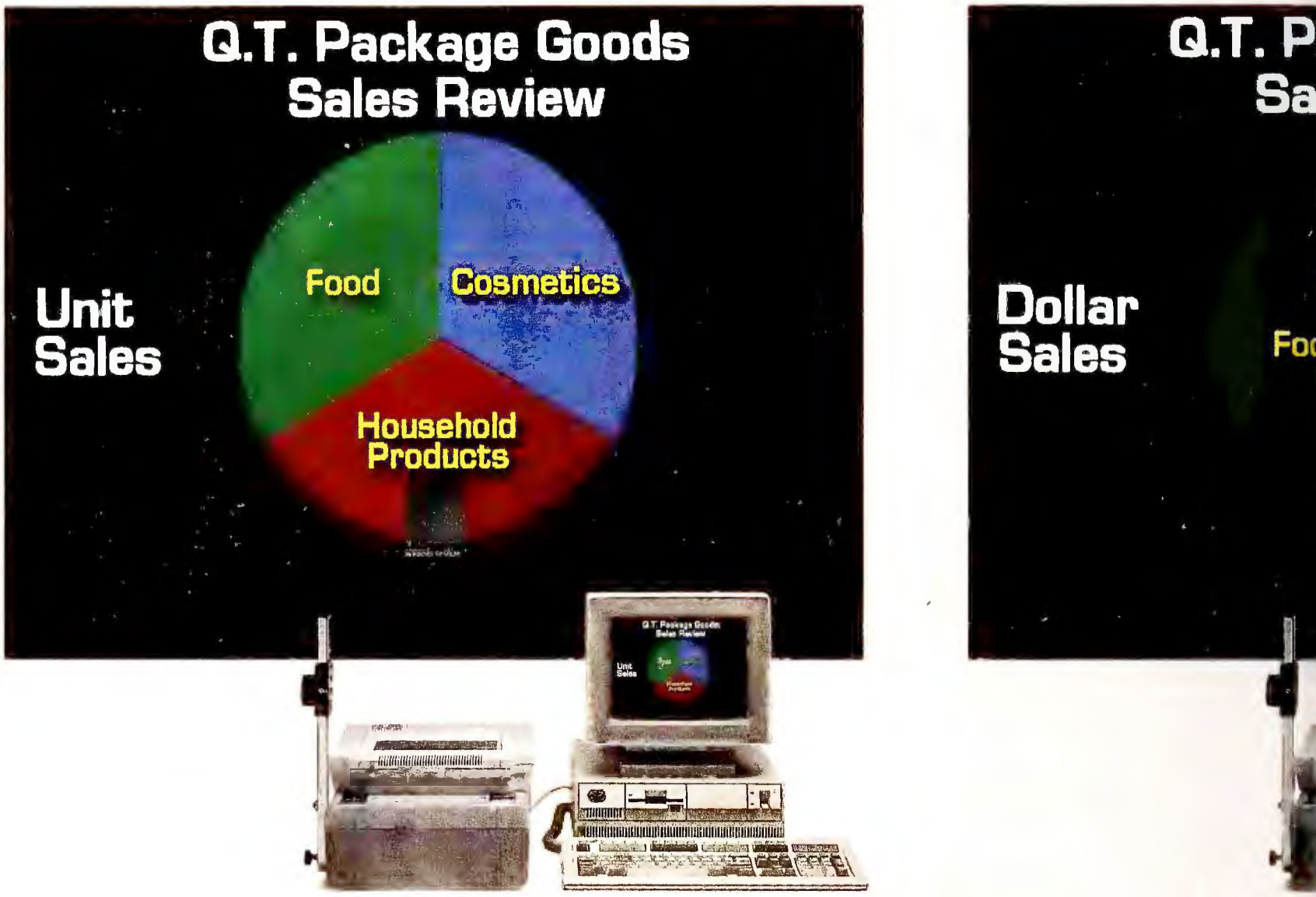
ThumbScan, Inc.
1919 S. Highland Ave. #118-C
Lombard, IL 60148
708/932-8844,
708/495-0279 (fax)

Trend Micro Devices, Inc.
2421 W. 205th St.
Torrance, CA 90501
800/228-5651,
213/328-5892 (fax)

WorldWide Software, Inc.
20 Exchange Pl.
New York, NY 10005
212/422-4100,
212/422-1953 (fax)

X-Lock Corp.
2001 Westside Pkwy.
Alpharetta, GA 30201
404/475-8787,
404/740-8050 (fax)

How to make accommodate every



TOM: "Well, that's an accurate presentation of unit sales, but what I'd like to know is dollar sales...."

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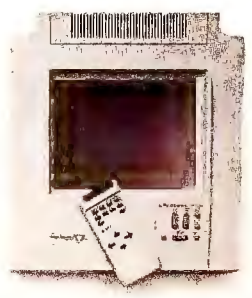

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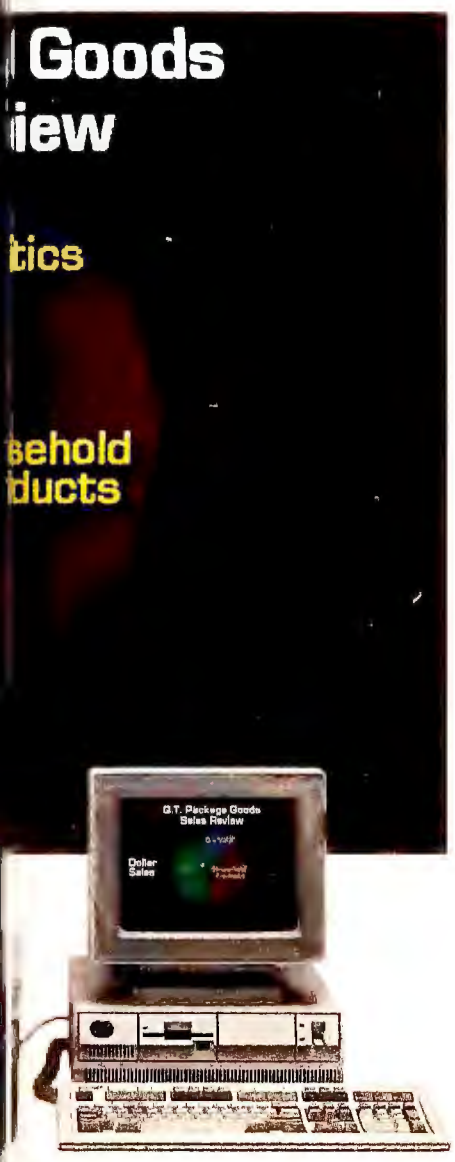
our presentation
m, Dick and Harriet.



K: "That was certainly k. Have you got any data on actual costs of goods?"

HARRIET: "That's not a pretty picture for the cosmetics division. By the way, do you think you could help me out on this presentation I'm giving tomorrow...."

sions. And tailor your presentation to accom-date every member of your audience. On spot.

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Circle 120 on reader service card

"...a godsend...it's quick and easy enough to make backup, finally, a daily habit."
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"Norton Backup clearly excels in ease of use, yet it doesn't compromise performance or features."
—PC World

"The Norton Backup has all the features you'll need to make the chore of backing up your hard disk a convenient and reliable one...it may even help you pick up the backup habit."
—InfoWorld

"Only Norton lets you back up multiple logical drives in a single step—a boon for users with partitioned hard disks."
—PC World

"Norton Backup is impressively fast...offers a high level of reliability and convenience at moderate cost."
—InfoWorld

"...its slick on-line help system makes the manual superfluous. [It] easily earns our Best Buy award."
—PC World

"Norton Backup ran smoothly and without error. We fed it faulty disks, disks of the wrong density, and already-filled disks from the same backup set, and it handled our forced errors without a twitch, popping up error messages that explained the problems clearly."
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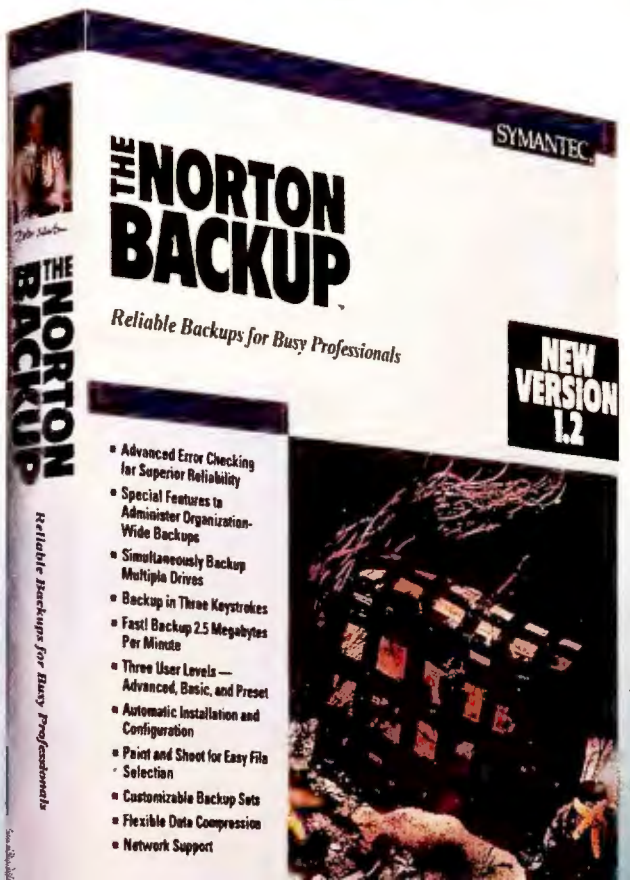

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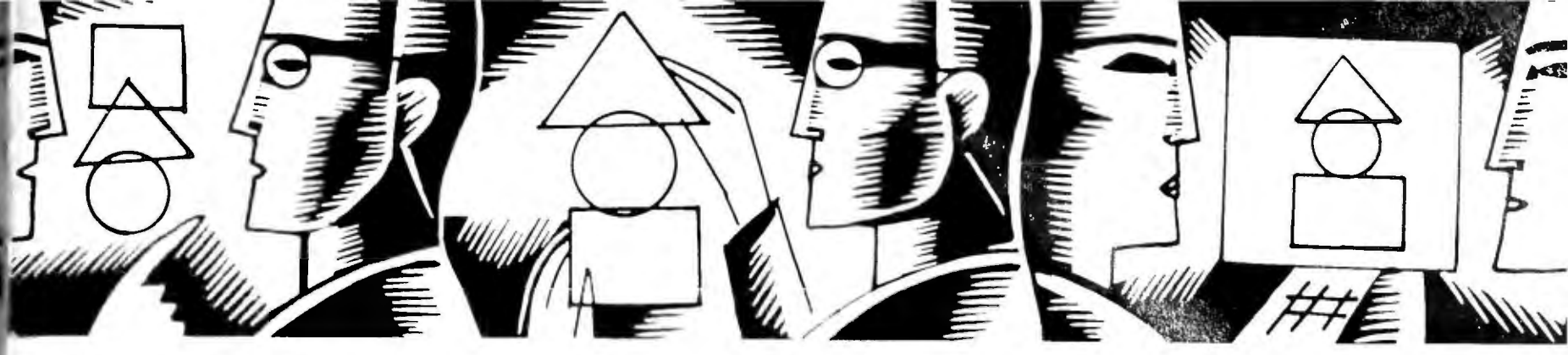

STAR-DOT-STAR *.*

A global exchange of personal computer discoveries

Run Windows 2 programs in 386 Enhanced mode, enter 1-2-3 dates in fewer keystrokes than ever before, format disks without cryptic codes, abort the DOS 'Abort' and 'Retry' options, get rid of strange LaserJet characters for good, learn about a better sort of sort, and check your programs for C sickness before they sail.

Edited by Brett Glass

Let's Get Real

Older, *Windows 2*-based software won't run in *Windows 3*'s Enhanced mode—or will it? These programs *will* run under *Windows 3*'s Real mode—and you can run Real mode *Windows* inside the Enhanced mode. You can even exchange data between newer and older *Windows* programs via the Clipboard.

For each *Windows 2* application, create a PIF file using the *Windows* PIF Editor: Enter **c:\windows\win.com** in the Program Filename text box and an appropriate name for Window Title. In the Optional Parameters text box, enter **/r** and a space, followed by the drive, path, and file name and extension of the *Windows 2* application. If, for example, the application is *Excel* and it's stored in a drive C: directory called EXCEL, you'd enter **/r c:\excel\excel.exe**. Fill in the Start-up Directory text box, and adjust the memory requirements as needed. Save the PIF file with an appropriate name, such as EXCEL-R.PIF.

Then, in a Program Manager window, create a Program Item icon for each of these new PIF files by choosing *New* from the File menu. and selecting *Program Item.* Type in an appropriate description and for the command line, type the name of the PIF file (you can include its path, as in **c:\windows\excel-r.pif**). The Program Manager will display a standard DOS icon labeled with your description. You can now run the application—in Real mode—by double-clicking that icon.

Pressing **<Alt>-<Tab>** (which moves you between *Windows* tasks) will switch you back to the Enhanced mode environment. But when you're finished with your application and select *File Exit,* watch out. Once the application's gone, you'll still be in Real mode, with a Program Manager on your screen that looks identical to the Enhanced mode Program Manager. You'll need to close this Real mode *Windows* session before exiting the Enhanced mode session that contains it.

If you don't want to bring up a Real mode Program Manager for every Real mode application you run, make a single PIF file called WINR.PIF, using **c:\windows3\win.com** as the program file name, and simply **/r** as the optional parameter. Make a Program Item for that PIF file, and label it **Real mode Windows**. You can run several Real mode applications within this one session, subject to memory constraints. Those applications can exchange data with Enhanced mode applications via the Clipboard.

Ross Allen
Belmont, California

Editor's note: If you use this technique, remember that running one Windows *session inside another means less memory for all your applications. Unless you can't live without your old software, you may want to price* Windows *3 upgrades while they're still available. If you wait too long, you may have to buy the new version at the full price.*

Serious Dating

I used to be annoyed, when performing my accounting duties, at how inconvenient it was to enter numerous dates in *1-2-3.* I therefore developed the following three macros for *1-2-3* version 2.2 that let me enter dates easily and without complicated formulas [see **FIGURE 1**].

Use **<Alt>-X** if the dates vary between years. To enter July 3, 1991, for example, press **<Alt>-X**, then type **91703** or **910703**. In either case, the result in your worksheet will be '07/03/91'.

If all the dates you're entering are in the same year, you can save even more keystrokes by typing **<Alt>-Y**, which uses a default from a cell labeled 'year'. In this example, July 7, 1991, is entered as **707** or **0707**.

Use **<Alt>-Z** if all dates are in the same month: July 5, 1991, is then entered as **5** or **05**. Set the 'year' and

(continues)

ANTHONY RUSSO

Recycle

Everyone wants more productivity out of their computers.

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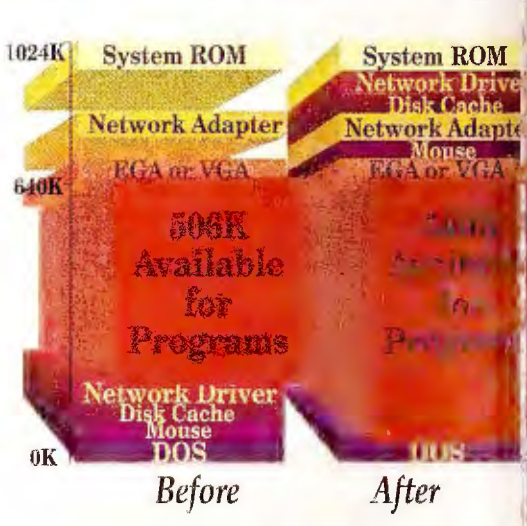
Number on

QEMM 50/60 is designed to work in IBM® PS/2™ Model 50 and 60 PCs with specific IBM adapter boards.

QEMM is the #1 selling utility according to distribution sources. In fact, it was the number one selling



Before *After*

software package in the PC industry April, May and June 1990.

These are some of DESQview's most recent awards

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your PC

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INFO WORLD BEST IN ITS CLASS Dec. 18, 1989

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```
@echo off
set pos=1
set fil=%1
set order=%2
if not "%2"=="" goto FIND
set order=%1
set fil=*.*
:FIND
if "%order%"=="N" set pos=1
if "%order%"=="n" set pos=1
if "%order%"=="E" set pos=9
if "%order%"=="e" set pos=9
if "%order%"=="S" set pos=14
if "%order%"=="s" set pos=14
if "%order%"=="D" set pos=24
if "%order%"=="d" set pos=24
if "%order%"=="T" set pos=34
if "%order%"=="t" set pos=34
dir %fil% | sort /+%pos% | more
set pos=
set fil=
set order=
```

LISTING 2: DS.BAT displays your directory in the sort order you prefer. The last three statements in this version delete environment variables that are no longer needed.

mand for sorting by date ignores years, so that '1-05-91' lists before '12-28-88'. I prefer sorting by year, so I use **pos=30** to do just that.

Kenneth Metz, Jr.
Duncanville, Texas

Editor's note: Cleaning up the environment is always a good idea. Many astute readers noticed that the date and time sorts in DS.BAT err because the DIR command does not normally produce dates and times that can be sorted alphabetically. Starting the sort in column 30, as Mr. Metz suggests, gets the year right but not the month or day.

After pondering this problem for a while, it dawned on me that there's a different fix that causes the original DS.BAT to sort everything *correctly (provided you don't mind seeing dates and times in a slightly different format). The COUNTRY= CONFIG.SYS statement lets you change the way dates and times are printed to match different countries' conventions, and use easily sortable conventions, such as Sweden, France, and Canada's '91-07-19' dates.*

To use DS.BAT as is, include the statement **COUNTRY=002,,C:\DOS\COUNTRY.SYS** *on one line in your CONFIG.SYS, adjusting the path in C:\DOS\COUNTRY.SYS if needed. The syntax may vary among DOS versions, so consult your manual for the right country code.*

This trick will work for another nine years, until the year wraps to '00'. After that, we'll have to come up with yet another fix for this batch file—or use a utility that looks at the entire date. Bill Claff's ShareWare program ! (pronounced bang!*) is one such utility; you may want to look for it on your favorite BBS or on-line service.*

Brett Glass is a contributing editor for PC World.

Have a macro, batch file, short program, or general tip you're proud of? Star-Dot-Star *pays $25 to $200 per tip used. Send your tips to* Star-Dot-Star, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail 179-3813; or 415/442-1891 (fax). We cannot acknowledge submitted materials.*

POWER TIP NO. 191

Where's That RAM?

More and more VGA boards are sporting 512K or 1MB of RAM. But if you check video RAM with the current version of programs like CheckIt, System Sleuth, or Norton Utilities, they show only 256K. Don't worry, the RAM exists—there's just no standard BIOS call for reporting the amount of video memory beyond 256K.

Robert Luhn
Contributing Editor

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PC WORLD

Instant Reference Card #14

For use with PC World Instant Reference Card Portfolio

BASICS: Q&A 4.0

What to do: The main menu gives you access to *Q&A*'s five components–word processor Write, and data base components File, Report, Utilities, and Intelligent Assistant. You select o menu option by typing the letter preceding it, or by moving the cursor to the option and pressing **<Enter>**, or by clicking on the option with the mouse. Most instructions require **<Enter>** for completion.

Q&A OVERALL

Return to previous option	**<Esc>**
Continue/proceed	**<F10>** (sometimes **<Enter>**)
Get Help	**<F1>**
Exit to DOS	**<Esc>** to main menu, **x**

USING Q&A WRITE

Creote new file	Write, Type/Edit
Get existing file	Write, Get, type file name, **<Enter>**
Clear memory for new file	Write, Clear
Save file	**<Shift>-<F8>**, type file name, **<Enter>**
Undo/restore text	**<Shift>-<F7>**
List all files and open one	Write, Get, erase file nome defaults, **<Enter>**, move cursor to file name, **<F10>**

Getting Around

Go to beginning/end of line	**<Home>/<End>**
Go to top/bottom of screen	**<Home>/<End>** twice
Go to top/bottom of page	**<Home>/<End>** three times
Go to beginning/end of document	**<Home>/<End>** four times
Go to page or line number	**<Ctrl>-<F7>**, type page/line number
Scroll up/down	**<F9>/<Shift>-<F9>**
Seorch ond replace	**<F7>**

Manipulating Text

Delete line	**<Shift>-<F4>**
Delete to end of line	**<Ctrl>-<F4>**
Delete word	**<F4>**

Note: To work with text as a block, ploce the cursor on the first character, then select a function from the list below.

Copy block	**<F5>**, select block, **<F10>**, move cursor to new location, **<F10>**
Copy block to file	**<Ctrl>-<F5>**, select block, type file name, **<Enter>**
Move block	**<Shift>-<F5>**, select block, **<F10>**, move cursor to new locotion, **<F10>**
Move block to file	**<Alt>-<F5>**, select block, type file name, **<Enter>**
Delete block	**<F3>**, select block, **<F10>**

Tip: The following two commands give access to mony of Write's features.

Text enhancement-choices	**<Shift>-<F6>**
Editing options	**<F8>**

USING Q&A FILE

Create new file	File, Design file, Design o new file, type file nome, **<Enter>**
Redesign existing file	File, Design file, Redesign a file, type file nome, **<Enter>**
Sove file	**<Shift>-<F10>**

USING Q&A File (continued)

Go to another menu or spec	**<Shift>-<F9>**
Import/export file	File, Utilities, Import data/Export data

Getting Around

Go to next record	**<F10>**
Go to last record	**<F9>**
Go to next field	**<Cursor Up>** or **<Cursor Down>** or **<Tab>** or **<Shift>-<Tab>**
Go to beginning/end of field	**<Home>/<End>**
Go to top/bottom of page	**<Home>/<End>** twice
Go to beginning/end of form	**<Home>/<End>** three times
Go to beginning/end of file	**<Ctrl>-<Home>/<Ctrl>-<End>**
Go to previous page of form	**<Page Up>**
Go to next page of form	**<Page Down>**

Manipulating Data

Add new records	File, Add data, type file name, **<Enter>**, type dato, **<F10>**
Add data from Update mode	**<Ctrl>-<F6>**
Delete character	**<Backspace>** or **<Delete>**
Delete word	**<F4>**
Delete line	**<Shift>-<F4>**
Delete record	**<F3>**
Insert current date/time	**<Ctrl>-<F5>/<Alt>-<F5>**

Retrieve/Sort Records

Search from main menu	File, Search/Update, type file nome, **<Enter>**, fill in retrieve specs, **<F10>**
Search from within data base	**<F7>**, fill in retrieve specs, **<F10>**
Sort from main menu	File, Seorch/Update, type file nome, **<Enter>**, **<F8>**, type sort spec, **<F10>**
Sort from within data base	**<F7>**, **<F8>**, type sort spec, **<F10>**

Tip: To save retrieve specs or sort specs, fill in the requirements, **<Shift>-<F8>**, type spec name, **<Enter>**. To retrieve saved specs, **<Alt>-<F8>**, select spec name, **<Enter>**, **<F10>**.

Design a New Form

Creote field	From Design/Redesign file, type *field label:* (with ending colon)
Create fixed-length field	type *field label:...>* or *field label<...>*
Create title	Type *label* without colon or bracket
Insert blank line	**<Insert><Enter>**
Editing options	**<F8>**
Insert/overtype	**<Insert>** (toggle)

Form and Table Views

Display Table View	**<Alt>-<F6>**
Return to Form View	**<F10>**
Redefine Table View	**<Shift>-<F6>**, type sequence, **<F10>**
Edit Mode in Table View	**<F5>**
Exit Edit Mode in Toble View	**<F10>**
Expond field length	**<F6>**

Print

Print one record	**<F2>**, set Print Options, **<F10>**
Print oll records	**<Ctrl>-<F2>**, set Print Options, **<F10>**
Print free-form or coordinate report	File, Print, type file name, **<Enter>**, Design/Redesign a Spec, type report name, **<Enter>**, retrieve specs, **<F10>**, field specs, **<F10>**, **<F10>**

Tip: Use Help to determine what parometers to use in setting up o report.

PC WORLD

Instant Reference Card #14

For use with PC World Instant Reference Card Portfolio

ADVANCED: Q&A 4.0

USING Q&A REPORT

For printing simple reports or preprinted forms, use File's free-form or coordinate printing options (see previous page).

Use *Q&A*'s report function for producing more complex columnor or cross-tob reports. Press **<F1>** for guidelines in filling out report specificotions.

Designing Reports

Design columnor report	Report, Design/Redesign report, type file nome, **<Enter>**, type report nome, **<Enter>**, choose Columnor report, fill in retrieve specs, **<F10>**, fill in Column/ Sort specs, **<F10>**, fill in Print options, **<F10>**
Design cross-tob report	Report, Design/Redesign report, type file nome, **<Enter>**, type report nome, **<Enter>**, choose Cross tob report, fill in retrieve specs, **<F10>**, fill in Cross tob specs, **<F10>**, fill in Print options, **<F10>**
Chonge poge size, morgins	From Print options, **<F8>** for Define poge
Redesign report	Report, Design/Redesign report, type file nome, **<Enter>**, type report name, **<Enter>**, fill in retrieve specs, **<F10>**, fill in Column/Sort or Cross tob specs, **<F10>**, fill in Print options, **<F10>**
Creote derived column	From Column/Sort spec or Cross tob spec, **<F8>**, fill in Derived column specs, **<F10>**, fill in Print options, **<F10>**
Sort columnor report	On Column/Sort spec, select fields to be sorted, ofter field ID type AS (oscending sort), DS (descending sort), YS (oscending by yeor), or MS (oscending by month)

Tip: Sort columnor reports when you intend to use o field for control breoks (for such tosks os colculoting totols ond subtotols os key volues chonge).

Print Report

Print from Column/Sort spec	**<F10>,** fill in Print options, **<F10>**
Print from Cross tob spec	**<F10>,** fill in Print options, **<F10>**
Print from moin menu	Report, Print, type file nome, **<Enter>**, type report nome, **<Enter>**, press **<Enter>** for no chonges
Chonge report heoders/footers	From Print options, **<F8>**, **<Tab>** to Heoder or Footer, type heoder or footer text, **<F10>**

Report Giobai Options

Set stondord column width	Report, Set globol options, type file nome, **<Enter>**, Column globol options, set column heoding/widths, type new heoding or widths, **<F10>**
Set columnor formot or defoults	Report, Set globol options, type file nome, **<Enter>**, Columnor globol options, select ond set options, **<F10>**
Set Cross-tob column/row heods, formot, or defoults	Report, Set globol options, type file nome, **<Enter>**, Cross tob globol options, select ond set options, **<F10>**

USING Q&A UTILITIES

Use the moin menu's Utilities to define stondords for *Q&A* os o whole. For tosks thot relote only to doto boses, look ot File Utilities, ond for word processing tosks, Write Utilities.

Printer Tasks

Instoll printer	Utilities, Instoll printer, choose printer, set/select printer port, model ond mode, **<F10>**
Instoll font description files	Utilities, Modify font file, follow directions

Miscellaneous Tasks

DOS list, renome, delete, or copy	Utilities, DOS file focilities, choose utility, **<F10>** to exit focilities
Chonge defoult directory	Utilities, Set globol options, **<Tab>** to directory, retype nome, **<F10>**
Modify moin menu	Utilities, Alternote progroms, type progrom nome, **<Tab>**, type menu selection, **<F10>**

USING Q&A INTELLIGENT ASSISTANT

The Assistont menu contoins two tools thot enoble you to retrieve doto from o doto bose using simple instructions: the Query Guide ond the Intelligent Assistont (IA). The Query Guide provides o structured, menu-driven woy to query the doto bose thot is time-consuming but well suited to beginners. The IA is more free-form, requiring you to type queries in sentences using o speciol syntox ond vocobulory. You con expond its vocobulory os your querying needs increose.

Disploy quick introduction	Assistont, Get ocquointed
Retrieve doto using Query Guide	Assistont, Query Guide, type file nome, **<Enter>**, follow directions
Retrieve doto using IA	Assistont, Ask me to do something, type file nome, **<Enter>**, type request, **<Enter>**, **<Enter>** to verify question
Print results of query	**<F2><F10>**
Define synonym	From request screen, type "Define Synonym" or press **<F8>**, select word function, **<Enter>**, type synonym, **<F10>**
List vocobulory	From request screen, **<F6>**, select type of vocobulory, **<Enter>**, **<Esc>**

Tip: To enoble *Q&A* to onswer your queries more efficiently, you con first define the contents of the fields in your doto bose.

Describe your doto bose to IA	Assistont, Teoch me obout your doto bose, go through options 1 to 6 of Bosic Lessons menu
Describe your doto bose to Query Guide	Assistont, Teoch Query Guide, follow directions os they ore presented

Special Vocabulary

Tip: Use the following terms to define the elements you wont a report to show.

Suppress identifying columns	WNIC – with no identificotion columns
Do not print restricted columns	WNRC – with no restriction columns
Print specified columns only	WNEC – with no extro columns

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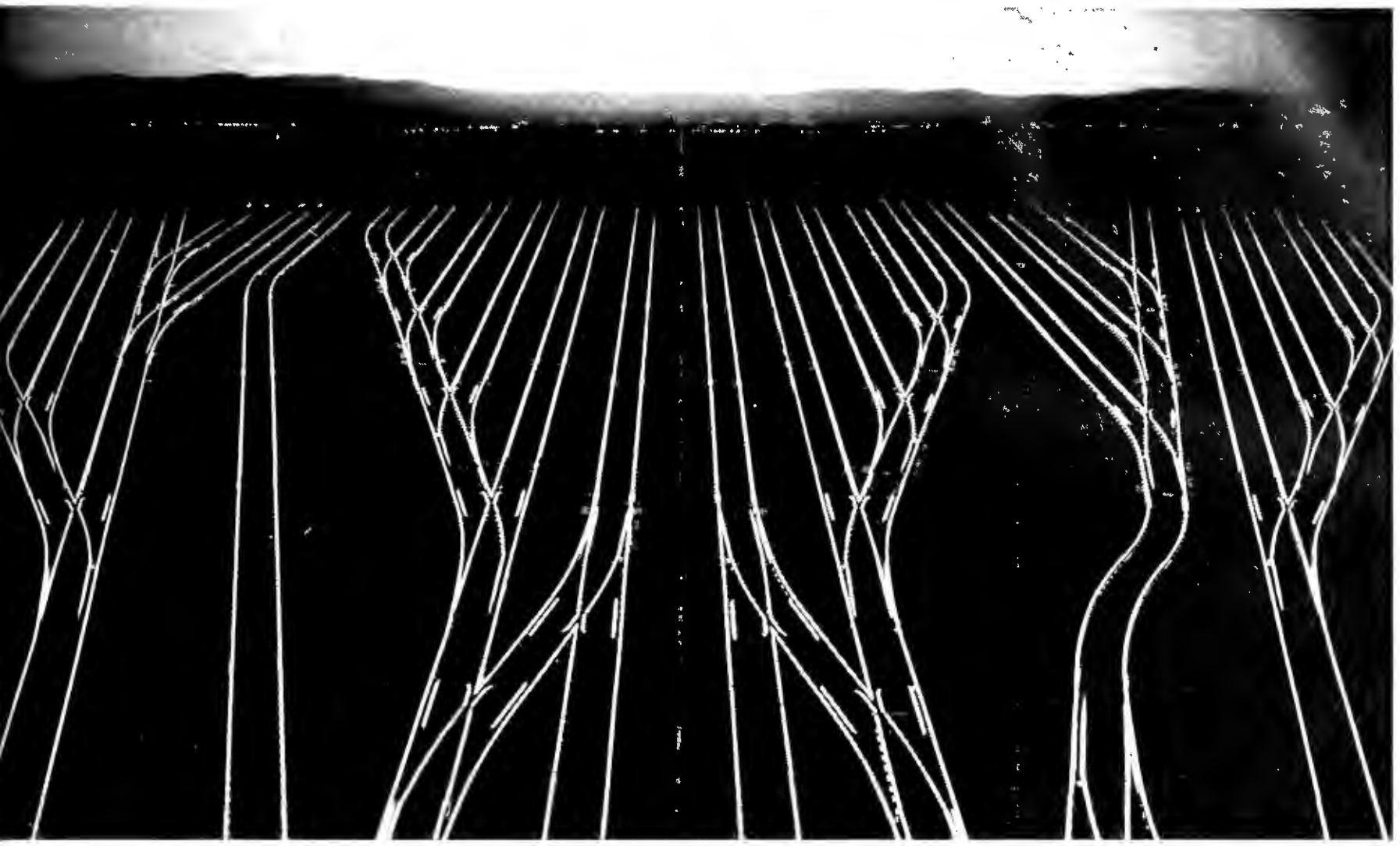

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DEVELOPER'S TOOLBOX

Keeping Your Program in Bounds

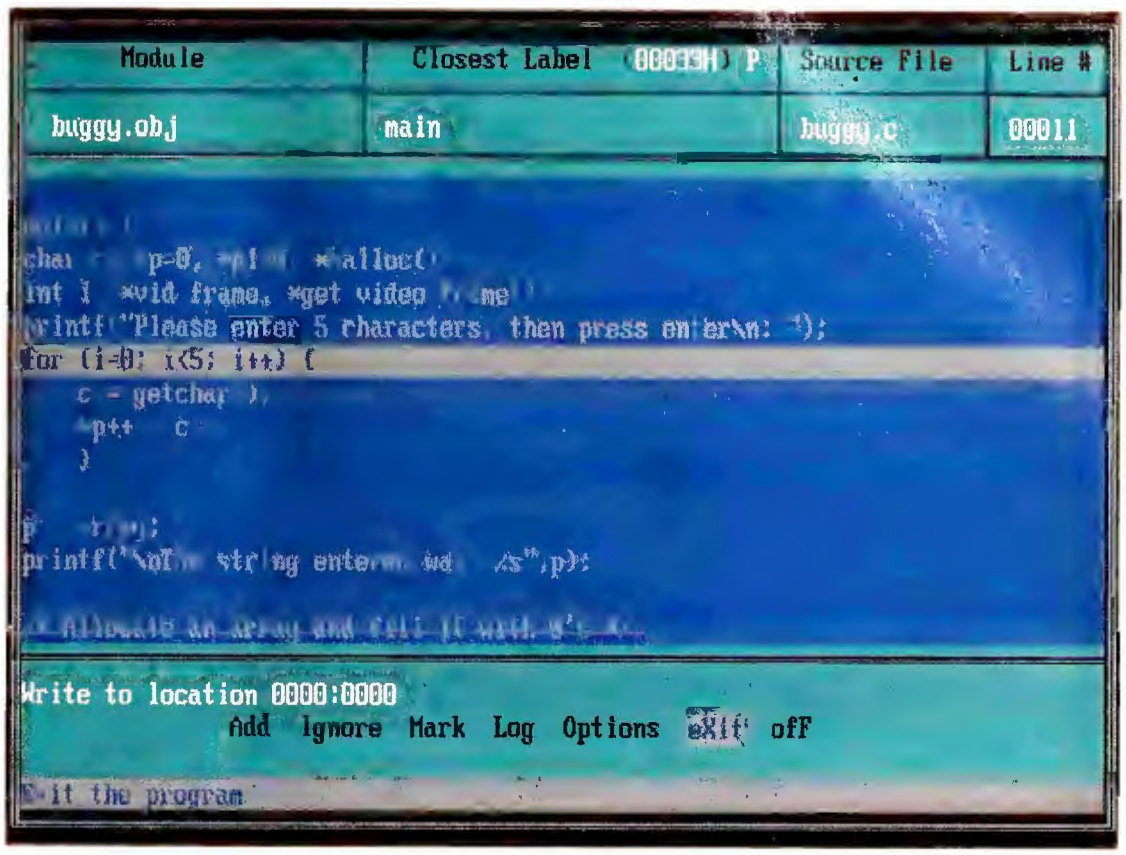
Brett Glass

It's sad but true: Of all the programming languages in use today, the most popular—C—offers virtually no protection against the most common bugs. No matter how expert a C programmer you are, at one time or another you will write a program that reads, or alters, memory it shouldn't be touching—and the compiler won't lift a finger to help you find the problem. And because MS-DOS, unlike OS/2 or UNIX, offers no built-in memory protection, *it* won't notice that anything's amiss either. The result: Many DOS programs are shipped with serious bugs that aren't caught until it's too late.

Enter *Bounds-Checker,* a program from a small New Hampshire company called Nu-Mega Technologies. *Bounds-Checker* loads into your system as a device driver and uses the special memory management features of the 386 or 486 to discover and flag suspicious memory accesses. It requires no modifications to your source code—after compiling, you simply run your MAP or CodeView-compatible EXE file through *Bounds-Checker,* and it shows you where your problems are.

I tried *Bounds-Checker* on two programs: a small sample provided by Nu-Mega with a problem designed in, and a larger C program of my own into which I introduced a wild pointer. In each case, it caught the problem, prevented the program from trashing memory, and recorded the location of the bug for later correction.

The program also flagged some legitimate accesses. When my program looked at variables in the BIOS data area, *Bounds-Checker* initially cried foul. However, it took only a few keystrokes to inform the utility that the reads of low memory were OK—after which my program continued with no false alarms.



Bounds-Checker discovers a pointer that was used before being initialized; a bar highlights the source line where the error occurred.

Bounds-Checker works its magic using the 386's Virtual 8086 mode. It turns on part of the chip called the Paging Unit and watches a program's every move—all memory that doesn't belong to the program is write-protected, and all accesses are monitored.

Because it uses Virtual 8086 mode, *Bounds-Checker* won't run under OS/2 or UNIX, and it won't coexist with memory managers like *QEMM* or *386Max.* At first this may seem like a major inconvenience: I, for one, use *QEMM* to load my disk cache, network drivers, and TSRs into high memory. Fortunately, Nu-Mega has already considered this problem and provided a solution. *Bounds-Checker* comes with its own memory manager, which implements EMS (expanded memory) and XMS (extended memory) and can load TSRs and drivers into memory above 640K. It also has special provisions to let *Bounds-Checker* detect unauthorized memory accesses. The version I tested wouldn't work with enhanced-mode *Windows,* but Nu-Mega is working on a version that will, and it should be out by the time you read this.

Bounds-Checker deserves to be part of every software company's quality assurance program. I've added it to my permanent arsenal of debugging tools—to be used whenever I'm caught short by a frustrating bug or want to make sure a program isn't doing something it shouldn't be doing. More modern languages, such as Pascal and Ada, are less likely to produce programs that run out of bounds, but it always pays to check—especially if you're programming in C.

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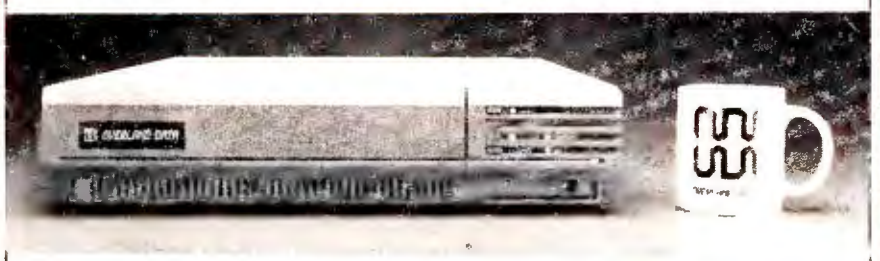

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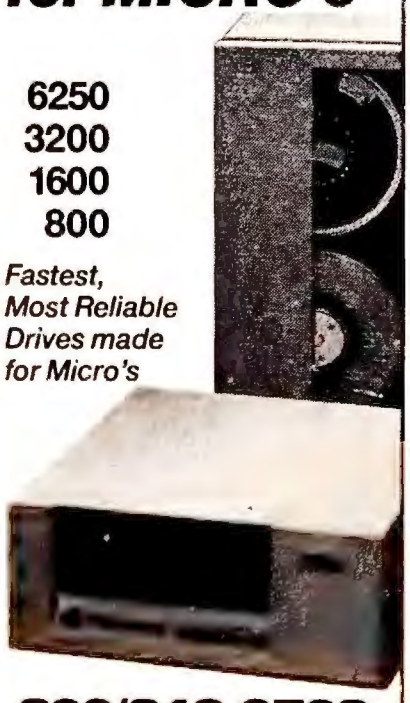

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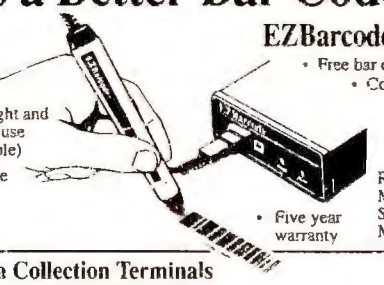

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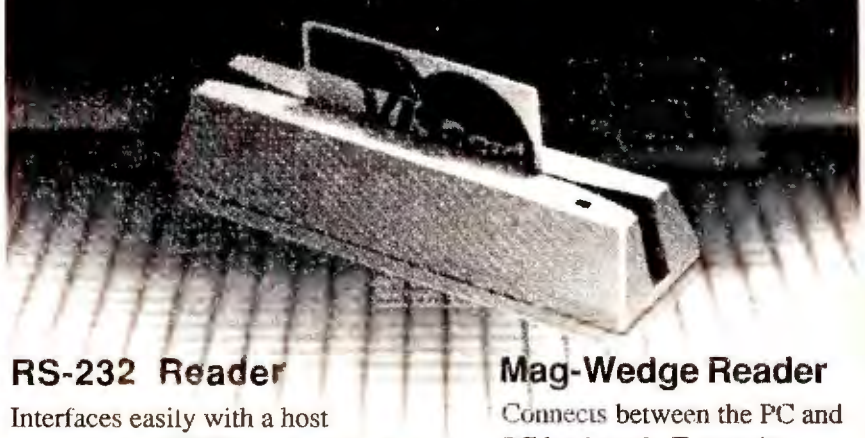

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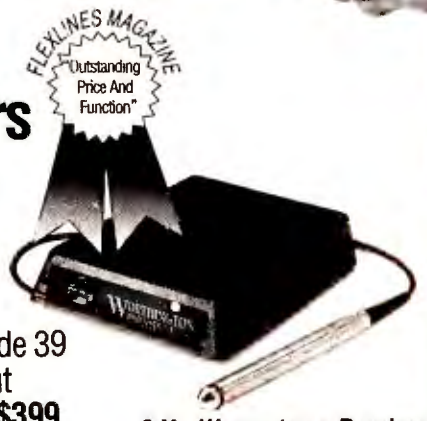

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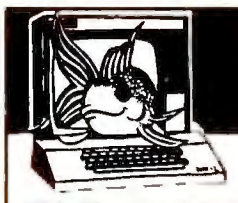

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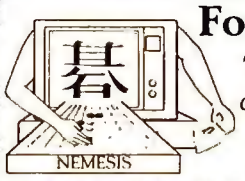

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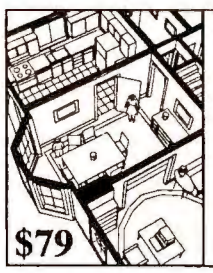

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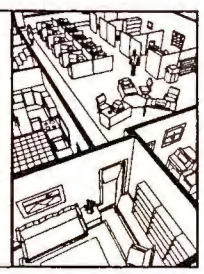

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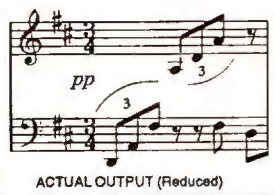

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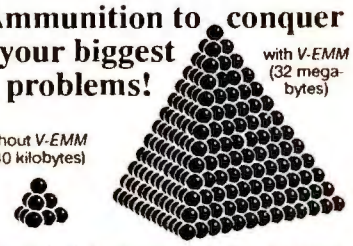

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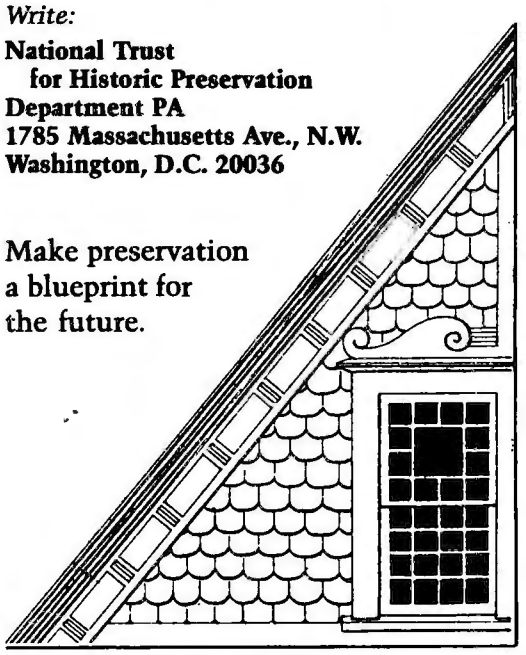

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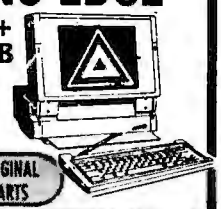

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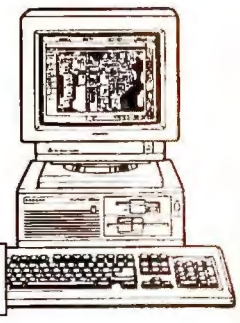

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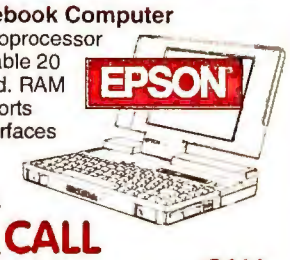

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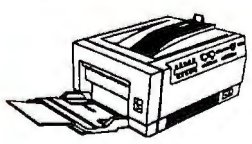

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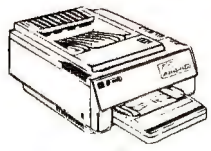

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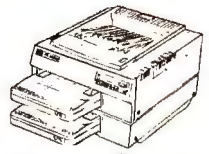

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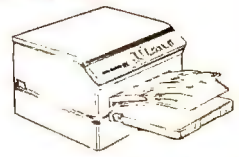

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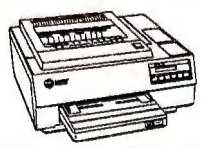

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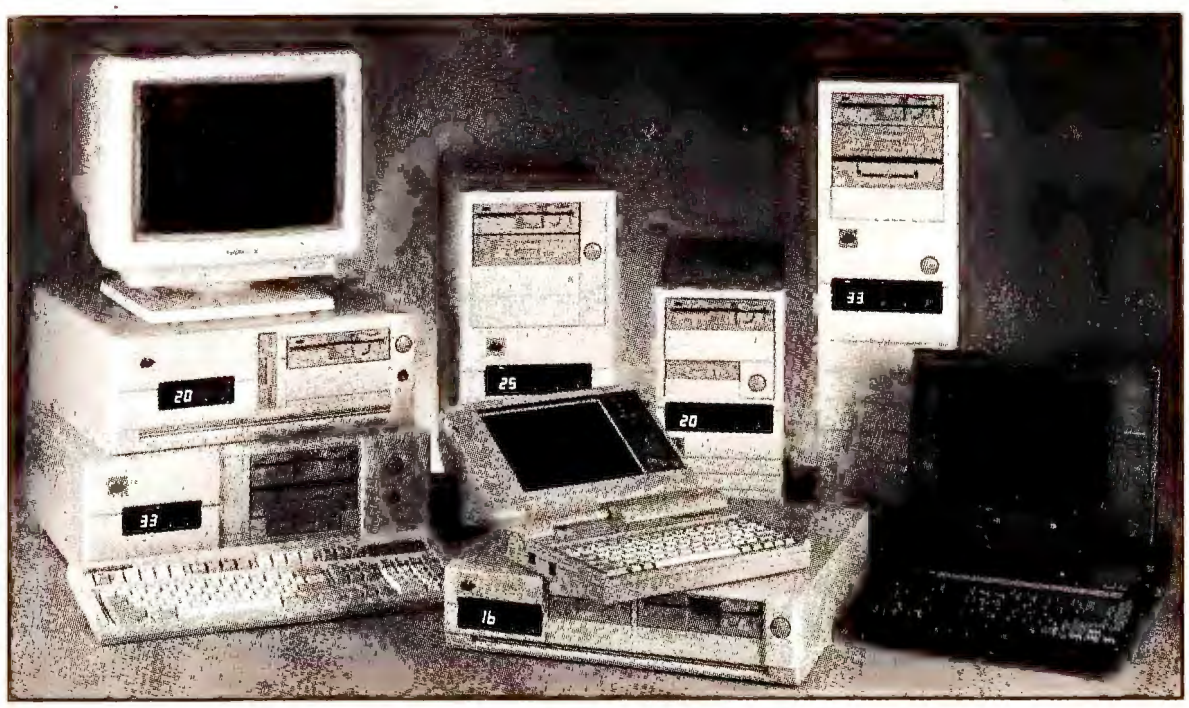

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DeskPro 386/33	2Meg Module	115144-001	119.00
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TAKING IT HOME

The practical guide to home/office computing

What to do when your computer stops computing

Steve Bass

"It's dead," he said, "finished, kaput—but listen, it'll make a great doorstop."

He was talking about my system board. His bill: $80. And I would gladly have paid twice as much to have avoided the hours of frustration it took just to find someone to make that official.

I had known for some time that my vintage 286 clone didn't have many miles left. After months of intermittent problems, I turned it on one day only to have the screen stare back at me blankly. (I guess turnabout's fair play.)

I tried to diagnose the problem. The machine came on but wouldn't go through the power-on self-test (POST) routines. The screen was blank, and the floppy drives wouldn't light up, but I heard a promising hum from the hard disk. Hitting the reset button occasionally brought it to life, but only if I crossed my fingers, spun around three times, and prayed to St. BIOS.

I loaded up the *CheckIt* diagnostic program, hoping for a quick assessment. *CheckIt* is thorough, but it isn't much use for system board or power supply problems. I considered an add-in board like the AMI Diagnostics Kit, but why buy a $500 tool to fix an old AT? I even called savvy members of my user group, but no one could help.

ANTHONY RUSSO

Finally, I faced facts: My only option was to find a technician for a bench-level exam. I called a dozen service centers; prices ranged from $35 to $190 an hour. The name chains were the highest; $75 an hour seemed to be average. Only three would agree to apply the diagnostic fee to the repair charge.

I finally settled on a friend of a friend even though, at $80, his fee was a little on the high side. But his shop is close to my home and had been in business for eight years so I figured he must be doing something right. More important, I liked his attitude. He offered some solutions I could try myself.

AD MCCAULEY

He also warned me that without a service contract, I would have to get in line behind the people who had one—it might take a week or more. No shop I called offered a loaner, so I was lucky to have a fast Toshiba laptop with a big hard disk and modem. I was able to sneak in a complete backup to disk during one of those rare periods when the ailing AT was working and then erased sensitive files from the hard disk.

But before I took my desktop in, I got in touch with the U.S. Office of Consumer Affairs (202/634-4140), which directed me to my state's Bureau of Electronic and Appliance Repair (916/445-4751), where I learned about some of my rights as a consumer. Spokesperson Gordon Boranian told me that the bureau's jurisdiction extends only to computers "used at home, normally for personal and household use."

The law provides that the repair person must supply you with a written estimate that the final bill cannot exceed. Get a breakdown of charges for parts and labor, and catalog the parts before you leave the shop.

Paranoia? Not at all. When my wife's Compaq stopped working last year, her office sent it to an authorized dealer for repair. It left with 1MB of RAM and returned with 640K. So I took a careful inventory of my PC, including the serial numbers of every removable component. I had the technician compare my list with the computer's components and sign my inventory. He liked the idea.

The estimate took only a day; the problem was the motherboard, and the recommendation was to replace it. The cost of repair was less than I feared, but the technician suggested I do it myself and save about $500.

I'm a shade-tree car mechanic, so I figured why not? It turned out to be easier than fixing a car, and a lot cleaner. Next month I'll tell you how I did it.

Contributing Editor Steve Bass is a family therapist and president of Pasadena IBM Users Group.

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   - ☐ 386™-based systems
   - ☐ i486™-based systems
   - ☐ UNIX® based systems
   - ☐ Laptops/Notebooks
   - ☐ Other: _____
2. Are you interested in computer products for:
   ☐ Home ☐ Business ☐ Resale
3. If for resale, please identify your primary customers:
   ☐ General Business ☐ Government ☐ Education ☐ Medical
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Quantity	Timeframe	Quantity	Timeframe
_____	Less than 1 month	_____	6-12 months
_____	1-3 months	_____	More than 12 months
_____	3-6 months		

5. What do you plan to use computer products for?

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6. How many PCs do you have installed now at your company?

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   - ☐ UNIX® based systems
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   - ☐ Other: _____
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3. If for resale, please identify your primary customers:
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Quantity	Timeframe	Quantity	Timeframe
_____	Less than 1 month	_____	6-12 months
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5. What do you plan to use computer products for?

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Our 25 MHz 386™ Dell System® 325D beat 14 other 25 MHz computers including Compaq's 386/25e, to win *PC Magazine's* Editors' Choice award. And our 33 MHz 386, Dell System 333D beat 22 others to gain an Editors' Choice award in the 33 MHz category.

So if you think these awards are noteworthy, turn the page and take note of our prices.

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This nagging recession has persisted for some time but now relief is finally in sight.

Because Dell has just reduced the prices on various 286, 386™ SX, 386 and i486™ desktops and 386SX laptops up to $900. And although our prices are now extraordinarily low, our quality and reliability remain extraordinarily high.

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HERE'S THE SUPPORT YOU'LL GET.

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- *One full year of on-site service included in the system price.△*
- *Self diagnostic software.*
- *24-hour TechFax line for instant access to Dell technical information.*
- *On-line Bulletin Board to communicate with Dell technical staff and other Dell users.*

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DELL SYSTEM® 433P.
WAS $5,199

NOW ONLY $4,299

Lease: $156/month.**

- i486 microprocessor running at 33 MHz.

100 MB VGA Color Plus System $4,299

Price listed includes 4 MB of RAM.* 200 and 320 MB hard drive configurations also available.

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- Intel® 80386 microprocessor running at 33 MHz.

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Price listed includes 1 MB of RAM.* 80, 100, 200, 330 and 650 MB hard drive configurations also available. *25 MHz systems also available starting at $2,699.*

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40 MB VGA Color Plus System $2,299

Price listed includes 1 MB of RAM.* 80, 100, 200 and 320 MB hard drive configurations also available. *33 MHz systems also available starting at $2,499*

*Performance Enhancements: Within the first megabyte of memory, 384 KB (433P), 128 KB (316SX, 320LT, 316LT and 210), 96 KB (333D, 325D, 333P and 325P) of memory is reserved for use by the system to enhance performance. Can be opt

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ecommended. Dell has won *PC Week's* Corporate Satisfaction Poll for PCs, laptops and servers an unprecedented eight times.

You deserve credit.

Back to this recession issue. If you don't want to buy a Dell computer outright even at these prices, just lease◊ one for as little as $51 a month. We make available the most comprehensive credit, operating lease and lease-to-buy programs in the industry.

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Because a deal like this is nothing to sneeze at.

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- Intel 80386SX microprocessor running at 16 MHz.

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40 MB, 1 MB RAM* $3,199

20 and 120 MB hard drive configurations also available.

16 MHz systems also available starting at $2,499.

DELL SYSTEM 210.
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Lease: $51/month.**

- 80286 microprocessor running at 12.5 MHz.

20 MB VGA Monochrome System $1,349

Price listed includes 1 MB of RAM.* 40, 80 and 100 MB hard drive configurations also available.

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A WIN WIN SITUATION.

$4,199
LEASE: $152/MO.**
THE DELL® 333D 33 MHz 386 SYSTEM

$3,799
LEASE: $138/MO.**
THE DELL 325D 25 MHz 386 SYSTEM

SYSTEMS INCLUDE: VGA COLOR PLUS MONITOR, 200 MB HARD DRIVE, 4 MB RAM,* ISA BUS TYPE.

A NO WIN SITUATION?

$6,899†
ACTUAL DEALER PRICES MAY VARY.
THE COMPAQ 386/33L 33 MHz 386 SYSTEM

$5,599†
ACTUAL DEALER PRICES MAY VARY.
THE COMPAQ 386/25e 25 MHz 386 SYSTEM

SYSTEMS INCLUDE: VGA COLOR MONITOR, 120 MB HARD DRIVE, 4 MB RAM, EISA BUS TYPE (386/33L), ISA BUS TYPE (386/25e).

PC Magazine doesn't give out its Editors' Choice Awards lightly, in fact, winning one is almost like winning an Olympic gold. Winning two in a row, which is what two of Dell's 386 systems did in January, is like putting up a new world's record at the same time.

About the closest you'll get to a gold with Compaq is the kind of money you'll have to shell out to buy one of their 386 systems.

And if you also consider that we've won 8 golds in *PC Week's* Customer Satisfaction Polls of corporate customers, who do you think wins when you buy a Dell PC? For more details, look inside.

THE DELL SYSTEM 333D 33 MHz 386 AND
THE DELL SYSTEM 325D 25 MHz 386.

Standard Features: • Page mode interleaved memory architecture. • Standard 1 MB of RAM,* optional 2 MB or 4 MB of RAM expandable to 16 MB on system board. • Integrated: VGA controller with 1024 x 768 support, hard drive and diskette drive interface, 1 parallel port, 2 serial ports, and PS/2 compatible mouse port. • 64 KB (333D) or 32KB (325D) SRAM cache. • SmartVu™-Advanced System Diagnostic Display. • 6 industry standard expansion slots (five 16-bit, one 8-bit). • High-performance hard drive 40-650 MB.

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†Source: Compaq Computer Corporation published price list effective 4/16/91.

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