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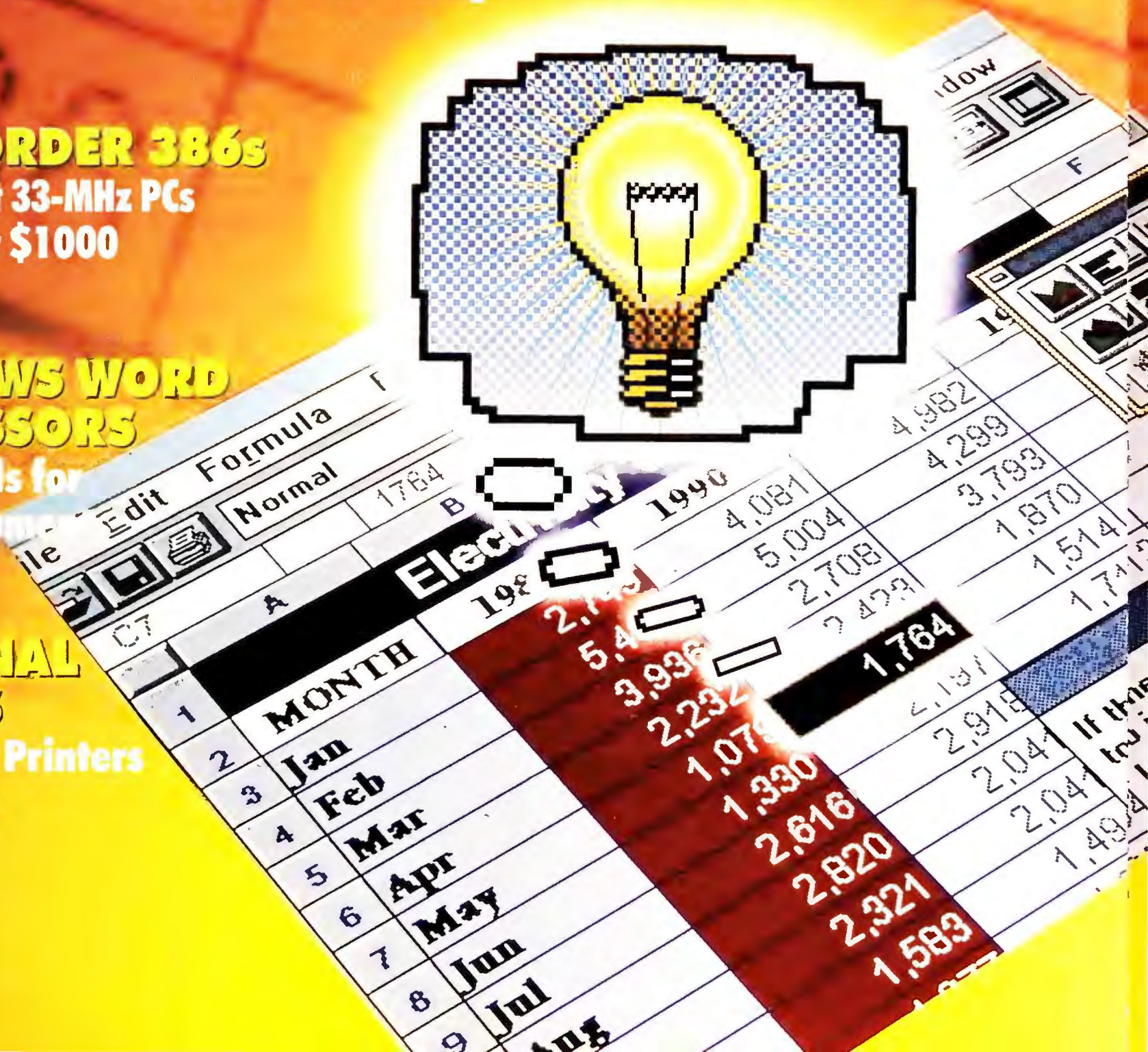
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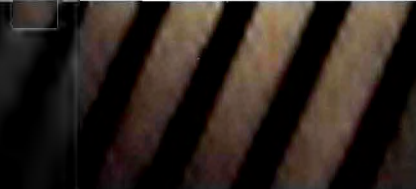
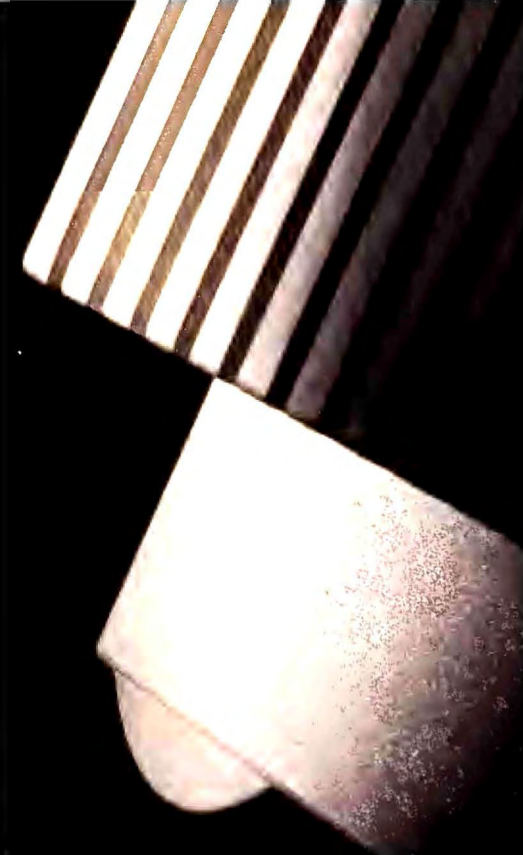
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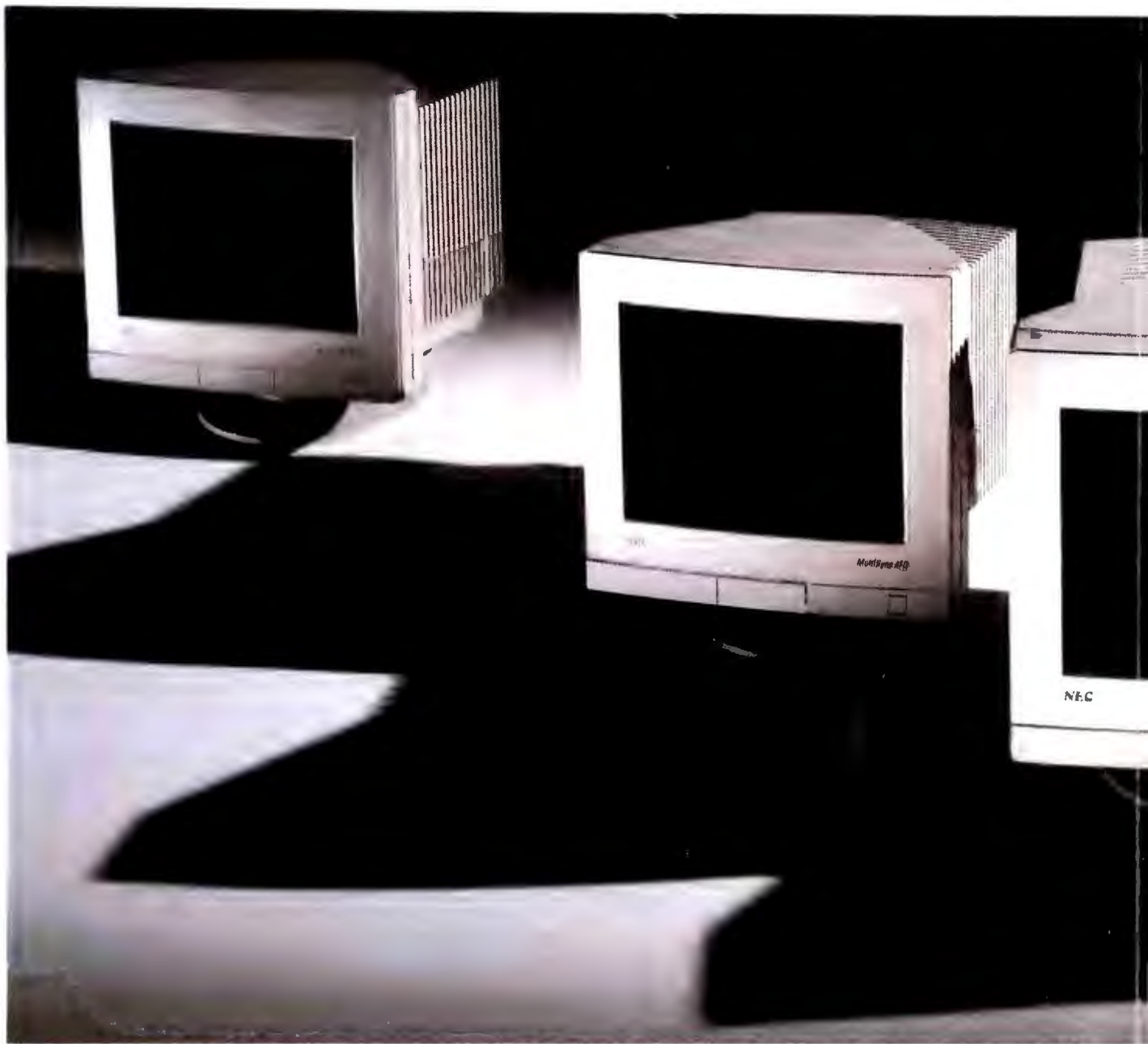


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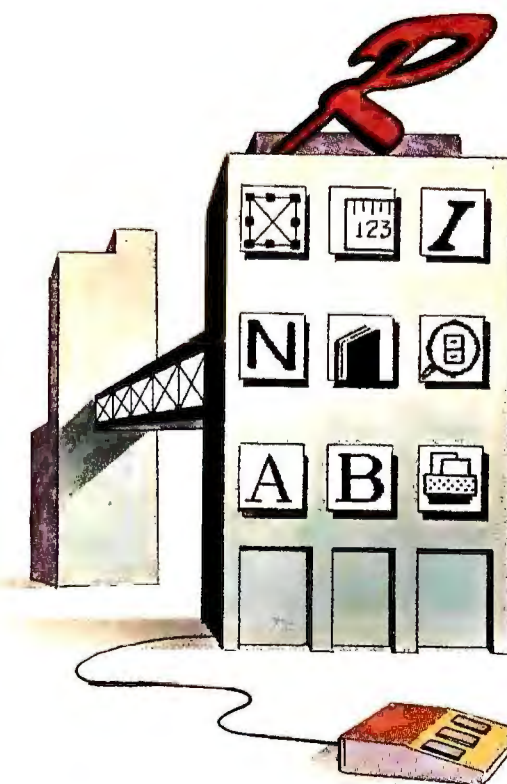
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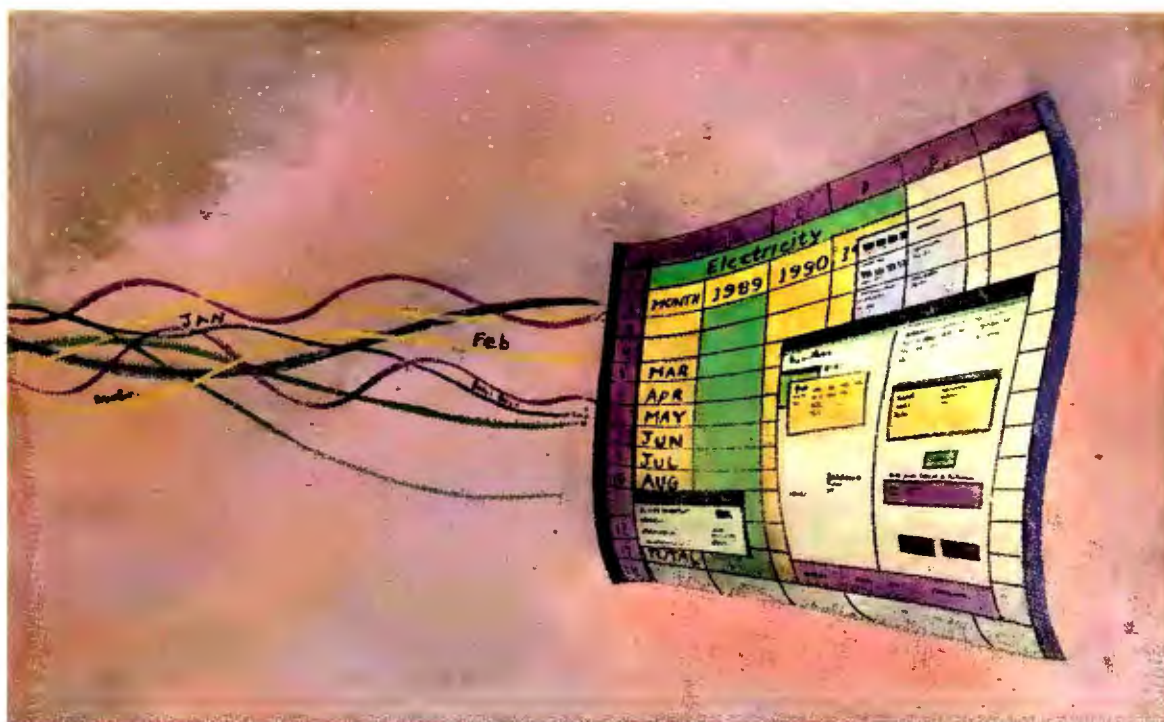


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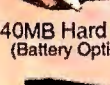
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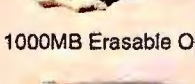
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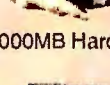
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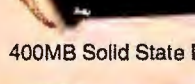
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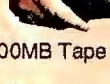
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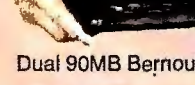
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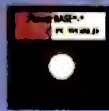
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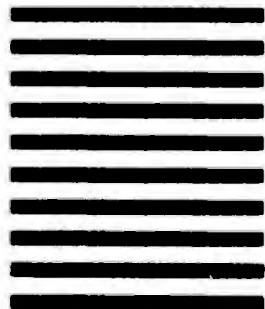
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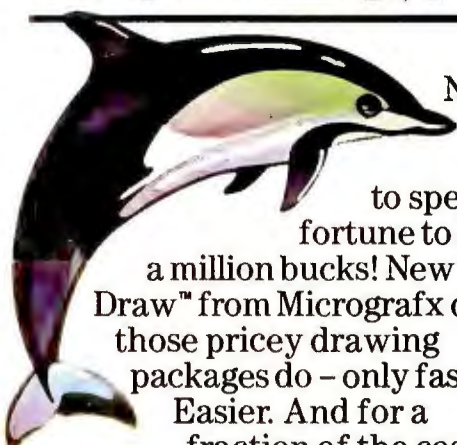
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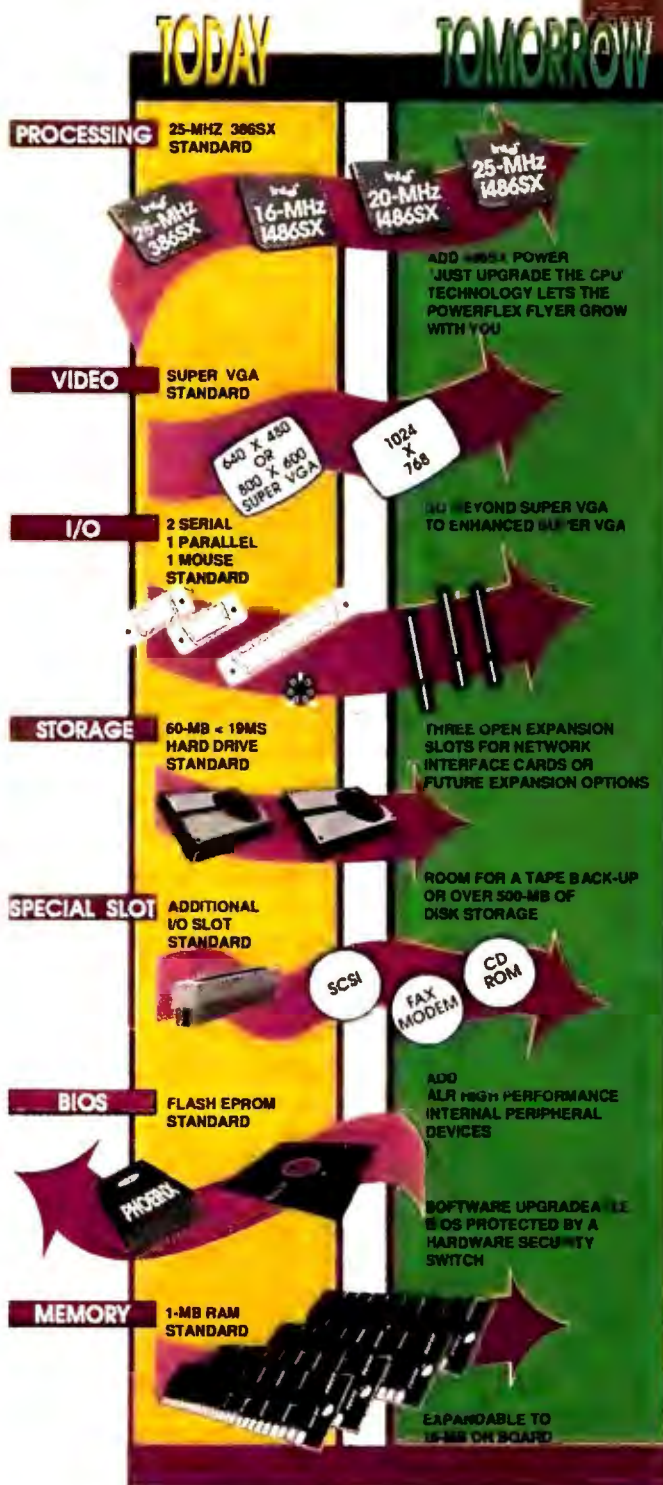
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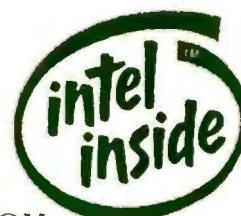
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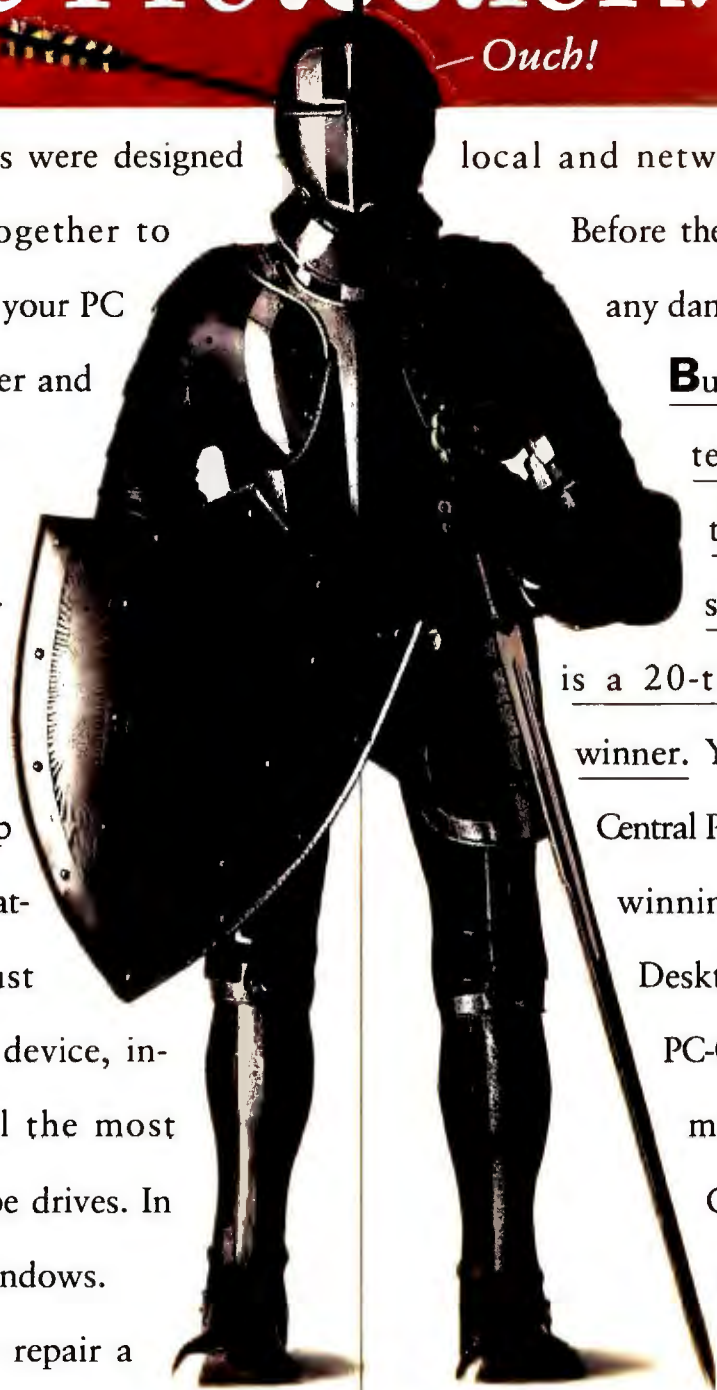
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Jan. 1992 Oct. 1991 Feb. 1991



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- Low-Level Formatting and Disk Maintenance
- Miscellaneous Utilities and File Support
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- Desktop Manager with Background Scheduler



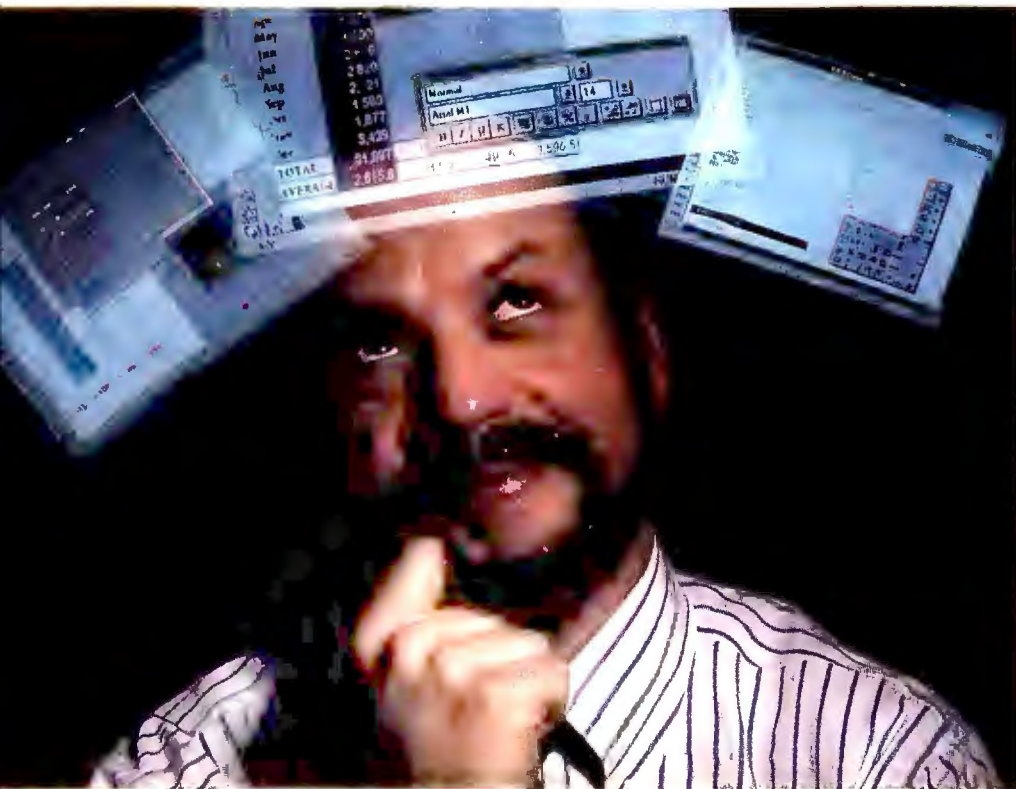
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Circle 52 on reader service card



Faced with choosing among excellent spreadsheets, Contributing Editor Richard Scoville opts for Excel 4.0.

Richard Scoville's preview of Microsoft's spectacular *Excel 4.0* follows by only one issue our preview of the best DOS spreadsheet ever, *Quattro Pro 4.0*. Borland's DOS spreadsheet and the forthcoming spectacular *Quattro Pro for Windows* straddle *Excel 4.0* strategically as well as chronologically.

Quattro Pro for DOS provides many of the benefits of *Windows*, without *Windows*. It also works so much like *Quattro Pro for Windows* that companies could reap productivity bonuses by standardizing on the pair of new *Quattro Pros*. The most compelling scenario for dual standardization plays out in companies that the recession has kept from upgrading to *Windows*-ready hardware. When economic conditions permit the forestalled hardware upgrades, users who know *Quattro Pro* for DOS can move easily to the *Windows* version.

The Applause Meter Speaks at Demo '92

But what if you're only trying to pick the best *Windows* spreadsheet? Few judges could be sharper or more critical than the attendees at Stewart Alsop's Demo '92. Here a group of industry insiders, venture capitalists, Wall Street analysts, and star technologists witnessed a "product debate" between product managers of *Quattro Pro for Windows* (beta), *Excel 4.0* (beta), and *1-2-3 for Windows*. After extended demonstrations and witty arguments by the three bright advocates, the astute mob shouted and whistled their opinions to an applause meter. This was harder than it sounds.

The problem was, each program deserved applause.

Applauding Spreadsheets

They all do three dimensions well. *Excel* can intelligently format a selected area and consolidate data at the touch of a button. *Quattro Pro* provides an excellent metaphor for 3-D operations and makes child's play of linking operations to sliders and buttons. *1-2-3* does everything anyone dreamed of just six months ago.

When the shouting was over, the general impression was clear: *Excel 4.0* and *Quattro Pro for Windows* are dazzling, and they are surpassing a Lotus product that is itself strong. *Quattro Pro for Windows* received the highest mark, though no one can be sure that its margin was more than a single penetrating whistle. (Watch this magazine for Scoville's analysis of *Quattro Pro for Windows* in the near future.)

Though *Quattro Pro for Windows* won the spreadsheet debate, Microsoft won in a larger sense. It's clear that the multimillion-user *Windows* environment is generating more than one state-of-the-art application in each major category; *Quattro Pro for Windows* will sell more copies of *Windows*. Once again, Microsoft can't lose for winning.

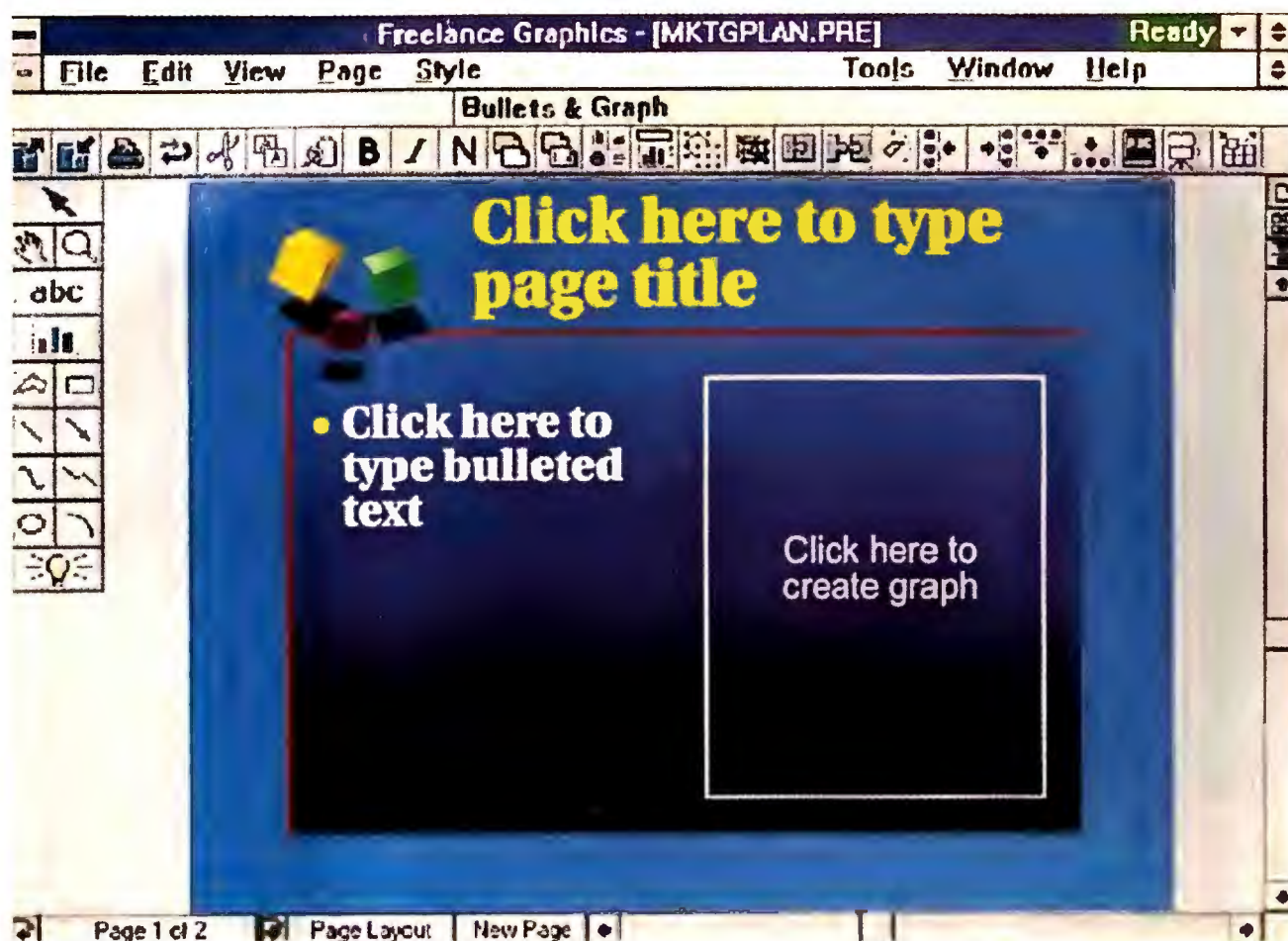
The Challenge At Hand

VisiCalc pioneer Dan Bricklin showed Slate's pen-based spreadsheet, *At Hand*, at Demo '92. Running under Go Corporation's elegant PenPoint operating system, *At Hand* gives a taste of pen-based computing to come. Some operations are easier with pen than mouse; *At Hand* makes it possible to use a powerful spreadsheet when there's no place to set a keyboard. To woo many of today's spreadsheet users, however, *At Hand* must entice people away from *Windows* spreadsheets, and that task is getting harder every month.

One thing the recession has failed to slow is innovation in the PC industry. ☺

Phil Lemmons

Phil Lemmons
Editor in Chief



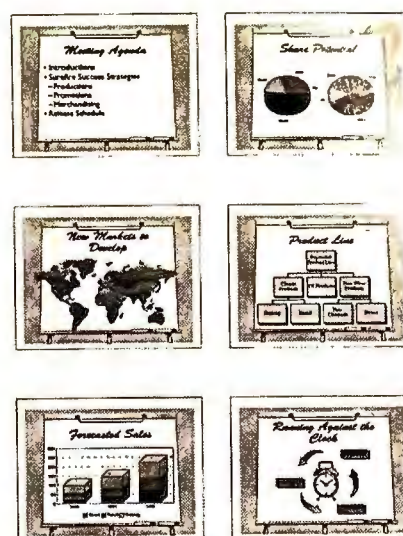
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In fact, PC/Computing continues, Freelance Graphics™ for Windows™ from Lotus® makes "the process ridiculously easy compared to what the competition requires. And the results make you look like a design pro." So yes, it's easy to use. But it's also incredibly easy to learn, thanks to its on-line tutorial, QuickStart, which leads you step-by-step through

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ouse, you can create ns with this program."

—PC/Computing, 11/91

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3.0/3.1

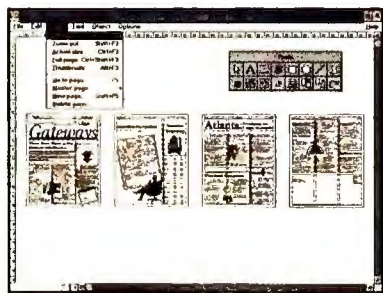
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Adobe Type Manager.™
New Express Publisher™
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ATM™ 2.0 plus 13
PostScript® fonts, for truly
creative designs. Microsoft
Publisher™ forgot to include
any Windows-standard
fonts.

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great-looking pages in a
hurry. (Import styles from
your word processor, too.)
Microsoft forces you to
make all formatting
changes manually.

Free Zoom. Express
Publisher's Free Zoom
sizes and centers
specific portions of
a page on-screen,
for fast and easy
attention to detail.
Microsoft has only
awkward pre-set
percentages.

Wrap to Fit. Express
Publisher wraps text
around *any* shape, for
sharp-looking layouts.
Microsoft wraps only
around rectangles – any
word processor can do that!



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to 32 standard-size pages.
Modify your whole news-
letter at once. Grab and
move items from page to
page. Microsoft shows you
only one page at a time.

Winter Issue Volume 8, Number 2
A Travel Plus Publication

Gateways

INSIGHTS FOR THE BUSINESS TRAVELER

Three Great Places to Mix Business with Pleasure

If business is taking you on the road soon, why not extend your trip into a memorable vacation? Three exciting American cities, Boston, Chicago, and San Francisco, are luring increasing numbers of business travelers, and provide plenty of sights, sounds, and flavors to satisfy even the most demanding vacationer.

* * * * *

Too often, business "travel" limits one to a view of the hotel and convention hall, much else. Here's ten missing all

Too often, limits on hotel and and not what you may have these years.

offers many rewards to those who take the time to uncover its cornucopia of riches. For an interesting lesson in American history, don your walking shoes and follow the Freedom Trail (536-4100). The trail's two loops will

lead you past no fewer than 16 historical sites, including the Old North Church, the location of the Boston Massacre, the Granary Burial Ground, the Old Corner Bookstore, Paul Revere's House, and the Old South Meeting House. Beantown contains far too many historical gems to mention here, but make an effort to visit the Boston Tea Party Ship and Museum in southern Boston (338-1773), the John F. Kennedy Presidential Library (929-4523) in Dorchester, the Bunker Hill Monument in Monument Square (Charlestown, 242-5641), and "Old Ironsides" (426-1812, also in Charlestown).

(continued on page 4)

**Make the Most of
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Suppose your company was going to attend an upcoming trade show. This would be an excellent opportunity to leverage the event. Your agenda might include making an important press announcement to the media covering the show, gathering your regional sales executives for a strategic review, and entertaining your key clients and contacts. You may be surprised to know that Travel Plus can help you arrange your entire trade show program.

(continued on page 4)

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Travel Productivity . . . 3

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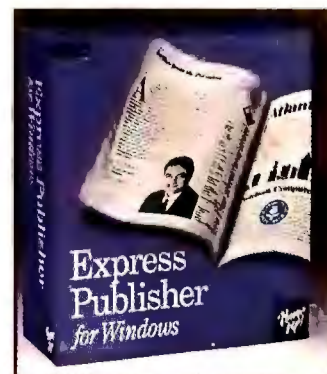
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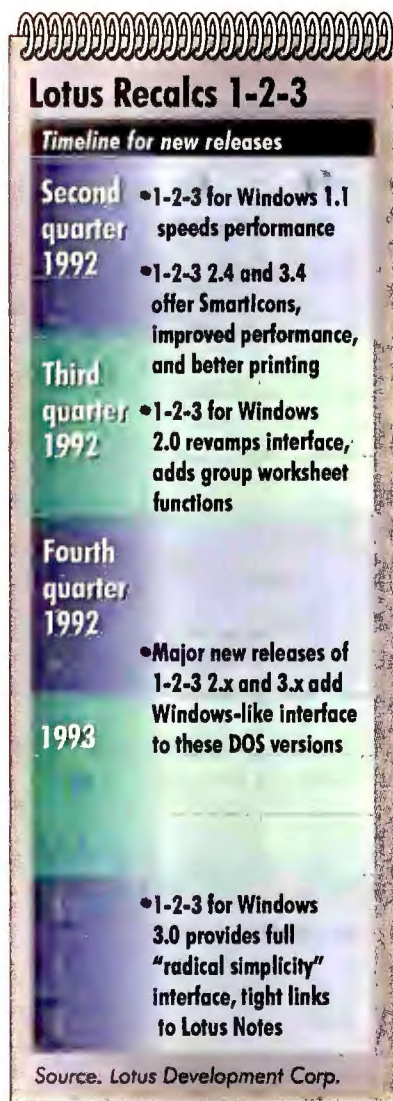
*Express Publisher for DOS contains most of the features mentioned above, for under \$150. Express Publisher and TextAppeal are trademarks, and Power Up! is a registered trademark, of Power Up Software Corporation, 2929 Campus Drive, San Mateo, CA 94403. Adobe, Adobe Type Manager, ATM, and PostScript are trademarks of Adobe Systems, Inc. MS and Microsoft are registered trademarks, WordArt and Microsoft Publisher are trademarks of Microsoft Corporation. All other trademarks are the property of their respective holders.

Circle 211 on reader service card

Edited by RUSSELL GLITMAN

Lotus Unveils 1-2-3 Plans

Aims: "Radical Simplicity," Group Sharing



Lotus plans extensive refinements to its flagship spreadsheet in the next 12 months.

Struggling against increasingly formidable challenges from Microsoft and Borland, Lotus will release new versions of 1-2-3 this year that boast slicker user interfaces, faster performance, and new work group connections.

Debuting in April, 1-2-3 version 2.4 will add a limited version of the SmartIcon interface found in Lotus's Windows packages, the capability to handle multiple files, a back-solver module, and printing enhancements. Roughly two months later, 1-2-3 version 3.4 will incorporate a similar user interface, printing upgrades, and faster performance.

More dramatically, the 2.x line will be fleshed out this fall with a fully graphical version that works on a 640K DOS machine but looks and operates very much like 1-2-3 for Windows, says Lotus chief technical officer John Landry. A similar 3.x version will follow within a few months, so 1-2-3 again will offer a relatively consistent interface on all PC platforms.

In April, 1-2-3 for Windows 1.1 will answer the biggest user complaint by providing zippier performance. This summer, release 2.0 will begin the move to what Landry calls "radical simplicity" with a rebuilt user interface. The redesign will emphasize drag-and-drop manipulation, context-sensitive menus, and (like its Borland and Microsoft rivals) the capability to click the right-hand mouse button on a screen object (such as a range or a graph) and get a pop-up menu of options. Lotus also plans voice annotations and animated Help. Version 3.0 will complete the move to radical simplicity.

1-2-3 for Windows 2.0's other important enhancement is multiple named scenarios for any given range of cells. This feature aids what-if analysis not only for individual users (the impressive *Excel 4.0* has a similar feature) but between work group members on a local area network. Customers who have *Lotus Notes* can share such worksheets over wide area networks as well. Lotus will also tightly integrate 1-2-3 and *Notes* so users can tap the services of either application from the other. —Eric Bender

Intel at Odds With Fast Bus Standard

Intel is squaring off against PC and chip set suppliers for control of the standard by which processors can communicate at CPU speed with peripherals. The struggle centers on a special local bus pegged to the processor's rated speed.

Debate began last month when the 100-member Video Electronics Standards Association (VESA) proposed a specification that would enable three peripherals to communicate directly with 386 and 486 processors at CPU speed. Once the standard was implemented, video or hard disk messages would travel to the CPU at its rated speed, up to 66 MHz, much faster than the 8-MHz limit of the ISA bus found in most systems. Faster I/O is especially beneficial for Windows screen updates.

But Intel is not a party to the VESA specification. Instead, the CPU kingpin is working with what Marketing Manager Mike Bailey calls "key PC and peripheral vendors" to develop a standard of its own. The Intel spec will be

ready this month, but Bailey would say no more.

Several vendors have already released systems with local buses—most recently Bell Computer of Van Nuys, California, whose 40-MHz 3140GT employs the OPTi Local/CPU Bus chip set to extend the CPU bus for use by its graphics and hard drive controllers. Bell claims the 3140GT can send data five times faster over the OPTi bus than over the typical ISA bus.

Intel doesn't want PC makers to use an extension of the CPU-to-memory bus as a local bus. VESA prefers the local-bus method, according to Executive Director Tom Ryan, but the association agrees with Intel that an industry-wide standard is needed to ensure that all implementations enable peripherals to be shared. The VESA bus, which Ryan said could appear in systems by third quarter, is being designed for limited bus mastering and backward compatibility with Micro Channel, ISA, and EISA buses.

—Mike Hogan

Hyundai Offers a Lifetime PC Warranty

Mention Hyundai, and most people think cars. Hyundai Electronics America, the U.S. PC division of the Korean industrial conglomerate, wants to change that, so it's offering a limited lifetime warranty on its PCs as part of a new promotional campaign. The offer runs through June 30, according to company officials.

What do you get? The warranty covers the base PC including the motherboard, video board, floppy drive, and keyboard. For example, if your

floppy drive bites the dust after five years of faithful service, Hyundai will replace it free of charge. The warranty does not cover monitors or hard drives that come with the system and is limited to the PC's "original user." In other words, if you sell the PC, the warranty is void.

According to the company, buyers of Hyundai PCs will also receive discounts on software from Borland, Software Publishing, Proteo, and other vendors. —Jeff Bertolucci

PC Theft Ring Uncovered

The Carrollton, Texas, Police Department in conjunction with the Federal Bureau of Investigation has uncovered a burglary ring that allegedly stole PCs worth more than \$600,000 from Dallas area businesses and resold them as far away as New York.

According to police, the burglars raided computer stores, warehouse clubs, and offices, then turned the goods over to employees of a Carrollton PC company, who shipped them to contacts out of state.

Few victims recorded their machine's serial numbers, so the units are difficult to trace, says Carrollton police detective Tom Pease, who adds, "If victims don't have their serial numbers, we can't prosecute."

The extent of the losses is hard to gauge, but police estimate that one of the nine burglars arrested netted more than \$500,000 in a month. The Carrollton Police Department is holding \$200,000 worth of unclaimed merchandise.

Police launched the investigation after an unsuspecting PC buyer noticed a name and phone number on the hard disk of his newly purchased used computer and thereby contacted one of the victims. Since the thieves hadn't bothered to reformat the hard drives of the stolen PCs, police have been able to return many machines. People with information relating to this case can call *PC World* Editorial at 415/546-7722 to be referred to a contact at the Carrollton Police Department.

To increase your chances of recovering your PC if it's stolen, you can leave an elec-

Take a Byte out of Crime

Add to Your AUTOEXEC.BAT:

```
@Echo off
Prompt $p$g
Path=C:\;C:\DOS;C:\Batch
Set Temp=C:\Temp
Cls
Echo THIS PC IS STOLEN
Echo CALL YOUR NAME
Echo YOUR PHONE NUMBER
Pause
```



Add the last five lines of this sample alert to your AUTOEXEC.BAT to help police recover your PC if it is stolen.

tronic trail by putting your name and phone number in a file called OWNER.FIL and hiding it on your hard disk with the DOS 5.0 command **ATTRIB +R +H C:\OWNER.FIL**. Your message can be read later using file viewers in shells like *The Norton Utilities* or *PC Tools*.

For more protection, you can add a message to your PC's AUTOEXEC.BAT file that displays your name and phone number when the computer boots. —Mike Hogan

Microsoft Removes Its Chinese Wall

Proving what many observers suspect—that Microsoft has little fear of the Federal Trade Commission's investigation into its competitive practices—the software giant has consolidated all software development, including systems, applications, and tools, into the single Worldwide Products Group as part of a sweeping management reorganization.

The consolidation came as part of an executive shuffle in which Microsoft president Michael Hallman was ousted and replaced by a three-member Office of the President. The reorganization removes the "Chinese Wall" that Microsoft officials had said effectively separated its applications and operating systems development groups and ensured that the former did not receive any advantage denied other developers.

The changes are not expected to affect Microsoft customers immediately, although current and would-be users of Microsoft languages and data

base development tools may see some benefits, say users and analysts.

"The [new] development divisions are intended to keep our focus on the customer," says Mike Maples, former head of Microsoft's applications group, now executive vice president in charge of the Worldwide Products Group. He adds that "the new organization is designed to keep development teams small, resulting in better products and shorter development cycles."

Some *Windows* developers have privately complained that the applications group's proximity to the company's operating systems group gave it an unfair advantage. But these objections didn't prevent Microsoft from consolidating application and operating system development. Microsoft did not consider the current FTC probe into its competitive practices when formulating its reorganization, says Maples. —Rob Garretson

Windows 3.1 Enables Portable Documents

The principal features of Microsoft's *Windows 3.1* have been known for some time, or so most people thought. In February, Microsoft revealed that one key new feature, TrueType, in fact offers a lot more than scalable fonts. It turns out that you'll be able to use future TrueType fonts, which will be available from a variety of vendors, to create documents that retain their format and fonts on any *Windows 3.1* machine—even if the fonts aren't installed on that system.

Making use of this TrueType capability involves *embedding*—inserting the desired fonts into the document file itself. When you save

a document, future applications that support embedding will request the font information, which will be saved with the document. As a result, *Windows 3.1* documents will be entirely "portable," says George Moore, TrueType product manager.

But there's more. If you receive a file containing future third-party read/write fonts that will be available late this year, you effectively gain complete rights to those TrueType fonts, even for future use with other documents. Most embedded TrueType fonts will be read-only: They'll temporarily install themselves on a system so that the receiver can view the document and print it out.

The fonts will be flushed from the system when the document is deleted.

Moore says Agfa, Bitstream, and Monotype will produce TrueType fonts employing the read-only strategy, while Bigelow & Holmes will release 22 Lucida read/write TrueType fonts. At press time, Aldus, Corel, and Microsoft planned to support embedding in forthcoming applications. Moore adds that the capability will also be available in the upcoming *Windows NT* environment-cum-operating system due out late this year.

The move is designed to promote TrueType as an alternative to Adobe's Type 1 PostScript fonts. Last year, Adobe announced a PostScript-based technology, code-named *Carousel*. —Steve Fox

Close-Up Wins Remote Honors

Close-Up is fast, easy to use, and reliable. What else do you need in a remote package?



Close-Up Dual Pack 4.0 earns its Best Buy by virtue of lightning speed, an easy interface, reliable error handling, and a complete set of tools for controlling one computer from another and collaborating with a partner. It's also the only package that can run Windows reliably from afar—even in extended mode. Runner-up **Remote2** isn't quite as fast, and its toolbox is smaller, but it is perfectly dependable with graphics.

WordPerfect mixed use		Time in Seconds
Close-Up	121	<i>"Close-Up is the undisputed speed champion."</i> —PC World, February 1992
Remote2	447	
Carbon Copy Plus	504	
Takeover Lite	574	
Co/Session	1206	
Commute	1423	
pcAnywhere	3244	

	Reader service number	Performance	Ease of use	Controlling the host	Collaboration	Service and support	Standard communications	Price	Overall value
Carbon Copy Plus 6.0	671	☆☆½	☆☆½	☆☆	☆☆½	☆☆½	☆☆	☆☆½	★★½
Central Point Commute 1.1	673	☆☆	☆☆	☆☆	☆☆	☆☆	½	☆☆☆☆	★★
Close-Up Dual Pack 4.0	672	★★★★	★★★★	★★★★	★★★★	★★	★★★★	★★★★½	★★★★
CO/Session 6.0	674	☆☆½	☆☆½	☆☆	☆☆	☆☆½	☆☆	☆☆½	★★½
pcAnywhere 4.03c	675	½	☆☆	☆☆	☆☆☆☆	☆☆	☆	☆☆½	★½
Remote2 2.1	676	☆☆	☆☆	☆☆	☆☆½	☆☆½	☆☆½	☆☆½	★★★
Takeover Lite 2.0	677	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆	☆☆½	★★

Overall value is calculated by multiplying each category rating by the category's weight percentage, summing the results, and rounding to the nearest half number.

Actual test results reprinted from PC World's Review of Remote Communications Software, February 1992.

"Close-Up...The Best Program You Can Buy for Remote Control"

—Reprinted from PC Magazine, January 14, 1992

The Ultimate Remote Program
"Norton-Lambert's Close-Up is the fastest, easiest, and the most reliable program we looked at..."
 —PC World, February 1992

The results are in and the experts agree. New Close-Up 4.0 has proven time and again to be the most advanced remote control system available.

Close-Up lets you view & control PCs miles away by modem. Now with full support for Windows, DOS, graphics and mice at record-breaking speeds, Close-Up is the fastest, easiest way to handle all your remote communications needs.

What You Can Do:

- ✓ Take control of PCs at any location.
- ✓ Work remotely on the road via laptop.
- ✓ Control your office PC from home.
- ✓ Access your company's branch offices.
- ✓ Train your associates on any application.
- ✓ Help customers miles away, remotely.
- ✓ Transfer text, data, any file between PCs.
- ✓ Remotely install and run Windows.
- ✓ Automate remote operations at night.
- ✓ Access networks all over the world.



January 1992



February 1992



November 1991



February 1992

Winner of the Top Awards

"Close-Up has been highly polished and it's flexibility and capability clearly make it the best program you can buy for remote control."

—PC Magazine "Best of 1991," January 14, 1992

"If you're serious about going remote, check out Close-Up. The program's handling of Windows is simply dazzling."

—PC World "Best Buy," February 1992

"Close-Up is one of the fastest products we've seen. It had the fastest file transfer times and the shortest times redrawing the screens."

—LAN Times, November 18, 1991

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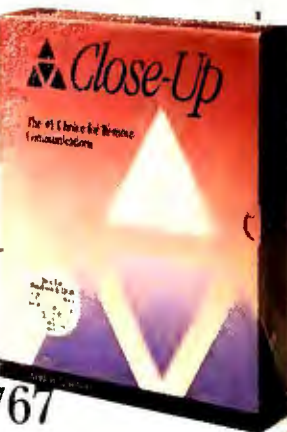
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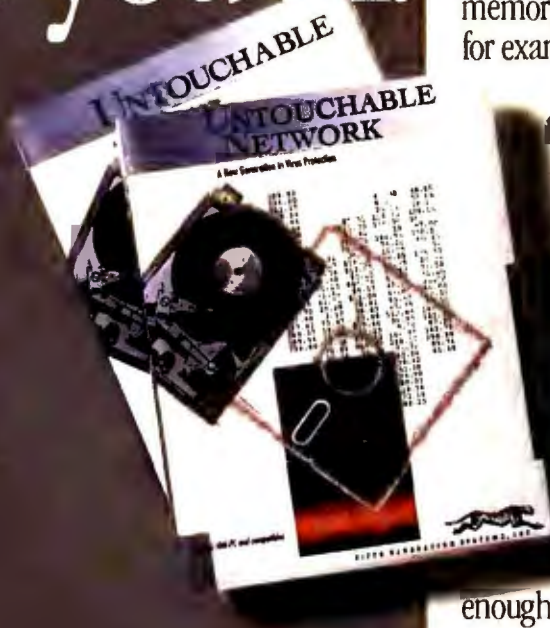
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Circle 81 on Reader Service Card

WHAT? NEXT

By Mike Hogan

Windows Gets Cosmetic Surgery

Windows 3.1 still ain't nothin' but a hound dog.



Reality is such a very elastic commodity. I used to disregard the reports of Elvis sightings—just skim over those stories at my supermarket library to get right to the good stuff about the dog babies from Venus. But years of page turning and nightly Elvis updates on the tube and, finally, Bill Bixby's definitive “The Elvis Con-

spiracy” have got me rethinking my position.

Maybe I'm out of touch. Maybe Elvis really is hiding out in a bunker under Graceland and going around impersonating a guy named John Burrows. Yeah, and maybe *Windows* is easy to use. Or—as Madonna so eloquently puts it—“Not.”

Rocket science was not my major, but I know what happens when “big concept” is distilled in media hype. I haven't believed a damn thing anyone has told me about *Windows* since one Microsoft product manager looked me in my face and insisted I could run his *Windows* application on a 286 with 1MB of memory. Sure I can, but I'd like a life.

You've been told by the press so often that *Windows* and *easy* somehow go together that you may wonder why you find the environment hard to navigate, painfully slow, and prone to hara-kiri.

You're not alone. Talk to advanced users, *Windows* consultants, even *Windows* vendors. Get past the consistent-user-interface platitudes, and they'll show you scars—on top of scars.

Reality is, *Windows* doesn't protect you from bad old DOS. Instead of just PATHing your AUTOEXEC.BAT and picking a DOS shell, you now must edit and reedit lines of WIN.INI, SYSTEM.INI, and PIF files as your applications change.

Version 3.1 ameliorates some of the most glaring problems: A still-anemic File Manager is beefed up, system resources are better allocated, and while DOS apps still crash, they now do so in more orderly

fashion. But you'll still be Balkanized by this would-be multitasker, unable to reach easily through a window frame to get what you want when you want it. Version 3.1 still ain't nothin' but a hound dog—a slow hound dog unless it's riding around in a 386 with at least 4MB of memory and 100MB of disk.

That's not to say you shouldn't use *Windows*. If you pass it over, you'll miss really good apps that are not only more powerful than their DOS counterparts but oddly enough, more fun. But the environment? The Macintosh it ain't.

Windows shells and utilities can help. It makes infinitely more sense to work from within *Norton Desktop for Windows* with its enhanced file management tools than to switch between Program Manager and File Manager. But of course, that means running a shell on top of an environment on top of DOS, and *NDW* has been known to be slow.

You'll see a much faster, richer version in April. Also due about that time is a new shell from Xerox PARC spin-off XSoft: *Rooms for Windows* will let you optimize multiple desktops and asks only 88K of memory for itself.

If *Windows* reality fulfilled *Windows*' press, these add-ons wouldn't exist. Even with them, *Windows* won't behave for you unless you throw a lot of computer at it. That's reality. ●

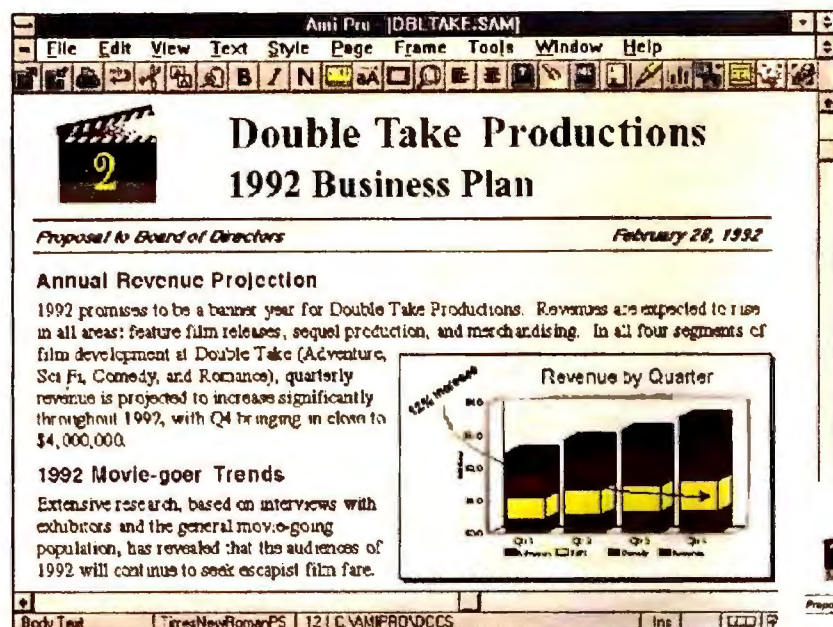
WHAT TO WATCH

Norton Desktop for Windows 2.0, due in April, is a kinder, gentler add-on that makes *Windows 3.1*'s promise of drag-and-drop a reality across different windows and lightens bothersome housekeeping chores . . . **Rooms for Windows** has a slick way to implement multiple virtual desktops: You create “rooms” where you can fine-tune different projects' apps and files, hopping between them through “doors” . . . A Multisoft utility triad planned for summer speeds up system performance and makes it easier to mix and match the *Windows* tools from other companies . . . If you don't mind really getting your hands greasy, the Windows User Group Network's **System Engineer** lets you edit many undocumented *Windows* parameters. Easier to use than Microsoft's little-known SysEdit, *System Engineer* goes free to members starting in April.

Questions? Contact me at 213/312-8041, 213/312-8048 (fax), PC World Online, or MCI Mail 329-2648.

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12

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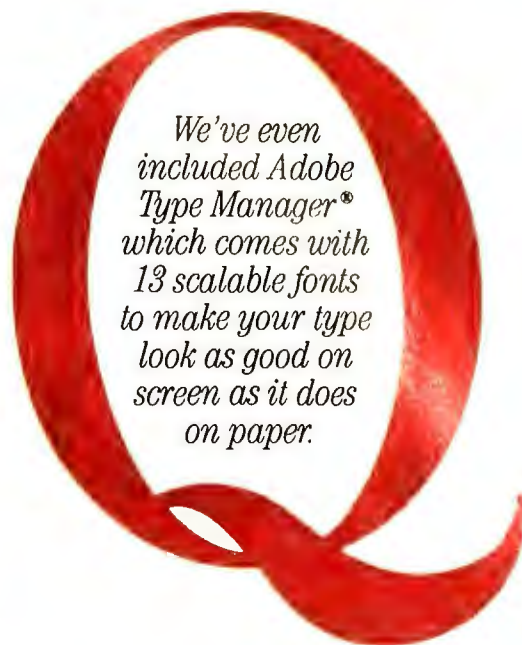
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challenged as the most Windows word processor."

—PC Magazine 11/12/91

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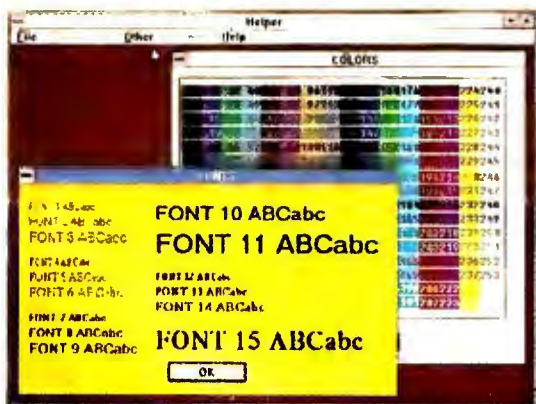
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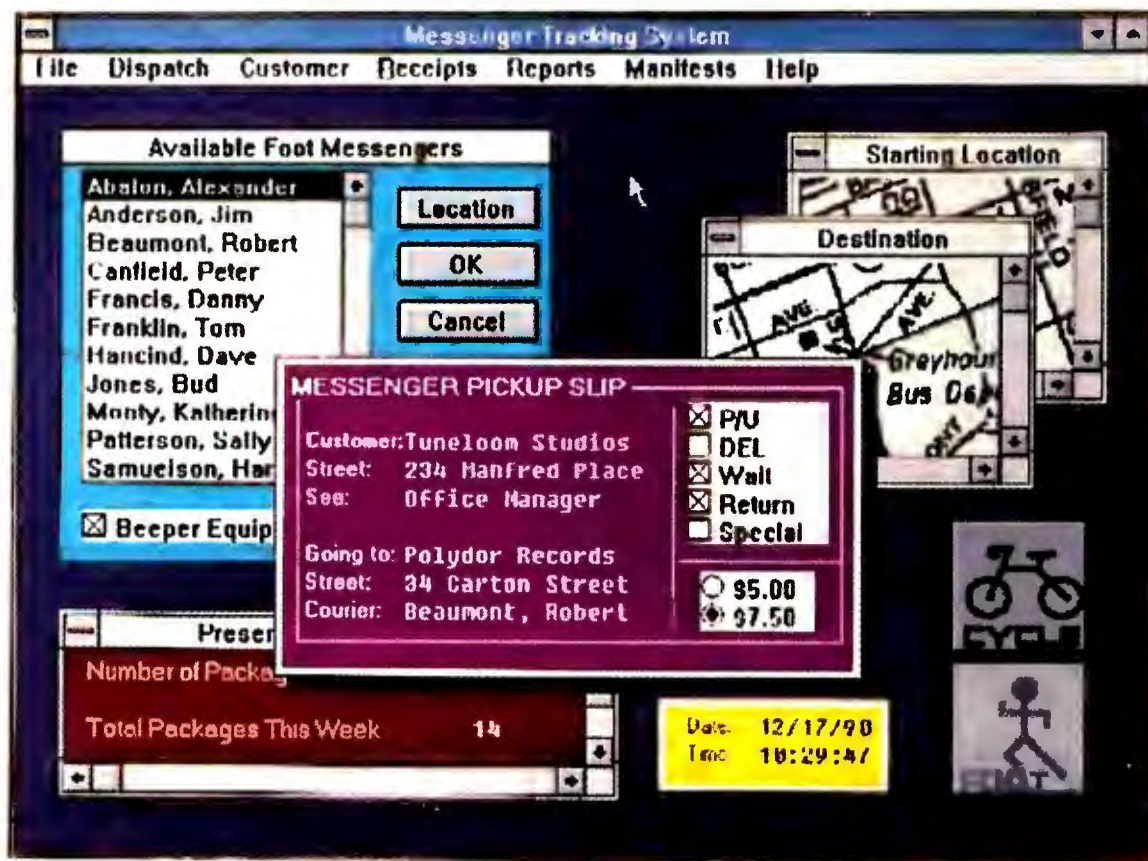


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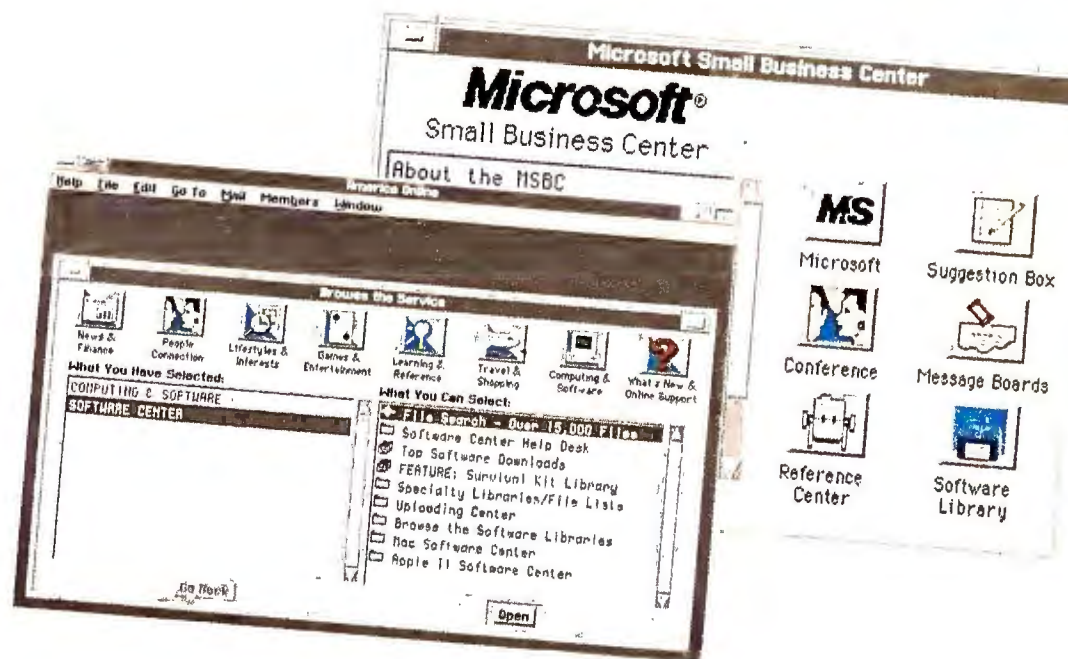
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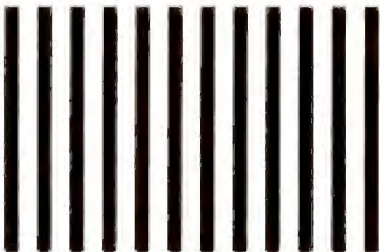
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LETTERS

Reactions and responses from the
PC World community



Bad News, Good News

It's unsettling these days to read about the throes of companies in trouble, especially one as large and successful as Compaq. But as a consumer, I think competition in the PC marketplace and what it's forcing companies such as Compaq to do is terrific. For ages, it seemed that vendors charged whatever the market would bear, and we consumers paid through the nose—often ending up with faulty equipment and inadequate service and support. If the current competition makes Compaq and other vendors tighten their belts and listen to their customers, I'm all for it.

I crossed Compaq off my list of possible vendors years ago, but if the company learns to listen and respond to the people who buy their products, then I'm

one of many who'll put it right back at the top of my list.

*Brian Evanston
Atlanta, Georgia*

High-Speed Modems

I'm an avid user of BBS's and appreciated the buyers' guide on high-speed modems [December 1991]. But you should have covered more 9600-baud V.32bis/V.42bis modems. I had to check catalogs to see if the models you listed supported V.42bis and communicated at 9600 or 14,400 baud.

*Michael Chu
Sepulveda, California*

As the article's introduction explained, all the modems we listed support the V.42bis standard and communicate at both 9600 and 14,400 baud. Since we published the article, however, many new models have been introduced, and prices continue to drop. To bring you up-to-date, we're working on another modem buyers' guide. Look for it in our June issue. —Ed.

PageMaker's Missing Links

In your January article on desktop publishing ["Road Test: Desktop Publishing"], road tester Sheila Brown was mistaken in saying that elements cannot be tied together in *PageMaker*. The program offers at least two ways to link text with graphic elements. Clicking on individual elements while holding down the <Shift> key lets you group elements so you can move them as a unit. You can also group elements by "lassoing" them within a box. These are just two of the many features that earn *PageMaker* high scores in my book, too.

*David Silla
Concord, North Carolina*

AST's Color Portable

In response to the preview of AST's Premium Exec 386SX/25C in your January issue ["Color and Light: The New Color Notebooks"], I'd like to clarify a point. The writer states the screen performed well, but warns that the shipping system might not have the same screen as the prototype he tested. Due to pending negotiations, AST could not name its screen vendor at the time your magazine went to press. However, we will indeed be shipping the same color screen that you previewed in our prototype units.

*Bret Berg
Product Manager, Portable Systems
AST Research, Inc.*

A Tip for DOS Tips

I ran into some trouble with Tip 47 in the January issue's "50 Tips for DOS and Windows." After trying to use the PROMPT command to program my function keys, I discovered that PROMPT key definition works only if the command line is displayed on screen. I use ECHO OFF at the beginning of my AUTOEXEC.BAT file, so I inserted an ECHO ON command before the PROMPT function key redefinition command. I then enter PROMPT \$P\$G (my prompt line configuration) on the next line. Figuring this out cost me a lot of time and a little sanity.

*Mick Bernardo
Springfield, Pennsylvania*

Avagio: Accenting the Positive

Deke McClelland's article "No-Sweat Desktop Publishing" [January] does a disservice to our program *Avagio*. His review contains outright errors and focuses on negative aspects of the program while disregarding the positive.

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Circle 300 on reader service card

First he states that *Avagio's* font support is "the weakest in the roundup." This is absolutely wrong. *Avagio's* outline fonts are fully scalable from 4 to 500 points (5½ inches) in 1-point increments. Because of the outline font technology, not only can font size, typeface, and special effects be changed instantly, there is also no loss of quality at any point size. Also, none of the other products can match *Avagio's* capability to rotate text and fit text to any shaped curve or object.

Second, McClelland focuses on *Avagio's* speed. Granted, *Avagio* may not be the fastest program in the category, but considering all that it does, and especially considering the high quality of the output, this should not be the point on which to focus. High-quality output, after all, is *the* reason for desktop publishing. Surprisingly, the article never discusses output quality.

McClelland criticizes Unison World's technical support. At the time he wrote

the article, we did have problems in this area due to the rapidly increasing demand for *Avagio*. These problems have since been corrected with the installation of a new phone system.

Finally, to compare DOS products to Windows products is absurd! These are completely different operating systems serving different needs. Contrary to what *PC World* seems to believe, not everybody uses a 486 running at 75 MHz with 16MB of RAM. I would like to see *Microsoft Publisher*, for instance, operate on a 286 machine with only 1MB of RAM. *Avagio* can.

David W. Chard
Division Marketing Manager
Unison World

We regret not spelling out that we faulted Avagio's font-handling capability solely because of its lack of PostScript support and not because of any limitation in the scalable fonts that come bundled with Avagio. Our reasoning

was that users of low-end desktop publishing programs may one day want to get output from a typesetting system or a PostScript printer, and that PostScript support is necessary in order to do that.

Avagio does sacrifice speed to make some high-end desktop publishing features available on low-end machines. We gave it four stars for its graphics and low price and three stars for page design and layout. We agree that the color output is spectacular. Readers can get samples of the output by writing to Attn: PC World Response, Unison World, 1321 Harbor Bay Pkwy., Alameda, CA 94501; 510/748-6670, 510/748-6964 (fax). —Ed.

Partitioning Hard Disks

In the otherwise splendid sidebar "Organizing Your Hard Disk" in the December issue ["Buyers' Guide: Hard Disks"], the authors made a serious error when stating the largest partition

Get A Life



supported by DOS 2.x or 3.x is 32MB. Not true! MS-DOS 3.31 supports a single partition of more than 500MB.

I learned this the hard way. When I added a 124MB hard disk to my AT, I upgraded to MS-DOS 5.0 so I wouldn't have to partition the disk. Calamity! Several of my application files corrupted data for the first time. Only then did I learn Compaq dealers (and perhaps others) sell MS-DOS 3.31, which permits one partition on a large hard disk.

David T. Griffith, Jr.
Lake Arrowhead, California

You're right—Compaq's version of MS-DOS 3.31 supports large partitions. However, no one else's does. —Ed.

Hard Disks and Optimizers

The December hard disk buyers' guide says that some drives are not compatible with disk optimizing software. What hardware characteristic could make a disk drive inherently incompatible with

software that merely copies data from one cluster to another?

Robert J. Sandler
New Milford, New Jersey

Some drives use unusual formatting with sectors laid down in a nonstandard way; six drives we listed don't work with optimizers. Check with the manufacturers for more details. —Ed.

More Fonts

Your January fonts buyers' guide passed over what I think is the best of the lot: *MoreFonts* and *MoreType*, sold by MicroLogic Software. *MoreFonts* offers a great selection of fonts at very reasonable prices, as well as the capability to create special effects. *MoreType* lets you convert fonts into formats compatible with PostScript Type 1, Agfa/Intellifont, Atech, and URW-GeoWorks. What more could you want?

Kenneth Beaudrie
Denver, Colorado

Presenting Hollywood

I always enjoy *PC World's* articles and advice. But I beg to differ with your opinion that *Hollywood* is the best choice for business presentation graphics ["One-Touch Presentation Software," November 1991].

Both *Aldus Persuasion* for Windows and *Hollywood* let you easily switch between an outline and slide views. But if you change the size of text in *Hollywood's* slide view, that change is reflected in the outline. For instance, if you increase the size of bullets on a slide, those large bullets stick out like sore thumbs in the outline. What a bother!

The product's other weakness is its vendor. With IBM's uncertain future, how stable can *Hollywood's* future be?

Jack Kissner
Indianapolis, Indiana

Built for Graphics

Your preview of NEC's PowerMate Image computers in the November 1991

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issue ["NEC's Twin Peaks: Hot PCs, Hot Monitors"] raises a very important point: optimizing computers for graphics-intensive programs. I think it's safe to say that almost all significant applications will be written for graphical environments, not DOS. Isn't running a graphical OS app on a box with no built-in component for speeding up redraws and other such functions akin to running a graphical OS app on a 286? It's critical that you address this capability in all your reviews of systems.

Charles Izevbigie
Tallahassee, Florida

Graduating to Harvard for Windows

In "Harvard Does Windows" [December 1991], you mentioned that *Harvard Graphics for Windows* will probably make *Windows* believers out of the program's DOS devotees. I'm an avid *Harvard Graphics 2.3* and *3.0* user, and I've found both to be huge assets in my busi-

ness. However, version 3.0 has one disadvantage: its printing. The process is slow, especially when printing presentations. If *Harvard Windows* corrects this problem, I'm one DOS devotee ready to graduate to *Windows*.

Robin Bock
New Rochelle, New York

Corrections and Clarifications

In the December 1991 issue, we mislabeled the chart in "Organizing Your Hard Disk" in our hard disk buyers' guide. On page 229, all the subdirectories on the E: drive should have been labeled E:.

In January's *User Group Tips*, the listing for the batch screen blanker was wrong. The correct listing is as follows:

```
@ECHO OFF
CLS
PAUSE > NUL
EXIT
```

The sidebar on *Braincel* neural net software in January's *Spreadsheets*

(A..Z) listed the wrong phone number for Promised Land Technologies. The correct numbers are 800/243-1806 and 203/562-7335. Also, the AST service number given in the February notebooks roundup ["20-MHz 386SX Notebooks: More Power to You"] is incorrect. The number should be 800/876-4278.

In the February "Special Report: Best Windows Software," the article "New Applications on the Horizon" gave an incorrect list price for the forthcoming *Ventura Publisher 4.0, Windows Edition*. The program's price is \$795. *PC World* regrets the errors.

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

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Circle 106 on reader service card

See Fox *RUN*.



We've just added a new word to the database vocabulary: *RUN*.

And it can make you a master of your database management universe. Even if you've never managed a database before.

The most powerful PC DBMS available is now the easiest to use, too: FoxPro™ 2.0.

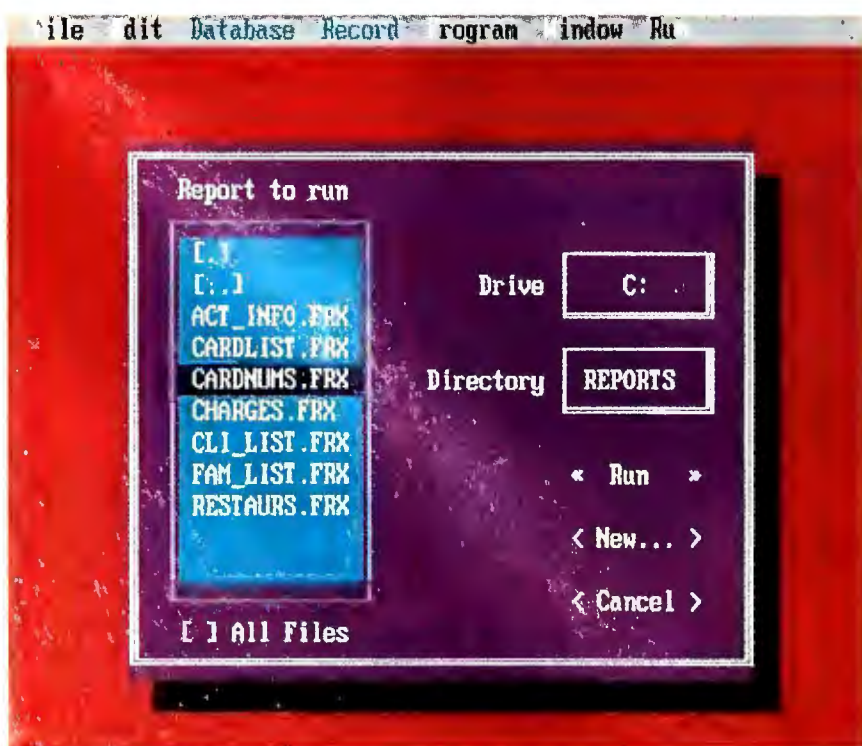
Pick *Run* from the FoxPro 2.0 main menu and you have instant access to your information. Click on *Report*, choose the name of the report you want, and it's yours. Do the same for queries, forms, labels and applications.

For answers on-the-fly, pick *RQBE* (Relational Query By Example) and get a simple interface for creating custom queries quickly and easily. Unlike other query systems, RQBE lets you browse the information or create instant databases, reports, labels, or business graphs (with optional FoxGraph or other graphic program).

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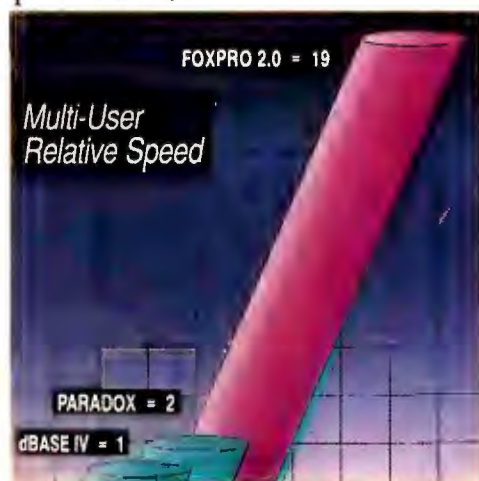
We've added a project manager on top of our debugger, trace window, and editor.

We provide an Application Program Interface (API) that links to C or assembler function libraries (Library Construction Kit optional).

And we offer an optional Distribution Kit to distribute your applications royalty-free.

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FoxPro is devastatingly faster than competitive products (see chart†—the difference is even greater in single-user tests), and has out-queried even mainframe databases like Oracle, XBD and DB2, using our patent-pending Rushmore™ query optimization.

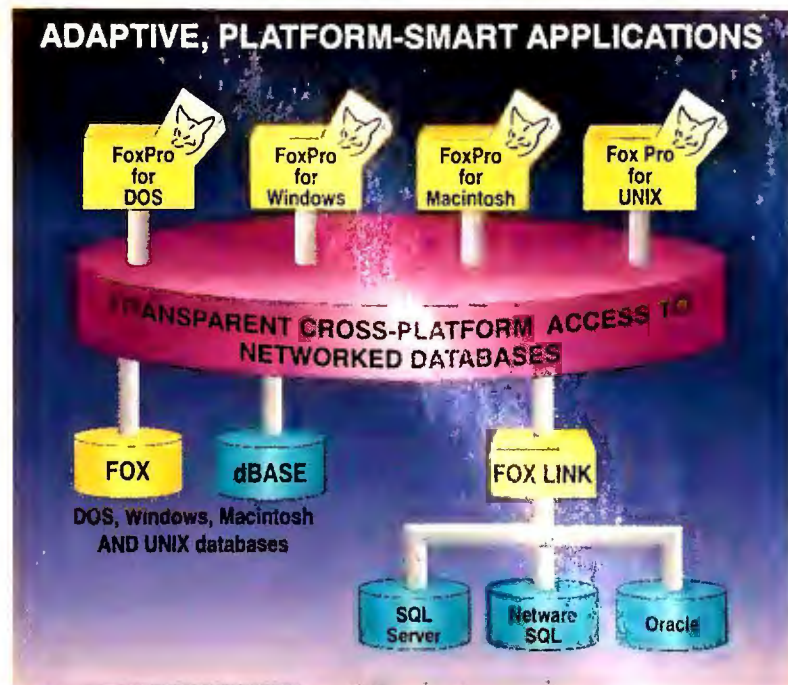


No one comes close to FoxPro's multi-user query response.

It's backward compatible with dBASE III+/IV and earlier versions of

Fox software to protect your investments in hardware, software, training, and support.

And in the few months since its release, FoxPro 2.0 has swept the awards. Best DOS Application - Spring COMDEX. Technical Excellence -PC. Award of Excellence -Byte. Best DBMS -Data Based Advisor. And many, many others from both editors and users of FoxPro 2.0.



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Moving Data From WordPerfect to dBASE

Q. *I have a large amount of information in WordPerfect files and would like to convert the data to dBASE format without retyping. Is there some way to do this?*

*Arnold Van Pelt
Greensboro, North Carolina*

A. You can convert the *WordPerfect* data into comma-delimited text, then import it into *dBASE* (or almost any other data base or spreadsheet). In a comma-delimited file, each field ends with a comma except for the last field of each record, which ends with a carriage return. If a field contains a comma, that field must be enclosed by double quotation marks to prevent the internal comma from being read as a field separator. Since there's no harm in putting double quotes around a field, it's safest

to put them around every field. Consider the following addresses:

Ms. Holly Arbogast
Recovery Systems, Inc.
5165 Clearlake Dr., Dent, OH 45248

Mr. David Richards
329 Blue Earth St., Ackley, IA 50601

Converted to comma-delimited text, they would appear as shown in **FIGURE 1**. For your data to import properly, every record must have the same number of fields. Since the second record has no business name, we've inserted an empty pair of quotes as placeholders. When imported into *dBASE*, they will create a blank in the record's company-name field so subsequent values will be placed in the correct data base fields.

Make a copy of the *WordPerfect* file containing your data, and edit it (manually or by search-and-replace commands) to comma-delimited format. Then save the document as ASCII text without line breaks by selecting *Text in/out* (<Ctrl>-<F5>)•*Save As*•*Generic*. Fire up *dBASE*, open your data base file, and enter the command **APPEND FROM textfile DELIMITED WITH ","**.

Do Super-VGA Boards Need Super-VGA Monitors?

Q. *I'm thinking of buying a super-VGA board. If I do, will I have to buy a super-VGA monitor as well?*

*Isaac Etrozier II
Washington, D.C.*

A. You can run a standard VGA monitor off a super-VGA board, but you'll be able to run the board only at basic 640 by 480 VGA resolution. However, if your software supports 256 colors, you'll be able to display them all instead of being limited to standard VGA's 16.

To take full advantage of a super-VGA board, you need a super-VGA (also called *multiscan* or *multifrequency*) monitor capable of high-resolution 800 by 600 and 1024 by 768 modes. Note, however, that many people find the characters in high-res modes too small to read when displayed on a 14-inch monitor, so look closely before you buy.

Even if you don't need or want higher resolution or more colors, there's still another advantage to super VGA. Most super-VGA boards now allow you to run standard VGA with a 72-Hz vertical refresh rate. This means the screen is updated 72 times a second instead of the usual 60, eliminating perceptible flicker. If you find your eyes tired or sore after working at your computer, flicker-free VGA might help. You'll need a super-VGA monitor for this trick too.

Starting Windows With or Without a Mouse

Q. *I don't like to use a mouse with my notebook unless I have to, but since some programs demand a mouse, I bought a Logitech MouseMan. Unfortunately, when I start Windows with the mouse disconnected, my system crashes. Is there some way to make*

```
"Ms. Holly Arbogast","Recovery Systems, Inc.,""5165 Clearlake Dr.,""Dent","OH","45248"  
"Mr. David Richards","","329 Blue Earth St.,""Ackley","IA","50601"
```

FIGURE 1: Most data bases and spreadsheets can import comma-delimited text files, in which a record is one line, with fields separated by commas.

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Windows run whether I have my mouse installed or not?

*Matthew B. Gerhardt
El Cerrito, California*

A. *Windows* shouldn't crash just because your mouse isn't plugged in. Call Logitech and ask if it will provide a new driver that won't cause this problem. Meanwhile, make two copies of *Windows*' SYSTEM.INI file, one configured for the MouseMan and one for no mouse, then use a batch file to pick the right one when you start *Windows*.

From the DOS prompt, change to your *Windows* directory. Enter **COPY SYSTEM.INI *.SAV** to save a backup copy of SYSTEM.INI. Enter **COPY SYSTEM.INI *.YM** to make a copy of SYSTEM.INI for the batch file to use when you have your mouse attached. Enter **SETUP** to run *Windows*' Setup utility. Move the cursor to highlight the Mouse entry, press <Enter>, cursor down to select *No mouse or other pointing device*, press <Enter> twice, and complete the mouseless configuration. Then enter **COPY SYSTEM.INI *.NM** to copy the newly modified SYSTEM.INI to SYSTEM.NM.

Next, type the batch file commands shown in **LISTING 1** into *Windows*' Notepad (or any other text editor). Save the file as WINMOUSE.BAT in your *Windows* directory. From now on, enter **WINMOUSE Y** to start *Windows* when your mouse is attached and **WINMOUSE N** when it isn't. You can add the usual parameters after the Y or N if you want *Windows* to start an application or run in a specific mode. Note that until you

get a new mouse driver, you'll have to repeat these steps to update all your SYSTEM.INI copies if you modify your *Windows* setup.

Digital Magnifying Glass

Q. *I have a friend with extreme vision loss due to multiple sclerosis. Is there a program that enlarges the characters on a monitor and works with WordPerfect, 1-2-3, and other DOS-based character applications?*

*Susan Dick
Roseau, Minnesota*

A. We found several programs that enlarge screen text, and a source for braille printers. On a graphics monitor, 1-2-3 2.3 and later versions can enlarge screen text 400 percent through Wysiwyg's :Display Zoom Manual command.

WHERE TO BUY

B-Pop, Big for WordPerfect

Hexagon Products
P.O. Box 1295
Park Ridge, IL 60068
708/692-3355
LIST PRICE: \$27, \$39
Reader service no. 824

LP-DOS 5.0

Optelec U.S., Inc.
P.O. Box 729
4 Lyberty Way
Westford, MA 01886
508/392-0707, 508/692-6073 (fax)
LIST PRICE: \$495
Reader service no. 826

MAGic, MAGic Deluxe

Microsystems Software, Inc.
600 Worcester Rd.

```
@ECHO OFF
FOR %%A IN (Y y N n) DO IF %1*==%%A* GOTO OK
ECHO Enter WINMOUSE Y to use Windows with a mouse,
ECHO or WINMOUSE N to use Windows without a mouse.
GOTO END
:OK
COPY C:\WINDOWS\SYSTEM.%1M C:\WINDOWS\*.INI
WIN %2 %3
:END
```

LISTING 1: For users who sometimes do and sometimes don't have a mouse attached to their system, this batch file, WINMOUSE.BAT, replaces SYSTEM.INI with an appropriately configured version before starting *Windows*.

Make the Smart Choice in LaserJet PostScript Language Emulation Cartridges

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PostScript to PCL switching	Yes	Yes	No
Upgrade program	Yes	Yes	No
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Edward Mendelson
PC Magazine, (June 25, 1991)

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Framingham, MA 01701
508/879-9000, 508/875-8009 (BBS)
LIST PRICE: \$79, \$295
Reader service no. 827

Romeo Braille Embosser
Enabling Technologies Co.
3102 S.E. Jay St.
Stuart, FL 34997
407/283-4817, 407/220-2920 (fax)
LIST PRICE: 20 cps \$2995, 40 cps \$3795
Reader service no. 825

ZoomText, ZoomText Plus
AI Squared
1463 Hearst Dr. NE
Atlanta, GA 30319
404/233-7065, 404/233-7059 (fax)
LIST PRICE: \$495, \$595
Reader service no. 828

For more information about all products in this section, circle reader service no. 906.

Hard Drive Upgrades for Low-End PS/2s

Q. *I have an IBM PS/2 Model 25 with two floppies. I'd like to install a hard*

drive, but IBM offers only an internal 20MB drive. I'd like at least 40MB, maybe more. Are such drives available from other companies?

*Scott Gammill
Shreveport, Louisiana*

A. Hard drive upgrades for the Model 25 are hard to find, it's true. Here are a couple that do offer them. Both of these companies have products for the Model 30 as well.

WHERE TO BUY

Plus Hardcard 40
Quantum Corp.
500 McCarthy Blvd.
Milpitas, CA 95035
800/624-5545
LIST PRICE: \$849
Reader service no. 829

hard drives for Model 25 or 30

jb Technologies, Inc.
5105 Maureen Ln.
Moorpark, CA 93021
800/688-0908, 805/529-0908

LIST PRICE: 40MB \$229, 80MB \$379, 100MB \$475, 200MB \$795
Reader service no. 830

Track Baseball Statistics

Q. *I keep the stats of a baseball team. I know there are programs to aid in this task, but I have searched everywhere without luck. Can you help me?*

*Félix M. Ríos
Sabana Seca, Puerto Rico*

A. Baseball statistics-tracking utilities seem to be very popular. We found no less than five shareware baseball stat programs in the Sports & Chance library of CompuServe's IBMNEW forum, plus a couple of softball stat counterparts and a spreadsheet template. If you don't have access to CompuServe and can't find any of these on your local BBS, several are available by mail. We also found five commercial programs. Many of these companies sell stat programs for other sports too.

1991

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Mighty Byte Computer, Inc.
Twin Forks Office Park
6040A Six Forks Rd. #223
Raleigh, NC 27609
800/237-7072, 919/846-0345, 919/676-0500 (fax)
LIST PRICE: \$40 (commercial)
Reader service no. 831

The Baseball Statbook

RJL Systems
106 New Haven Ave.
Milford, CT 06460
203/878-0376
LIST PRICE: \$69 (commercial)
Reader service no. 832

Baseball Statistical Manager 2.95

Caboose Software Engineering
2921 Bluff Point Ln.
Silver Spring, MD 20906
301/460-1437
LIST PRICE: \$25 (shareware)
Reader service no. 833

Baseball Statpak 4.0

Federal Hill Software
3722 Greenway Ln.
Owings Mills, MD 21117

410/356-5592
LIST PRICE: \$30 (shareware)
Reader service no. 834

Complete Team Series

Score Book Software
P.O. Box 3677
Estes Park, CO 80517
303/586-8726
LIST PRICE: \$125 (commercial)
Reader service no. 835

File Clerk Baseball

Landrum Software, Inc.
P.O. Box 842
Palm City, FL 34990
407/286-1324, 407/220-1218 (fax)
LIST PRICE: \$79 (commercial)
Reader service no. 836

Stats Pack

All American SportsWare
90 High St.
Newtown, PA 18940-1450
215/860-8535
LIST PRICE: \$59 (commercial)
Reader service no. 838

For more information about all products in this section, circle reader service no. 907.

Out of Environment Space in NetWare

Q. *My PC is part of a Novell network. When I turn it on, I get a message saying 'Insufficient space in DOS environment to add new search mapping'. Do I have too many items in my PATH statement, or is there a way to give the DOS environment more space?*

*Mary Bonnell
Ashton, Illinois*

A. The *environment* is a small portion of memory where DOS stores the current PATH and prompt definitions and other variable information. Applications can use the environment, too—for instance, *Windows* uses it to store the location of its temporary files, and NetWare uses it to store drive mappings. (To see what's in your environment, enter **SET** at a DOS prompt.)

The error message you're getting indicates your AUTOEXEC.BAT file or NetWare log-in script has filled the

Q.

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A.

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THE HELP SCREEN

available environment space, so NetWare can't add all the search mappings you and your network supervisor have defined. To expand the environment from its conservative default of 256 bytes, add a SHELL command to CONFIG.SYS and reboot. For example, **SHELL=C:\DOS\COMMAND.COM /E:1024 /P** would increase environment space to 1K. You can make the environment as large as 32K (/E:32768), but there's no reason to make it larger than necessary.

Print Selected Pages in WordPerfect Redux

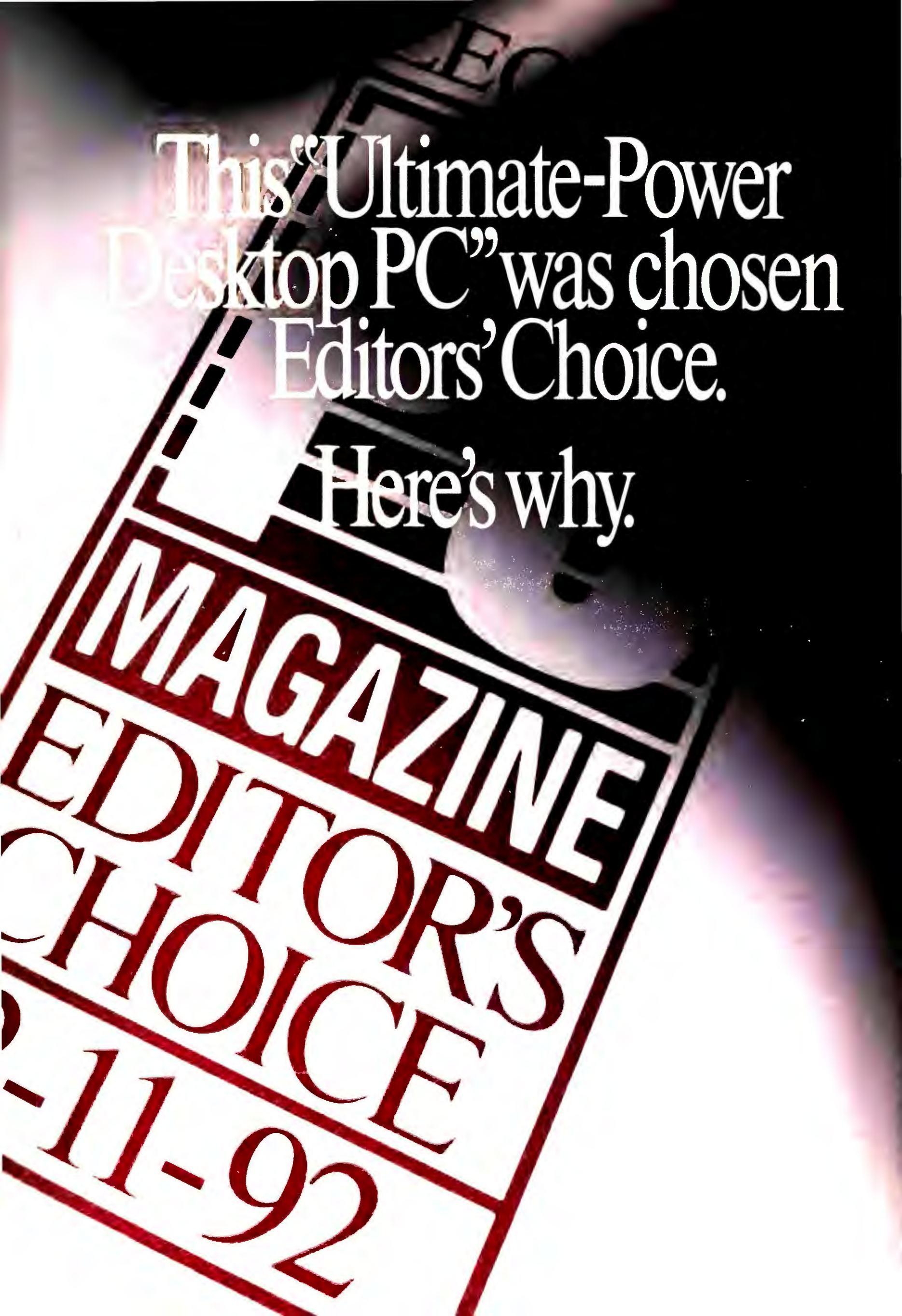
Several readers wrote to tell us our September tip on printing odd and even pages in *WordPerfect 5.1* didn't work for them. It turns out that in early releases of the program, this feature didn't work with all printers. If it doesn't work for you, check the date in the upper right corner of the main Help screen. If it's '3/30/90' or earlier, call WordPerfect and request a free update.

Problems Running DOS 4.0

We still get quite a few questions every month regarding unusual problems with DOS 4.x—disk errors, memory problems, strange files appearing in the DOS directory, apps that run fine under DOS 3.3 behaving oddly under DOS 4.x, and so on. In most cases, our recommendation is the same: Upgrade to DOS 5.0. That should solve most problems. If the problem persists, write to us.

Send your questions to Robert Lauriston, PC World Online, Help Screen; CompuServe 73707,1731; MCI Mail 381-7106; Internet duck@well.sf.ca.us; or 415/442-1891 (fax); or mail them to The Help Screen, PC World, 501 Second St. #600, San Francisco, CA 94107. PC World pays \$50 for published questions. Sorry, we cannot acknowledge submitted materials. ●

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



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386-16



386-16FS



system comes complete with *Lotus 1-2-3 for Windows* and *Ami Pro 2.0 for Windows*. These are not trial copies or sample discs, they are full blown, fully documented production packages. And, with a suggested retail of over \$1,000, even at "street prices" that's a *great* value. It's **ZEOS** value. After all, **ZEOS** sets the pace for innovation and value for you in the direct marketing channel. Here's another good example.

Upgradable.

than anyone else.

First of all, our prices are great! You can get a **ZEOS 386-33** upgradable for as little as \$1,395. Or you can move right into a *complete 486DX2-50MHz for only \$1,995*. Outrageous! And it's not just the price. It's all the extras we give you, too.

As an example, your new **ZEOS Windows**



You have probably heard about the importance of protecting your new computer investment with a surge suppressor. Well, your new ZEOS upgradable desktop system already has one. *Built into the power supply!* That's innovation, built in from ZEOS.

Your new ZEOS system really is unlike anything else you can buy. It's better. Whether it's performance, quality, compatibility, upgradability, expandability, reliability, safety or support—whatever it is that you look for in a system, ZEOS has it. Here's another innovation we introduced to the hardware industry.

Zeos Windows systems include Lotus 1-2-3 for Windows plus Ami Pro 2.0 at no extra charge!



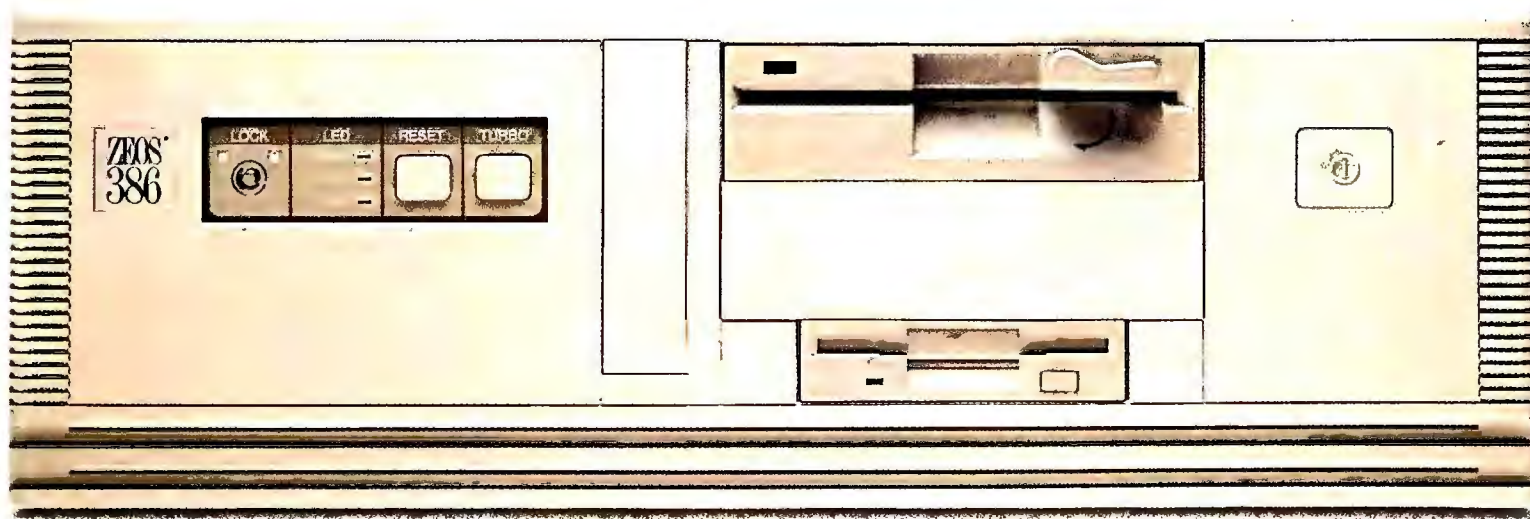
Low Cost.

**Choose
the *Editors'*
Choice
Upgradable.
Now avail-
able as a
486-50!**

24 Hour a Day Toll Free Technical Support. While most of the others still only offer part time technical support, as a ZEOS customer, you get around-the-clock 24 Hour a Day support, 365 days a year. Not that you'll need the help. But it's comforting to know if you do have a question, all you have to do is pick up the phone and give us a

call, *anytime* of the day or night!

And all of this is just for starters. Because when you turn the page we're going to talk about a lot of other very exciting and important reasons for you to buy from ZEOS. Like 486SX-25s, the new 486DX2-50, your ZEOS *Editors' Choice* '486 and more. A whole lot more. *Come on in!*



ZEOS COMPLETE SYSTEM PACKAGE #1

The Processor and Speed of your choice plus future upgradability!

1MB of High Speed RAM, expandable to a system total of 32MB right on the motherboard.

42MB High Speed IDE hard drive with its own cache.

1.2MB or 1.44MB Teac[®] floppy drive.

ZEOS 14" flat screen Hi-Res amber monitor with Tilt/Swivel Base.

Shadow RAM and EMS support for enhanced performance.

ZEOS/RS 101 key SpaceSaver keyboard.

Two Serial, one Parallel & one Game Port built right onto the motherboard.

7-16, 1-8 bit expansion slots. 80387 math co-processor support for '386 systems.

Rugged ZEOS SpaceSaver case with twin cooling fans for added reliability and product life.

Seven drive bays and our custom 300 Watt power supply with built-in surge suppressor!

Includes ZEOS 24 Hour a Day Toll Free Technical Support and Customer Satisfaction package.

PACKAGE #1

INCREDIBLE ZEOS PACKAGE #2

We take Package #1 and upgrade your ZEOS Modular System to include:

2 full Megabytes of Rip-roaring RAM.

Our incredible 107MB IDE hard drive with its own built-in cache.

Both the Teac[®] 1.2MB and 1.44MB floppy drives.

Diamond SpeedStar Hi-Color VGA card/1MB RAM & Sierra DAC.

ZEOS 14" High Res VGA Mono Monitor with Tilt & Swivel Base.

Lotus 1-2-3 for Windows, plus Ami Pro 2.0, plus Microsoft Windows and DOS 5.0, plus a genuine Microsoft mouse!

PACKAGE #2

ZEOS.

ZEOS is the best computer for your money, no matter how much you spend. Why?

Because ZEOS delivers to you high performance, fully compatible systems with more quality and features than any one else. Not only that but our after the sale support is second to none. And the prices? They're best described as incredible! It's no wonder PC Magazine has awarded ZEOS systems the coveted *Editors' Choice nine times*. Your new ZEOS Editors' Choice '486 is no exception.

After all, the ZEOS '486 upgradables are the hottest systems on the market today. As *PC Magazine* says, "it's a lot of computer for a little cash." And that's an understatement! No matter how much power you're looking for, ZEOS has it for you.

486DX-50	\$2195
486DX2-50	\$1995
486DX-33	\$1795
486SX-25	\$1695
486SX-20	\$1595
386-33	\$1395

ANNOUNCING THREE HOT NEW PROCESSOR OPTIONS: '486SX-25, '486DX2-50 AND '486DX-50!

Go ahead and Pick your Power! ZEOS gives you all the options.

You can start out by taking a look at the de facto desktop power standard, the 386DX-33.

Our '386-33 workhorse is a great entry point for true desktop power computing. But if it's a '486 you're after.

Hang on to your hat!

Because you're off to a fast start with a 486SX-20 or our brand new 486SX-25. The 486SX is like a 486DX without the built-in math coprocessor. It's the easiest way to own the '486. And for full blown 486DX power, why not opt for your



486DX-50	\$2695
486DX2-50	\$2495
486DX-33	\$2295
486SX-25	\$2195
486SX-20	\$2095
386-33	\$1895

More Power.



own *Editors' Choice* system!

It's the ZEOS Editors' Choice 486DX-33. Quite simply, there is nothing else like it. *PC Magazine* said "the race toward 486 systems is faster than expected." One good reason for that is our *ZEOS Editors' Choice 486-33*. Go with the ZEOS '486 if you want the type of quality, performance and value that makes an *Editors' Choice* machine. And if it's 50MHz you've been dreaming about, dream no more.

Because right here, right now, ZEOS gives you the option of '486 50MHz power! We're talking power unlike anything you've seen before. Take either the ZEOS 486DX2-50 or the 486DX-50. Absolutely unbelievable *performance!* And the price? That's what you really won't believe; only a couple hundred dollars more than the ZEOS 486-33. *Amazing.*

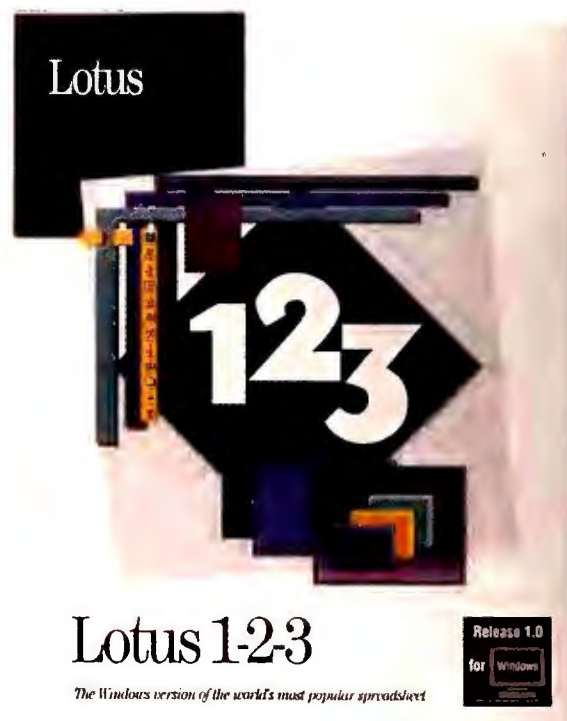
AND THAT'S JUST FOR STARTERS.

Because ZEOS combines the high speed upgradable processor of your choice with some of the fastest DRAM made. Both

are mounted on your ZEOS system board, one of the most advanced in the industry. And that's where your new system really begins to shine.

Because to this we add an *incredibly fast* IDE hard drive and genuine Teac® floppy drives. We have located the ports for these drives right on the motherboard along with your serial, parallel and game ports. The result? Two slots are saved giving your new ZEOS system a total of *eight*. All this while others are trying to get you to accept fewer slots. It's part of your ZEOS expansion advantage. The slots to expand, how about the room?

This is where ZEOS has performed something akin to magic. We call it our SpaceSaver case. Complete with *seven* drive bays (six with the DX-50), this incredible case is actually smaller than many cases offering only five drive bays. Plus, we've also added a *second whisper quiet cooling fan*. Why? Because the cooler a system runs the longer it will last. Now



ZEOS COMPLETE SYSTEM PACKAGE #1

- The Processor and Speed of your choice plus future upgradability!
- 1MB of High Speed RAM, expandable to a system total of 32MB right on the motherboard.
- 42MB High Speed IDE hard drive with its own cache.
- 1.2MB or 1.44MB Teac® floppy drive.
- ZEOS 14" flat screen Hi-Res amber monitor with Tilt/Swivel Base.
- Shadow RAM and EMS support for enhanced performance.
- ZEOS/RS 101 key SpaceSaver keyboard.
- Two Serial, one Parallel & one Game Port built right onto the motherboard.
- 7-16, 1-8 bit expansion slots. 80387 math co-processor support for '386 systems.
- Rugged ZEOS SpaceSaver case with twin cooling fans for added reliability and product life.
- Seven drive bays and our custom 300 Watt power supply with built-in surge suppressor!
- Includes ZEOS 24 Hour a Day Toll Free Technical Support and Customer Satisfaction package.

INCREDIBLE ZEOS PACKAGE #2

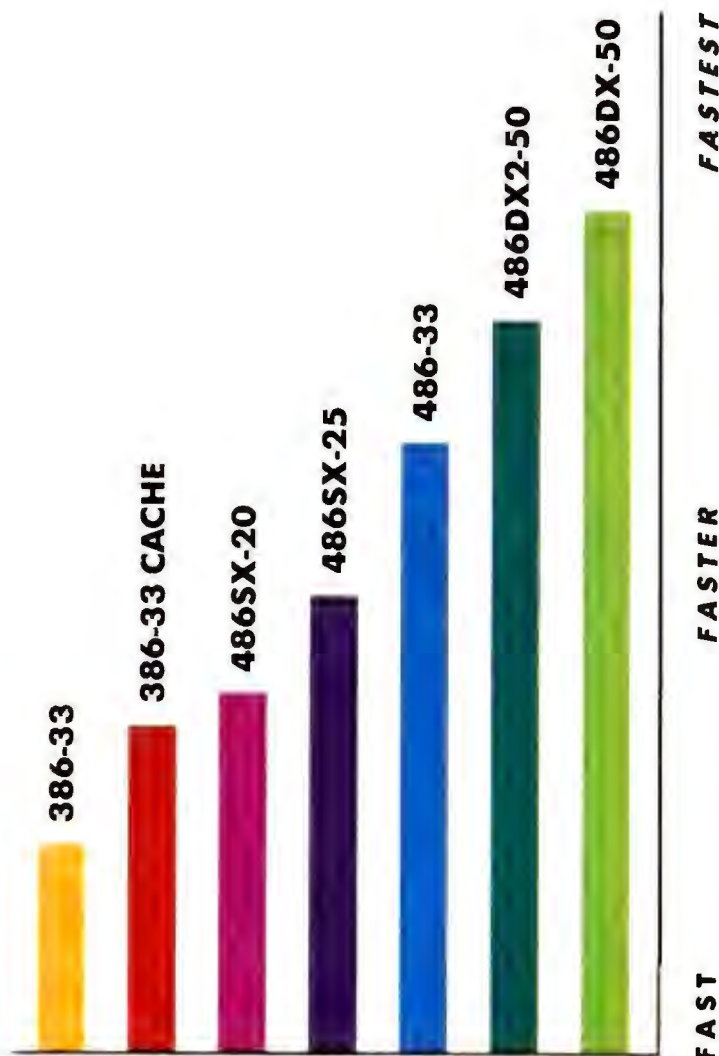
We take Package #1 and upgrade your ZEOS Modular System to include:

- 2 full Megabytes of Rip-roaring RAM.
- Our incredible 107MB IDE hard drive with its own built-in cache.
- Both the Teac® 1.2MB and 1.44MB floppy drives.
- Diamond SpeedStar Hi-Color VGA card/1MB RAM & Sierra DAC.
- ZEOS 14" High Res VGA Mono Monitor with Tilt & Swivel Base.
- Lotus 1-2-3 for Windows, plus Ami Pro 2.0, plus Microsoft Windows and DOS 5.0, plus a genuine Microsoft mouse!

Now, ZEOS lets you pick exactly the power you want for the price you want to pay. Simply match the processor with the package configuration and you have your price. Or if you wish, we will custom build any system to your exact specifications.

And don't forget, with every ZEOS Windows System (packages 2, 3 and 4) you'll also receive Lotus 1-2-3 for Windows plus Lotus' new word processor for Windows *Ami Pro 2.0*. The Lotus software alone carries a suggested retail of over \$1,000 and even street prices are over \$700. Yet we're giving it to you at *no additional charge!* That's ZEOS value.

No doubt about it. ZEOS has broken the price/performance barrier with these great new upgradables,



Z-SPEED GRAPHOMETER

Let the "Z-Graphometer" help you pick the processing power that's right for you. The comparisons are easy to make. Fast, Faster or Fastest!

Or
Customize, Customize
Customize!
Just Tell Us and
We'll Do It.

Pick Your Power!

and you're the beneficiary. Incredible power, upgradability, and free software. What more could there be? From ZEOS, lots more.

Because your new ZEOS system is not only fast, it's absolutely loaded with features. Like our 300 watt power supply with *built in surge suppression*, eight expansion slots, twin cooling fans for even more reliability plus our unique seven bay SpaceSaver case. And, every ZEOS system is UL® listed.

And don't forget you're also receiving 24 Hour a Day Toll Free Technical Support, our 30 day Absolute Satisfaction Money Back Guarantee, Express Parts Replacement and more. So go ahead.

Pick your Power, your Package, and your Price and give us a call. Your friendly, expert ZEOS Systems Consultant is ready to answer any questions you may have. *Call Now Toll Free 800-423-5891.*

PACKAGES 2, 3 AND 4 INCLUDE LOTUS BUNDLE!

	Pkg. #1	Pkg. #2	Pkg. #3	Pkg. #4
386-33	\$1395	\$1895	\$2395	\$2895
486SX-20	\$1595	\$2095	\$2595	\$3095
486SX-25	\$1695	\$2195	\$2695	\$3195
486DX-33	\$1795	\$2295	\$2795	\$3295
486DX2-50	\$1995	\$2495	\$2995	\$3495
486DX-50	\$2195	\$2695	\$3195	\$3695

Add \$200 to any price for a 128K cache. 486DX-50 SpaceSaver case has 6 bays.

PICK YOUR PAYMENT OPTION TOO:

When you buy from ZEOS you have a wide variety of payment options. We accept MasterCard, VISA, American Express and Discover cards, or if you wish we can ship COD.

We also have our own ZEOS credit card, the "Z-Card." The Z-Card allows you to charge your ZEOS purchases just like a MasterCard or VISA. There is a low consumer rate and there is no annual fee. We can send you an application or you can apply right over the phone. Our special Toll Free application number is 800-421-8942.

ZEOS also offers a terrific leasing program for businesses. The rates are lower than those charged by most of the others in our industry. We will promptly mail or fax you an application on request. Just give us a call at 800-423-5891.

Purchase Orders from Fortune 1000 companies, governments and institutions are subject to credit approval. Wire transfer is also available. Please call 800-423-5891 for details.

INCREDIBLE ZEOS PACKAGE #3

Add even more memory, a larger drive. And more Savings! You now receive:

- 4 full Megabytes of Ultra High Speed RAM.
- Our fast 130MB IDE hard drive with built in cache.
- Teac® 1.2 & 1.44MB FDD'S!
- Diamond SpeedStar Hi-Color VGA card/1MB RAM (32,000+ colors)!
- ZEOS 14" 1024x768 Non-interlaced VGA Color Monitor w/Tilt & Swivel.
- Lotus 1-2-3 for Windows, Ami Pro 2.0, Microsoft Windows, DOS 5.0 plus a Microsoft mouse!

THE ULTIMATE ZEOS PACKAGE #4

Now, Memory goes to 8MB and the drive to 210MB. PC Magazine Editors' Choice as a 486DX-33 Vertical!

- 8 full Megabytes of High Speed RAM.
- Your screaming 210MB IDE hard drive with its own built-in cache.
- Teac® 1.2 & 1.44MB FDD'S!
- Diamond SpeedStar Hi-Color VGA card/1MB RAM (32,000+ colors)!
- ZEOS 14" 1024x768 Non-interlaced VGA Color Monitor w/Tilt & Swivel.
- Lotus 1-2-3 for Windows, Ami Pro 2.0, Microsoft Windows, DOS 5.0 plus a Microsoft mouse!

ORDER NOW TOLL FREE 800-423-5891

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Outside US and Canada
Call: 612-633-6131
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Am Exp, Z-CARD, COD and
Leasing Programs.
GSA00K91AGS5176
Open 24 Hours a Day,
365 Days a Year!



If you thought power like this was out of your budget, take another look. While many of the others don't even offer 50MHz power, you can own the new ZEOS 486DX2-50 starting *complete for as low as \$1995!*

Starting at \$1995, you can select from any of four money saving ZEOS System

100+ megabytes, applications just don't seem to be shrinking (however, before you go too wild, remember you can always add more drives). Both of our Packages #3 and #4 incorporate these suggestions.

Certainly another option you may want to consider is our Vertical case. This heavy

ZEOS POWER GRID FOR THE 486DX2-50

Apply The "Zeos Power Grid" To Match Your 50MHz Needs: Add \$200 for 128K cache. Prices shown are for Intel 486DX2-50 CPU, for 486DX-50 add \$200.

Pkg. #1 Only \$1995
Pkg. #2 Only \$2495
Pkg. #3 Only \$2995
Pkg. #4 Only \$3495

	Intel 80486DX2-50MHz	Upgradable CPU	1MB High Speed RAM	2MB High Speed RAM	4MB High Speed RAM	8MB High Speed RAM	42MB HDD, Fast IDE	107MB HDD, Fast IDE	130MB HDD, Fast IDE	210MB HDD, Fast IDE	Teac 12 Floppy Drive	Teac 144 Floppy Drive	14" Hi Res TTL Monitor	14" VGA Mono Monitor	14" VGA Color 1024 x 768 NI	Monitor Tilt & Swivel	Hercules® Graphics Card	Hi-Color VGA Card	Sierra DAC	Shadow RAM/EMS Support	ZEOS/RS 101 keyboard	2 serial, 1 parallel, 1 game port
Pkg. #1 Only \$1995	■	■	■				■				■	■			■	■				■	■	■
Pkg. #2 Only \$2495	■	■		■			■				■	■		■	■		■	■	■	■	■	■
Pkg. #3 Only \$2995	■	■			■			■		■	■	■		■	■		■	■	■	■	■	■
Pkg. #4 Only \$3495	■	■				■				■	■	■		■	■		■	■	■	■	■	■

Packages. Or, if you wish, let us custom build your hot new 486-50 to your exact specifications.

WHAT SHOULD I GET?

How should you configure your new ZEOS 486-50? Of course the best answer depends on your needs and what you plan to use your new system for. But never before has so much power been available to everyone at such a low price. Our suggestion would be to consider investing in two areas when you buy your new 50MHz system. The memory and drives. Particularly the memory.

From what we're hearing, memory will be important with the new operating systems debuting later this year. We would strongly recommend at least 4 megabytes, eight if it's in the budget. As for drives, think in terms of



Your 486

ZEOS Breaks the '486-

duty case holds more drives than most others and has a top notch power supply and plenty of cooling.

It really is quite a buy. The power supply is the *TurboCool 300 watt* unit (check the retail price of the power supply

alone if you really want to see what a good deal you're getting). It's well worth considering.

YOUR ZEOS EXTRAS. NO EXTRA CHARGE.

And don't forget, if you purchase a ZEOS Windows system we'll also include

746, 18 bit expansion slots
300 Watt Power Supply
Built in Surge Suppression
ZEOS SpaceSaver Case
Two cooling fans
24-Hour a Day Tech Support
System UL® Listed
FCC Class B
30 Day Money Back Guarantee
1 Full Year Limited Warranty
Microsoft DOS
Microsoft Windows
Microsoft Mouse
Lotus 1-2-3 for Windows
Ami Pro 20 for Windows
Adobe Type Manager
WinRIX Drawing Package
100's of Other Options
24 Hour Sales,
800-423-5891

Consider the Vertical Option. We can build your new upgradable system in our eight bay vertical case. It comes complete with the 300 watt TurboCool power supply and two cooling fans. Add only \$150.

Lotus 1-2-3 for Windows plus Ami Pro 2.0 with Adobe Type Manager. You'll be getting all the other ZEOS extras too.

If you don't go with the Vertical case, we'll send your 486DX2-50 in our seven bay SpaceSaver case (the 486DX-50 has 6 bays); it's complete with our top quality 300 watt power supply, *built-in surge suppressor*, and *two* whisper quiet cooling fans.

Remember too, ZEOS also provides you with 24 Hour Support, our 30 Day Money Back Guarantee, One Full Year Limited Warranty and our Express Parts Replacement Policy.

Ordering your new ZEOS 486DX2-50 is really quite easy. Simply pick up the phone and

give us a call. You're going to love your new ZEOS '50. And that's a guarantee! Call now Toll Free 800-423-5891.

DX2-50!

50MHz Price Barrier!

Computers Now! SM

Take Your Pick. We'll Ship Today!

RIGHT NOW. GUARANTEED!*

Yes, we can ship your new ZEOS '386 or '486 today! We've built up an extra supply of the hottest selling computers in America in their most popular configurations.

Here's how it works. We have these incredible ZEOS '386 and '486 color VGA systems pre-built and ready to ship. While supplies last, we will ship any of these systems to you *the day you order* subject to these conditions:

1. Your order must be received by 1PM Central Time M-F.
2. Credit Cards are subject to authorization.
3. Orders must be for ZEOS '386 or '486 systems configured as shown here. Any other systems or upgrades are custom built and will take slightly longer.

*OUR GUARANTEE TO YOU:

If we accept your order for immediate shipment and fail to ship your system under the conditions outlined, we will ship it at *our expense* as soon as it is ready.

This offer is good only as long as these pre-built systems remain in stock; please give us a call to verify availability. This offer does not apply to other ZEOS systems or custom configurations.

IMMEDIATE SHIPMENT IS ONLY PART OF THE STORY.

These are not just any computer systems. They're the high performance, high quality ZEOS *upgradable* systems. Packing all the ZEOS value that has won PC Magazine Editors' Choice—*nine times!*

So why not give us a call right now. If we hear from you by 1:00 this afternoon, we'll get your new system on the way to you today! Call now Toll Free 800-423-5891.



**Yes! We can ship
your new ZEOS system
Right Now!
Place your order
by 1:00 PM Central
Time and we'll ship
today. Guaranteed!***

Our most popular '386 & '486 packages! 128K Cache, 130MB Drive, 4MB Memory and More. Ready to ship today!

**'386-33 ONLY \$2595.
As a '486-33 ONLY \$2995!**

- Upgradable CPU module allows you to change processors as your computing needs change!
- Ultra high speed Zero-Wait 128K SRAM Cache.
- 4MB of Zero-Wait DRAM, expandable to a Total of 32MB on the motherboard.
- Ultra Fast 130MB IDE Hard Drive.
- 1.2MB and 1.44MB Teac® floppies.
- ZEOS 14" High Res 1024x768 Non-interlaced VGA Color Monitor with Tilt/Swivel base.
- High speed Diamond SpeedStar Hi-Color VGA graphics card with 1MB RAM and Sierra DAC (32,000+ colors) *plus* WinRIX drawing software!
- Lotus 1-2-3 for Windows, *plus* Ami Pro 2.0 with Adobe Type Manager, *plus* Microsoft Windows and DOS 5.0, *plus* a genuine Microsoft mouse!
- Shadow RAM and EMS support for enhanced performance.
- ZEOS/RS 101 key SpaceSaver kbd.
- High Speed ZEOS I/O with two Serial, one Parallel & one Game Port built in.
- 7-16, 1-8 bit expansion slots. Math coprocessor support for '386.
- Rugged ZEOS SpaceSaver Case with two cooling fans for added reliability and product life.
- Seven drive bays and our custom 300 Watt power supply now with its own built-in surge suppressor.
- Includes ZEOS 24 Hour a Day Toll Free Technical Support and Customer Satisfaction package.

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FEE!

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Now you can send for your own ZEOS Credit Card. It works just like a MasterCard or Visa for ZEOS purchases.

Fill out your Z•Card™ Application and mail it today to **ZEOS International, Z•Card Processing Center, 530 5th Avenue N.W.,**

St. Paul, MN 55112. We'll give you a call as soon as your credit line is established!*

Please complete all appropriate sections, *providing at least two years residence and employment history.* **THIS IS NOT A CREDIT AGREEMENT!** One will be sent to you upon authorization of an account. (This Form Must Be Signed To Process Your Order.) All Financed Purchases Are Subject To Credit Approval. **If You Have Any Credit Questions, Please Call 800-421-8942 For Assistance. Thank You!**

A married person may apply for individual credit. I am applying for (please check appropriate box):

- ☐ **JOINT CREDIT** with another person. Complete entire application.
- ☐ **INDIVIDUAL CREDIT** but rely on income or assets of another person as a basis for repaying the credit requested. Complete entire application.
- ☐ **INDIVIDUAL CREDIT.** Do not complete Section C.**

**If you are a married Wisconsin applicant, you must provide your spouse's information as indicated, even though your spouse may not be signing the contract.

NOTICE TO WISCONSIN APPLICANTS:
YOU MUST DISCLOSE YOUR MARITAL STATUS:

☐ married ☐ unmarried ☐ legally separated

A. YOUR PERSONAL INFORMATION

Name _____
Home Phone (_____) _____
Soc. Sec. No. _____ Date of Birth ____/____/____
Address _____ Apt. _____
City _____ State _____ Zip _____
Since? (Mo./Yr.) _____ ☐ Buy ☐ Rent ☐ Other _____
Previous Address _____
City _____ State _____ Zip _____
Employer _____ Since? (Mo./Yr.) _____
Monthly Gross Salary \$ _____ Daytime Bus. Phone (_____) _____
Previous Employer _____ From - To _____
Occupation _____
Income from alimony, child support or separate maintenance payments need not be disclosed if you do not wish to have it considered as basis for repaying this obligation.
Additional Monthly Income \$ _____ Source: _____
Name & Address of Nearest Relative Not Living With You _____
Relationship _____

B. CREDIT INFORMATION

PLEASE TELL US IF YOU HAVE: Checking Account ☐ Yes ☐ No
Savings Account ☐ Yes ☐ No

	Y/N	How Many?		Y/N	How Many?
Bank Loan	_____	_____	Dept. Store Charge Card	_____	_____
VISA	_____	_____	Credit Union Account	_____	_____
MasterCard	_____	_____	Other Major Charge Cards	_____	_____
Finance Company Loan	_____	_____			

C. JOINT APPLICANT INFORMATION

Joint Applicant's Name _____
Soc. Sec. No. _____ Date of Birth ____/____/____
Address _____ Apt. _____
City _____ State _____ Zip _____
Home Phone (_____) _____ Date of Residence (Mo./Yr.) _____
Joint Applicant's Employer _____ Since? (Mo./Yr.) _____
Bus. Phone (_____) _____ Monthly Gross Salary \$ _____

CUSTOMER AUTHORIZATION

I authorize ZEOS International, Ltd. or its assignees to investigate credit records and to report my performance hereunder to credit agencies. I hereby certify that the following information is furnished to you for the purpose of obtaining credit and is true and correct to the best of my knowledge and belief.

Applicant's Signature _____
Date _____

Joint Applicant's Signature _____
Date _____

FOR MARRIED WISCONSIN APPLICANTS:
I acknowledge that the obligation described herein is being incurred in the interest of my marriage or family.

Buyer's Signature _____ Date _____

There are costs associated with the use of this credit card. To obtain more information about these costs, call us at 800-421-8942 or 612-635-0613 or write to ZEOS, Z•Card Processing Center, 530 5th Avenue N.W., St. Paul, MN 55112.

NY—A consumer credit report may be requested in connection with this application or in connection with updates, renewals or extensions of any credit granted as a result of this application. If I subsequently ask for this information, I will be informed whether or not such a report was requested and, if so, the name and address of the agency that furnished the report.

OH—THE OHIO LAWS AGAINST DISCRIMINATION REQUIRE THAT ALL CREDITORS MAKE CREDIT EQUALLY AVAILABLE TO ALL CREDITWORTHY CUSTOMERS AND THAT CREDIT REPORTING AGENCIES MAINTAIN SEPARATE CREDIT HISTORIES ON EACH INDIVIDUAL UPON REQUEST. THE OHIO CIVIL RIGHTS COMMISSION ADMINISTERS COMPLIANCE WITH THIS LAW.

*Financing not available in Alaska, Hawaii or outside the continental U.S.

PC WORLD

You could sit there until you're as stiff as a statue and never remember it. And reference books won't help because you can't look up what you don't know.

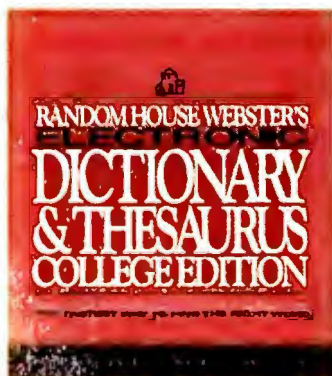
Introducing the Random House Webster's Electronic Dictionary & Thesaurus College Edition.[™] 180,000 words with definitions and 275,000 synonyms, integrated into software that enables you to find words fast. Even if you don't know what you're looking for.

For example, simply type in the things you *do* remember; like "Sculptor AND French." The Random House Webster's Electronic searches its definitions and comes up with a list of French sculptors including August Rodin. "AHA," you say — "Rodin's Thinker." It's like using a dictionary in reverse. And it's impossible with a book.

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Imagine, all the ideas locked up in two of the world's most respected reference books, unleashed and at your fingertips. Then imagine how much better your writing could be. With the Random House Webster's Electronic — the fastest way to find the right word.

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**You Know 'The Sculptor
But You Can't 'Think
Of His Name.**

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CONSUMER WATCH

Advice and information for the
computer consumer

by Roberta Furger

Stores That Sell PCs Can't Always Fix Them

I purchased a Packard Bell 386SX computer from a local appliance store in April 1991. Everything worked fine until one day in September, when I turned the machine on and everything went dead. Trying to restart the system only caused the lights to flash on and off. I figured that the power supply was gone and took the computer back to the store to have it repaired. I thought if these people were authorized to sell Packard Bell computers, they would also have a contract to service them.

The computer was in the shop for four weeks, and when I brought it home, I discovered that the hard drive didn't work. I had to take it back once again for repairs. I've now been without my PC for six weeks, and I'm wondering if it's worth all the hassle.

David Marchand
Windsor, Ontario, Canada

Editor's note: The store that sold you your computer is not always the best place to go for repairs, as Marchand found out. Authorized repair facilities receive priority shipment of replace-

ment parts and complete technical documentation, which often (although not always) facilitates a quick turnaround on repairs. In the case of Packard Bell systems, which are sold through the mass market, resellers are often not equipped to service them, according to company representative Christopher Krauss.

After receiving a copy of Marchand's letter, Packard Bell gave him the address and phone number of the nearest authorized service center and offered to extend his system's warranty for six months, given the repair delays he encountered. According to Krauss, customers can call Packard Bell's customer service line at 818/886-1111 to determine whether an outlet is authorized to handle repairs.

Warranty Woes

Northgate Computer Systems advertises a one-year warranty on its systems and component upgrades. However, I have discovered that what actually hap-

pens is much different from what the company's policy states.

I purchased a 65MB hard drive from Northgate for \$549. The drive failed within the first month. Northgate sent a refurbished drive as a replacement, and this second drive failed while still under warranty. I was offered another refurbished drive and a 90-day warranty for 5 percent of the original purchase price, but I refused this offer. Northgate then offered a refurbished drive with a 90-day warranty at no charge, but I again refused, because I paid for a new, unused hard disk. I have yet to receive a new unit from Northgate that works.

Harry Lewis
Virginia Beach, Virginia

Editor's note: According to Northgate representative Bill Everson, Northgate follows the "industry-standard" policy of replacing hardware that fails while still under warranty with refurbished units. These replacement parts are warranted for 90 days or the remain-

Mistaken Identities

Two New Jersey companies have been mistakenly inundated with calls from irate customers of two Southern California mail-order companies, One Stop Micro of Van Nuys and American Computer Technology (ACT) of Garden Grove. The California mail-order firms have charged these customers for goods that were never shipped.

ACT (American Computer Technologies) of Methuchen, New Jersey, and One Stop Micro of Little Silver, New Jersey, are *not* affiliated with the similarly named California firms. One Stop Micro of New Jersey is a national distributor of computer hardware and has been in business for seven years. "We have an excellent reputation, and we don't want to ruin that," says President Larry Firestone. The New Jersey-based ACT is a third-party provider of PC service and support, according to Office Manager Candace B. Ramirez.

der of the initial warranty period, whichever is longer. At no time, says Everson, has Northgate sold a 90-day warranty for 5 percent of the cost.

Lewis's confusion regarding the warranty and replacement of the defective drive is understandable, however, because his unit's documentation states only that "the obligation of Northgate...is limited to repair or replacement of defective parts of the system at no charge if Northgate determines such part is defective." It doesn't mention replacing defective units with "refurbished" ones.

Perhaps Lewis was not the only customer having trouble with the warranty: A revised manual now clarifies the point in question. Under a new section titled "Coverage of Replacement Parts," the revision reads, "The obligation of Northgate under this warranty is to repair or replace the part or the unit with new or warranted-as-new [emphasis added] parts or units at its

discretion at no charge...." The new section also clarifies the warranty period on the replacement unit.

Because of the confusion over warranty coverage, Northgate sent Lewis a new hard drive and added 90 days to the time left on his initial warranty.

Now That's Service

I recently purchased a Tandy 3000 HL floppy drive, which does not take kindly to running non-Tandy components. After discussing my system configuration, the PC Connection salesperson put me on hold and discussed my desired upgrade with his tech department. In addition to the floppy drive, he suggested I replace my controller. The equipment was delivered the next day, as I requested, and performed flawlessly.

PC Connection's sales department isn't there just to sell products, but to help customers make the right purchase. Its technical department understands PCs, and the company delivers

when promised. With these qualities, I'm sure it's here to stay.

Joseph A. Boudreau, Jr.
Fort Walton Beach, Florida

Not All Surge Protectors Are Created Equal

Snow broke a neighbor's tree limb, which hit a power line and cut off power to my house. When the power was restored, the electricity came through the house on the ground wire—a power reversal, according to the power company. My computer, printer, surge protector, and backup power supply all went up in smoke. Although I was protected from power outages and surges, power coming in on the ground wire burned my backup protection along with everything else.

George Dwight
Pueblo, Colorado

Editor's note: As Dwight discovered the hard way, many surge protectors

Congratulations...

Now all your applications can read.



protect only one line. That's enough to earn them a UL rating but not enough to protect against all power catastrophes. Look for a surge protector that covers positive, negative, and ground lines. While more expensive, the extra protection would likely have saved Dwight's system.

Compatibility Conundrum

Nearly two years after *Windows 3.0*'s release, *Consumer Watch* still gets letters from purchasers of *Windows* products who found out too late that compatibility isn't all it's cracked up to be.

David Minsterman of Lafayette, New York, had a problem when he tried to use Logitech's *ScanMan Plus* with *Windows 3.0*. "I purchased a package that claims *Windows* compatibility and states that *Windows 2.x* is required," writes Minsterman. "I couldn't know that my *ScanMan Plus* purchase in April 1991—well after the release of *Windows 3.0*—would be outdated."

Many products designed for *Windows 2.x* won't run under *3.0*. Most vendors upgraded their packages and offered competitive pricing to users wishing to upgrade. Others, like Logitech, introduced new software rather than upgrading an existing package.

In a form letter sent to Minsterman and other *ScanMan* or *ScanMan Plus* users, Logitech states it doesn't intend to upgrade its software to run under *Windows 3.0*. Instead, it touts the benefits of its new scanning software, *Ansel*, and provides information on how to buy a copy. "I spent \$150 on the scanner package to begin with. Their solution to my problem is to spend another \$85 for new software," says Minsterman.

After *Consumer Watch* contacted Logitech, the company sent Minsterman a free copy of *Ansel*.

Defective Parts Delay Shipment

I was attracted by a huge advertisement and good consumer ratings for

Zeos, so I ordered a PC from the company last October.

The salesclerk said the system would be delivered in ten days. He also told me the order would be placed the same day, even though my company's check might not reach them until a week later. Fifteen days later (after my check cleared the bank), I called. I was told the PC was on the production line because of back-ordered parts and was given a new delivery time. Later, I called again to make sure I would receive delivery as promised. I was told the unit was not on the production line and they didn't know the reason for the delay. I called again five days later and canceled the order.

Lynn Hsu
Cerritos, California

Zeos responds: At the time Ms. Hsu placed her order, the lead time for custom-built systems was the ten days quoted. However, soon after that, we received two consecutive shipments of

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IN A CATEGORY OBSESSIVE AND LIGHTER, COMPAQ WANTS ANOTHER ADJECTIVE

Make it smaller. Make it lighter. Make it lighter. Make it smaller.

These must be the mandates emblazoned upon every R&D document handed to the engineers of today's crop of notebook computers.

Admirable goals to be sure. Goals that the engineers at Compaq, however, believe fall well short of making the most of portable computing.

Which explains why the latest 386SL notebook technology from the labs in Houston — the new COMPAQ LTE Lite/25 and LTE Lite/20 PCs — are not only the lightest (a scant 6 lbs.) and the smallest (only 8.5"x11"x1.75") notebook PCs that we've ever built. They're also the smartest.

The COMPAQ Hibernation feature saves all open files to the hard drive and turns the unit off, either upon request or as an automatic feature. Power up the COMPAQ LTE Lite later and you're back exactly where you left off.

THE BRAINS BEHIND THE OPERATION.

When it came time to design a new notebook, we started (logically enough) with the battery.

The new COMPAQ Power Smart Pack battery in our new notebooks delivers up to 4.5 hours of computing, a full hour longer than most.



Accurate to within minutes, the COMPAQ Power Smart Pack battery gauge clearly displays remaining battery life at the touch of a button.

A microprocessor inside the battery itself monitors current usage levels and continually calculates the available power remaining.

It can even instruct the notebook to save all open files to the hard drive should the battery power run too low.

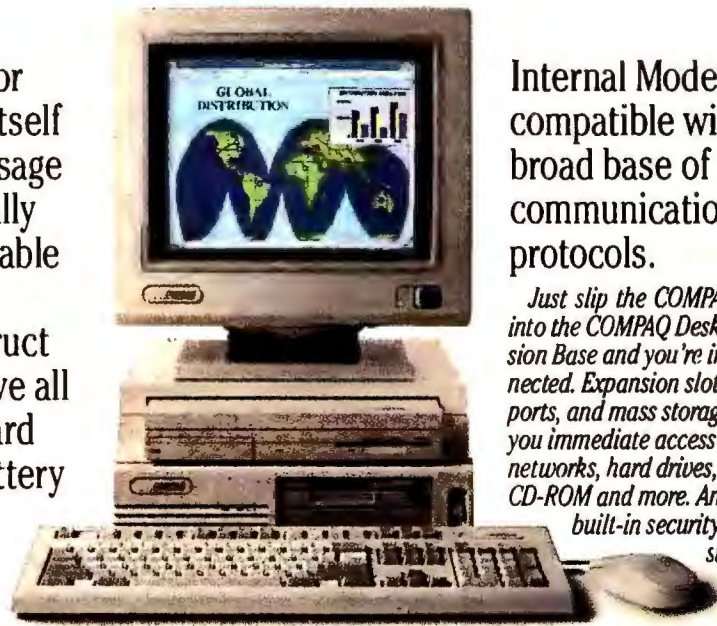
And the energy-saving features in our newest notebooks go far beyond the presence of an Intel 386SL chip. To make the most of the smarter battery, the new COMPAQ LTE Lite also comes with user-adjustable power-drain settings, and three dif-

ferent sleep modes — System Idle, System Standby, and Hibernation.

A MOST MODERN MODEM.

Our optional 9600-bps modem for the COMPAQ LTE Lite PCs would make even Alexander Graham B. proud.

The COMPAQ Enhanced 9600-bps



Internal Modem is compatible with the broad base of today's communications protocols.

Just slip the COMPAQ LTE Lite into the COMPAQ Desktop Expansion Base and you're instantly connected. Expansion slots, external ports, and mass storage bays give you immediate access to monitors, networks, hard drives, tape drives, CD-ROM and more. And all the while, built-in security features ensure a safe harbor for your notebook.

In modem talk, that means true V.32 9600-bps data transmission and V.42bis compression for up to 38.4 kbps throughput, as well as full support for Hayes AutoSync.

This little marvel negotiates the fastest transmission throughput that the other end of the line can muster, whether it's sending or receiving.

It even drops to a low power-drain standby state and monitors incoming signals if you're waiting for a call to come in.

Or for that matter, another modem to catch up.

NOT ONLY SMART, BUT BRIGHT.

The new, efficient COMPAQ Maxlight VGA display makes for a much brighter screen than our previous notebooks, and does it without sacrificing battery life.

Sharper graphics and text in up

DESIGNED WITH SMALLER WOULD LIKE TO SUGGEST EFFECTIVE: SMARTER.

to 64 shades of gray complement an enhanced video subsystem that's so fast it virtually eliminates "submarining," better known as "where did that #%\$**# cursor go?"

A NOTEBOOK THAT'S USELESS IN THE WRONG HANDS.

At Compaq, we realize that data security is every bit as important as hardware security.

At the hardware level, DriveLock locks the hard drive, preventing access to data even if the drive is removed.

One-touch QuickLock and QuickBlank functions



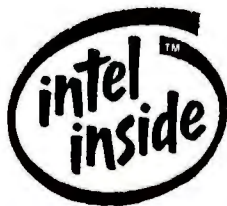
Isolated inverted "T" cursor controls are in a familiar position so you don't have to teach your fingers new tricks.

allow you to quickly (surprise) disable the keyboard or blank the screen.

And of course, our new notebooks come with a Keylock slot for an optional cable lock.

With all of the above, plus a 120-MB hard drive*, RAM expansion to 10 MB, cache memory, simultaneous display, and an auxiliary battery, to say these are the best notebooks we've ever made would be something of an understatement.

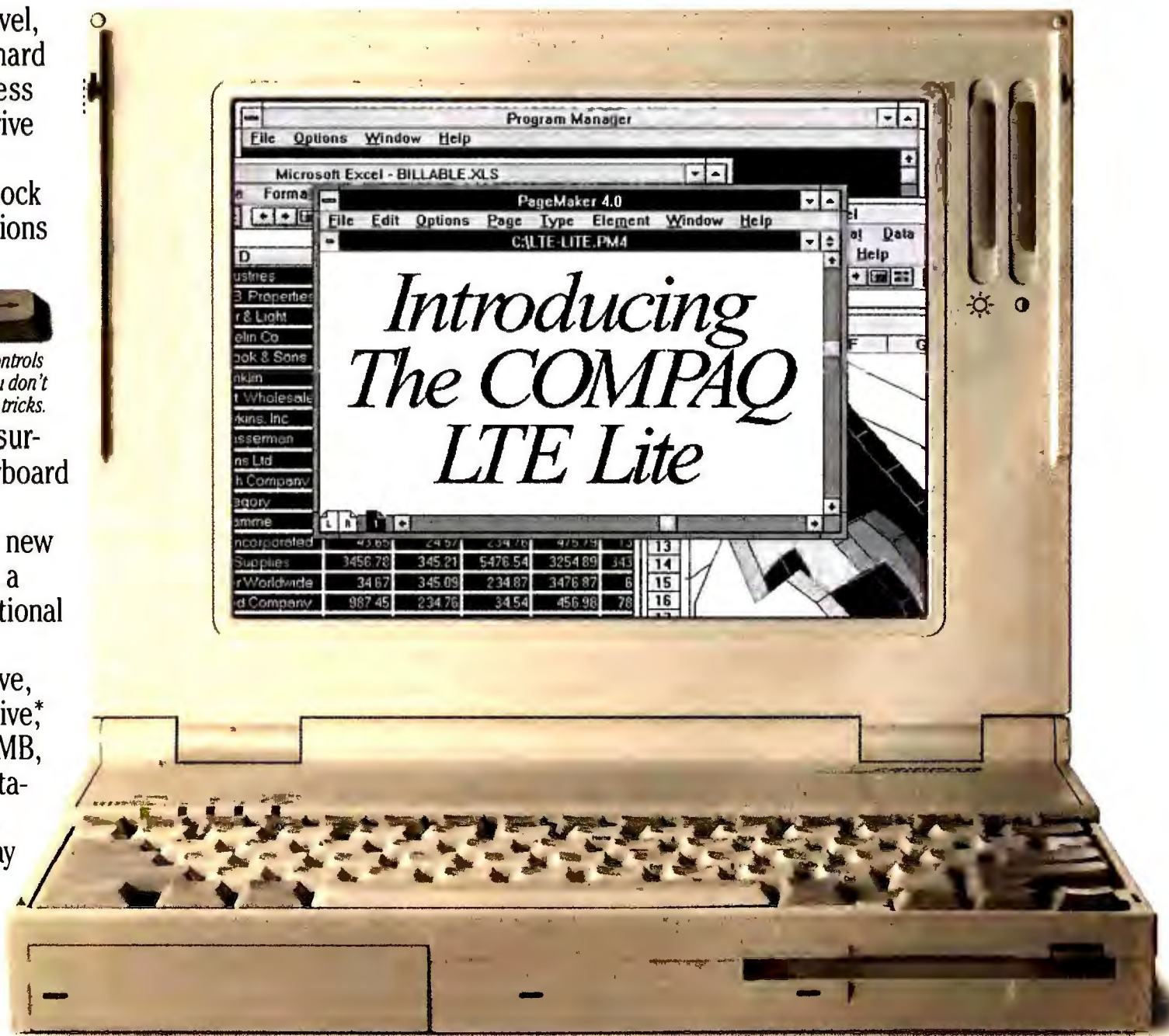
To back them with a one-year worldwide warranty and our toll-free Compaq Customer Support Center hotline would be more like it.



So don't choose between a small notebook and a smart notebook. Choose both.

Choose the new COMPAQ LTE Lite. For information about our new notebooks or an Authorized COMPAQ Reseller near you, call Compaq in the U.S. at 1-800-231-0900, Ext. 100, or in Canada at 1-800-263-5868, Ext. 100.

COMPAQ



Actual weight: 6 lbs. Actual dimensions: 8.5"x11"x1.75". Actually, this is the best notebook we've ever built.

Circle 47 on reader service card

cases that were not up to our standards. The confusion over when the system would ship was due to our not knowing when acceptable cases would arrive.

Ms. Hsu wondered why her check was cashed before her computer was shipped. Because of the high value of computers, we must wait for a check to clear before we can ship the product. When a customer uses a credit card, for which credit authorization is available, we do not charge the card until the computer is ready to be shipped. Ms. Hsu's refund was processed the same day she called to cancel the order.

Rick Apple

Vice President, Marketing

Editor's note: In a follow-up conversation, Zeos's Apple added that the company's new policy is to inform customers when there will be a "significant delay" in shipment. Customers then can opt to cancel their order.

Customers buying PC hardware or

software by mail should confirm a ship date with the salesperson and request written notification of any delays. Credit card shoppers should insist that their card not be charged prior to product shipment.

An Offer Too Good to Be True

ChipSoft of San Diego placed a full-page ad in the January 1992 issue of *PC World* offering readers a free copy of the \$179 *Norton Utilities* when they purchased *TurboTax*. But as the roughly 3000 people who took ChipSoft's offer discovered, the free copy wasn't the full *Norton* but a version created specially for ChipSoft called *Norton Utilities 6.01 LTE*. The "light" version did not include NDOS or the Disk Editor and came with condensed documentation. In addition, users could not register the software, since it didn't include the required UPC code.

Alan Gleicher, president of ChipSoft's Personal Division, told *Consumer*

Watch that the company had changed its ad to identify the bonus package as "Norton LTE" and had begun explaining the Norton offer to callers before they placed an order. Under an agreement with the Massachusetts attorney general's office, which acted on behalf of a Massachusetts resident, the company has also agreed to offer anyone who responded to the misleading ad a free upgrade to *The Norton Utilities 6.01*. ChipSoft also made a \$1000 contribution to the Attorney General's Trust Fund in lieu of paying a penalty.

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; PC World Online, Consumer Watch; MCI Mail PC World Editorial; CompuServe 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest. ☺

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Edited by ERIC BENDER

Competitive Upgrades Ease Windows Path

Are Software Prices Falling? Yes and No

Street Prices for Major Packages Barely Waver

Borland Int'l ignited a brushfire in 1989 when it offered the first big "competitive upgrade," and software buyers and sellers are still feeling the heat.

Instead of upgrading to the next version of 1-2-3, Borland told Lotus users, pay the same small upgrade fee—to us—and we'll send you *Quattro Pro*. "We essentially took price out of the [buying] equation," says Spencer Leyton, Borland's senior vice president of business development.

The scheme succeeded so well that virtually all major PC software vendors have fol-

lowed Borland's lead—most recently with a flurry of attractive competitive upgrades targeting users who are moving from DOS-based to *Windows*-based applications. Companies making that transition can now upgrade their entire software population quite cheaply.

Gerard Nussbaum, management information systems director of Premier Hospital Alliance in Round Lake, Illinois, found Microsoft's \$129 *Excel* upgrade irresistible. "If I'd had to pay full price for *Excel*, I probably wouldn't have switched from 1-2-3, because I still needed to be able to link my DOS users to *Windows* users," says Nussbaum. "The hassle wouldn't have been worth it. For a \$400 savings, though, I decided I'd figure out a way."

The scheme also plays well in the DOS world. Keith Dolan, a PC specialist at Hussey Seating in North Berwick, Maine, happily exchanged old versions of *SuperCalc* for the latest *Quattro Pro*. "They told us they'd take anything in exchange, so we thought it would be a good chance to make a switch," says Dolan.

Regular Prices Unchanged

But for the majority of customers, who aren't changing brands, PC software street prices have held steady for years. "You tend to see a drop in price when a revision or update is due, then the price goes up for a little while, then it goes back down to the origi-

nal level," says John Murphy, president of Metro Computing in Gibbsborough, New Jersey, which tracks hardware and software street prices.

Firm prices don't mean list prices, though, says Murphy: "Anyone who pays retail for software is out of their mind."

dor offers different terms, conditions, and ways of tracking network usage.

Fortunately, in response to user demand, most vendors now offer concurrent LAN licensing, so you needn't buy a copy for each PC on the network—you simply agree on a maximum number of simultaneous users. "This is much more apropos to the way that our customers operate," explains Pete Higgins, vice president of Microsoft's analytical software unit.

So... How Much Did You Pay?

Pricing options for single-unit buys of *Windows* packages

Package	Full list price	Street price	Competitive upgrade list price	Competitive upgrade street price	Upgrade list price	Upgrade street price
WordPerfect	\$495	\$249	\$150	\$129	\$99	\$79
1-2-3	\$595	\$370	\$129	\$89	\$129	\$89

Source: Metro Computing, Fry's Electronics

Single-copy prices for popular applications such as *WordPerfect* and 1-2-3 vary enormously depending on how you buy. Network packs, other volume purchases, and unpublished special deals make the price picture even more fiendishly complex.

"If I don't see an automatic 40 percent off retail, there is no way I'm going to buy," says Dick Aiken, PC manager for GE Armaments Division in Burlington, Vermont. "I provide my users with support, so there's no need to pay margin for those services." Aiken scours the papers for mail-order ads to help him negotiate prices with local dealers and distributors and buys via mail if he sees a good deal.

Turmoil on the LAN

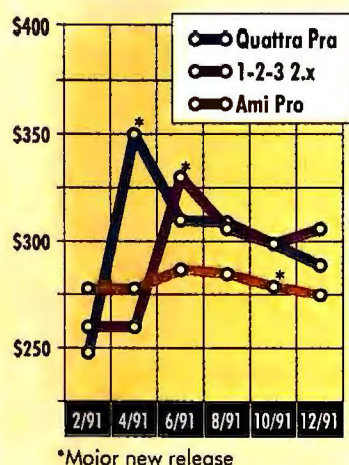
Networks add even more pricing complications. Each ven-

Still, the various pricing structures can be bewildering. If a business wants to install a LAN version of *WordPerfect 5.1 for Windows*, for example, the price it pays depends on whether any PC-based word processing packages are currently installed, whether it has existing copies of *WordPerfect* for DOS or some other word processor, whether it wants documentation included or is willing to copy its own, and where it buys the product: from a mail-order firm, a dealer, or direct from the vendor.

—Alice LaPlante

Early Buyers of New Versions Often Pay More

Street pricing for selected applications



Source: Metro Computing

While prices of major applications have remained steady over the years, you often pay extra for a major new release soon after it ships. 1-2-3 and *Quattro Pro* followed that pattern; *Ami Pro* did not.

E-Mail Finds Bigger Audience, Role

Microsoft, Lotus Offer Rival "Mail Enabling" Platforms

Your local software store doesn't stock electronic-mail packages, but vendors and network resellers are quietly installing them by the truckload. By year-end there will be 9 million-plus users of PC local area network mail in the United States—far more than there will be, say, registered *WordPerfect* users.

Impressive as these numbers are, they're not what persuaded Lotus and Microsoft to acquire the two leading mail vendors last year. The principal motivation is mail's potential role as the foundation for controlling the next generation of PC software—"mail enabled" applications.

Establishing Mail Dominance

The idea is that developers who want to write network applications can piggyback on the mail system rather than write their own messaging code. The resulting applications range from Software Publishing's *Professional Write Plus* (which lets you send mail from a pulldown menu) to group schedulers to networked-form publishers to sales-lead systems (which cull customer prospects from a data base and mail them to salespeople nightly). "Every department within an organization has an opportunity for applications of this type," says Laura Jennings, Microsoft's group product manager for work-group applications.

Early mail-enabled applications often used Message Handling Service (MHS), a least-common-denominator mail engine that accompanies NetWare. A year ago, mail vendors began opening their product architectures to allow users and third parties to fully exploit a given mail package.

Exploiting mail packages would be easier if a standard let developers write a version of an application that could talk to all major mail systems. Last fall two conflicting standards were proposed—the first by Lotus, IBM, and Apple; the second by Microsoft.

While a mail interface standard would be a boon, just building full-powered mail-enabled applications remains a formidable task because each organization's needs and computing environment are so idiosyncratic. "Mail-enabled applications are going to be very big, very exciting, but each must be done for the customer—almost like a custom-tailored suit," cautions Eric

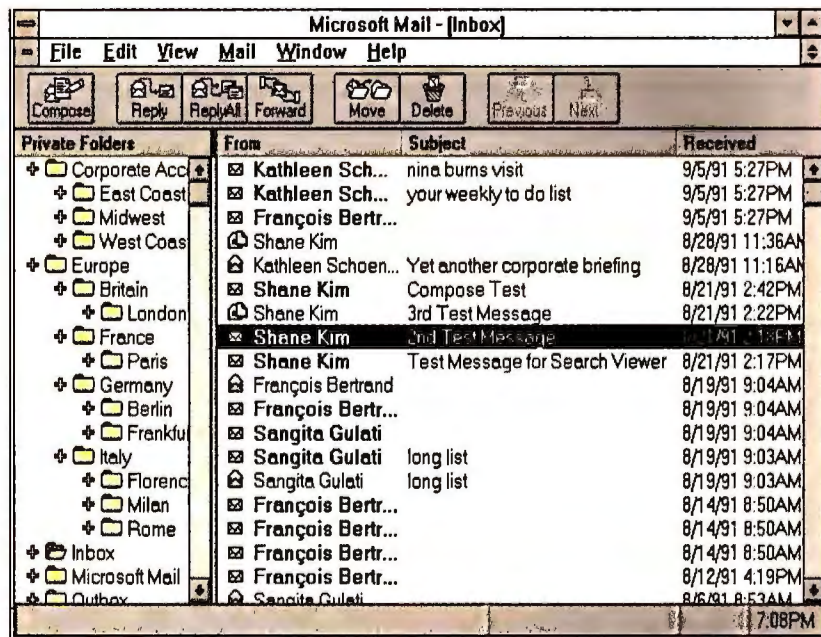
Arnum, editor of *Electronic Mail and Micro Systems* in Forest Hills, New York.

Making Better Connections

This year mail vendors will make a big push to remove a

also tailoring versions for a menagerie of new portable PCs: palmtops, pen-based systems, and notebooks toting wireless data communications.

As development costs and support requirements rise, so will prices. "Vendors are pretty unanimous that E-mail has been underpriced," says Shelly Harrison, *cc:Mail* marketing director.



Upcoming Windows mail packages like Microsoft Mail 3.0 leverage the graphical user interface to ease tasks in handling mail.

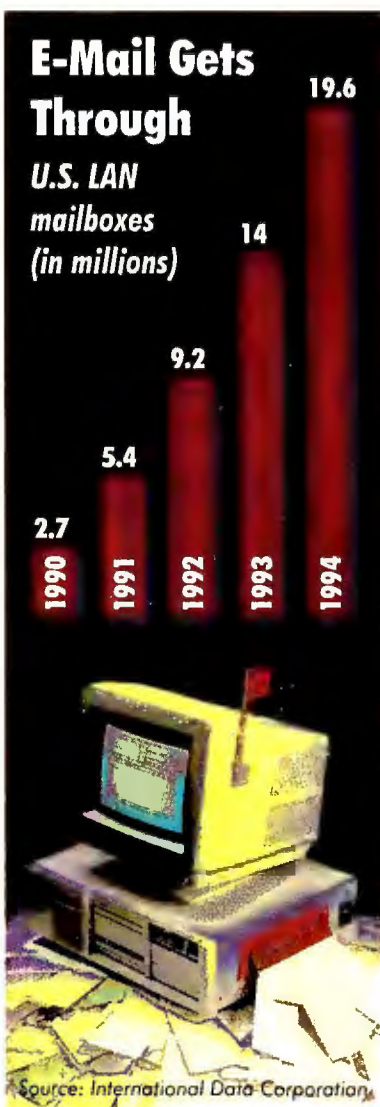
perennial customer headache—the difficulties of connecting from one mail system to another brand of PC net mail, large-system mail, or other communications service.

They'll also grapple with what Arnum calls "the dirty little secret of LAN E-mail: network management and reliability." These problems reside mainly in the nets themselves rather than in the mail packages. Networks "require a lot of attention if they're going to run properly," says Peggy Pisani, information technology consultant at Baxter Healthcare in Deerfield, Illinois, which is rolling out Lotus's *cc:Mail* to 3000 users on 20 networks. "For our enterprise E-mail system to work, all these LANs have to stay up."

Another major effort will be to give remote (dial-in) users more powerful access to mail services. Suppliers are

Lotus has taken the lead in mail with *cc:Mail*'s 1.5-million installed base (plus the ground-breaking *Lotus Notes*, which incorporates mail and acts as a tool kit for information-sharing applications). Microsoft is right behind with *Microsoft Mail*; the company is planning to launch a marketing offensive midyear with a major new release.

Da Vinci eMail from Da Vinci Systems in Raleigh, North Carolina, should get a boost from the company's purchase of Action Technologies' *The Coordinator*. Other major players include *WordPerfect Office*, and *Higgins* from Enable Software in Ballston Lake, New York. Among smaller suppliers, *Right Hand Man* from Futurus in Metairie, Louisiana, and *Network* from Notework in Brookline, Massachusetts, are selling well. —Eric Bender



Offering PC users powerful connections at relatively low cost, network-based electronic mail is flourishing.

LOGICAL PRINTER SHARING

Justification

If one user prints 40 pages a day on an 8 page per minute laser printer, that printer will be in use for only 5 minutes per day! Logical Connections allow several users to easily share expensive printers and other resources, like modems and plotters. Choose the peripheral that you need from a pop-up menu.

If your company has a LAN, use Logical Connections for local printer sharing in smaller workgroups, rather than printing centrally through the LAN. Local printing is more convenient and more secure!

Versatility **LC Plus – 512Kb \$595**

All six ports of the Logical Connection Plus are automatically configured as parallel or serial, and input or output. Installation is a breeze. You just plug in your cables and run the installation software; the LC Plus will do the rest. Besides being very user friendly, the LC Plus processes data at blazing speed for any application. You can share modems and transfer files at 115,200 bps.

6 PCs or Printers/Any Combination

Practicality **LC – 256Kb \$395**

The original Logical Connection is still all the printer sharing device that most people need. The LC is ideal for printing of word processing and occasional graphics data. Its eight ports are: four bi-directional serial ports which can be set as input or output, two parallel inputs and two parallel outputs. Six users can share two parallel printers. The serial ports can also share modems.

6 PCs to 2 Printers (Typical)

Simplicity **LC Jr. – 256Kb \$239**

Inexpensive modular cable, even hundreds of feet in length, can be used to serially connect up to four PCs to the Logical Connection Jr. at speeds up to 115,200 bps. Plug your existing parallel printer cable into the LC Jr. and it will automatically convert the data from serial to parallel for fast parallel printing. Multiple users can send data simultaneously since the memory will buffer and queue jobs on a first-in-first-out basis.

4 PCs to 1 Printer

- **Made in the USA**
- **UL Listed Power Supplies**
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EISA Bus Moves Closer to Mainstream

Offerings Abound as Cost Premium Drops Below \$500

Two-and-a-half years after the grand debut of the Extended Industry Standard Architecture (EISA) bus, you can purchase a PC with the high-speed 32-bit bus for under \$4000—making such systems affordable for many

gence/InfoCorp in Santa Clara, California. Towers of power like Compaq's Systempro carried heavy prices and targeted niches like network servers and CAD systems.

Since then, however, "many manufacturers have migrated

Computer Intelligence/InfoCorp predicts 550,000 EISA PCs will ship this year in the United States—less than one-tenth the predicted number of ISA-bus shipments, and less than half the predicted deliveries of MCA PCs (almost all from IBM). But EISA should overtake MCA by 1996 and pass ISA late in the decade.

Planning for an EISA Future

Like many EISA users, Dave Alison, director of management information systems for Nantucket Software in Los Angeles, employs his ALR EISA systems as net servers. EISA's 32-bit data transfers accelerate access to Nantucket's 4GB disk subsystem. "The performance is a lot better than what we'd get with 8- or 16-bit cards," he says.

Alison chose EISA because the prices were "ridiculously low" and the systems are built for the long term—they can handle upcoming requirements like a switch to high-speed fiber optic networks. "I want to invest in a chassis that I don't have to chuck out the door two to three years down the road," he explains.

Stephen Burkholder, a computer consultant in Regina, Saskatchewan, uses his 486/EISA system from Insight Computers as an OS/2 workstation to support and develop mainframe software applications. Burkholder says EISA was worth the additional cost to gain a "20 to 30 percent" performance boost. He also feels he's "protecting against obsolescence" by buying EISA. When the day comes that Burkholder decides to replace his old 16-bit video card, he expects to find a wide selection of high-performance EISA video boards.

Today he'd choose among a handful of EISA graphics boards. "We've estimated there are between 50 and 100 EISA boards on the market," says Gerald Wineinger, EISA program manager at Texas Instruments in Austin. Most are network adapters and disk controllers.

However, Wineinger expects more choices as EISA PC sales pick up, a shift that will be accelerated by new technologies such as multimedia. "Real-time video cards will need the speed of the EISA bus," he declares. —Jeff Bertolucci

Alice LaPlante is a freelance writer based in Palo Alto, California.



Nantucket's Dave Alison says EISA provides "a chassis that I don't have to chuck out the door two to three years down the road."

businesses that once balked at paying \$10,000 and up.

The brainchild of a consortium of nine influential PC clone makers, EISA was designed to offer all the performance pluses of IBM's much-touted Micro Channel architecture (MCA) bus while maintaining compatibility with standard XT/AT add-in cards. EISA offered data transfer rates between peripherals and the CPU of up to 33MB per second, plus a blueprint for *bus mastering* (allowing an add-in board with its own processor to manage the bus, thereby lessening the burden on the CPU).

The first EISA PCs were high-performance products built to compete against mini-computers, says analyst Stella Kelly of Computer Intelli-

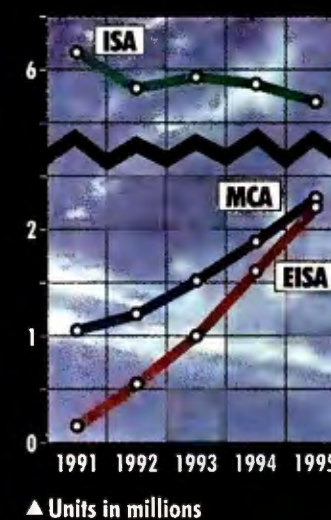
EISA across their entire line" of PCs, Kelly says. For example, each of Compaq's Deskpro/M models have an EISA bus, with prices starting at around \$3500, and Dell's PowerLine EISA models begin at around \$3200.

These price drops reflect both general trends among PCs and a much diminished premium for EISA components. The EISA chip set, EISA connectors, and a beefed-up power supply still cost slightly more than their ISA equivalents.

Customers should expect to pay \$300 to \$500 more for an EISA PC than for a similar ISA machine—less than half the differential of a year ago, notes Paul Gupta, president of Blackship Computer in Fremont, California.

EISA PCs Show Greatest Growth


Estimated U.S. shipments of PCs by bus type



▲ Units in millions



The advanced 32-bit EISA bus is gaining ground but will not soon replace the ISA bus. InfoCorp expects IBM's MCA bus to make slower progress.



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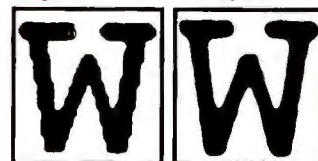


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PREVIEW

PC WORLD OFFERS FIRST IMPRESSIONS OF PRERELEASE HARDWARE AND SOFTWARE

Compaq Redefines Its PCs

Snappy graphics and blazing speed at an affordable price

by Jeff Bertolucci

Rough-and-tumble competition may have forced Compaq to cut costs and reduce prices, but it's also spurred the company to bring out some of its most innovative products in years. Fresh to market are a powerful graphics controller, a dual-speed 25/50-MHz 486 system upgrade board, new Deskpro/M models based on these boards, and two high-resolution monitors guaranteed to make *Windows* users more productive.

The price tag on products this formidable used to make you gasp. No longer. Compaq wants your business, and its prices prove it.

Topping the list is Compaq's Deskpro 50M, the newest member of the family of compact, modular, EISA-based Deskpro/M's, which feature removable CPU, memory, video, and I/O boards for easy customization. A Deskpro 50M with a single floppy drive and no hard drive will cost about \$5000.

Sporting Intel's new 25/50-MHz 486 clock doubler chip on its removable processor board, the Deskpro 50M can boost the performance of processor-intensive applications like spreadsheets by executing instructions at the clock doubler's 50-MHz internal processing speed. However, since the CPU interacts with the rest of the system at a slower 25 MHz, you can't expect 50-MHz performance.

One frequent complaint about the Deskpro/M 486 fam-



Compaq's dual-speed Deskpro 50M sets a new standard in speed, and its 15- and 17-inch monitors have very high contrast.

ily involved the lack of a secondary RAM cache on models that rely on the 486's built-in 8K cache. Compaq has silenced its critics by adding a secondary 256K cache on the Deskpro 50M's processor board. The board also features a socket for a Weitek 4167 math coprocessor and comes with a minimum 8MB of RAM, expandable to 64MB.

Want to upgrade your Deskpro 386/25M, 486s/16M, 486s/25M, or 486/33M? Compaq says that you'll be able to replace your old single-speed CPU board with the new clock doubler board. Pricing wasn't set at press time. Compaq is adding a 33-MHz 386 sibling to its Deskpro/M family as well. Prices for the new Deskpro 386/33M will start at just under \$3000.

Top-Notch Graphics

Compaq knows that PCs can't live by processing power alone, so the company is bundling a new high-performance EISA video graphics controller with the Deskpro 50M. Also available in an ISA-bus version for older Compaq systems, the new graphics controller comes with 1MB of video RAM and supports resolutions up to 1024 by 768 and a screen refresh rate of up to 73 Hz. Both the EISA and ISA graphics controllers will be priced at approximately \$700, with the ISA version costing slightly less.

Sold separately are two new flat-screen high-resolution monitors that provide you with outstanding clarity as well as an impressive collection of ergonomic features.

These 15- and 17-inch (diagonal) models offer resolutions up to 1024 by 768. An excellent .25mm-dot-pitch high-contrast screen makes characters easier to read, and a nonglare coating helps reduce eye fatigue. The 15-inch monitor will cost just under \$1000; the 17-inch monitor will be an extra \$300 or so. ☺

Jeff Bertolucci is an assistant editor for PC World.

SNAPSHOT

Deskpro 50M model, EISA/ISA graphics board, high-resolution monitors

The Deskpro/M line offers more choices with clock doubler models. Compaq debuts high-resolution boards and monitors.

KEY FEATURES

- Intel clock doublers
- EISA/ISA graphics boards with 1024 by 768 resolution
- Two flat-screen monitors with impressive ergonomic features

AVAILABILITY

Immediate

PRICING

Deskpro 50M \$5000 and up, Deskpro 386/33M \$3000 and up, monitors \$1000 and up, EISA/ISA graphics controllers \$700 and up, Systempro with no IDA \$5000 and up, with IDA \$8800 and up

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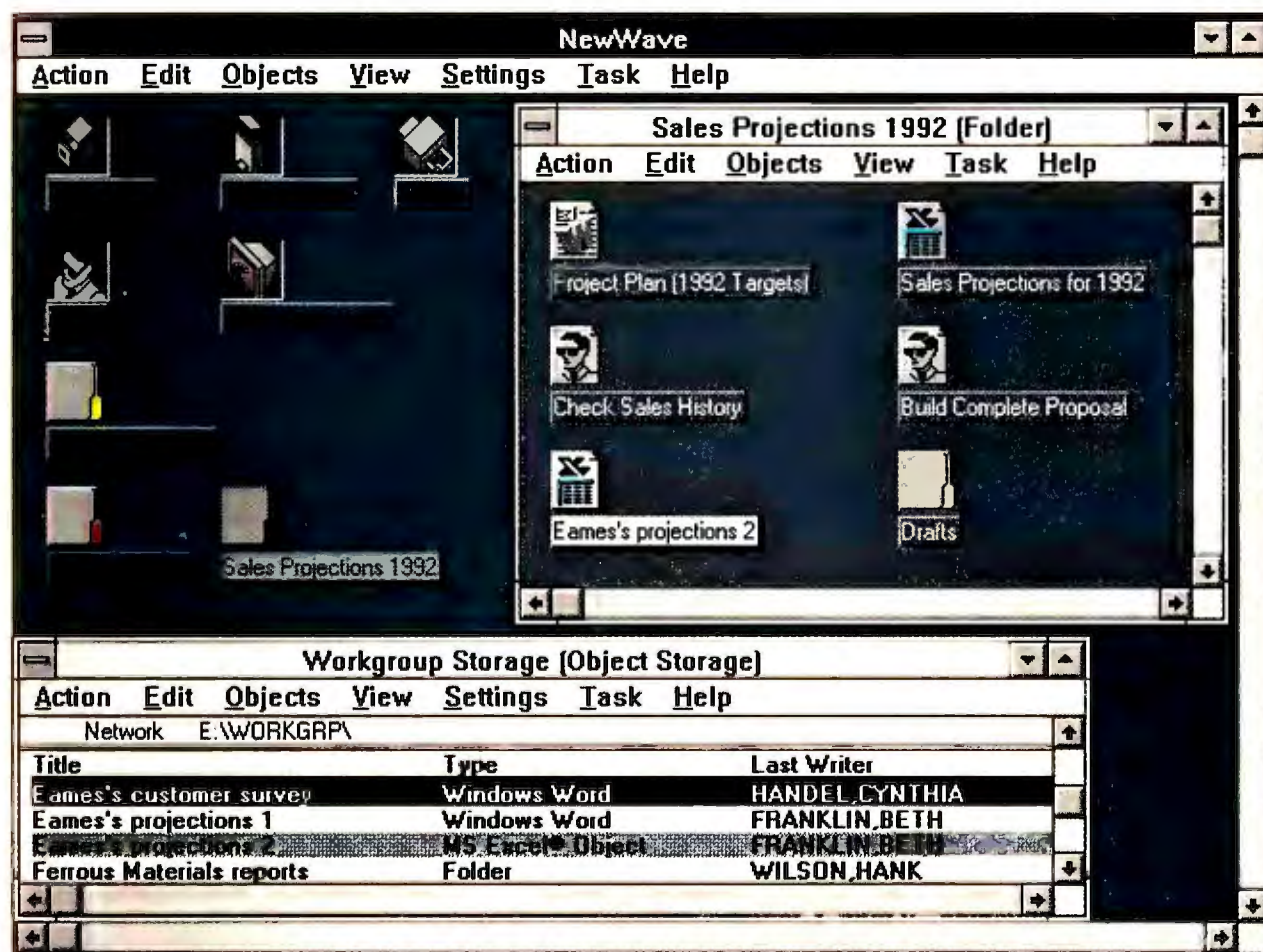
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Get Power Windows With HP's Enhanced NewWave 4.0

HP improves NewWave with new functions that simplify everyday tasks, while giving Windows a power boost.



NewWave incorporates Windows' OLE standard and a task management approach to computing.

by Robert Lauriston

NewWave has a reputation as a tool for big corporations that need to build custom Windows-based systems, but Hewlett-Packard says that reputation is undeserved. According to HP, its main mission is to make life easier for Windows users by offering them a Mac-style desktop, easy customization, and vastly improved file management.

You don't need special NewWave apps anymore to take advantage of NewWave's OLE features, because NewWave's slick document embedding features now use Windows' OLE standard. That enables all OLE supported

applications to benefit from NewWave's capability to embed objects, such as an application and an associated file, or a template that includes files created by a variety of applications. Thanks to OLE, you could access Excel features from a word processing file by clicking on an embedded Excel chart.

NewWave's improvements to Windows make it worth the consideration of any Windows user. It provides enhanced application integration, extended file names, work group file management features, and a powerful task automation feature—agents—that makes Windows' macros look comparatively anemic.

Double-Duty Desktop

NewWave's approach to file and program management is totally unique. Say you want to create a new Excel spreadsheet: In Windows, you have to open the Program Manager, double-click on the Excel icon, then select *File • New* from Excel's menus. HP reverses this process: You choose *Objects • Create a New* from NewWave's desktop menu, then select the kind of object you want to create.

Long document and folder names are a big NewWave plus. You can use as many as 32 characters to write file names, a latitude that's particularly helpful when sharing files on a crowded network.

Agents: Macros on Steroids

NewWave's macros, or agents, are sophisticated tools for automating simple or complex Windows tasks. On the most basic level, you can record a series of keyboard and/or mouse commands for playback. Want to get fancier? Record tasks that involve multiple programs, add dialog boxes, or use the programming language (backed up by an on-line reference guide) to create macros that respond to changing conditions.

With its support for Microsoft's OLE standard, NewWave opens Windows to new vistas. Combined with its other enhancements, extended file names, powerful agents, and objects, NewWave lets you organize your desktop to suit the way you work—by task rather than by application. ●

Robert Lauriston is a contributing editor for PC World.

SNAPSHOT

HP NewWave 4.0

HP's alternate desktop manager for Windows is easier to use than ever.

KEY FEATURES

- Drag-and-drop program and document management
- Long document names
- Sophisticated macros
- Network document "checkout"

AVAILABILITY

Within 30 days after Microsoft ships Windows 3.1

PRICING

\$195

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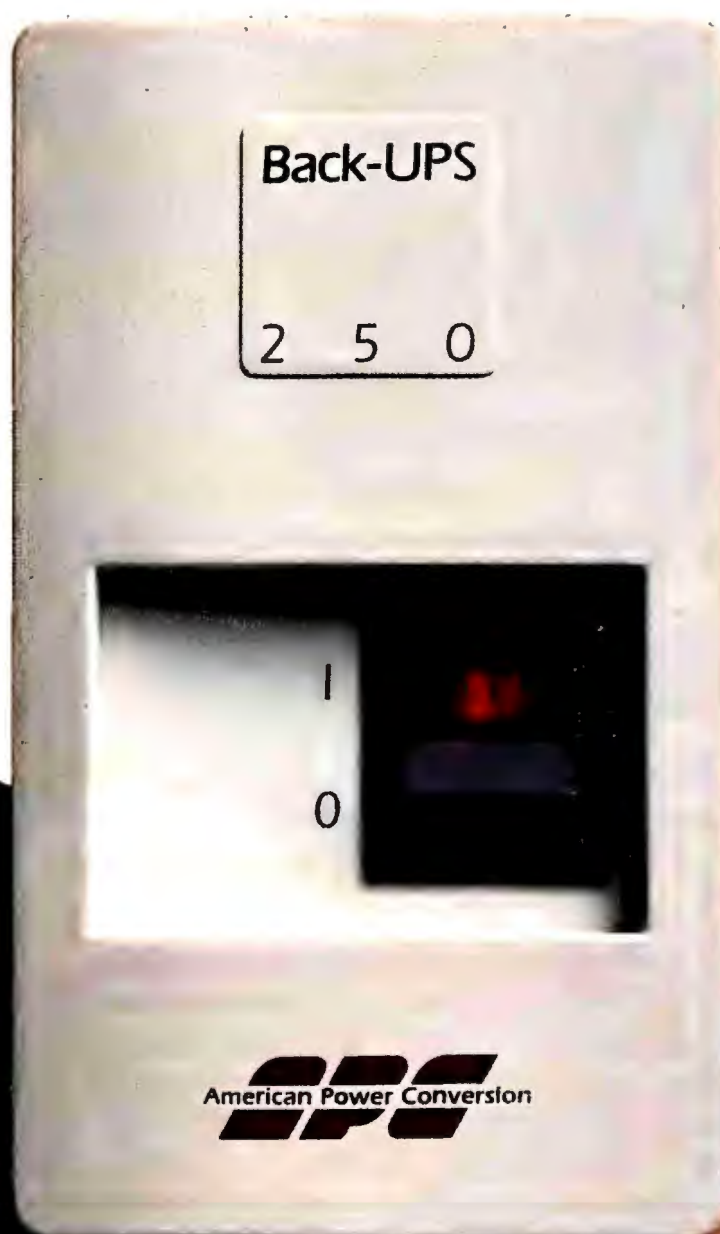
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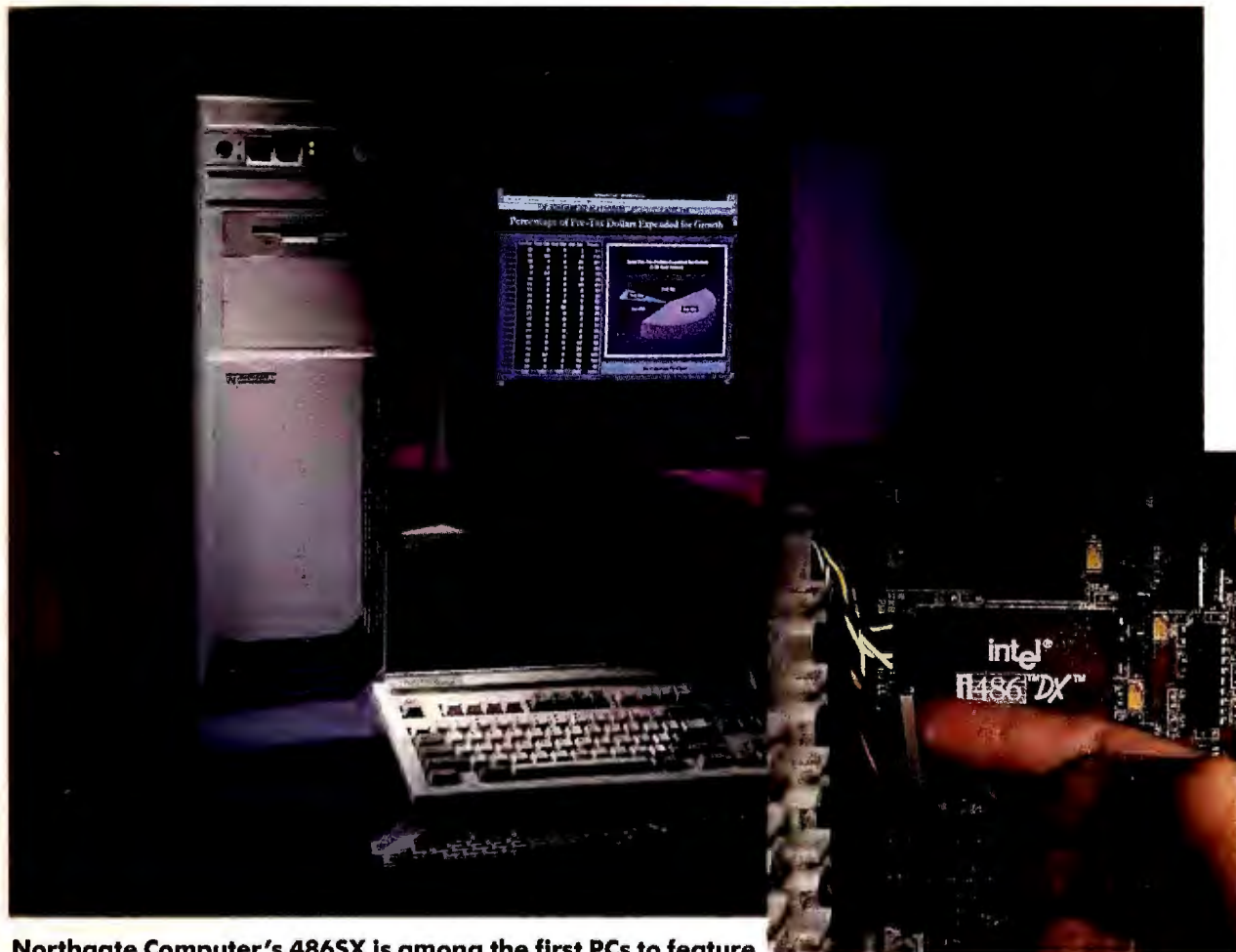


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Northgate's Upgradable 486SX

Elegance ZXP systems feature inexpensive chip and clock swap-up for unsurpassed future value.



Northgate Computer's 486SX is among the first PCs to feature the Zero Insertion Force socket, which lets you effortlessly and inexpensively upgrade processors.

by Michael Goodwin

With more business users insisting on a CPU upgrade path, system vendors are dreaming up a variety of ways to supply one. Northgate Computer Systems offers one of the most elegant options with an easy, inexpensive chip upgrade that lets you simply pop out the CPU and drop a faster one in its place.

If you've been down the upgrade path before, you may roll your eyes at the words "pop" and "drop," knowing all too well how much force it takes to wrench a 168-pin 486 chip from its socket, and how hard it is to insert a replacement without damaging it or the motherboard.

Fortunately, Northgate knows too, and has responded with a Zero Insertion Force

(ZIF) socket built onto the Elegance ZXP's motherboard. When the time comes to swap up, you raise a small lever next to the socket and the old chip lifts out effortlessly. You can slip its replacement in just as easily, and lowering the lever locks it into place. Moving the jumper tells the multispeed system clock synthesizer chip how fast to run.

Moving Up and Up and Up...

The Elegance starts out as an unusually affordable 16-MHz 486SX system: With 4MB of RAM (expandable to 32MB), a 64K external memory cache, a Weitek coprocessor socket, a 100MB hard drive, and a 14-inch super-VGA (1024 by 768) monitor, it will set you back a mere \$2349. When the need for more processing punch overwhelms you, swap up to a

486SX/20, a 486SX/25, or a full-fledged 486DX/33, or even one of Intel's clock-doubler chips, which means you can boost the CPU's internal speed as high as 66 MHz.

While Northgate sells the Elegance ZXP with any one of the four CPUs standard, it doesn't sell the upgrade chips as separate items, so you will have to buy them on the open market. That's good because you'll pay market price—from \$300 to \$800, depending on the CPU—but it also means you probably won't get a trade-in on your old CPU.

Alternatively, if you know you're going to want more processing power right off the bat, you can start at the top with the 33-MHz Elegance for a scant \$450 more than the entry model.

Perhaps the most tempting

way to enhance your Elegance is Orchid's Fahrenheit 1280 video board, which speeds *Windows* block-transfer graphics functions so screen updates *fly*. Orchid claims that for most people *Windows* screen updates will run four times as fast. The Fahrenheit board costs only \$100 more than the ZXP's standard video board—making it virtually irresistible. You also have a choice of tower or desktop configurations.

Northgate's first-rate service and support package includes a year of free on-site service (via NCR) and 24-hour toll-free tech support. ☎

Michael Goodwin is an associate editor for PC World.

SNAPSHOT

Elegance ZXP

This 486SX system provides a painless and affordable upgrade path thanks to its easy-out, easy-in ZIF socket.

KEY FEATURES

- Zero Insertion Force (ZIF) CPU socket
- Multispeed system clock
- Choice of 486SX/20, 486SX/25, 486DX/33 processors for upgrade

AVAILABILITY

Immediate

PRICING

486SX/16 with 4MB RAM, 100MB hard drive, 1024 by 768 VGA and 14-inch color monitor \$2349; 486SX/20 \$2399; 486SX/25 \$2699; 486DX/33 \$2799; Orchid Fahrenheit video board \$100; Vertical Power tower case \$150

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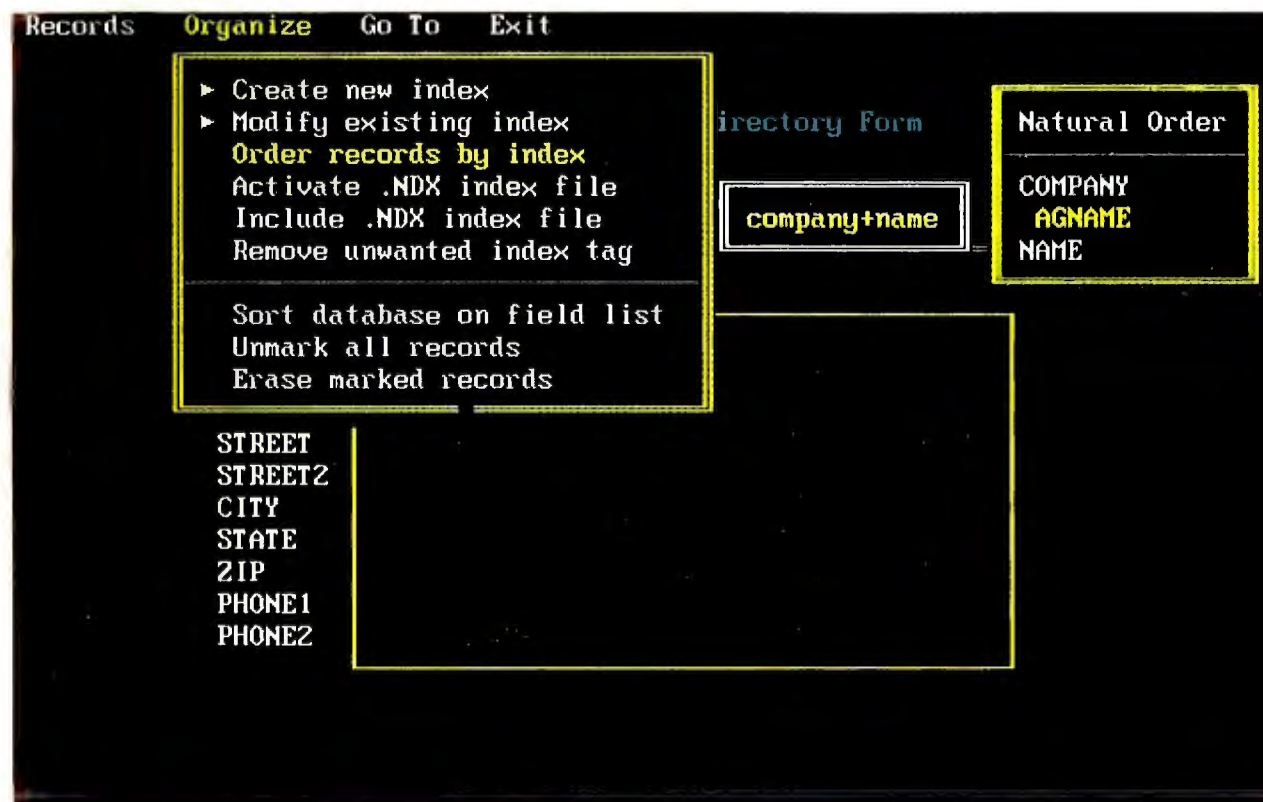
NEC

C&C Computers and Communications

Circle 182 on reader service card

dBASE IV 1.5: Refining an Industry Standard

This long-awaited upgrade speeds up dBASE and brings it into the nineties with mouse support, a more powerful QBE feature, and improved programmability.



dBASE IV 1.5 adds mouse support and an improved query-by-example (QBE) feature.

by Mark Brownstein

The first thing you'll notice about *dBASE IV 1.5* is mouse support. Second is snappier performance; third an improved Control Center and query by example (QBE); and fourth, *dBASE* really hasn't changed all that much.

Borland hasn't done anything revolutionary to *dBASE*, which it acquired when it bought Ashton-Tate last year, but it has refined the product with a number of long-awaited enhancements.

Programmers will be pleased because the new version has some improvements they've been hoping for, such as the capability to open 40 work areas and perform conditional compiles. All users will appreciate the cleanup job

Borland has done by eliminating the bugs from earlier versions. And a new SET KEY command lets you filter an index expression, a capability that's been sorely needed.

But if you're looking for a graphical user interface and a taste of the exciting changes promised for the *Windows* version Borland's been promoting at trade shows, you'll be disappointed.

Still, you do get mouse support, although if you're used to *Windows*, you'll be surprised at how primitive and inconsistent it is. To move the cursor to a menu option, for instance, you have to first move the pointer (a block on screen) to where you want to place the cursor, click, and the cursor moves. Neat, huh?

If you actually want to do

something once the cursor is positioned, you have to click the mouse a second time to activate the selected option. The mouse's behavior varies depending on what it's doing. In the Form design screen, clicking a third time brings up a Fields pick list; when you're designing a report, a third click may close a design band.

Query by example is also enhanced. You can include related options in a selectable pick list, perform group analysis of calculated fields, and delete calculated fields one at a time rather than all at once. New indexing options also provide more speed and usefulness. For instance, you can set *dBASE* to add files and to update the index only after all files have been added. Moreover, you can save indexes cre-

ated for a query so that you can find fields in an indexed data file without having to rebuild the index—a time-saver particularly appreciated by network users.

The Control Center looks the same, but now you can shrink *dBASE* to a 10K TSR and launch another application—a better report writer, a different text editor, or maybe even an application generator that completely replaces the Control Center—and return to *dBASE* once you're done with that application.

dBASE IV 1.5 is a solid version of a program designed in 1986 and 1987. It has features developers will appreciate but lacks the more attractive look and feel promised in its upcoming (*Windows*) version. ☹

Mark Brownstein is the Los Angeles bureau chief for InfoWorld.

SNAPSHOT

dBASE IV 1.5

Borland tweaks *dBASE*, adding mouse support and improving query by example.

KEY FEATURES

- Capability to open 40 work areas
- Capable of conditional compiles
- New indexing options
- Enhanced QBE
- Capable of launching applications from the Control Center

AVAILABILITY

Immediate

PRICING

\$795, upgrade from all previous *dBASE* versions \$100

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Scotts Valley, CA 95067
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When Buyers Rate ZEOS:

Support: How Mail-Order Vendors Stack Up					
What Buyers Say	CompuAdd Corp. CompuAdd 325 (with 32K-byte cache) \$2,881	Dell Computer Corp.* Dell System 325P (no cache) \$3,144	Gateway 2000 Gateway 2000 25MHz 386 (with 80M-byte hard drive, 32K-byte cache) \$2,090	Northgate Computer Systems Inc. Northgate Elegance 386/25 (with 64K-byte cache) \$2,839	Zeos International Ltd.* Zeos 386-25 (includes AmiPro, 1-2-3 for Windows, no cache) \$2,540
How long does it take to get a support representative on the phone? (most frequent answer)	1 to 5 minutes	1 to 5 minutes	more than 30 minutes	1 to 5 minutes	1 to 5 minutes
Technical competence of support representative (10 is best)	7.5	8.1	8	7.8	8.1
How long does it take for the vendor to solve your problem? (most frequent response)	Immediate	1 to 2 days	2 days or more	Immediate	Immediate
If your job depended on it, would you recommend buying more PCs from this firm?	12 yes 1 no	13 yes 2 no	12 yes 2 no	10 yes 5 no	15 yes 0 no
Overall rating for service and support (10 is best)	8.3	7.8	7.5	7.8	8.6

NOTES: Customer satisfaction results were compiled from PC Week's survey of PC managers whose organizations have purchased mail-order PCs. 15 customers of each vendor were surveyed.

Prices and specifications shown were supplied by vendors, each of which was asked for a quote on its lowest-priced 25Mhz 386 machine with 4M bytes of RAM, dual floppies, a 100M-byte hard drive, 14-inch Super VGA monitor, keyboard, mouse, Windows and DOS 5.0. Any changes to the configuration or no-cost options are shown. Prices were gathered by calls to each vendor between Oct. 3 and Oct 14, and include tax and shipping charges.

*System is upgradable.

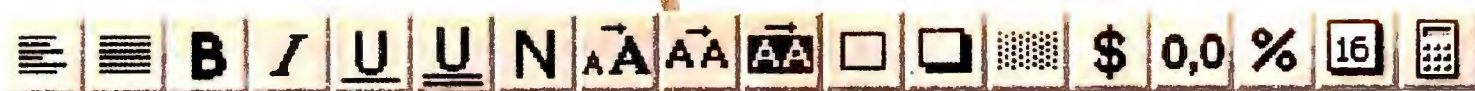
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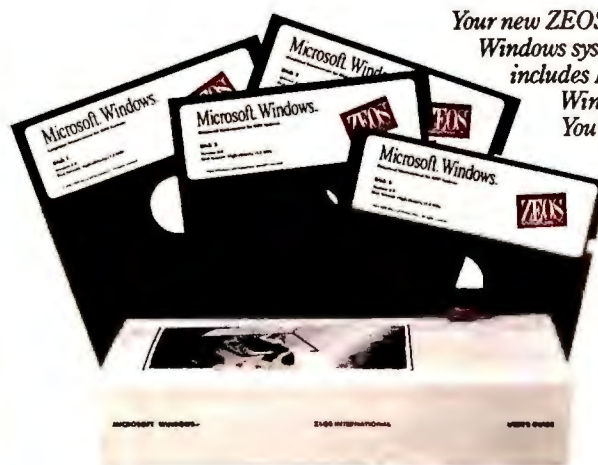
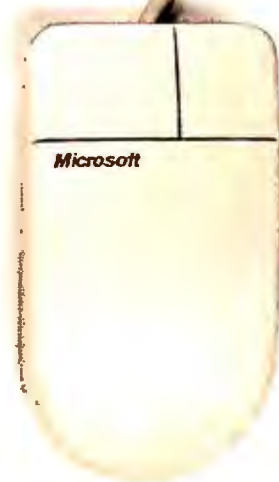
Circle 311 on reader service card



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Circle 313 on reader service card



The Gateway 2000 33-MHz 386 and TI TravelMate 2000 were the most aggressively priced desktop and portable PCs in the January survey by International Data Corporation.

BARGAINS OF THE MONTH

Best-Sellers





Leading PCs sold through traditional dealer channels

- | | |
|------------------------------|---------------------------|
| ① IBM PS/2 Model 55 SX | ⑥ IBM PS/2 Model 35 SX |
| ② IBM PS/2 Model 70 (20 MHz) | ⑦ NEC PowerMate SX, SX/20 |
| ③ Compaq LTE 386s/20 | ⑧ Compaq Deskpro 386/25M |
| ④ IBM PS/2 Model 57 SX | ⑨ IBM PS/2 Model 40 SX |
| ⑤ Compaq LTE/286 | ⑩ Compaq Deskpro 386s/20 |

At year-end, IBM and Compaq regained their domination of sales through the dealer channel, according to Storeboard/Computer Intelligence's December survey.

Over the Counter

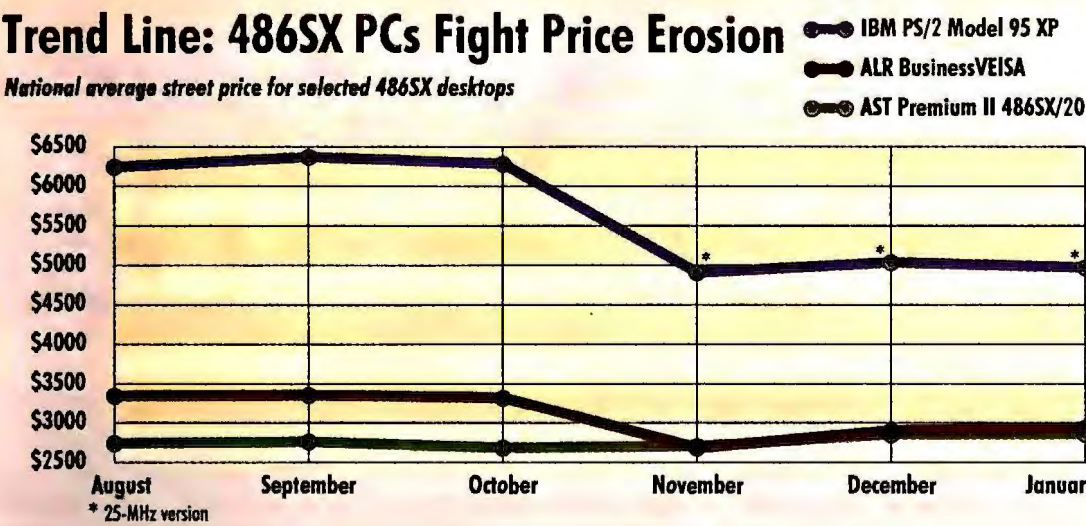
What you pay at retail stores for popular PCs

Over the Counter	Configuration				National		Boston	Chicago	Dallas/ Ft. Worth
	 Speed (MHz)	 RAM (MB)	 Hard disk (MB)	 Video adapter	List	Average			
What you pay at retail stores for popular PCs									
80386SX-based desktop PCs									
AST Bravo 386SX/20	20	2	40	VGA	\$1695	\$1399	\$1419	\$1427	\$1387
Compaq Deskpro 386s	16	2	40	VGA	\$2299	\$1898	\$1871	\$1924	\$1987
Compaq Deskpro 386s/20	20	2	60	VGA	\$2599	\$2170	\$2119	\$2184	\$2292
Dell System 320 SX	20	2	40	VGA	\$1400	\$1400	\$1400	\$1400	\$1400
IBM PS/2 Model 35 SX-043	20	2	40	VGA	\$2525	\$1925	\$2058	\$1908	\$1905
IBM PS/2 Model 55-041	16	4	40	VGA	\$2745	\$2022	\$2068	\$1942	\$2196
NEC PowerMate SX/20i	20	2	60	VGA	\$2049	\$1628	\$1630	\$1581	\$1614
80386DX-based desktop PCs									
AST Premium II 386/33	33	4	210	VGA	\$3795	\$3099	\$3170	\$3017	\$3137
Compaq Deskpro 386/33L	33	4	120	VGA	\$6199	\$5156	\$5008	\$5103	\$5198
Dell System 333P	33	4	100	VGA	\$2400	\$2400	\$2400	\$2400	\$2400
Epson Equity 386/25 Plus	25	2	100	VGA	\$3199	\$2414	\$2384	\$2417	\$2411
Gateway 2000 33-MHz 386	33	4	200	VGA	\$2020	\$2020	\$2020	\$2020	\$2020
IBM PS/2 Model 70-A16	25	4	160	VGA	\$5475	\$4084	\$4462	\$4046	\$4380
80486SX-based desktop PCs									
ALR BusinessVEISA	20	5	120	none	\$3495	\$2931	\$3024	\$2933	\$2913
AST Premium II 486SX/20	20	4	80	VGA	\$3495	\$2853	\$2847	\$2908	\$2832
IBM PS/2 Model 90XP-OH9	25	4	160	XGA	\$6545	\$4967	\$5335	\$5332	\$4974
80486DX-based desktop PCs									
AST Premium II 486/33	33	4	210	VGA	\$5495	\$4438	\$4350	\$4415	\$4375
Compaq Deskpro 486/33M	33	4	340	VGA	\$7199	\$5983	\$5775	\$5781	\$6051
IBM PS/2 Model 90 XP-OKF	33	8	400	XGA	\$12,495	\$9599	\$10,184	\$9648	\$9489
NEC PowerMate 486/33e	33	4	300	none	\$6349	\$4940	\$5076	\$4640	\$5230
Portables/laptops									
AST Premium Exec 386SX/20	20	2	40	VGA-LCD	\$2395	\$2059	\$2068	\$2083	\$2029
AST Premium Exec 386SX/25	25	4	80	VGA-LCD	\$3295	\$2867	\$2962	\$2808	\$2900
Compaq LTE/286	12	640 K	20	CGA-LCD	\$1949	\$1509	\$1552	\$1570	\$1372
Compaq LTE 386s/20	20	2	30	VGA-LCD	\$3599	\$3067	\$2895	\$3159	\$2900
Dell System NX20	20	2	60	VGA-LCD	\$2499	\$2499	\$2499	\$2499	\$2499
IBM PS/2 Model L40 SX	20	2	60	VGA-LCD	\$3645	\$2903	\$2779	\$2933	\$2916
NEC UltraLite 286F	12	1	20	CGA-LCD	\$2199	\$1451	\$1457	\$1683	\$1517
TI TravelMate 2000	12	1	20	VGA-LCD	\$1199	\$999	\$976	\$984	\$996
Toshiba T2000SX	16	1	40	VGA-LCD	\$2699	\$2233	\$2310	\$2305	\$2221
Toshiba T2000Sxe	20	2	60	VGA-LCD	\$3299	\$2736	\$2836	\$2827	\$2606

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.

Trend Line: 486SX PCs Fight Price Erosion

National average street price for selected 486SX desktops



Intel launched its 486SX chip with much ballyhoo last spring as an inexpensive entry-level platform for power PCs. Despite general PC price pressures and competition from a blizzard of even newer CPU alternatives, manufacturers—especially those such as AST and ALR, which brought out extremely aggressively priced machines—have held the price line fairly steadily into early 1992.

Metropolitan					
Los Angeles	Ft. Lauderdale	Miami	New York	San Francisco Bay Area	D.C. Washington
\$1373	\$1343	\$1371	\$1396	\$1401	
\$1887	\$1987	\$1811	\$1899	\$1904	
\$2123	\$2196	\$2058	\$2366	\$2148	
\$1400	\$1400	\$1400	\$1400	\$1400	
\$2025	\$1793	\$1860	\$1822	\$2051	
\$2043	\$1903	\$2019	\$1983	\$2058	
\$1628	\$1584	\$1670	\$1656	\$1629	

\$3089	\$3117	\$3086	\$2797	\$3154
\$5167	\$5271	\$4959	\$5420	\$5233
\$2400	\$2400	\$2400	\$2400	\$2400
\$2474	\$2224	\$2381	\$2437	\$2455
\$2020	\$2020	\$2020	\$2020	\$2020
\$4004	\$3872	\$3907	\$4027	\$4144

\$2929	\$3123	\$2748	\$2876	\$3008
\$2831	\$2804	\$2795	\$2823	\$2861
\$4998	\$4511	\$4663	\$4756	\$5143

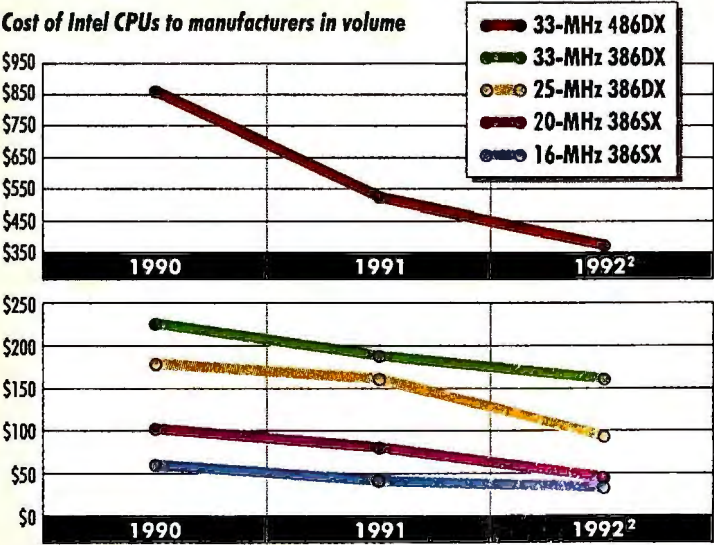
\$4451	\$4253	\$4496	\$4648	\$4490
\$6007	\$6084	\$5860	\$5903	\$6143
\$10,132	\$8935	\$8818	\$9254	\$10,322
\$5185	\$4903	\$4798	\$4776	\$4281

\$2040	\$2098	\$2001	\$2113	\$2127
\$2771	\$2783	\$2763	\$3016	\$2743
\$1462	\$1541	\$1256	\$1812	\$1658
\$3103	\$3018	\$2999	\$3119	\$3091
\$2499	\$2499	\$2499	\$2499	\$2499
\$3055	\$2770	\$2813	\$2976	\$2944
\$1813	\$1319	\$1188	\$1238	\$1405
\$991	\$1003	\$910	\$1441	\$966
\$2281	\$2171	\$2115	\$2222	\$2320
\$2980	\$2631	\$2656	\$2685	\$2838

PC Futures: A Momentary Price Plateau

PC prices were generally holding firm early this year after substantial price cuts in 1991, buoyed partly by signs that sales are rising slightly. The Gateway 2000 33-MHz 386 again claims the title of desktop Bargain of the Month,¹ while TI's TravelMate 2000 is the portable Bargain of the Month. IBM and Compaq regained their dominance on the best-seller lists, with some of IBM's newer SX machines climbing the charts along with one of Compaq's new modular line, in its first appearance. Pricing on 486SX desktops has held surprisingly steady since their debut in spring 1991, partly because they often arrived with prices significantly discounted to compete against 386s. However, costs of Intel chips generally dropped quickly in the past year—even in the 486DX market, where Intel holds a monopoly. This lower component cost has translated into substantial savings on PCs, especially higher-end models.

Competition Slashes CPU Prices



Intel is cutting its CPU prices aggressively this year—motivated largely by competition from rival chip makers like Advanced Micro Devices, which has grabbed one-fifth of 386-compatibles sales. This "CPU war" is one of the factors chipping away at system street prices.

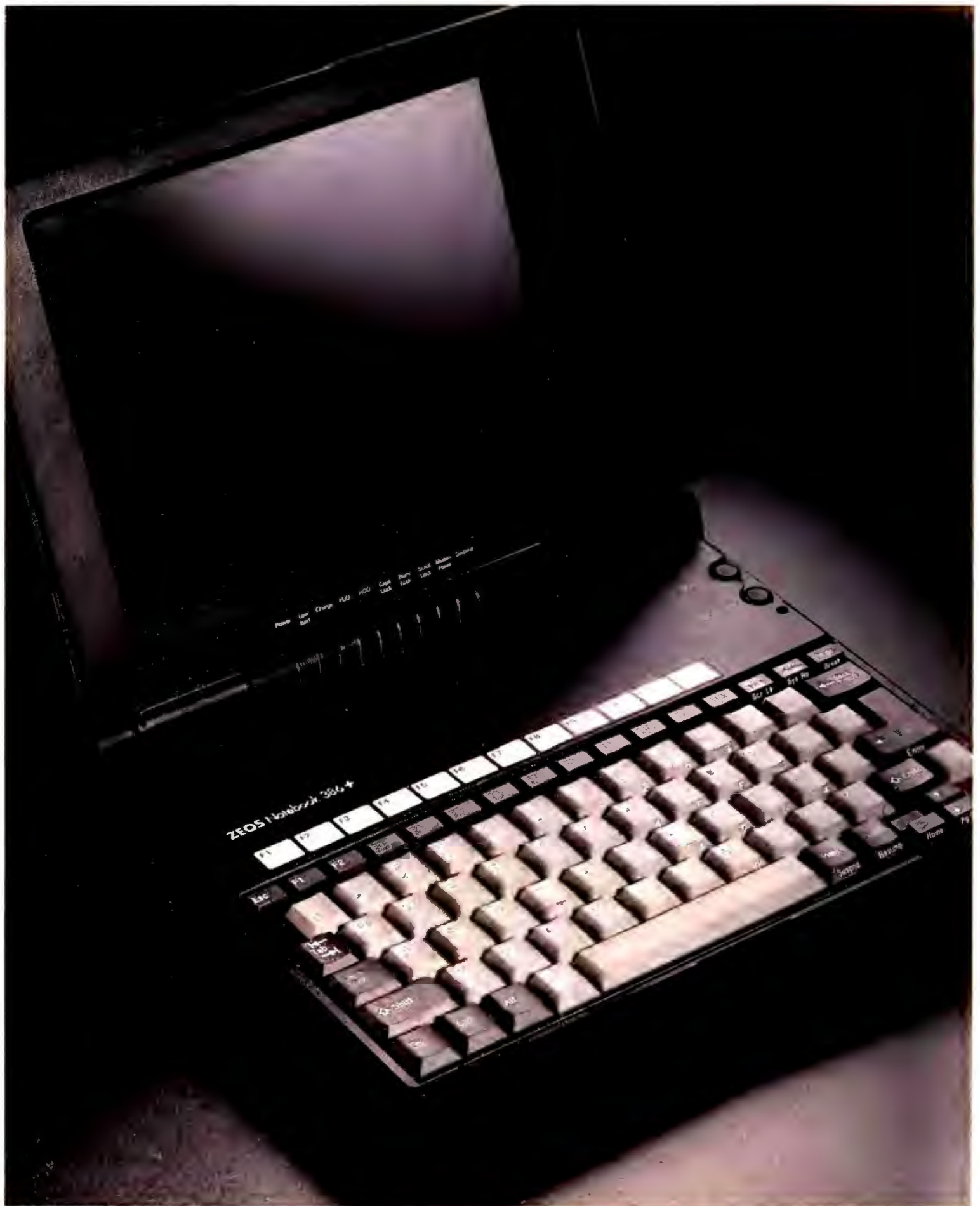
¹ Bargains of the Month are determined by adjusting prices on PCs of a given class for standard memory and storage, then finding which PC compares best.

² Second-quarter prediction.

Source: Instat

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Longer battery life. In addition to programmable power-saving features, we've added "Suspend and Resume," so you can put your computer "in suspense" if you pause while working. Now you can extend your battery life—which is typically over 2.5 hours—to last even longer!

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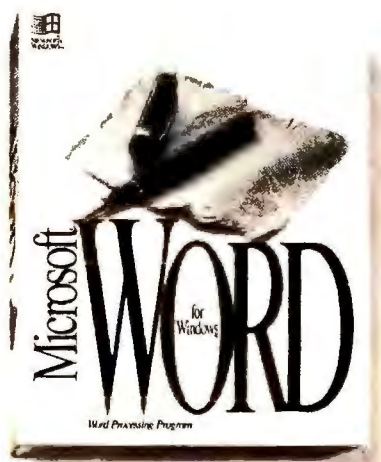


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WordPerfect users prefer Microsoft Word for Windows.

NSTL TEST RESULTS, DECEMBER 1991

	Word for Windows	WordPerfect for Windows
Preferred to use	79%	21%
Easier to learn	71%	21%
Easier to use	83%	13%
Would purchase	79%	21%



In a recent test conducted by the National Software Testing Labs, nearly 8 out of 10 users of WordPerfect[®] for DOS preferred Microsoft[®] Word for Windows[™] 2.0. They not only

discovered how fast Microsoft Word lets them accomplish everyday tasks, but they

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Edited by RUSSELL GLITMAN

Compaq's SL Notebooks Clinch the Pennant

These little 386SL sluggers hit home runs with battery life that just keeps going and going and a 6-pound form that won't slow you down.



Compaq's 25-MHz LTE Lite/25 is among the thinnest, lightest, and longest-running battery-powered machines on the market. With a recharge time of less than an hour, this note is built to compute on the road.

As has become its habit of late with new technology, Compaq was not the first to announce a 386-SL-based notebook. But as you might expect, the Houston power hitter's 25-MHz LTE Lite/25 is not just another 386SL.

At 8½ by 11 inches and 6 pounds, the LTE Lite/25 (and its 20-MHz twin, the LTE Lite/20) is smaller and lighter than most notebooks. A scant 1½ inches tall, it's also substantially thinner than most notebooks. But what brings this note home is its advertised capability to squeeze as much as 4½ hours of uninterrupted spreadsheet crunching and

word processing from a single battery charge.

That's with normal power conservation features enabled; your notebook's battery life can vary widely depending on your applications, the CPU speed, and the use of power-down for backlight, hard drive, and other components. Still, most notebooks this size don't give you the choice, and 3 hours is the minimum for both Lite models.

The Lite/25 achieves this feat by taking advantage of its speed-selectable processor, design efficiencies, and Compaq's component power management, which has always

been among the best. A nickel-hydride battery helps the Lite/25 deliver the same useful life with 25 percent more speed than the nickel-cadmium-equipped Lite/20. Both notes have special battery features that provide you with precise readings of your remaining power.

Quick Recharge

Both machines recharge in an hour from a Compaq Desktop expansion base or a diminutive 1-pound AC adapter—even while you're computing. Compaq also goes the SL chip one better by offering not just auto-resume but true hiberna-

tion, saving the contents of RAM to the hard drive so you can put the note to sleep and take up exactly where you left off, even in a Windows application months later.

The Lite/25 and Lite/20 have edge-lit VGA displays measuring 9½ inches on the diagonal that can simultaneously drive an external color VGA monitor for desktop presentations. Other extras include an on-disk, hypertext help system, a variety of hardware locks and software password capabilities, and an optional 9600-bps internal modem supporting MNP 5 and V.42bis data compression/error correction.

The Lite/25 ships with 16K of memory cache, 4MB of memory expandable to 10MB, and your choice of under-19ms 60MB, 84MB, and 120MB hard drives. The Lite/20 ships with 2MB of memory expandable to 10MB and your choice of sub-19ms 40MB, 60MB, and 84MB hard drives.

The suggested list prices for the 84MB versions of the Compaq LTE Lite/25 and Lite/20 are \$3599 and \$4199, respectively—matching the prices of comparable alternatives from Zenith and Toshiba.

—Mike Hogan

IN BRIEF

Compaq LTE Lite/25, Lite/20

These notebooks log longer battery operation than any others and are lighter and smaller than most.

Compaq Computer Corp.

P.O. Box 692000
Houston, TX 77269
800/345-1518,
800/231-0900

Reader service no. 760

A Fleet of Font Choices Comes With Panasonic's Personal Printer



Panasonic's KX-P4430 Laser Partner combines the font-scaling power of the HP LaserJet IIIP's PCL 5 with the \$1495 price of a personal laser.

Looking for scalable fonts, but don't want to shell out the bucks for a full-fledged PostScript printer? If so, the new \$1495 Panasonic KX-P4430 Laser Partner is worth checking out.

Following in the footsteps of the KX-P4420 (a February 1991 Best Buy), the P4430 combines the font-scaling capabilities of the Hewlett-Packard LaserJet IIIP's PCL 5 with the low price of a personal printer.

The KX-P4430 comes with eight outline fonts, all scalable from 4 to 999.75 points in 1/4-point increments. You also get 28 internal bit-mapped fonts (14 each in portrait and landscape modes).

For documents requiring more type choices, you can load fonts from the P4430's cartridge slot into memory and then insert another cartridge, giving you effective simultaneous access to two cartridges (or more, if you've got the RAM).

Panasonic also includes its new SatinPrint resolution enhancement technology, which should help smooth

curves and keep lines crisp so you don't have to worry about the jaggies.

In addition to these font options, Panasonic has added a power-save function, a toner cartridge that's good for 90,000 sheets (versus 20,000 sheets on the KX-P4420), and

a standard 200-sheet paper tray that can handle anything from number 9 envelopes to legal-size paper. You also get 1 MB of RAM standard, instead of the 512K that came with 4430's predecessor, and a footprint that's 27 percent smaller than the 4420's.

Some of the KX-P4430's other new features, however, may not be so welcome. The 4430 is slower than the 4420—5 pages per minute versus 8—which Panasonic says is due to its space-saving engine and the processing time required by outline fonts. The new printer also has smaller standard input and output paper tray capacities.

The biggest potential problem with the KX-P4430 Laser Partner may be in software support, because drivers for the P4430 are not yet available. However, Panasonic says that drivers will soon be ready, from both Panasonic and software vendors. Meanwhile, users should be able to use HP LaserJet III drivers in

both *Windows* and other popular software packages without noticing any problems.

With the promise of PCL 5 support in the future, plenty of font options in the meantime, and its low price, the P4430 looks to give HP a run for its money. At an expected \$1495 list price, perhaps as little as \$1100 on the street, the KX-P4430 Laser Partner is one of the least expensive scaling laser printers available, if not *the* least expensive. Anyone looking for high-quality fonts without the expense of PostScript should consider it.

—Dan Miller

IN BRIEF

Panasonic KX-P4430 Laser Partner

A personal laser printer with scalable fonts.

Panasonic Communications and Systems Co.

2 Panasonic Way
Secaucus, NJ 07094
800/742-8086,
201/348-7000

Reader service no. 761

Dell Does Upgradable Desktops for Less

The PC price wars rage on. Dell Computer's new 486P series offers a lot of bang for fewer bucks, with prices starting around \$2000 for 486SX systems and less than \$3000 for a 486DX-based PC.

Featuring a pizza box design (4 by 15.1 by 15.6 inches) that's compact enough to fit on almost any desktop, the new Dell line includes the 486P/20 and 486P/25 models, which use Intel's 486SX 20- and 25-MHz chips, respectively. The 486P/33 uses Intel's 33-MHz 486DX chip, which includes a built-in math coprocessor and offers overall faster performance.

Each 486P unit is upgrad-

able. To replace your CPU, you pull out the existing CPU from the motherboard and replace it with a faster chip. Dell's unique CPU socket on the motherboard accepts both 486SX and 486DX chips, and a jumper lets you select different clock speeds—from 20 MHz to 33 MHz.

Other than having different CPUs, the three 486P systems are identical. Each comes with 2MB of RAM, an 8K cache, a 50MB hard drive, your choice of a 5 1/4-inch (1.2MB) or a 3 1/2-inch (1.44MB) floppy drive, three 8/16-bit slots, and a VGA color monitor that operates at a 70-Hz refresh rate for flicker-free viewing. The 486P/20,

486P/25, and 486P/33 are priced at \$1999, \$2299, and \$2899, respectively. Each system comes with 512K of video memory. An optional 512K video memory upgrade adds support for up to 32,768 colors in VGA resolution.

—Jeff Bertolucci

IN BRIEF

Dell 486P Series

The three Dell System 486P PCs feature upgradable CPUs and a small footprint.

Dell Computer Corp.

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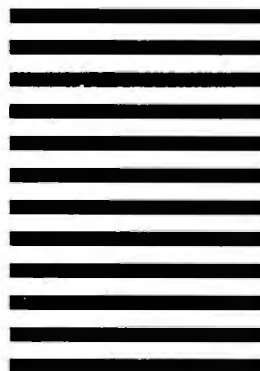
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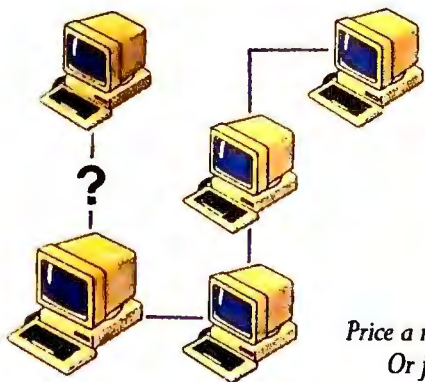
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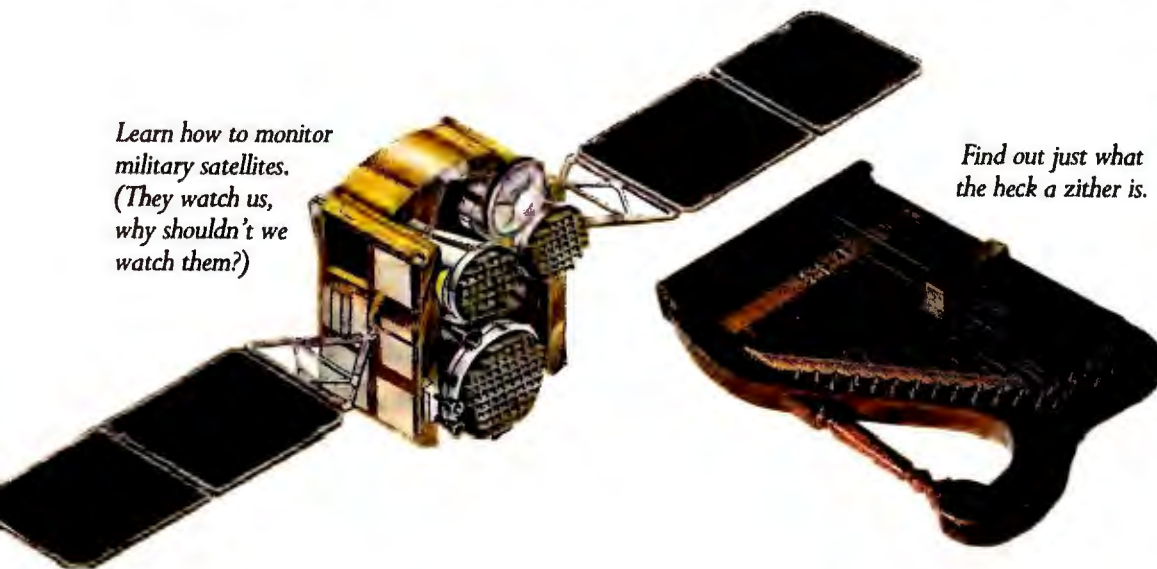
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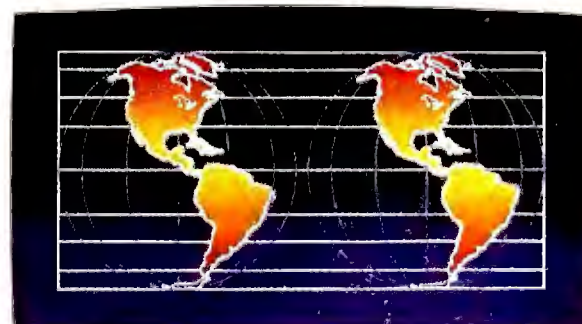


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Oversize Documents No Problem for High-Speed Network Laser

Sure, laser printers keep getting cheaper. But you'll still have to pay \$10,000 or more for a high-speed, network-quality laser that offers 11-by-17-inch (ledger-size) printing, PostScript output, and multiple resolution settings.

At least until now. Dataproducts' new LZR 1560 laser printers have driven down the price of top-notch laser printing. With prices that range from approximately \$5700 to \$7000, the LZR 1560 line of lasers features ledger-size printing, a speedy 15-page-per-minute print engine, PostScript Level 2, and your choice of either 300- or 400-dpi resolution.

Certainly not every office requires a printer that can produce ledger-size output, but if you print large spreadsheets, charts, newsletters, posters, or engineering or architectural drawings, you will appreciate the additional page space.

You'll need a lot of horsepower to print those oversize documents, so the LZR 1560 printer comes with a fast 15-ppm Fuji Xerox engine, a Weitek RISC processor, and 4MB of RAM (expandable up to 16MB).

The LZR line includes single-, double-, and triple-tray models. The trays come in letter, legal, and ledger sizes, and each of them holds 250 sheets of paper.

In addition to Hewlett-Packard's PCL 4, the LZR 1560 line of printers features PostScript Level 2.

This latest version of Adobe Systems' page description language supports additional colors, patterns, and forms. PostScript Level 2 also gives you data compression, improved memory management, and a variety of other features. The package comes with 35 PostScript fonts.



Dataproducts sets a new price level for top-notch printing with its LZR 1560, which churns out 11-by-17-inch output at 15 pages per minute.

Need a network printer? The LZR 1560 comes with parallel, serial, AppleTalk, and SCSI ports for multiple PC connections. To ease network

printing, the printer has built-in port polling, which automatically senses the active port so you don't have to flip printer switches manually.

You can choose between 300- and 400-dpi resolution via the printer's control panel. The LZR 1560 costs \$5695 with one paper tray, \$6495 with two trays, and \$6995 with three trays.

Dataproducts LZR 1560 printers make high-speed, large-output laser printing available and affordable for a wider variety of fast-paced business users.

—Jeff Bertolucci

IN BRIEF

Dataproducts LZR 1560

A new line of laser printers with 11-by-17-inch printing, PostScript Level 2, and 300- or 400-dpi resolution.

Dataproducts Corp.

6219 De Soto Ave.
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800/334-3174,
818/887-8000,
818/887-4789 (fax)

Reader service no. 763

A Speedy Way to Take Your Data and Go

While removable hard drives have always been an excellent way to protect sensitive files, they've never been as fast as deskbound hard drives when it comes to reading and writing data. No more, says Quantum Corporation. The hard disk maker's new Passport XL removable hard drives offer deskbound disk speed, top-notch reliability, and up to 240MB of storage capacity.

The Passport XL drives perform very fast data transfers with an average access time of 17 ms, according to Quantum. This speed boost is the result of a proprietary caching scheme that uses 256K of high-speed RAM in the 120MB and 240MB drives, and 64K of high-speed RAM

in the 50MB and 105MB models. The drives use a standard SCSI interface in order to connect with AT-compatible, Micro Channel, and Macintosh systems.

To ensure reliability, the Passport XL drives are enclosed in airtight cases that contain both the heads and the

media. This construction means that your valuable data isn't exposed to dust or other particles that can lead to head crashes and data loss.

Prices for the 50 MB, 105MB, 120MB, and 240MB Passport XL hard drives are \$449, \$629, \$899, and \$1099, respectively. The SCSI adapter costs \$219 for AT compatibles and \$329 for Micro Channel systems. You'll also have to choose between an internal (\$359) or external (\$469) chassis.

To make it easier to add storage capacity when you need it, the Passport XL drives are interchangeable. You can start with the 50MB drive and switch to a higher-capacity unit later if your data storage needs grow.

—Jeff Bertolucci

IN BRIEF

Passport XL

A line of removable hard drives with access times that rival fixed drives.

Quantum Corp.

500 McCarthy Blvd.
Milpitas, CA 95035
800/624-5545

Reader service no. 764

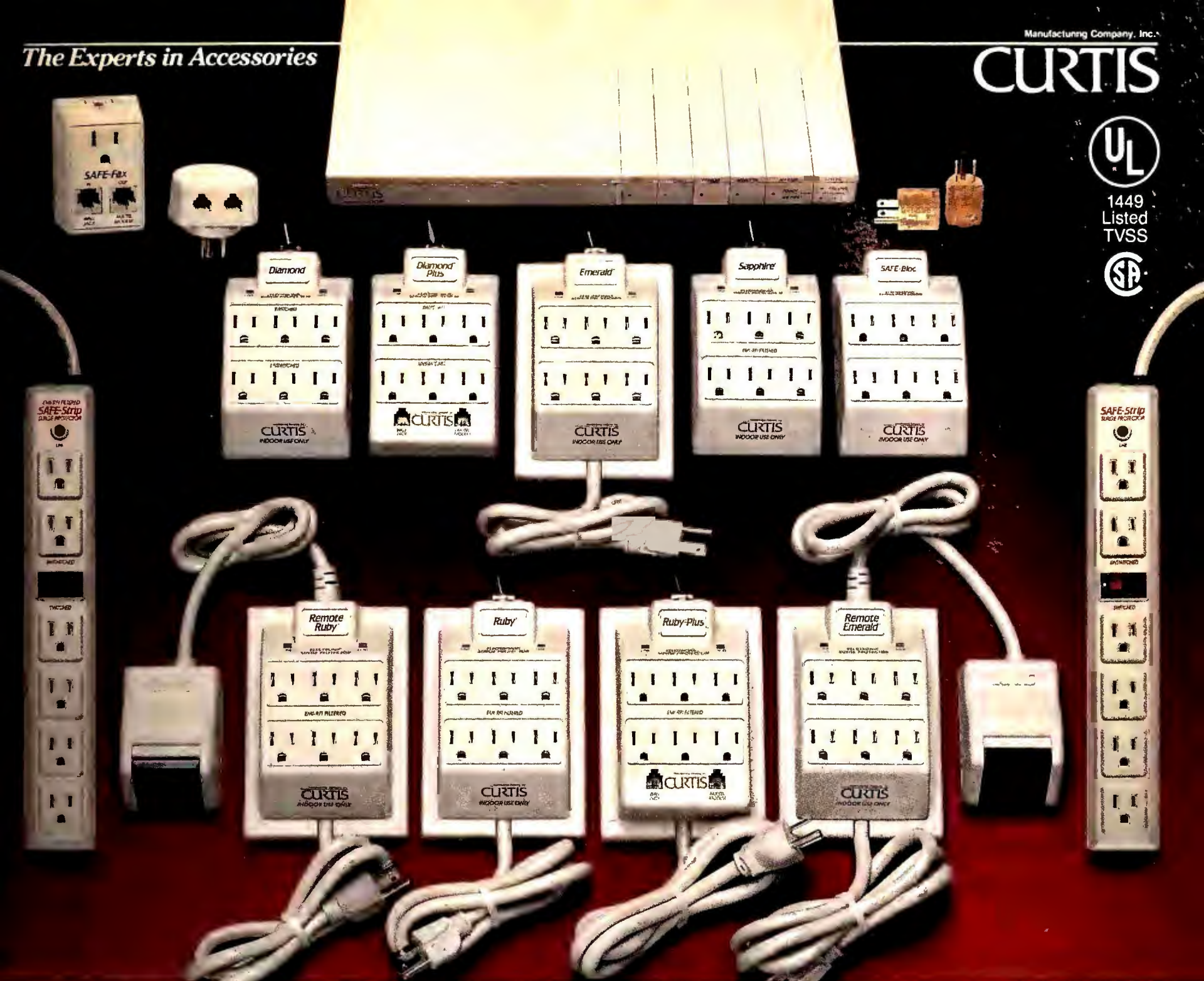
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A Power-Saving Notebook With Horsepower and Stamina



Zenith has optimized its 386SL notebook with a number of power-saving options that provide from 3 to 8 hours of mobile computing.

Combining Intel's 25-MHz, low-power 386SL with a high-speed parallel port and a hard drive that protects your data if you accidentally power down, Zenith Data Systems' MastersPort 386SLe is set to do battle in the hotly contested notebook PC market.

Like Zenith's MastersPort 386SL, which uses the 20-MHz version of the SL, the 25-MHz 386SLe features a 64K RAM cache to speed operations between the CPU and the data you use most often.

As you'd expect from an SL notebook, the MastersPort 386SLe incorporates a number of helpful power-management features. For instance, the *rest* button sets the 386SLe at 0 MHz while keeping your application (and your data) in memory for about two weeks. The 386SLe also automatically rests when its battery power is nearly drained.

A standby mode—helpful for business travelers who use their notebooks intermittently during the day—reduces power consumption by roughly 75 percent and lets you resume work simply by hitting a key or moving the mouse. Zenith claims a battery life of 3 to 8 hours.

The internal 85MB hard drive designed by Zenith and Conner Peripherals protects your data if you accidentally power down. If you hit the *rest* button while the hard drive is reading or writing data, the drive will stop immediately and continue its read/write

function when you resume operations.

For faster LAN connections and speedy printing, the MastersPort 386SLe features a high-speed enhanced parallel port (EPP). This improved interface can boost by up to four times the transmission to network adapters and other parallel port peripherals such as printers, scanners, and even UPC bar-code readers, according to Zenith.

However, since peripherals will need special drivers to take advantage of the EPP, it may be a while before you'll get your money's worth from this new parallel port.

Zenith had the future clearly in mind when it placed the 386SLe BIOS in flash memory. This setup allows you to upgrade your BIOS easily—adding, for example, support for power management features that will be built into

NEC's Colorful UltraLite Has a Screen to Die for but Weighs In With a Heavy Price

NEC's new UltraLite SL/25C may set the performance standard in the raciest segment of the PC market—lightweight color notebooks.

The 7.5-pound unit sports a superb 9½-inch TFT (thin film transistor) active-matrix color LCD display and a speedy 25-MHz 386SL processor with 64K of cache memory. Together they make the NEC as quick as any SX-based notebook or desktop machine.

The \$5999 UltraLite SL/25C comes with 2MB of RAM expandable to 10MB, an 80MB hard disk, and a full complement of I/O ports, including an enhanced parallel port and a super-VGA CRT port that supports simultane-

ous video output in conjunction with the LCD. The UltraLite's nickel-cadmium battery lasts from 1.5 to 5 hours, depending on usage and the settings of its four power-saving operating modes. Changing the battery is a snap, and a 5-minute "bridge" battery lets the user switch to a fresh battery without shutting down (an extra battery is \$149).

The NEC displays crisp, clear, vibrant colors that are a match for those from most standard CRTs. Its new back-lighting system replaces the typical one or two fluorescent tubes behind the screen with nine very thin tubes that distribute light more evenly and dramatically increase the

future DOS and *Windows* applications—by downloading BIOS updates from Zenith's ZLink COM1 bulletin board or from CompuServe.

Other features of the \$4999 MastersPort 386SLe include 2MB of RAM (expandable up to 8MB), a backlit black-and-white SuperTwist LCD screen, VGA resolution, and an 82-key keyboard.

The system weighs in at 7 pounds with battery. An optional internal fax-modem will cost you \$499.

—Jeff Bertolucci

screen's operating life, according to NEC officials.

The UltraLite SL/25C's crisp color display and impressive performance exact a premium in both price and weight. But you get unrivaled performance that is truly at the leading edge of computing. —Rob Garretson

IN BRIEF

MastersPort 386SLe

The notebook from Zenith Data Systems includes a 25-MHz Intel 386SL and a host of power-saving features.

Zenith Data Systems

2150 E. Lake Cook Rd.
Buffalo Grove, IL 60089
800/553-0331

Reader service no. 765

IN BRIEF

NEC UltraLite SL/25C

One of the first and most powerful color notebooks to reach the market, the UltraLite SL/25C boasts unparalleled screen clarity.

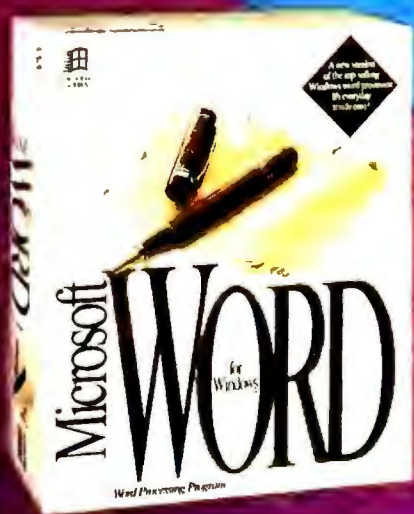
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Look at the comparison below. We took the information from the summer issue of Peachtree Times. Peachtree informs its customers of add-ons available for their software from third-party developers. Most of their add-ons are standard features in ACT-Plus. We added up the cost of the add-ons that are free in ACT-Plus. As you can see, you would have to pay over \$6900 to make Peachtree do what ACT-Plus does!

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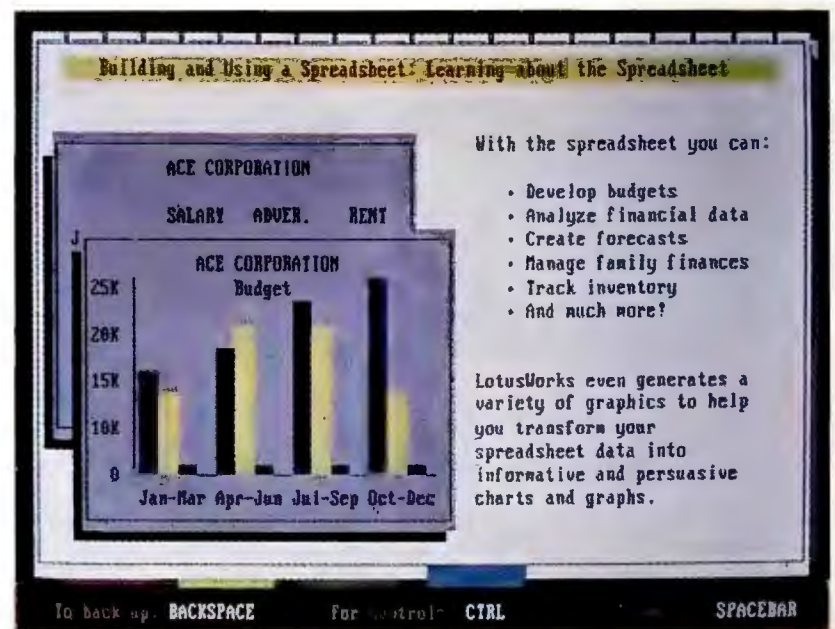
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Lotus Works Out With a Better Look



LotusWorks 3.0 features extensive tutorial sessions and help modules designed to get beginning and occasional users up and running fast.

If you want the best and latest integrated software program, *LotusWorks 3.0*, a major upgrade of Lotus's integrated software package, offers an impressive set of new features, among them a redesigned interface, an improved word processor, and extended help and tutorial sessions. All this, and *LotusWorks 3.0* still works within 640K of RAM—essential for laptop and beginning users who don't have multiple megabytes of memory.

When you load *LotusWorks 3.0*, you're greeted by an uncluttered, graphical "executive screen" that lets you choose among word processing, spreadsheet, data base, and communications modules. You can select other functions from this menu as well, including help, a detailed tutorial, or setup options.

But you'll need to load a *LotusWorks 3.0* application to truly appreciate the program's redesigned interface. Influenced by the look of *Windows 3.0*, *LotusWorks 3.0* features a variety of graphical enhancements including scroll buttons, resizable windows, pulldown menus, and dialog boxes. New mouse support makes using this environment a snap.

Not only does *LotusWorks 3.0*'s improved appearance make it easier to use, behind that pretty interface are some rugged new features. The word processor, for instance, now lets you embed graphics in documents and includes a new preview mode that lets you view your full-page documents before printing them.

Need to download scalable Bitstream fonts to your dot matrix or laser printer? *LotusWorks 3.0* allows you to choose between the standard 4-font set or the extended 32-font set, which you must load when you install it.

Priced at \$149, *LotusWorks 3.0* may be exactly what a lot of laptop and beginning users are looking for.

—Jeff Bertolucci

IN BRIEF

LotusWorks 3.0

This major upgrade of Lotus's all-in-one package features an improved interface and more.

Lotus Development Corp.

55 Cambridge Pkwy.
Cambridge, MA 02142
800/343-5414
Reader service no. 766

Circle 56 on reader service card

Fiction

SPACE ALIENS MARRY IN LAS VEGAS



LAS VEGAS, NEV. — Recently discovered aliens from planet X were married Jan. 7, 1992. The bride and groom both wore green. The aliens drew

a large crowd of well wishers for the festive occasion. The newlyweds honeymoon in H

Fact

HAYES OPTIMA PANICS COMPETITION

by Gary Lancaster

The incredible quality and low cost of the OPTIMA line of modems deserves a five-star rating. With superior design and loaded with features, the OPTIMA series has the competition run-

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Circle 105 on reader service card

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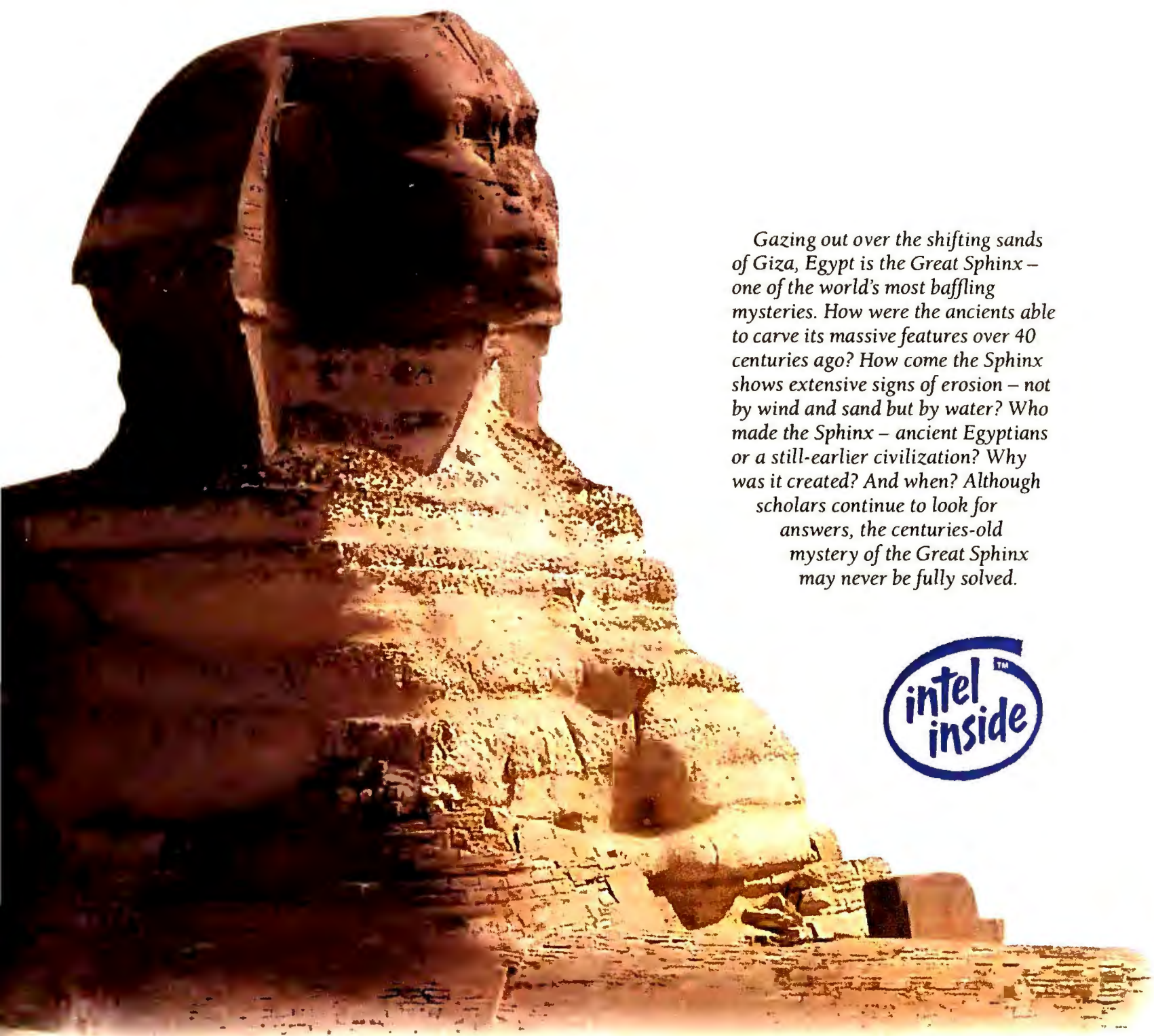
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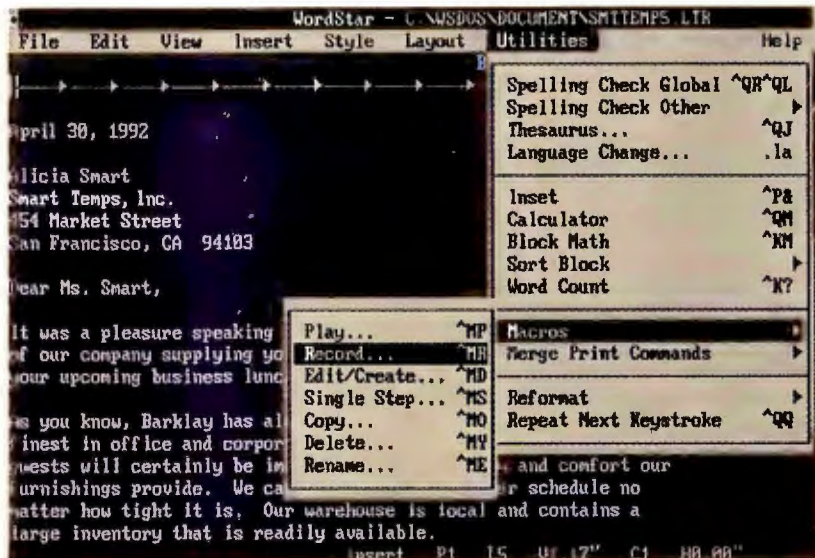
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A Kinder, Gentler WordStar Shows a Windows-Like Interface

WordStar for DOS bridges the gap between the Windows version of the product and good old WordStar 6.0, with a new interface, extensive mouse support, and a new macro language.

The most striking thing about the new WordStar is its Windows-like interface, which makes the program a lot easier to use for those who haven't memorized WordStar's complex keyboard commands.

All the program's features are available through pulldown menus, and there are lots of Windows-like features such as scroll, style, and title bars and status and rule lines. In the redesigned dialog boxes, you can click on check boxes and radio buttons to activate features. In addition, you can choose many commands simply by pressing their first let-



WordStar for DOS includes graphical menus that let you navigate through the program quickly without paying a performance penalty.

ter, and shortcut key combinations abound.

In most DOS programs you pay a performance penalty for working in a graphical mode. Not with WordStar. According to company officials it's just as speedy as a character-based program, and if getting used

to the new interface seems too much like breaking in a pair of shoes, the classic WordStar interface is just a click away.

Another important new feature is a long-overdue macro language. The product ships with 40 prerecorded macros for selecting a style, starting a

spelling check, or saving a file; and you can record, edit, and play back your own macros with a single keystroke.

WordStar for DOS now lets you create fax files or import 27 different kinds of graphics files. Priced at \$495 (or \$89 to upgrade from previous versions), this granddaddy of word processors shows it can still learn a few new tricks.

—Bronwyn Fryer

IN BRIEF

WordStar for DOS

WordStar now features a new name, a Windows-like interface, a new macro language, and support for graphics files.

WordStar Int'l, Inc.

201 Alameda del Prado
Novato, CA 94948
800/227-5609,
415/382-8000

Reader service no. 767

Virus Protection Against the Unknown

Does it make you uneasy to think that any worker in your office—even a temp—can bring in a virus-infected disk and wipe out a critical PC, workstation, or your entire LAN? It should. Viruses are multiplying, with new infections cropping up all the time. And even though the proliferation of infected disks gives LAN administrators nightmares, most still take an ostrichlike approach to prevention. Savvy users, on the other hand, are weighing in with an ounce of antivirus prevention from programs such as Fifth Generation Systems' new *Untouchable* and XTree's recently updated *VirusSafe 4.5*.

These programs promise to protect LANs or individual PCs from known and unknown viruses by launching a two-pronged defense against

infection. Memory-resident (TSR) monitors check system RAM for known boot-sector and partition-table viruses, and virus scanner/removers

IN BRIEF

Untouchable, VirusSafe 4.5

The new breed of antivirus software gives your whole office protection against even unknown viruses.

Fifth Generation Systems

10049 N. Reiger Rd.
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800/873-4384,
504/295-3268 (fax)

Reader service no. 768

XTree Co.

4330 Santa Fe Rd.
San Luis Obispo, CA 93401
800/395-8733,
805/541-0604

Reader service no. 769

search out and eradicate any that may have contaminated your undefended systems. *VirusSafe's* resident scanner can even block viruses from entering RAM. You don't have to spare much memory: *Untouchable's* RAM-resident module takes just 5K of conventional memory, while *VirusSafe's* uses 9K to 12K. And you can load either TSR high with DOS 5.0 and give up almost no conventional RAM.

As an ultimate line of defense, both programs use an installation scheme that registers file signatures to protect against unauthorized changes by unknown viruses. *Untouchable* even makes a data base of all your file signatures. But with either program, you should keep a floppy safely stashed until a change is detected. With this kind of preparation, it's easy to reconstruct infected files.

Untouchable also lets you set up a report structure that leaves a clear audit trail of any alerts and infections. Fifth Generation and XTree offer periodic updates of known viruses, but both claim that their programs will protect against unknown viruses by detecting alterations to executable files.

A stand-alone version of *Untouchable* is available for \$165; a LAN starter kit with a supervisor package and a 10-node license is \$695. *VirusSafe 4.5* lists for \$99 with upgrades available for \$39.95. A LAN version with a 10-node license is \$595. These are not the only effective antivirus programs on the market—you have plenty of other choices. But if you're not already considering virus protection for your PCs, it's time. Burying your head in the sand won't do the job. —Rex Farrance

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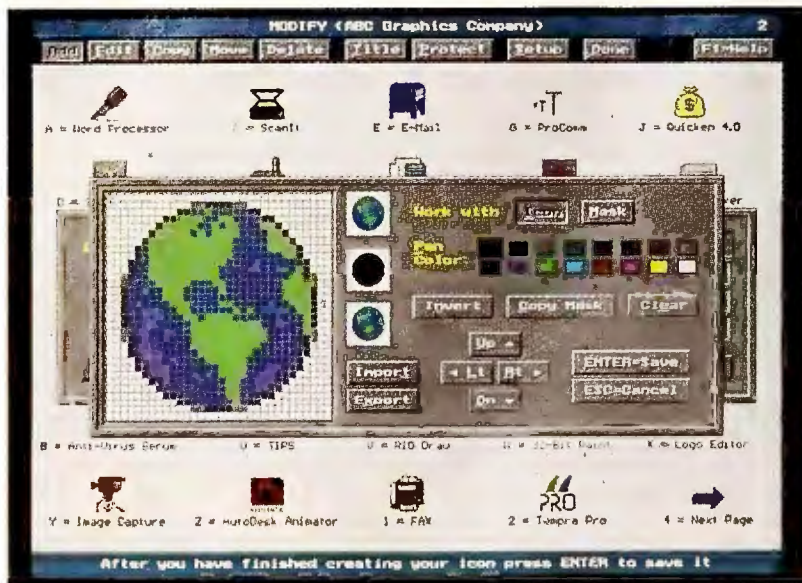

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Circle 296 on reader service card

Graphical Computing With DOS



SuperGUI includes an icon editor that lets you create custom icons for this graphical DOS shell and assign icons to popular DOS applications.

It's hard to escape the graphical world of computing today—even if you are a dyed-in-the-C->-prompt DOS user. If you're just getting started, a graphical view of the files and applications on your hard disk can make computing far easier and more fun.

To help novice users ride the wave to graphical computing, Media Management has introduced *SuperGUI*, a simple, graphical DOS shell that provides a quick and convenient way to launch applications and perform basic file management chores such as copy and move.

In fact, *SuperGUI* may be all you need if you or your users are mouse proficient, run mostly DOS programs, and have limited file management needs. It provides an attractive, graphical interface similar to GeoDOS, from which you can load programs by clicking on multicolored icons. *SuperGUI* comes with more than 150 icons and in addition allows you to create your own.

The icons are assigned during installation, when *SuperGUI* searches for programs it recognizes and automatically matches them with appropriate icons. However, you will

have to assign icons manually to a number of popular programs including *ProComm Plus*, *Norton Utilities*, *PageMaker*, and *PC Paintbrush*. Fortunately, this task is an easy one.

You can use *SuperGUI*'s file manager to copy or move a file

or group of files and perform other common file management chores. Unlike the shell in DOS 5.0 or *PC Tools*, however, it won't let you view more than one subdirectory and its files at once or view files according to their extension or date. Nor will you find any multitasking or task switching capabilities.

SuperGUI does include some extras, such as a phone dialer, a time-tracking feature to log how much time you spend in any given application, a macro recorder to automate tasks such as tape backup and disk optimization, and a simple file editor. The editor won't, however, wrap around long lines.

The program's on-line help is context sensitive and hypertext based, making it easy to use, but it lacks both an index and a table of contents.

Unlike character-based DOS shells such as *Menu Direct Gold*, *SuperGUI*

IN BRIEF

SuperGUI 1.4

An easy-to-use graphical DOS shell that makes innovative use of icons.

Media Management Systems, Inc.

One Meca Way
Norcross, GA 30093
404/564-5606,
404/564-5610 (fax)

Reader service no. 771

doesn't have a calendar or calculator, and it can't improve on DOS's file naming limitations.

The program lists for \$129.95 and requires DOS 3.1 or a later version, a graphics adapter, and a minimum 512K of RAM.

SuperGUI is a colorful application launcher and a way for DOS users to ease into the world of graphical computing without having to trade up to 386 hardware.

—Reid Goldsborough

Cut-Rate and Personal, Take Three

Microrim started the trend early last year when it shipped *Personal R:base*, a stripped-down, low-cost version of its full-powered relational data manager and a *PC World* Best Buy in July 1991. Borland followed last fall with *Paradox SE*, offering many of *Paradox*'s capabilities for a dirt-cheap price. Now DataEase International is joining the trend with *DataEase Personal*, an inexpensive data manager based on its more-powerful *DataEase 4.5*.

DataEase Personal has plenty for the novice user who wants a powerful data manager but isn't sure how to use one. Its step-by-step, prompted guides help you set up your data base and explain everything you need to know every time you have to make a deci-

sion. On the other hand, if you know your way around a data base, you can write an application in *DataEase*'s programming language. (This ability is unique—Microrim's and Borland's low-cost alternatives aren't programmable.) If you want to run an application right out of the box, *DataEase Personal* comes with address and check-writing applications already set up.

So what's missing? First off, there's no spreadsheetlike table view, which means you can't look at several records on one screen. Furthermore, you can't create a relational form in *DataEase Personal* as seamlessly as you can in *DataEase*, and you can't incorporate one form into another or create a lookup field to see from one table to another.

Since this version doesn't support extended or expanded memory, large applications may hit their heads on the 640K ceiling. As befits a "personal" program, there's no multiuser support and there's support for only 65,000 fields.

The program lists for \$99 and requires 512K of RAM and DOS 2.1 or later.

—Lincoln Spector

IN BRIEF

DataEase Personal

Another low-cost version of a full-fledged data manager that also offers some programming capabilities.

DataEase Int'l Inc.

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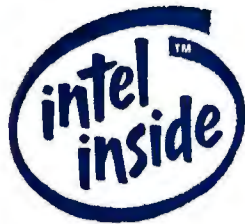
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STRING 100M	STRING 100M	STR	3.00	1.00	2.

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Great American's One-Write Plus Accounting Works bundles the firm's accounting package with new analytical tools for small businesses.

Following the lead of DacEasy and Peachtree, which have become famous in the small-business accounting market for packing comprehensive accounting functionality into one low-priced bundle, Great American Software has introduced *One-Write Plus Accounting Works*, a bundle of its popular accounting package and several recently developed add-ons.

Priced at \$299, *Accounting Works* brings together *One-Write Plus*—including general ledger, accounts receivable, invoicing, accounts payable, and SuperTrack inventory features—with the company's payroll package.

Taken together, the add-ons give small businesses the basic tools they need to analyze the volumes of customer data locked up in their accounting package. That should improve inventory and order management as well as customer relations. Armed with *Accounting Works*, a small business has some of the analytical resources associated with large corporations.

Specifically, *Accounting Works* gives you *Get Paid Plus*, a collection of letters for customer and vendor mailings (for such areas as marketing and collections); *@Account-*

ing, the firm's link to 1-2-3 for streamlined analysis of accounting data; *Data Save*, a backup utility; and *PC Menu*.

One-Write Plus Account-

ing Works requires 640K of RAM, a hard disk-equipped PC, and DOS 3.1 or later.

Also new from Great American Software is *One-Write Retail Express*, a bundle of the general ledger and check-writing features in *One-Write Plus*, together with *Retail Controller Junior*—point-of-sale software developed by MicroBiz Corporation. Targeted at small retail and service businesses, *Retail Express* manages a variety of check-out functions, including processing of credit card authorizations, printing itemized receipts and invoices. It can also figure the appropriate sales taxes and provide inventory tracking.

Retail Express requires 640K of RAM, 4MB of hard disk space, and DOS 3.3 or later. It sells for a suggested retail price of \$199.95.

—Roberta Furger

IN BRIEF

One-Write Plus Accounting Works, One-Write Retail Express

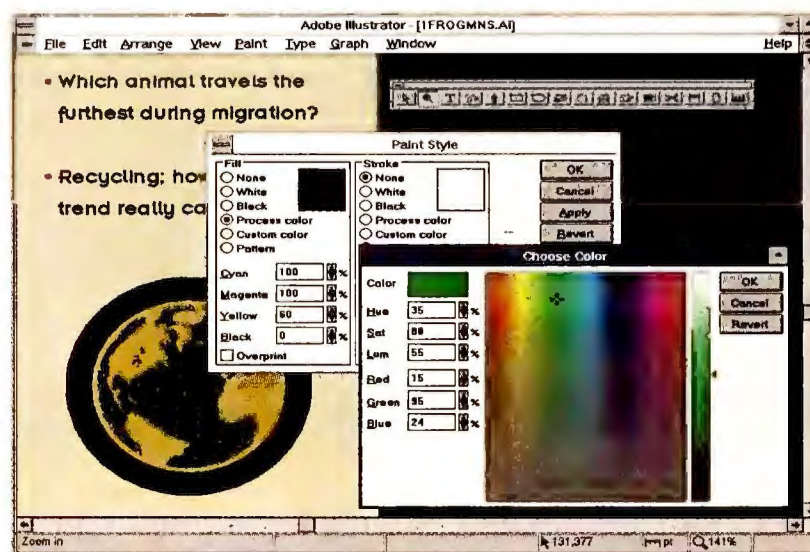
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Reader service no. 773

Second Time's the Charm for Illustrator



Illustrator's new color-pick menu lets you select colors on screen, while the resizable floating toolbox enables you to customize your work space.

Three years ago, Adobe introduced *Illustrator*, a Macintosh mainstay, to the DOS world. The result was a commercial failure. This time Adobe's taking no chances. *Adobe Illustrator 4.0 for Windows*, targeted at professional graphical designers, has all the features of the best-selling Mac version plus a host of extras—most notably

on-screen editing of color illustrations in preview mode.

As you'd expect from an Adobe product, text handling is a strong suit. You can enter WYSIWYG text directly on screen—in any of 40 bundled Type 1 scalable typefaces—and combining that text with graphics effects is easy. The \$695 price includes *Adobe Type Manager* and the type-

manipulation program *Adobe TypeAlign*.

A full complement of drawing tools—including a graph-making tool and a powerful blend device—are accessible from a customizable toolbox. *Illustrator*, which boasts 16- and 24-bit color support (up to 16.7 million colors), also does color separation, courtesy of *Adobe Separator*. In keeping with Adobe's cross-platform philosophy, *Illustrator* accepts files from the Mac or NeXT machines. —Steve Fox

IN BRIEF

Adobe Illustrator 4.0 for Windows

WINDOWS A top-rated Macintosh drawing package enters the Windows fray.

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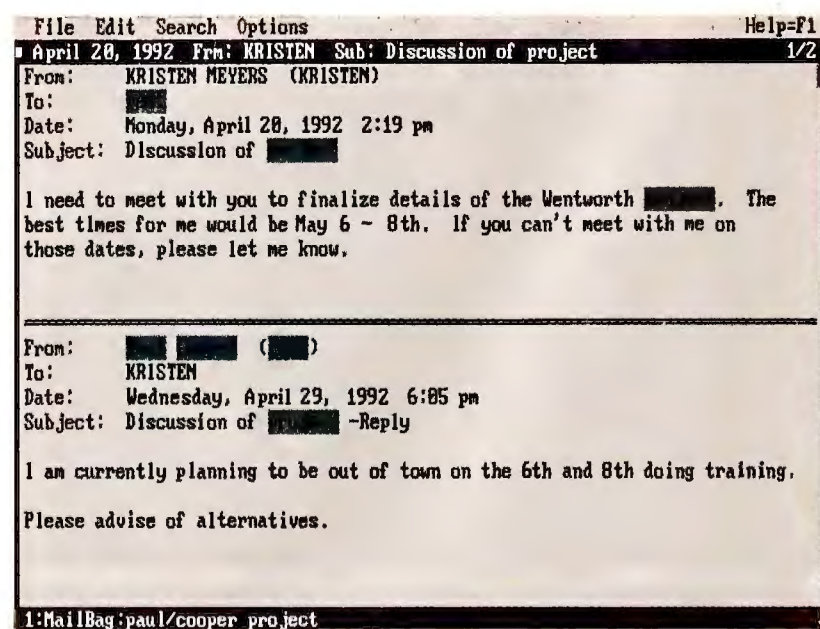
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 **CITIZEN™**

Circle 91 on reader service card



Search and Track E-Mail With MailBag



The E-mail utility MailBag organizes and archives your in-box and keeps track of message strings so you'll always know the context of your mail.

Has this ever happened to you? You've got 200, maybe 300 messages cluttering your E-mail in-box. Not very organized, are you? Suddenly you have to find an important message—maybe a business pro-

posal—sent to you months ago by, uh, let's see now . . . who sent that message?

Even if your E-mail package lets you organize messages in folders, it's not easy to store, catalog, or retrieve them

on demand. To the rescue comes *Mail-Bag*, an E-mail storage-and-retrieval utility designed for NetWare.

Created by Folio Corporation, the developer of NetWare's Help utility, *MailBag* helps you archive your E-mail messages so you can quickly find the right message at the right time.

MailBag archives mail from most of the well-known LAN-based E-mail products, including *Da Vinci eMail*, Lotus's *cc:Mail*, *Microsoft Mail*, and *WordPerfect Office*, according to Folio. You can also send messages to *Mail-Bag* from within your E-mail program. It works with any version of Novell Netware except for NetWare Lite, Novell's peer-to-peer offering, and should be installed by your LAN administrator on the network server.

To save a particular E-mail message in your own personal *MailBag* "infobase" file, you just highlight the message and press a pair of keys. You can also save text attachments to messages—useful for network users who exchange a lot of document files.

MailBag automatically indexes every word and number in your messages, making it possible for you to do fast full-text searches. You can also categorize E-mail by author, date sent, date archived to your infobase, and topic.

To access your infobase, you must first exit your E-mail program and then run *Mail-Bag* from the DOS prompt. From there you use the program's simple, menu-driven interface to search for words or messages.

To help save hard disk space, *MailBag* uses a proprietary compression algorithm to reduce the size of your infobase—up to a 50 percent reduction for infobases over 1MB, Folio says.

MailBag costs \$295 for 25

IN BRIEF

MailBag

A storage-and-retrieval utility for Novell NetWare helps organize your E-mail.

Folio Corp.

2155 N. Freedom Blvd.
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Reader service no. 774

users. For the thousands of Novell NetWare users who find themselves lost among the bits and bytes of electronic mail, this handy utility can make computerized communications a bit more civilized.

—Jeff Bertolucci

Convert Paper Forms to Digital

PerForm Tracer automatically converts the scanned image of a paper form into an electronic format usable by the *PerForm* family of form design packages. This *Windows* program uses object recognition technology to identify and convert graphic elements such as lines, boxes, and tables into objects that you can move and resize via an easy-to-use graphical interface. It converts images scanned in TIFF, PCX, or PNT (*MacPaint*) formats. You can import a converted image directly into the program or save it for later use. *PerForm Tracer* costs \$495.

—Jeff Bertolucci

IN BRIEF

PerForm Tracer

Delrina Technology
6830 Via Del Oro #240
San Jose, CA 95123
800/268-6082
Reader service no. 865

COMPUTER SECURITY PRODUCTS

COMPLETE LINE OF PROVEN AND EASY TO INSTALL
COMPUTER SECURITY PRODUCTS FOR COMPUTERS.

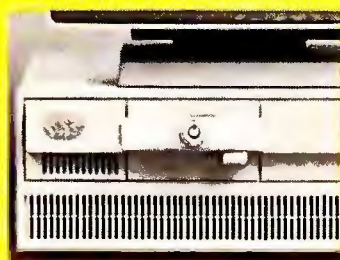
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Kablit™ Security System

This system allows you to secure all your computer components: CPU, monitor, keyboard, printer. **Internal component security:** Kablit fasteners secure the rear panel of CPU protecting internal boards and hard drives. Fasteners available for all applications. Prices \$34.95 to \$49.95 depending on system.

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IBM PS-2 DLK-270 Series

Now you can lock a diskette into your disk drive and force the computer to boot from the diskette. Disk Drive Lock models available for PS/2 - 30, 55SX, 50, 70 and 90. Protect your data from viruses or from being copied. Other drive locks to fit most non IBM PS/2 and Macintosh disk drives. List price \$24.95

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Secure-It, Inc. 1-800-451-7592
18 Maple Court East Longmeadow, MA 01028

Take The Money And Run!



Take the Money With **All ^{NEW!} DacEasy® Point of Sale™**

New DacEasy Point of Sale is the perfect stand-alone point of sale system for every size business that also integrates fully with DacEasy Accounting 4.2! New Point of Sale turns any 286 or better PC into a powerful Point of Sale system and it's compatible with PC-Based point of sale hardware, too.

Anyone Can Use It!

You don't have to be a computer genius to use DacEasy Point of Sale. Install it in minutes and perform all sales activities from one screen such as scanning bar codes, tracking customers, processing layaways and credit-card transactions, accessing product prices and information, tracking inventory and more. Since it's so easy to use, you'll speed up your sales transactions which will increase sales.

Customize It to Meet Your Needs.

The DacEasy Point of Sale interface can be customized to work the way you need it to. And it prints invoices and receipts with custom headers and sales messages, giving your business the flexibility to meet growing demands.

Reports That Keep You Informed.

DacEasy Point of Sale's reports help you manage your daily transactions such as sales by product, sales person and customer, credit transactions, layaways, returns, receipts by payment method, audit tape and more!

Integrate With DacEasy Accounting 4.2!

Best of all, DacEasy Point of Sale can integrate with DacEasy Accounting to provide complete inventory management and streamline your accounting activities! Use them together and you'll find there's no better way to take the money *and* run your business.

Run Your Business Easily With **DacEasy® Accounting™ 4.2**

Over one million businesses have learned the advantages of using DacEasy Accounting to manage their books. Its 12 integrated modules make running your business easier than ever: General Ledger, Accounts Receivable, Accounts Payable, Cash Management, Inventory, Product Assembly, Purchase Order, Billing, Budgeting, Graphics, Forecasting, and Report Generator. Use all of the modules or just the ones you need. Either way it's your total business solution.

Friendly Accounting.

DacEasy's logical interface and complete on-line, context sensitive help make it easy to learn and use. And the simple point-and-shoot mouse environment with transaction-oriented, pull-down menus is friendly to even the most novice of users.

Powerful Accounting.

With a complete report generator and 3-D graphics capability, DacEasy Accounting has your business covered with critical information at your fingertips. And printing Invoices, Purchase Orders, Statements, Credit Memos and other forms are a keystroke away.

The Most Award-Winning Accounting.

Over the past six years, DacEasy has won more awards than all other Accounting software combined. Plus, we're proud of having the industry's largest support staff and quality DacEasy Certified Consultants nationwide, all professionally trained to provide complete support should *you* ever need it.

Unmatched Value.

Nothing matches DacEasy's combination of power, simplicity and value. Add DacEasy Point of Sale to the equation and running your business will be easier than you ever imagined.

Network Versions Also Available

Network versions of DacEasy Accounting and Point of Sale are also available for just \$299.95 each, or check out the special network offers in the single-user packages! These NetBIOS compatible systems have the same features as the single user versions but allow unlimited access with multiple PCs - just think of the possibilities!

See Your Local Dealer or Call Us and Order Today!

1-800-DAC-EASY

30-Day Money-back Guarantee when ordered directly from DacEasy.

Media Code: PCW

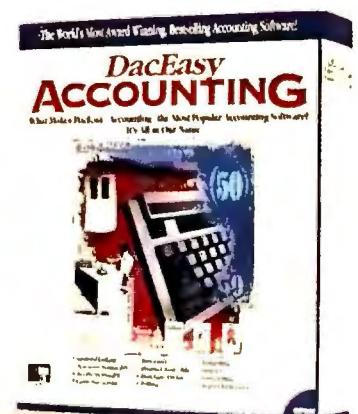
Requires 640K, IBM or compatibles or PC based Point of Sale System, Hard disk, DOS 3.1 or later, mouse optional. Network versions require NetBIOS compatible LAN. DacEasy, DacEasy Accounting and Point of Sale are trademarks of DacEasy, Inc. Copyright ©1992 All Rights reserved.

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See us at COMDEX/Windows World, Booth #W820, McCormick Place



\$149.95



\$149.95

Announcing A Grammar Check It Yanks Writing Errors Out

Morphology. It's the linguistic science of recognizing root words. It's also the science behind our breakthrough grammar checking technology that's a quantum leap in proofreading power for PCs—the writing improvement technology we call Mor•Proof.™
Introducing Grammatik™ 5 for DOS and Windows.



THE POWER

New Grammatik 5 uses Mor•Proof (morphological proofreading) to analyze parts of speech using root words so it's not fooled by prefixes, suffixes, and conjunctions. It identifies nouns, verbs, and other parts of speech with unprecedented accuracy. And ferrets out even the most complex grammar errors with ease.

Subtle writing errors like tense shifts and incorrect verb forms are ripped out like weeds. Comma splices and conjunctive clause errors are clipped. Before they can cause you embarrassment.

Yet for all of its error detection prowess, Grammatik 5 is still as easy to use as a spelling checker.

THE PROOF

But precision proofreading is just the beginning. Virtually everything that's made Grammatik the #1 grammar and style checker is now even better.

Of course, it still proofreads your writing for errors in grammar, style, punctuation, usage, and spelling. But

now, Grammatik checks 58 comprehensive classes of writing rules, protecting you against literally hundreds of thousands of possible errors. Including errors that even proofreading professionals often miss.

Grammatik 5 includes specific error-checking patterns for ten writing styles, from advertising and business letters to proposals and fiction. It works inside all major DOS and Windows word processors including Word, WordPerfect, and Ami Pro. And, it even has an instantly accessible writing guide with "Hot-Word" writing advice linked specifically to errors you've made.

THE PAYOFF

Which brings us to the payoff: Better writing.

If you use Grammatik 5, we guarantee it will improve your writing immediately, or your money back.*

At the touch of a key, your writing will communicate more clearly, it will be tighter, smarter, and always error-free. Everything you write, every letter, memo, and proposal will present you at your best.

So rip those writing errors out by the roots with Grammatik 5. You'll discover what 1.5 million users already know. Grammatik is the easiest way to improve your writing.

Memo:

To: Department Heads
From: The Big Boss
RE: Sloppy Writing

You are all well aware that Burdette Inc. got the big again. Although they were much more expensive. We had to pay a lot of money to get the big again. You are all well aware that Burdette Inc. got the big again. Although they were much more expensive. We had to pay a lot of money to get the big again.

He uses computer these days himself and he's demanded his sales people do to. Using with some secret software that checks for hundreds of thousands of errors in grammar, style, punctuation, usage, and spelling. He wants them to easily improve their writing and make him rich and me poor.

I do not want to be poor.

If you do not either, I suggest you find that secret software and get it in here faster than greased lightning. Otherwise you are in for a shock.

Answer: you all know that better writing can make a big difference in your career. If the to point out and I can't believe you haven't then, before, after, whenever has that writing improvement software on my desk on Monday will be here Tuesday. And we'll be rich, won't we?

BEFORE

Memo:

To: Department Heads
From: The Big Boss
RE: Sloppy Writing

We just did another bid to Burdette Inc. even though their bid was more expensive. We lost because of sloppy writing. I hope it will be the last time that happens.

Last weekend at the club, Mr. Big Boss was bragging and boasting out criers to celebrate his victory. This did not make me happy. He was using about the new software he talked about. He called it secret software that checks for thousands of errors in grammar, style, punctuation, usage, and spelling. Burdette Inc. said that his people improve their writing with it, and use it to make him rich. I don't believe him. Please find that secret software and get it in here quickly.

You all know that better writing can make a big difference in your career, and right now that's especially true. Whoever has that writing improvement software on my desk Monday will be a hero.

AFTER

See your dealer or call 1-800-872-9933 ex. 500W to order now for only \$99 on our 60-day money-back guarantee.

Introducing Gram•mat•ik 5

Checker So Powerful, By The

FOR DOS & WINDOWS

ROOTS!

Grammatik 5
The #1 Grammar & Style Checker

THE EASIEST WAY TO IMPROVE YOUR WRITING

*Proofreads your writing
for mistakes in grammar,
style, usage, punctuation,
spelling, and more.*

Grammatik 5
The #1 Grammar & Style Checker

UPGRADE!

Grammatik, RightWriter, and Correct Grammar users, upgrade to the proof-reading power of Grammatik 5 with a 60-day money-back guarantee!**

INSTRUCTIONS: Please specify DOS or Windows version when upgrading. Grammatik users call 1-800-872-9933 to upgrade for \$34.99 plus tax/shipping, or fax this coupon with your serial number and credit card authorization to 1-415-541-0916. RightWriter and Correct Grammar users send original manual title page or program disk and \$44.99 plus tax/shipping. Send to Grammatik 5 Upgrade, Reference Software, 330 Townsend Street Suite 119, San Francisco, CA 94107. In CA add appropriate sales tax and \$5.00 shipping. In US, outside CA, add \$7.50 shipping.

Name

Company

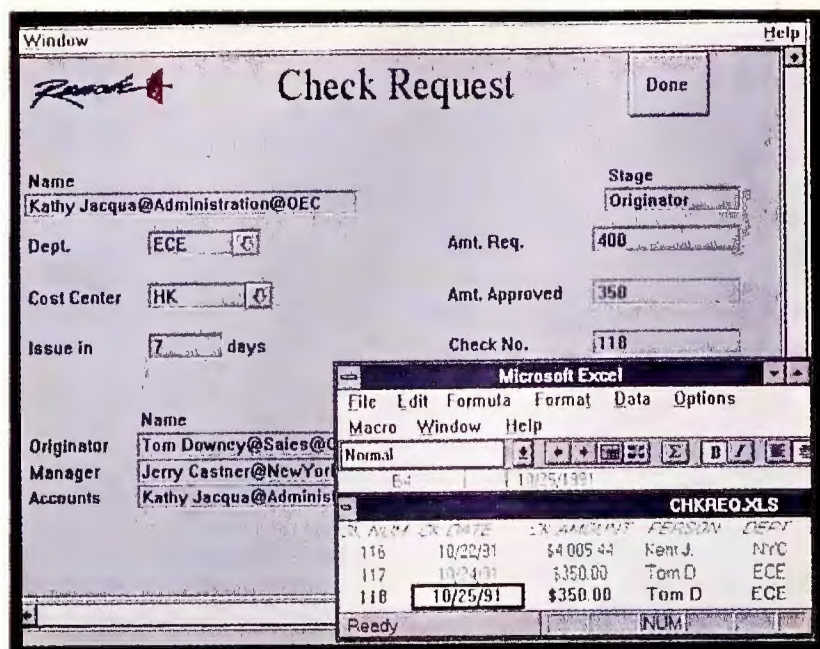
Address

City, State, Zip

ex. 500W

Reference Software
INTERNATIONAL

Let E-Mail Manage Your Work Flow



WorkMan lets you route electronic forms through your business and swap information with other Windows applications via DDE links.

E-mail is a great way to exchange messages and files. But Reach Software says electronic mail should also give you a better way to organize and route your daily business operations across a network.

Enter Reach Software's *WorkMan*, a Windows program that lets you create, send, and track "intelligent" electronic forms across a LAN. These smart forms automatically route themselves through your company, disclosing certain fields only to designated managers.

WorkMan consists of two programs: a run-time environment for deploying *WorkMan* applications, and *WorkMan Tools*, a graphical-based development program for creating *WorkMan* forms.

Starting in the *Tools* environment, you create a form by clicking on icons—one to build a dialog box, another to add "action" buttons, and so on until the basic shape is completed. You can then customize the form with text, lines, and graphics. You can also make viewing certain fields, such as those that contain sensitive financial data, dependent on who's receiving the form.

Once the form is complete, you define who receives the form and what actions they can take. Using the point-and-click interface, you establish

your form's route. You can route it to departmental managers before sending it to personnel, for example. And you can alter the form's appearance depending on who's receiving it, creating different action buttons for different recipients, for example. A purchase order form you send to your boss may include "approve" and "disapprove" buttons. The same form routed to accounts payable may not include them.

You can integrate your *WorkMan* electronic forms with other Windows applications using DDE (Dynamic Data Exchange), which allows you to swap information with other Windows apps. *WorkMan* also comes with scripts for performing SQL queries to mainframe-based data.

WorkMan runs on Novell's NetWare MHS and Banyan's VINES Mail. A five-user

license that lets you create an unlimited number of *WorkMan* applications costs \$2495. Additional five-user licenses cost \$1495 each. For \$995 you can buy a five-user version of *WorkMan* that lets you run a single *WorkMan* application, such as purchase order tracking. The *WorkMan Tools* development kit costs \$995.

—Jeff Bertolucci

IN BRIEF

WorkMan

WINDOWS LAN-based software and development tools let you create and exchange "intelligent" forms via E-mail.

Reach Software Corp.

330 Potrero Ave.
Sunnyvale, CA 94086
800/624-5356,
408/733-0482 (fax)

Reader service no. 775

Take Central Station to Your LAN

Artisoft's new Central Station spins a unique twist on the concept of notebook docking stations. In addition to connecting your notebook to the corporate LAN, this modem-size unit can also be a full-time printer and modem server for *Lantastic* and NetWare

LANs when it is equipped with software modules from Artisoft.

At \$595, Central Station costs less than docking stations. While you won't get any room for add-on cards or additional memory, one of Artisoft's \$99 *StationWare* mod-



Central Station lets notebooks access network printers and modems.

IN BRIEF

Central Station

The Central Station "connectivity processor" lets you connect portable PCs to a LAN.

Artisoft, Inc.

691 E. River Rd.
Tucson, AZ 85704
800/846-9726,
602/293-8065 (fax)

Reader service no. 776

ules allows the Central Station unit to act as a NetWare or *Lantastic* print server while another provides dial-in connection to both networks.

Central Station features three serial ports, one parallel port, one PC port, and an optional SCSI port. It comes with 128K of RAM, which you can expand to 512K. Another nifty feature: The front panel includes a row of LED lights that let you know which port is active.

—Jeff Bertolucci

YOUR CHOICE JUST GOT EASIER.



FastData 386/33

\$1699

Includes

- Intel 386DX™ 33mhz Processor
- 64K Static Ram Cache
- 4 megabytes of high speed Ram.
- 105 mb 17ms IDE hard disk, 1:1 interleave with 32K cache.
- Desktop Chassis or Mini-Tower
- 1.2mb 5.25" & 1.44mb 3.5" drives
- Non-Interlaced 14" SVGA color monitor, 1024x768 resolution
- 16 bit 1mb Super VGA card.
- Clock/calendar, parallel port, game port and two serial ports.
- 8 expansion slots, 2 occupied
- MS-DOS 5.0.

more ➡

A photograph of a FastData 486/33 computer system. On the left is a vertical tower unit with a floppy disk drive at the top, a 3.5-inch drive below it, and a control panel at the bottom with a digital display showing '33' and several buttons. A vertical speaker is attached to the front of the tower. To the right of the tower is a CRT monitor displaying the text '486 33 Mhz' in large yellow letters. In front of the monitor is a keyboard with a 'FastData' logo on the top left. The background is a warm, orange-toned gradient.

FastData 486/33

\$2199

Includes

- ⇒ Intel 486DX™ 33mhz Processor with 8K Internal Cache
- ⇒ 128K External 25ns Cache
- ⇒ 4 megabytes of high speed Ram.
- ⇒ 105 mb 17ms IDE hard disk, 1:1 interleave with 32K cache.
- ⇒ Tower (shown) or Desktop Chassis
- ⇒ 1.2mb 5.25" & 1.44mb 3.5" drives.
- ⇒ Non-Interlaced 14" Super VGA color monitor, 1024x768 resolution.
- ⇒ 16 bit 1mb VGA card.
- ⇒ Clock calendar, parallel port, game port and two serial ports.
- ⇒ 8 expansion slots, 2 occupied.
- ⇒ MS-DOS 5.0.

486
33 Mhz

FastData Satisfaction

Why buy an underfeatured overpriced PC without full support when you can get your hands on a hot new FastData PC for hundreds less?

"this is a likable computer"
-PC Magazine 10/27/90

Superior Design

You get more of your FastData personal computer because we put more into it. FastMicro's 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'll be sure to pass yours.



"the component list reads like a Who's Who in the computer world"
-Computer Shopper 6/91

Full Support

Should you have a question or a problem, call us seven days a week. Our support engineers will work with you to solve the problem over the phone. In the unlikely event your system is down, it's our goal to get your system back up - and quick. If a part has failed, we'll get a



replacement part out the door via FedEx the same day (Mon-Fri). If that doesn't solve the problem, we'll dispatch GE on-site service or completely replace your computer at no charge to you.

GE Computer Service

"FastMicro has lasted while scores of other companies have come and gone"
-Computer Buyer's Guide 10/91

Risk Free

FastMicro sells to over half the Fortune 500 and Universities in 49 states. Those who buy for a living rely on us, you can too. Take more than our word on it - purchase any FastData brand product and if you are not thoroughly satisfied within thirty days, you can return it for a full refund.

"bargain hunters may find it hard to resist"
-PC World 10/91

Easy to Buy

FastMicro makes it easy to own a FastData personal computer. Call toll-free seven days to ask a question, get a price, or place an order. Talk to one of our system consultants. Ask your tough questions, we think you'll like our answers. After all, FastMicro wants you as a customer for life, not just today.

FASTMICRO

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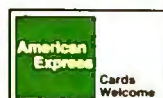
FastData 386/SX-20



\$1499

Includes

- Intel 386SX™ 20mhz Processor
- 4 megabytes of high speed RAM.
- 105 mb 17ms IDE hard disk, 1:1 interleave with 32K cache.
- 1 2mb 5.25" and 1.44mb 3.5" Teac floppy drives.
- Mini-Tower (shown) or Desktop Chassis.
- 200 watt power supply.
- Non-Interlaced 14" Super VGA color monitor, 1024x768 resolution.
- 16 bit VGA card with 1mb Video Ram.
- Clock, calendar, parallel port, game port and two serial ports.
- Key Tronic 101 key keyboard.
- 8 expansion slots, 2 occupied.
- MS-DOS 5.0.
- Microsoft Windows & Logitech Mouse add \$69.
- FCC Class B.
- FastMicro Peace of Mind

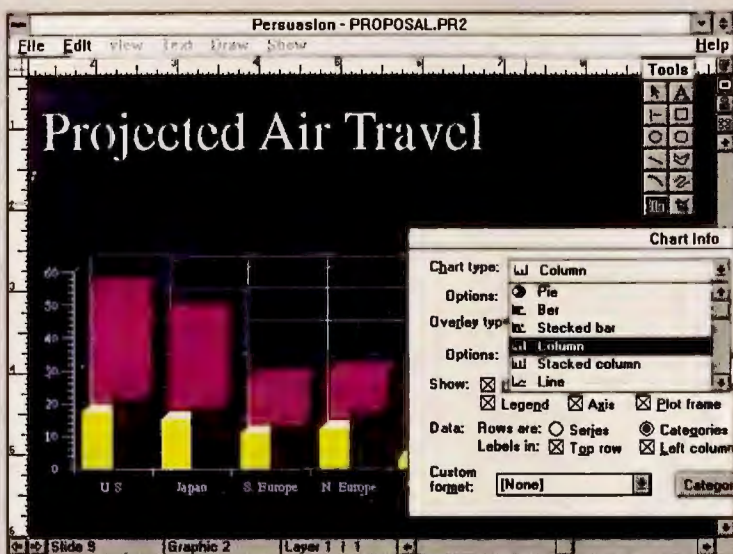


FastMicro, Inc. 4405 East Baseline Road, Phoenix, AZ 85044
U.S. Sales 800-824-6000 / 602-431-8200, FAX 602-431-8300

UPDATE

New Versions of Your Favorite Products

Persuasion 2.1 for Windows



Persuasion 2.1 for Windows now displays Persuasion slides on either a PC or Macintosh. Version 2.1 supports OLE and DDE, too.

WINDOWS Aldus's presentation graphics package gets even more persuasive with version 2.1. The handiest new feature is a player that displays *Persuasion* on-screen slide shows on either a PC or Mac, regardless of which machine you used to create the presentation. Indeed, any *Persuasion* file—not just slide shows—can now be read by either platform. Version 2.1

also picks up support for OLE and DDE and adds 28 master "AutoTemplates." The price, which includes a bundled copy of *Adobe Type Manager*, holds steady at \$495. An upgrade from version 2.0 is \$50; an upgrade from a competitors' presentation package is \$99. Aldus Corp., 411 First Ave. S, Seattle, WA 98104-2871; 206/622-5500.

Reader service no. 777

Micrografx Designer 3.1

WINDOWS This already impressive draw program beefs up its type handling by bundling *Adobe Type Manager* and *Type Align*, an Adobe font-manipulation package. Either bundled application can be launched from within *Designer*, which looks unchanged but has been slightly reengineered to take advantage of the add-ins. *Designer* is enhanced by 167 additional Type I fonts from

Adobe and DTC. *Designer 3.1* retails for \$695; 3.x upgrades are \$99.95 and upgrades from earlier versions are \$149.95. Micrografx, Inc., 1303 Arapaho, Richardson, TX 75081; 800/733-3729, 214/234-2694.

Reader service no. 778

SmarText 2.0

If you have to make your way through long documents like manuals or books, you know how easy it is to get lost.

SmarText 2.0, an upgrade to Lotus's *SmarText* hypertext software, makes it easier to build, publish, and read long electronic documents. The product comes in two parts—*SmarText* Builder and *SmarText* Reader. The *SmarText* Builder converts word processing or text files to documents that can be searched by text strings or combinations of keywords. When the Builder converts a word processing file to an electronic document, hypertext links automatically connect words or phrases to related text and graphics, so you can navigate through very long documents to find specific information. The *SmarText* Reader lets you distribute documents created with the Builder and comes with a host of reading, searching, and annotation features. The *SmarText* Builder is priced at \$495; the Reader is available for \$99. Lotus Development Corp., Word Processing Division, 5600 Glenridge Dr., Atlanta, GA 30342; 800/831-9679, 404/851-0007.

Reader service no. 779

R&R Report Writer for Paradox

Concentric Data's *R&R Report Writer*, long a favorite *dBASE* accessory, is now available for *Paradox* users, offering a versatile tool for creating great-looking reports. *R&R Report Writer for Paradox* supports LaserJet and PostScript proportional fonts (including soft fonts and cartridges), allowing you to mix type styles and point sizes while keeping your lines and columns straight. And to make sure that the printed report will be to your liking, there's also a graphics page

preview. *R&R Report Writer for Paradox* lists for \$249, with a LAN six-pack available for \$1249. Concentric Data Systems, Inc., 110 Turnpike Rd., Westborough, MA 01581; 800/325-9035, 508/366-1122.

Reader service no. 780

InCommand 1.3

Command line aficionados will appreciate the wild card and text searching enhancements in the latest update of *InCommand*, a collection of command line utilities. Now you can specify several wild card patterns in one command, and when searching through files for a text string, you can easily go back to the most recent match. *InCommand*'s wild cards are a superset of DOS's and include some powerful options. Typing **DIR *.*.TXT, .DOC**, for instance, will show a list of all files in the current subdirectory and all subdirectories under it with the extensions TXT or DOC. *InCommand* may not simulate *The Norton Utilities*' NDOS, but it offers extra options, including the capability to search for whole words only, use subdirectory wild cards, and enter dates as days of the week. Version 1.3 of *InCommand* retails for \$60. Inductive Logic, P.O. Box 26238, San Diego, CA 92129; 619/578-5146.

Reader service no. 781

SQLBase 5.0

Released simultaneously for DOS, OS/2, NetWare, and SPARC (UNIX) operating systems, *SQLBase 5.0* offers enhanced compatibility across these platforms, faster performance, better support for

graphical applications, and an "easy install" option for users unfamiliar with SQL data base servers. *SQLBase 5.0* has an improved query optimizer that reduces the time needed to compile and execute complex queries. The program handles partitioned data bases that span multiple disk drives and contain megabytes of data. *SQLBase 5.0* also works with IBM's DB2 mainframe data base. The five-user version of *SQLBase 5.0* for all platforms is \$995. The unlimited-user versions for DOS, OS/2, NetWare, and UNIX are \$2995, \$3995, \$4995, and \$9995, respectively. Gupta Technologies, 1040 Marsh Rd., Menlo Park, CA 94025; 800/876-3267, 415/321-9500.

Reader service no. 782

AVR ScanPack Bundle

Advanced Vision Research (AVR) is now bundling *ScanPack*, a set of scanning utilities, with its AVR 8000 line of 400-dpi scanners. *ScanPack* includes a menu-driven program for installing your scanner, and *EasyScan*, a *Windows 3.0* utility that lets you scan documents or images directly to disk from within any *Windows* application. The utility includes a gray-scale preview feature and an adjustable scan window. Among others, *ScanPack* supports TIFF, GIF, Targa, and PCX file formats. In addition to *ScanPack* the AVR 8000 scanner comes with Micrografx *Picture Publisher*, a *Windows 3.0* image editor for both gray-scale and color images. The AVR 8000/GSX gray-scale scanner, which is targeted at OCR users, comes with Ocron's *Perceive* OCR software, SCSI interface kit, and bundled software for \$1690. The AVR 8000/CLX color scanner, SCSI kit, and software costs \$2190.

Advanced Vision Research, Inc., 2201 Qume Dr., San Jose, CA 95131-9809; 800/544-6243, 408/434-0968 (fax).

Reader service no. 783

MenuWorks Total Security 2.0

With *MenuWorks Total Security 2.0* you get bank-vault protection in a friendly menu shell that recognizes and organizes up to 2500 programs. This *Windows*- and network-compatible security program from PC Dynamics supports 100 security levels, passwords, log-on IDs, and user profiles. You can restrict up to 64 DOS commands—such as *FORMAT* and *DELETE*—and prevent anti-security end runs by locking the keyboard during boot up and making protected drives invisible to the end user. Do you have top secret data? Protect it with the Data Encryption Standard (DES) encoding used by many government agencies. *MenuWorks Total Security* also provides virus checking and lets you maintain a detailed log of system activity. *MenuWorks Total Security* lists for \$149.95. PC Dynamics, Inc., 31332 Via Colinas #102, Westlake Village, CA 91362; 800/888-1741, 818/889-1741.

Reader service no. 785

Citrix Multiuser 2.0

Based on IBM's OS/2 version 2.0, Citrix Multiuser 2.0 is a powerful, reliable multiuser operating system that delivers all popular PC applications at a cost far below that of a traditional PC network. Unlike the earlier version, which primarily supported mission-critical text-mode OS/2 applications, Multiuser 2.0 runs any combination of DOS, *Windows*, OS/2 1.x, and OS/2 2.0 packages—without memory constraints and with full graphics sup-

Personal Biz*Base 2.2

The screenshot displays the 'Personal Biz*Base' window. At the top, it shows 'Updated: 12/19/91' and 'Personal Biz*Base'. Below this, a client record for 'Mr. Daniel V. Francis, President' is shown, including his address (Emerging Biology, 3212 Grogg Street, Suite 200, San Diego, CA 90045), phone (619-555-6700), fax (619-555-6710), and operator account. The record is organized into several sections: 'D) User' (Business: Biotechnology, Referral: Net 3H, Card #: UPS Ground, Type Equip: 3440 IBM, 50 PC, Terms: Weekly, Remarks: possible investment), 'E) Dates' (Last Ord: 12/12/91, Shipped: 12/17/91, Registered: 09/07/91, Last Meet: 08/15/90, Birthdate: 08/15/60, Annivers: 08/15/90), and 'F) Sale' (Annual \$\$: 50000, Last Ord: 4000, Fgrt Min: 0, Avail Crt: 10000.00, Average \$: 0.00, Min Order: 0.00). At the bottom, there is a 'HEMOS' section with a list of items (L-Last, N-Next, P4 N-Foll, P7 L-Call, P7 L-Expn, P4 N-Invc) and a status bar with various menu options like 'Add Copy Del Edit Find Group List Memo Next Prev Query Recalls Stats Tag Views'.

Each record in *Personal Biz*Base 2.2* provides space for detailed client information. The program holds up to 200 records in a single data base.

If you need a full-featured contact management program but blanch at paying several hundred dollars for it, *Personal Biz*Base 2.2* from Creagh Computer Systems is your \$69.95 solution. *Personal Biz*Base 2.2* boasts the same legion of features as its high-end sibling *Biz*Base Gold*, which sells for \$189.95. The one difference: *Biz*Base Gold* holds an unlimited number of records in as many data bases as you wish, while *Personal Biz*Base 2.2* only holds 200 records in a single data base. If you have more than 200 contacts to track, an additional \$9.95 buys the

*Biz*Key* disk, which will upgrade the program's capacity to an unlimited number of data bases with up to 500 records each. Notable features of *Personal Biz*Base 2.2* include *dBASE* compatibility, Boolean Logic searching, an unlimited report generator, and tracking of invoices, expense reports, phone calls, and correspondence. It also has a macro maker, a sophisticated calculator, a word processor, and an auto dialer. *Biz*Base*, Inc. 505 Lomas Santa Fe Dr., #130, Solana Beach, CA 92075; 800/833-8892, 619/792-1367.

Reader service no. 784

port. Once the host software is installed on a 386 or 486 desktop or tower, terminals can be added for about \$900 per user—less if graphics support is not required. The system can be installed as a departmental network or as a network extender for NetWare, *LAN Manager*, *LAN Server*, or *VINES*. Multiuser 2.0 comes with a full suite of mini-computerlike security, remote access, and administration

facilities. It costs \$995 for a host with 5 users, \$1490 for 10 users, and \$1985 for 20 users; unlimited-use licenses also are available. Citrix Systems, 210 University Dr. #700, Coral Springs, FL 33071; 800/437-7503, 305/341-6880 (fax).

Reader service no. 786

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

Why Some Communications Software Don't Talk Real Good.



Something isn't quite right in the world of PC communications...

Too many comm programs have far too few emulations and protocols. Others demand big bucks for more emulations and protocols than you could use in a lifetime. A lot of programs are simply shareware in a box.

Many come from such small companies that the tech support is less than supportive.

There's even one surprisingly well-known comm package which completely shuts up the minute you attempt a high-speed file transfer.

No Size Fits All.

To cap it all off, an appalling number of software manufacturers will tell you—with a straight face—that a single, “one

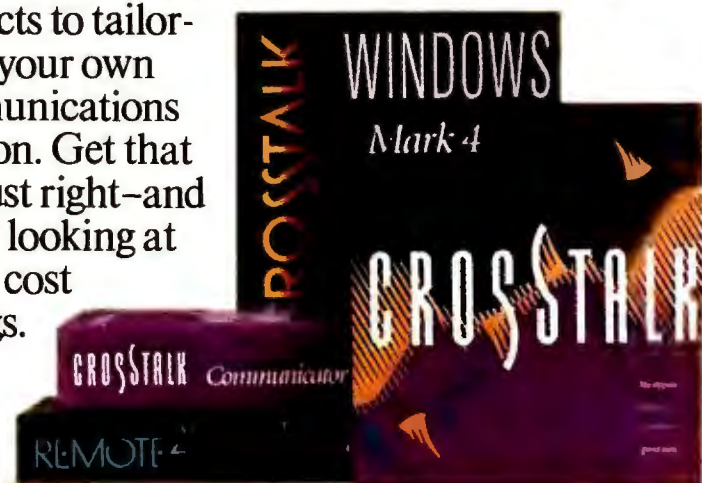
size fits all” product is going to solve every communications need for every individual in every situation. Well it won't. We know. We invented the category.

All In The Family.

More importantly, we've developed the only truly workable solution for all the PC communications requirements out there. But it's not a disk.

It's a family. A family of communications solutions that's gone beyond Crosstalk® XVI and now ranges from high powered “programmers” program to economical executive models. To Windows™ software. To remotes.

Best of all, the family works so well together that you can mix and match certain Crosstalk products to tailor-make your own communications solution. Get that mix just right—and you're looking at major cost savings.



Top Talkers

Compare the "stars" from *Software Digest*.

- ★★★★ Crosstalk Mk.4
- ★★★★ HyperAccess/5
- ★★★★ Mirror III
- ★★★★ Smartcom Exec
- ★★★★ Crosstalk for Windows
- ★★★★ Smartcom III
- ★★★ Procomm Plus

Look Who's Talking.

Take Crosstalk Mark 4 and Crosstalk Communicator. In the hands of a programmer, Crosstalk Mark 4 can perform miracles. After all, it has the CASL™ scripting language (a powerful programming language like C or Pascal). Plus, highly specialized emulations (from VT™ emulators to FTTERM). Data transmission rates up to 115,200bps. Multi-sessions. Modem sharing on LANs. The list goes on. With capabilities like that, you're able to create the kind of scripts programmers write home about.

Yet—and this is the amazing part—a company executive or salesman or secretary can run that very same script on economical, easy to use Crosstalk Communicator.

And while Crosstalk Communicator is the ideal complement to Crosstalk Mark 4, it's a powerful little package that can also fly solo. It's simple enough to configure in three minutes, yet supports virtually all modems plus direct connections. It has a Learn feature. The most popular protocols and emulations. Even preconfigured log-in scripts for information services and BBSs that can get you on line with a single keystroke. Calls to other systems like a VAX® are made with surprisingly little set-up. In fact, the built-in diagnostics of Crosstalk Communicator "intelligently" aids all your installation and set-up for calls.

Crosstalk Mk.4 "does almost everything and does it right."

"Crosstalk Communicator...for the price, it's hard to beat."

"...Crosstalk for Windows is a sure bet."

—PC Magazine (April, 1991)

Crosstalk Even Opens Windows.

Since Crosstalk for Windows is a *true* Windows product, you can take full advantage of capabilities like multi-tasking. In other words, you can work on a spreadsheet while Crosstalk for Windows is calling Dow Jones News/Retrieval® in the background. Then, you can cut and paste that Dow Jones information into your document, or import it transparently through DDE, Dynamic Data Exchange. Like Crosstalk Mark 4, Crosstalk for Windows also runs on LANs. And since it combines the flexibility of Windows with the engineering excellence of Crosstalk, *Software Digest* calls Crosstalk for Windows the "best of the graphical communications packages."

Remote, Yes. Alone, Never.

Crosstalk solutions even extend to remote computing. Remote2® gives you all the performance that made it the *PC Magazine* "Editors' Choice." Not only is it a remarkably straightforward and economical package, it's also a fully fledged member of the Crosstalk family. It even has the same helpful dialing directory that's in Crosstalk Mark 4 and Communicator. Not to mention the same outstanding support and back up that have made Crosstalk the only total solution for PC communications.

Just Say The Word.

Sure, a lot of comm software "don't talk real good." But then, a lot of comm software isn't Crosstalk. So, find out how Crosstalk can overcome your communication gaps. All you have to do is call and we'll send you a free working model of Crosstalk for Windows or Crosstalk Communicator, which includes information on Crosstalk Mark 4!

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April 1991
Crosstalk Mk.4



April 1991
Crosstalk Communicator



June 12, 1990
Remote2 Version 2.0A



★★★★
Vol. 7 No. 12 1990
Crosstalk Mk.4



April 30, 1991
Crosstalk Mk.4 Version 2.0



1990
Crosstalk for Windows



Circle 62 on reader service card

A Laser on Every Desk



**A fully loaded
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under \$1000?**

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one of these nine
compact personal
lasers, you can
put printing
power where it's
needed most.**

By Daniel Miles Kehoe

W

hat's the biggest drain on your productivity? Too many meetings? Too much paperwork? Waiting for *Windows* to load? For many users the worst time-waster is printer gridlock: Print jobs arrive at the work-group printer faster than it can process them, impatient co-workers are obliged to wait in line, and as a result, activity in the office grinds to a halt.

The solution, of course, is to buy more printers and spread them around the office. Until recently, that meant purchasing lower-quality dot matrix printers; the expensive laser printers had to be shared among as many workers as possible. But now you can find laser printers with list prices starting under \$1000 and street prices that are even lower. And you won't compromise much on fonts or performance—today's personal lasers are faster and more sophisticated than ever.

Even if your budget is tight, low prices will allow you to deploy a personal laser printer wherever one is needed:

- Does your business manager waste time hiking to the work-group printer whenever she prints a spreadsheet? Put a stripped-down 4-page-per-minute (ppm) laser on her desk for \$800.
- Does your clerk-typist churn out letter after letter, tying up the network printer in the process? Give him his own \$1000 9-ppm speed demon.
- What about your in-house publishing specialist, who has to wait for everyone else to log off the network before printing all those fancy fonts and sophisticated



graphics? Buy a PostScript printer for \$1295 and let her print what she wants when she wants it.

- And what about you? Do you have to race down the hall to the network printer every time you print a letter

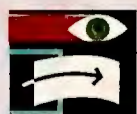
that you'd rather not have the whole office see? With prices this low, no one will call you extravagant for buying a laser of your own.

Not surprisingly, none of these little printers are designed to be used by

more than one or possibly two or three people at a time. Few of them have the advanced features required of shared printers, such as automatic port and emulation switching, configurable ports, dual paper bins, and long duty

Buying Smart: Picking a Personal Laser

When you're buying a low-end laser printer, you can't expect to get all the fancy fonts and speedy, sophisticated paper handling you'd find in more expensive printers. But even when you're spending less than \$1000, you should demand a lot. At the very least, you'll want crisp, professional-looking output and reasonably fast performance.



OUTPUT QUALITY

Because all the printers we reviewed have 300-dot-per-inch resolution, almost all deliver reasonably sharp text. A few of them lost points because of jaggies—the stair-stepping pattern you sometimes notice on the curves of letters—and shadowing—the blurring of characters by faint outlines of themselves. Also, many low-end printers have problems with graphics output: They often produce streaks in solid areas of black or gray and apply toner unevenly.



PERFORMANCE

Print speeds vary widely from printer to printer and from print job to print job. The Printer Works LX-29000, for example, came in first printing an Excel spreadsheet but dead last producing a Word for Windows document. We ran these printers through a variety of tests, including straightforward word processing files, spreadsheets, and complex desktop publishing jobs, so you can check out the speeds

for the kind of work you do.

You should note that rated engine speeds can be misleading. The Texas Instruments microLaser Plus, for example, which is rated at 9 ppm, achieved a top-of-the-line 6.3 ppm in our WordPerfect test; the 6-ppm Sharp JX-9500 actually hit 6.2 ppm on the same test. Speeds plummeted on graphics tests; for example, the top speed in our PageMaker test was the Printer Works LX-29000's not exactly smoking 0.73 ppm.



PRICE

The whole point of personal laser printers is their low price—shop around and you'll find some great deals. Our street prices represent national averages; you may find prices both lower and higher. Our prices are also for machines with our testing configuration of 2.5MB of RAM, so if you don't need that much memory, you can find bare-bones versions of the same printers for hundreds less. Remember, however, to add in the cost of consumables to your budget: These printers will require a new toner cartridge every couple thousand pages.



SERVICE AND SUPPORT

Because printers are mechanical beasts with plenty of moving parts that can break, solid service and support are essential. All the printers in this roundup come with one- or two-year warranties.

When it comes to repairs, look for on-site service from the manufacturer, but if you can't get it, check your dealer's repair policies. Shipping your printer back to the factory for service can put you out of commission for a long time.

In rating service and support, we looked at the length and breadth of the warranty and the availability and quality of support. To judge the latter, we called each vendor three times and asked questions of varying complexity. We then rated their answers for timeliness and accuracy.



DESIGN AND CONSTRUCTION

Convenience is the best measure of good design. With this in mind, we awarded points for small footprints, low weights, and integrated toner-drum assemblies that aren't a mess to change. You'll also want understandable front-panel controls—all but one of the printers we looked at had controls and an LCD on the front panel. All of them come with a parallel port, but some also have a serial and/or an AppleTalk port, so you can share the printer with your neighbor. Those printers with automatic port switching are able to detect a print job coming in through a particular port and switch to that port on their own; others have to be switched manually. We did look at the rated duty cycle, but with a skeptical eye: These figures are not based on any standard defi-

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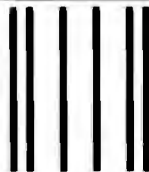
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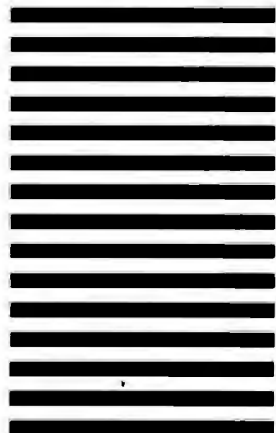
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cycles. If you're going to print lots of graphics- or font-intensive documents, you'd probably be better off with one of the PostScript printers reviewed in our December issue, or else a Hewlett-Packard LaserJet III or compatible

printer offering PostScript-level fonts and graphics handling with the PCL 5 language. These printers sell in the \$1700 to \$2500 range and provide enough work-group features for shared usage (see "Best of the Rest: More Per-

sonal, More Printer"). For really high-volume work-group printing, you'll want a high-duty-cycle network printer selling for between \$5000 and \$10,000.

Personal Proof Positive

For this review, *PC World* looked at nine personal lasers with list prices under \$1400. We configured each printer with 2.5MB of RAM, enough to comfortably print a full page of graphics or download a passel of fonts. Street prices for this testing configuration ranged from \$916 to \$1450, but if you'll be satisfied with the standard 512K of RAM that most of these printers offer, you can pay as little as \$600.

We ran these lasers through a variety of speed and compatibility tests. We then cast a critical eye on the quality of the resulting output. Finally, we checked out their font options, paper handling, design, and customer service. In judging overall value, print quality and speed were given the greatest weight, followed by price and the remaining factors.

After the toner dust settled, one printer emerged with a Best Buy: the speedy, low-priced Epson ActionLaser II. Honorable mention goes to the Printer Works LX-29000, the one printer we looked at that comes with PostScript compatibility standard. The C.Itoh ProWriter CI-4, Hewlett-Packard LaserJet IIP plus, and Star Micronics LaserPrinter 4 also proved to be superb deals.

With personal laser printers this affordable, you can put a couple of them on the right desks and ease the workload for the whole office. By making printer gridlock a thing of the past, they make real bottom line sense.

Daniel Miles Kehoe has written about laser printers for PC World for four years. He is a contributing editor for NeXTworld magazine.

For more information about all products in this article, circle reader service no. 903.

dition of usage, and your mileage will inevitably vary.



FONT/GRAPHICS OPTIONS

Most of these printers do a fine job with typical office correspondence. They come with an adequate supply of resident bit-mapped fonts—the Star Micronics LaserPrinter 4 comes with 165, and most of the others come with 14 or more—and they all emulate Hewlett-Packard's standard PCL 4 printer language, meaning they should be compatible with most of your software. Four can emulate the old Epson FX/LQ dot matrix language—handy if you're using older applications.

If the resident fonts aren't enough for you, you can either add a font cartridge or download soft fonts. All but one of these printers have at least one cartridge slot (and the one that doesn't is PostScript compatible). Look for printers that take HP-compatible font cartridges, because they give you access to a wide range of fonts and emulations from both HP and third-party vendors. If you're stuck with just one vendor's cartridges, you won't have the same range of options.

Most of the printers here can be upgraded to PostScript with the addition of a cartridge or a plug-in controller card. Upgrade cartridges start at around \$400, and cards can be had for \$450; cards are faster than cartridges. PostScript gives you a

choice of 35 internal fonts as well as better output quality, especially with graphics.

If you want to download fonts or print full-page graphics, figure you'll need 1.5MB of memory. PostScript also calls for more memory, at least 2MB, and if you consistently print multipage documents with lots of graphics, such as newsletters or big spreadsheets, or if you download a lot of fonts, you'll want at least 4MB of RAM to make these print jobs proceed at a reasonable pace.



PAPER HANDLING

Personal printers don't need as sophisticated paper handling as a network machine does. But even on a personal printer, a large paper tray means you spend less time running to the supply cabinet for another ream of bond. Good output capacity means you won't have long print jobs spilling all over your desk. And it's always nice to be able to print on legal-size paper and envelopes as well as letterhead without having to buy a special tray—look for printers with adjustable trays that can accommodate more exotic paper sizes. If you print a lot of letters and your printer has the option of dual bins, you might consider buying a second tray so you can load letterhead in one bin, envelopes in the other, and then switch between them.

C.Itoh ProWriter CI-4

PROS: Crisp output, low price, small footprint, three ports standard

CONS: Low RAM capacity

The CI-4 is the archetypal personal laser printer: cheap, small, reasonably fast, and flawless at text printing. It's one of two printers in the roundup that received top scores for both text and graphics output quality—edges were crisp and distinct, and blacks were nice and solid. With a footprint of only 227 square inches and the flexibility of three standard ports, this printer could find a home in almost anyone's cubicle.

The CI-4's only real drawback is that it can be expanded only to a maximum of 2.5MB of RAM, which could be a problem if you're doing lots of graphics or decided to upgrade to a PostScript cartridge. So though the CI-4 may not be your best choice for desktop publishing, at only \$967 on the street, it delivers excellent output quality without taking up too much desk space—which is just about everything that a personal laser printer is supposed to do.



The affordable CI-4 will do a beautiful job on text documents as long as you don't need exotic fonts.



The Best Buy Epson ActionLaser II gives you excellent output and top speed for a remarkably low price.

Epson ActionLaser II

PROS: Top-of-the-line output, very fast, low price

CONS: Big footprint, limited paper handling



If you need your documents fast, pretty, and chock-full of fonts, the Epson ActionLaser II is ready to please—and for a low \$930 street price. Like the C.Itoh ProWriter CI-4, the ActionLaser II earned top scores for print quality, but it was also quick on the uptake, especially in our *Word for Windows* test. The ActionLaser II comes with 14 Courier fonts resident, but gives you plenty of other font options: two cartridge slots, room for a hearty 6MB of RAM, and an Epson FX/LQ emulation. You can also upgrade to PostScript by popping in an optional upgrade card.

The Epson is not designed for volume use—its standard paper tray is not adjustable and has a low capacity. But this personal printer is clearly the best we reviewed—its price, performance, and output quality add up to a terrific Best Buy.

Hewlett-Packard LaserJet IIP plus

PROS: Very good output, fast, low price, versatile paper handling

CONS: No toll-free tech support, no second cartridge slot

When Hewlett-Packard replaced the IIP with the new IIP plus, they didn't just add a plus sign to the name: They also boosted performance and reduced the list price by about \$50. For a low \$1008 on the street, you'll enjoy fast, high-quality output, especially with text.

The IIP plus carries on the HP tradition of smart design. It has a tiny 221-square-inch footprint and at 22 pounds is the lightest unit in the roundup. If you plan to print at a fairly high volume, you'll appreciate the robust rated duty cycle of 8000 pages per month, and if you print a variety of documents, you'll like the IIP plus's optional second bin and its capability to handle almost any kind of paper, including envelopes. You get only one cartridge slot, but you can use it to add a PostScript language cartridge. This multitasking printer is one of the best values here, especially as a straight-ahead text printer.



With the new IIP plus, you get big printer performance in a small personal laser package.

FEATURES EVALUATION

Personal Printers Improve Font Power, Paper Handling

The best of the personal laser printers, the Epson ActionLaser II gives you more font options and better paper handling than you might expect in a small, inexpensive printer.

- Yes
○ No

	C. Job ProWriter CI-4	Epson ActionLaser II	Hewlett-Packard LaserJet IIP plus	Kodak EktaPlus 7008	Okidata OL400 LED Page Printer	Printer Works LX-29000	Sharp JX-9500	Star Micronics LaserPrinter 4	Texas Instruments microLaser Plus
Standard features									
Street price ¹	\$967	\$930	\$1008	\$1450	\$916	\$1295 ²	\$1057	\$1054 ³	\$1108
List price ¹	\$1245	\$999	\$1249	\$1395	\$999	\$1295	\$1399	\$1395	\$999
Rated speed (ppm)	4	6	4	8	4	4	6	4	9
Design and construction									
Footprint (square inches)	227	270	221	248	306	253	190	350	190
Weight (pounds)	28.7	30	22	37.5	24	26	33.5	24.5	33
Rated duty cycle (pages per month)	2500	3000	8000	5000	3000	5000	3000	2500	10,000
Front-panel controls	●	●	●	●	●	○	●	●	●
Front-panel LCD	●	●	●	●	●	○	●	●	●
Integrated toner-drum cartridge	○	●	●	○	○	●	○	●	○
Parallel port	●	●	●	●	●	●	●	●	●
Serial port	●	●	○	●	●	●	●	●	● ⁴
AppleTalk port	●	● ⁴	○	○	○	●	○	● ⁴	● ⁴
Automatic port switching	○	●	○	○	○	●	○	○	○
Font/graphics options									
Resident fonts	14	14	14	14	17	35 ⁵	12	165 ⁶	5
Epson FX/LQ emulation standard	●	●	● ⁴	○	○	○	○	●	○
PostScript	● ⁷	● ⁸	● ⁷	● ⁷	○	●	○	● ⁸	● ⁸
Cartridge slots	1	2	1	2	1	0	2	1	2
Takes HP-compatible cartridges	●	●	●	●	○	○	○	●	○
Standard/maximum RAM (MB)	0.5/2.5	0.5/6	0.5/4.5	1.5/2.5	0.5/2.5	5/9 ⁹	0.5/4.5	1/5	0.5/4.5
Paper handling									
Standard/maximum input capacity	100/400	100/250	70/320	200/200	200/200	75/325	250/500	50/300	250/500
Legal-size paper	●	● ⁴	●	●	● ⁴	●	● ⁴	●	● ⁴
Envelopes	● ¹⁰	● ⁴	●	● ¹⁰	● ⁴	●	● ⁴	●	● ⁴
Optional second bin	●	●	●	○	○	●	●	●	●
Adjustable trays	●	●	●	●	○	●	○	●	○
Standard maximum output	100	50	50	200	200	50	230	50	250
Service and support									
Warranty (years)	1	2	1	1	1 ¹¹	1	1	2	1
Toll-free technical support	●	●	○	●	○	○	●	○	○
Daily support hours	8	9	11	9	10	9	10	8	8
On-site service available	●	●	●	●	●	●	○	○	●
Fax/BBS support	●/●	●/●	●/○	●/○	○/○	●/○	●/○	●/●	●/○

**BEST
BUY**

¹ Price based on 2.5MB RAM unless otherwise noted.

² Direct sales only; with 2MB RAM, 3MB ROM.

³ With 3MB RAM.

⁴ Extra-cast option.

⁵ Scalable PostScript typefaces.

⁶ 14 resident, 151 on free bundled cartridge.

⁷ Extra-cast cartridge.

⁸ Extra-cast controller card.

⁹ 2MB RAM, 3MB ROM.

¹⁰ Manual feed.

¹¹ Five years on LED print element.

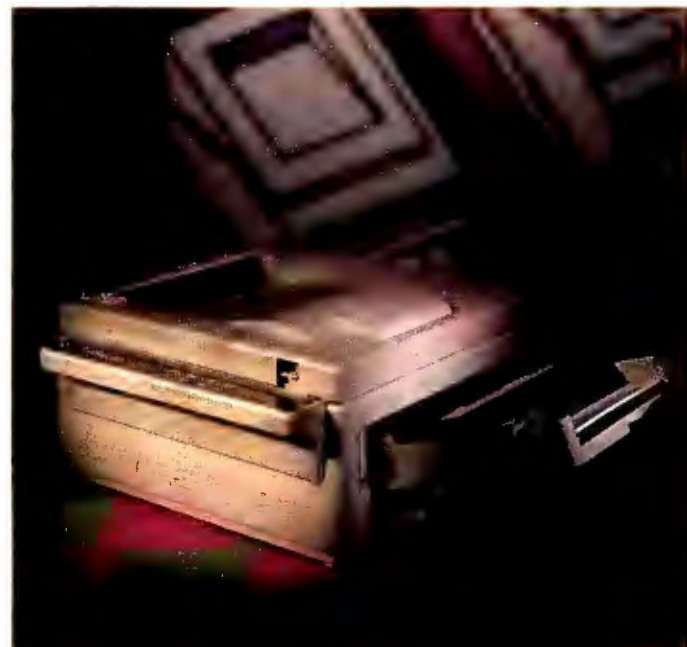
Kodak Ektaplus 7008

PROS: High-quality output, very fast

CONS: Most expensive in roundup, some poor design details, low RAM capacity

At \$1450 on the street, the Ektaplus 7008 is the most expensive printer in this review, but its speed may justify the price: It placed near the top on most speed tests, particularly with long documents. Text quality was excellent, and graphics quality was good, with nice, even toner coverage. Also, Kodak's customer service was among the best we encountered, with fast callbacks and accurate answers.

Some design details need attention: The two-part consumables package is messy, and the membrane control panel is unresponsive. You'd better have a big desk—the printer's shape is unwieldy, and the 37½-pound weight is back wrenching. Also, the printer has room for only a lowly 2.5MB of RAM. But if you can overlook these flaws, you'll get rapid, high-quality output, with fast technical help when things go wrong—just the ticket for dedicated clerical printing.



If you can afford the \$1450 price, the Ektaplus 7008 gives you sharp output without a lot of waiting around.



The OL400 is the least expensive laser on the market, but low speed and unexceptional quality are major trade-offs.

Okidata OL400 LED Page Printer

PROS: Rock-bottom price

CONS: Slow, mediocre output, balky tech support, big footprint

The Okidata OL400 is the lowest-priced printer in our group—\$916 on the street. It's also slow, finishing last or next to last on four out of our five speed tests and three times slower than its closest competitor on our 1-2-3 test. Print quality was somewhat disappointing, with jaggies on some characters and vertical streaking of gray shades on graphics.

The OL400's design needs to be updated as well—the footprint is the second largest in the roundup, and setup was difficult, resulting in a toner spill. Although the OL400 gives you a few more resident fonts than most printers do, it has just one cartridge slot, lacks a PostScript option, and limits you to a low 2.5MB of RAM. Though the OL400 comes with a generous five-year warranty, technical support was below par; too many calls to tech support went unanswered. Still, if price is your major concern, you can't get a laser for less than this.

Printer Works LX-29000

PROS: Built-in PostScript compatibility, excellent graphics print quality, superb support

CONS: No front-panel controls, no cartridge slots

Unlike other printers reviewed, the LX-29000 comes standard with PostScript compatibility, in the form of the TrueImage page description language. This means you get 35 typefaces in any size you like, plus smooth edges and curves for graphics. With 2MB of RAM and 3MB of ROM standard (the ROM for the TrueImage typefaces, the RAM for incoming print jobs), the LX-29000 also delivers graphics quickly, finishing first on our *PageMaker* and *Excel* tests.

The printer's greatest deficiency is its interface. It has no front-panel controls and only four LEDs to provide messages; you adjust settings with software. Still, at \$1295 list (direct from the manufacturer, so there's no street discount), the LX-29000 is a nice bargain when you take into account what you'd have to pay for a PostScript upgrade to any of the other printers reviewed here.



The LX-29000 gives you PostScript compatibility for the lowest possible price.

TrueType: Opening Windows on Scalable Type

When *Windows 3.1* ships this spring, it may change the way many users think about printing, because Microsoft is bundling its TrueType font-scaling technology with the new version of its popular operating environment.

There's little argument about the benefits of scalable fonts. They give you the versatility of different typefaces and point sizes without jamming your hard disk and your printer's memory with libraries of slow-loading bit-mapped characters.

Until now, the best way for many users to get font scaling was from programs like *Adobe Type Manager (ATM)* and *Bitstream's FaceLift*, which generate fonts on the fly from outlines and send the resulting bit maps to the printer. With these programs, you get all the fonts you want without clogging your system with megabytes of bit-mapped type collections or spending thousands on hardware. You can print the downloaded type on any printer, from dot matrix to laser, though the printer will think it's producing a graphics page, significantly reducing output speed. Also, as a pleasant by-product, these programs give you screen fonts—nice and readable at both small and large point sizes—that mimic the printed result.

Microsoft promises that TrueType will have all the advantages of software font scaling, with none of the problems. Since TrueType will be fully integrated into *Windows*, you won't have to load separate scaling programs, drivers, or fonts that may have compatibility problems. Microsoft also claims that TrueType will be faster than other font scalers and will also avoid the compatibility problems—such as screen flicker,

slow refresh rates, and a ceiling on the number of fonts you can actually use—that have plagued other scaling programs.

Like *ATM*, TrueType includes a font rasterizer, plus a baker's dozen of outline typefaces. When you type a character, *Windows 3.1* finds the appropriate TrueType typeface file and calls up the rasterizer, which then scales the font outline, generates a bit map, tunes the bit map for the specific resolution of your screen, and sends the bit map to the display.

Microsoft says TrueType shouldn't have any compatibility problems with other fonts. If you have fonts in your printer equivalent to those you've requested in *Windows*, TrueType will let the printer use its own type, as do *ATM* and other programs. The result: faster performance. You shouldn't have any problems adding to your font library, either—Microsoft claims that *Adobe Type 1* fonts will work with TrueType (as long as you have *ATM* as well), and third-party font vendors have already announced their own TrueType fonts.

How will the appearance of TrueType affect your printer buying decision? Apparently, only slightly. For one thing, you'll still want some resident fonts in your printer, because you may need them for non-*Windows* applications and because resident fonts should still be faster than any downloaded type. One possible impact: If you print primarily text and not graphics, using TrueType (or *ATM*, for that matter) means you don't need as much printer RAM as you would if you were downloading entire font sets.

What about PostScript? Truetype is to TrueType what PostScript is to *ATM*: The first describes pages, the



second describes type. Truetype and TrueType were both developed by Apple and Microsoft, PostScript and *ATM* by Adobe. Truetype and PostScript reside in output devices, such as printers; TrueType and *ATM* reside in your computer, whence they can control output to both printer and screen. Microsoft says Truetype is a "superset" of PostScript, fully compatible but more powerful.

If you send *ATM*-compatible type to a PostScript printer, you'll get faster output because the fonts in PostScript printers are *ATM* fonts; similarly, Microsoft claims, TrueType will be more effective if you're using a Truetype printer, such as the *Printer Works LX-29000*.

Because it has built-in TrueType fonts, a 4-ppm Truetype printer will have a slight speed advantage over other 4-ppm printers when printing from *Windows 3.1*, but it won't perform better than printers with faster engines. Microsoft also claims that TrueType fonts printed on a Truetype printer will have the advantage of a "richer hinting technology," but we suspect that only a typographic expert would be able to tell the difference.

Even if TrueType ends up performing no better than *ATM*, its impact should be considerable. Its availability to all *Windows 3.1* users and its transparent operation will open up the world of scaled fonts to a whole new wave of users.

Sharp JX-9500

PROS: Low price, good design, good paper handling

CONS: Limited font selection

Like the Okidata OL400, the Sharp JX-9500 has been around for a while, but unlike the OL400, the JX-9500 is holding up pretty well. This printer's greatest assets are its low \$1057 street price, strong paper-handling skills, and intelligent design. The standard and optional input trays hold 250 sheets each, but even with accessory trays, this compact printer will fit in the snuggest of corners.

On the other hand, output quality isn't anything to shout about—blacks were light, toner coverage was uneven on graphics, and text characters looked fuzzy. The JX-9500 lagged on all speed tests except the *WordPerfect* long-document benchmark. The JX-9500 gives you two cartridge slots but has no PostScript option or HP cartridge support. But low price, flexible paper handling, and fast long-document performance make the JX-9500 a good choice for long drafts and merged mailings.



With its low price, flexible paper handling, and adequate speed, the JX-9500 would work best as a draft printer.



The fast LaserPrinter 4 offers an impressive number of fonts but is less successful with graphics.

Star Micronics LaserPrinter 4

PROS: Fast, great text quality, low price, 151-font cartridge

CONS: Poor graphics quality, big footprint

At \$1054 on the street, the Star Micronics LaserPrinter 4 is a bargain, and it also ranks among the fastest printers we tested. But the real argument in its favor is its embarrassment of riches in terms of font options. Star Micronics bundles a free 151-font cartridge with every printer, giving you access to all of Hewlett-Packard's most popular fonts, so with the 14 fonts already on-board, you get a grand total of 165 fonts out of the box. You also get a PostScript option, and you can use third-party HP-compatible font cartridges.

Output quality, however, is a mixed bag. Text was top-notch, but graphics suffered from streaky gray shades and uneven toner coverage. Also, the LaserPrinter 4 had the biggest footprint of any printer we reviewed. Still, this printer is a great choice, particularly if you want lots of fonts for your money.

Just Your Type: Personal Output

Sharp JX-9500

in the trade as a
matter: It's easy
the pretenders.

Texas Instruments microLaser Plus

in the trade as a
matter: It's easy
the pretenders.

Epson ActionLaser II

in the trade as a
matter: It's easy
the pretenders.

Our Best Buy Epson ActionLaser II scored perfectly on text, producing crisp, black letters. Two of the printers were judged to be only fair at text output: the Sharp JX-9500 and the Texas Instruments microLaser Plus. They both had problems with shadowing, when characters are faintly doubled, making them blurry, and jaggies, when curves appear jagged.

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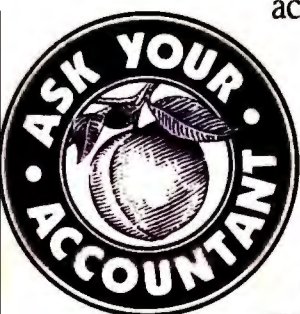
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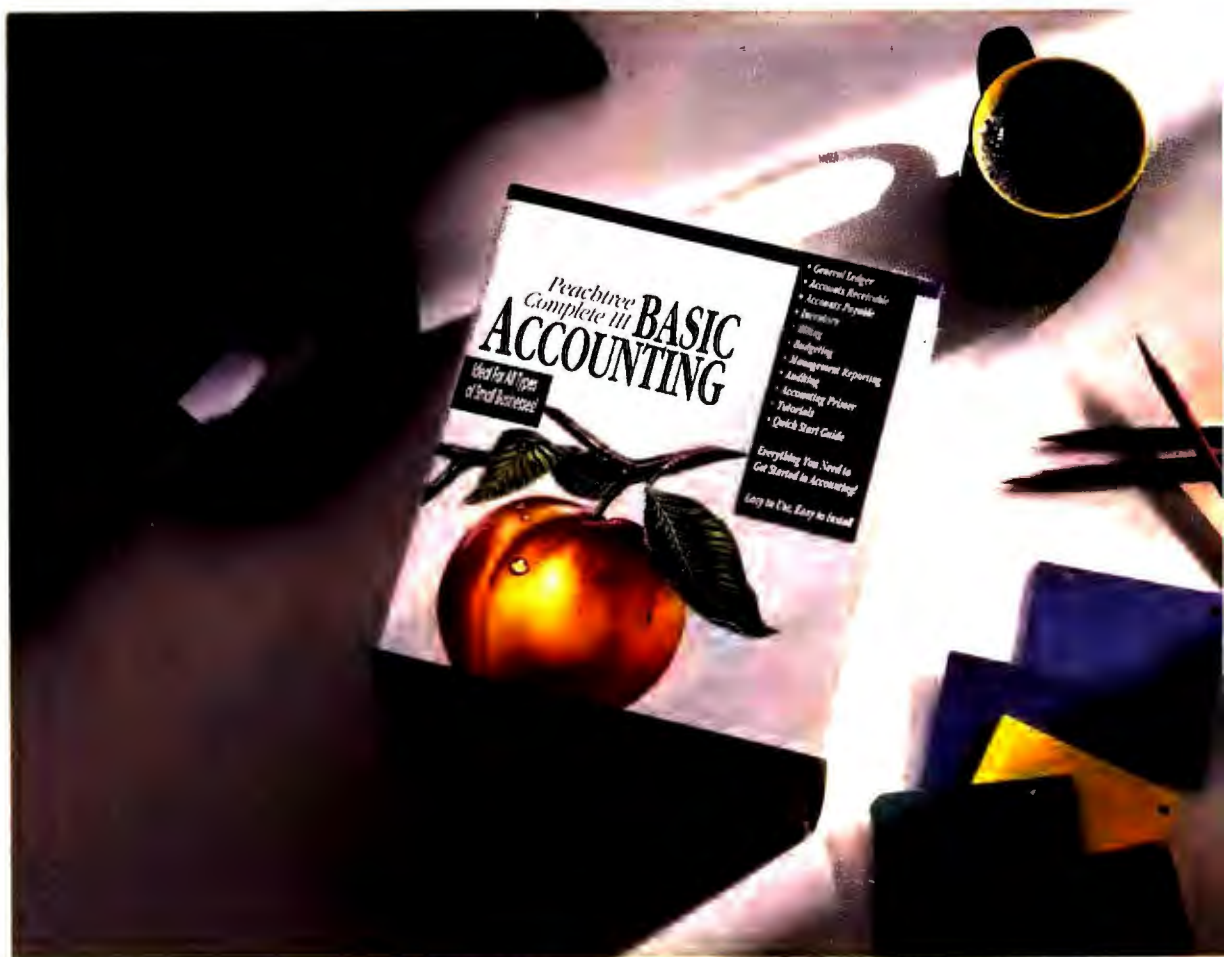
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**QUICK
START
GUIDE**

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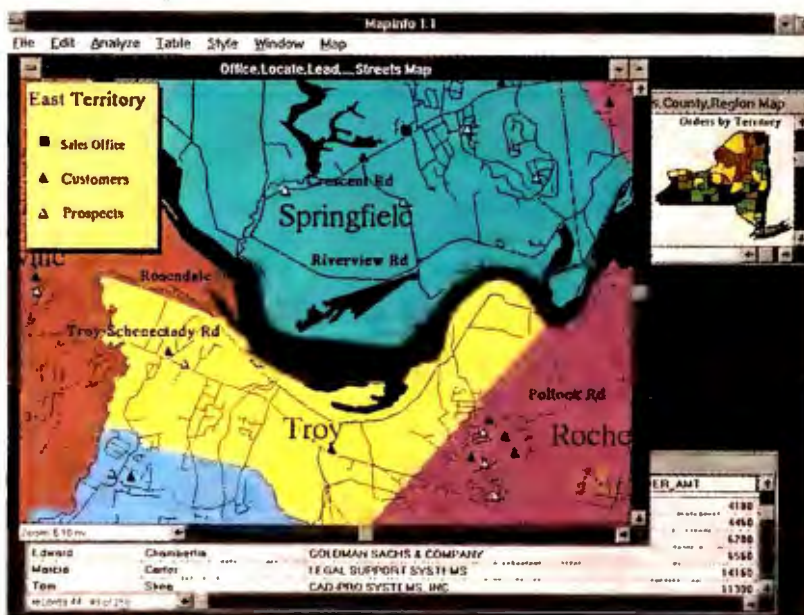
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MapInfo
The Standard On The Streets

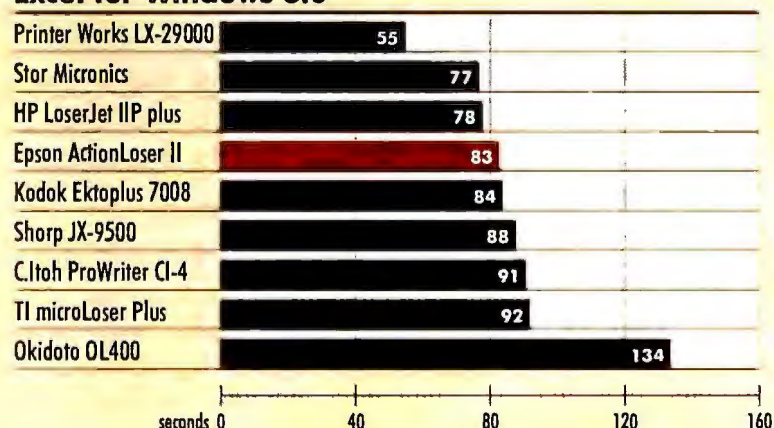
PC WORLD TEST REPORT

Jack-of-All-Trades Beats the Specialists

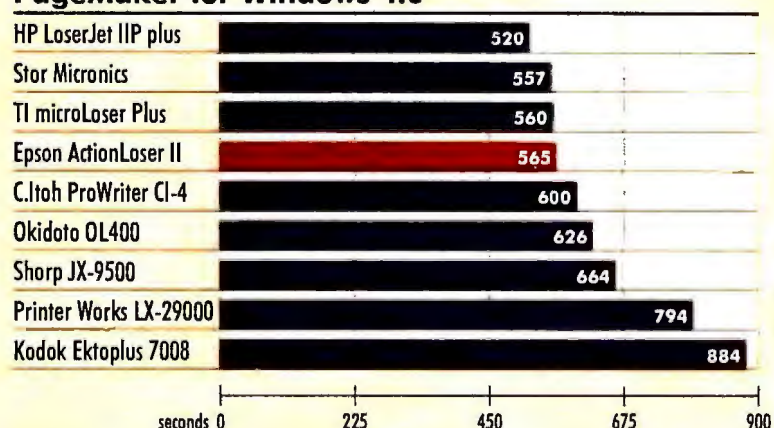
The Printer Works LX-29000 was fastest at producing graphics, and the Texas Instruments microLaser Plus was fastest at printing text, but for consistent speed on a variety of printing tasks, the Epson ActionLaser II was tops.

BEST BUY

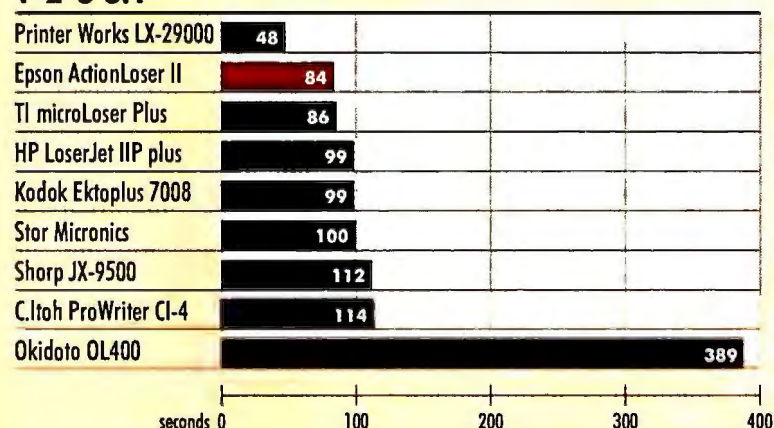
Excel for Windows 3.0



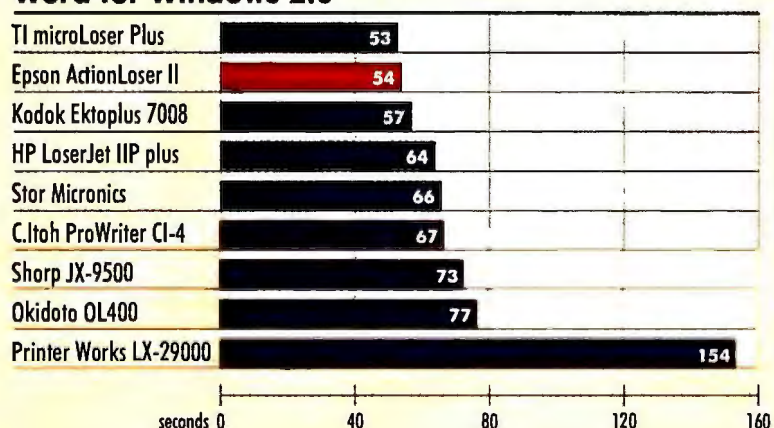
PageMaker for Windows 4.0



1-2-3 3.1



Word for Windows 2.0



Methodology

All printers are connected to the parallel port of a 20-MHz Compaq Deskpro 386/20e running under DOS 5.0 with 4MB RAM and a 110MB hard disk. The applications used in the benchmarks are installed on the hard disk along with their test files in discrete subdirectories. Tests are timed from the moment the print command is initiated until the last page is ejected from the printer.

Excel for Windows 3.0

We print a single-page document composed of two pie charts with slices containing various shades of gray.

PageMaker for Windows 4.0

We print a single, newsletter-style page that contains a small scanned TIFF image, a large PCX masthead, and Helvetica and Times Roman text with varying attributes.

1-2-3 3.1

We print a simple stacked bar chart.

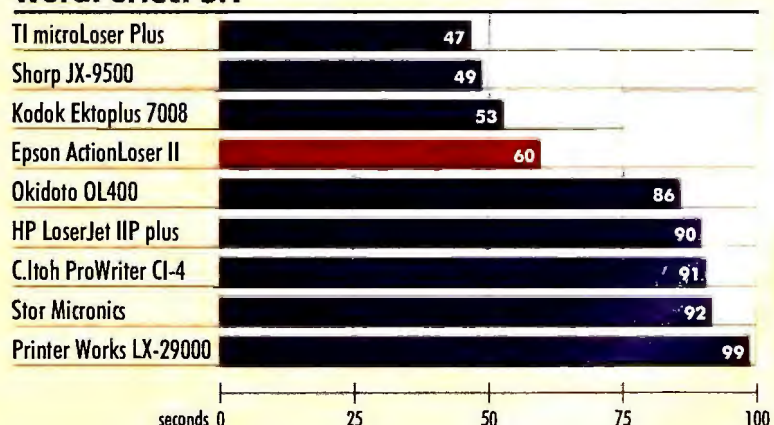
Word for Windows 2.0

We print a single-page document composed of 10-cpi Courier text with a sampling of 16.66-cpi boldface and underlined text.

WordPerfect 5.1

We print a five-page document composed of 10-cpi Courier text enhanced with boldface and underlining.

WordPerfect 5.1



Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Texas Instruments microLaser Plus

PROS: Excellent print speed, low price, sturdy design

CONS: Small choice of fonts

For a reasonable \$1108 street price, the Texas Instruments microLaser Plus delivers superb performance—it came in first in our *Word for Windows* and *WordPerfect* tests. Its speed is due in part to an innovative design that pulls paper into the engine early in the printing cycle. Among the printers we reviewed, the microLaser also has the highest rated duty cycle—10,000 pages per month—and smallest footprint—190 square inches, same as the Sharp JX-9500.

The microLaser's output quality, though not the best, was still passable for everyday use. Font options are fairly limited: The printer has two cartridge slots and a PostScript option, but only five resident fonts and no support for HP cartridges. Despite these drawbacks, if you need to do a lot of draft printing at high speeds, you'll like the microLaser's fast performance and capable paper handling. ☺



With its high speed and low price, the TI microLaser Plus is the quintessential workhorse draft printer.

Best of the Rest: More Personal, More Printer

A new generation of surprisingly sophisticated, low-cost personal printers has arrived. Here are some models that didn't make it into our review, all priced under \$2000 list.

Model	List price	Rated engine speed (ppm)	Resident fonts	PCL	Post-Script compatible	Standard/maximum RAM (MB)	Cartridge slots	Paper capacity (sheets)	Footprint (square inches)	Weight (pounds)
Bézier BP4040	\$1895	4	35	PCL 4	Y	5/5 ¹	0	50	391	26
Brother HL-4V	\$1595	4	6	PCL 5	optional	1/5	2	50	223	26.5
Canon LBP-4 Plus	\$1545	4	25	n/a	optional	2.5/4.5 ²	2	50	213	22
C. Itah ProWriter CI-8	\$1695	8	22	PCL 5	optional	1/5	2	250	246	30.9
Hewlett-Packard LaserJet IIIP	\$1595	4	22	PCL 5	optional	1/5	1	70	221	22
Lexmark LaserPrinter 5e	\$1595	5	26	PCL 4	optional	1/9	2	200	292	33.6
Okidata OL830	\$1999	8	17	PCL 4	Y	2/4	1	200	313	24
Panasonic KX-P4430	³	5	22	PCL 5	N	1/5	1	200	226	30
Tandy LP 950	\$1599	6	6	PCL 4	N	0.5/2	2	250	195	33
Texas Instruments microLaser Plus PS17	\$1399	9	17	PCL 4	Y	1.5/4.5	2	250	190	33
Texas Instruments microLaser Plus PS35	\$1749	9	35	PCL 4	Y	1.5/4.5	2	250	190	33

¹ 2MB RAM, 3MB ROM.

² 0.5MB RAM, 2MB ROM.

³ Not available at press time.

For more information about all products in this sidebar, circle reader service no. 904.

WHERE TO BUY

Bezier Systems Inc.
800/444-2624,
408/345-0345
Reader service no. 749

Brother Int'l Corp.
908/356-8880,
908/469-5167 (fax)
Reader service no. 750

Canon USA Inc.
516/488-6700
Reader service no. 751

C-Tech Electronics, Inc.
800/347-4017,
714/757-4473
Reader service no. 752

Hewlett-Packard Co.
800/752-0900
Reader service no. 754

Lexmark Int'l, Inc.
800/426-2468,
Reader service no. 755

Okidata
800/654-3282,
609/778-4184 (fax)
Reader service no. 756

Panasonic Communications and Systems Co.
800/742-8086,
201/348-7000
Reader service no. 757

Tandy Corp.
817/390-3011
Reader service no. 758

Texas Instruments, Inc.
800/527-3500,
800/847-2787
Reader service no. 759



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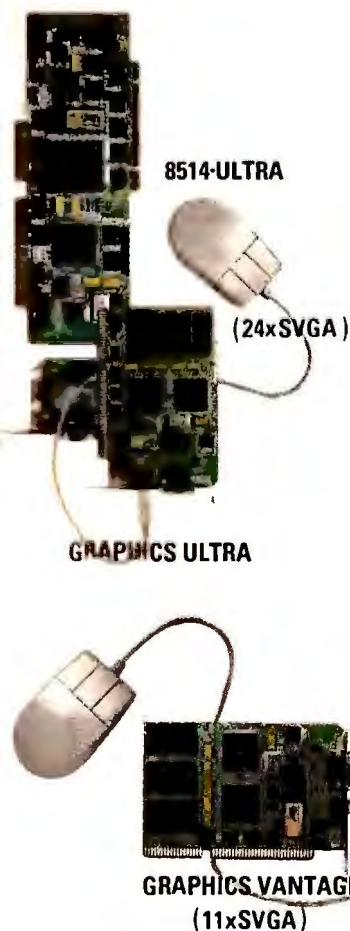
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Circle 5 on reader service card



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Multi-Link™

Serial/parallel device for twelve or

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- 12 concurrent high-speed ports — 8 serial, 4 parallel
 - High-speed link — up to 32 Multi-Link devices — 384 total ports!
 - Dynamically allocated, field-expandable SIMM memory — 256 KB to 4 MB
 - RJ-11 serial ports for snap-in cabling
 - Any-port-to-any-port connectivity
 - Any-port designation for printer or plotter
 - Each port individually programmable
 - Windows or DOS pop-up menu software for instant device selection and status
 - Uses standard parallel PC-to-printer cables
- 12 any-to-any ports; buffered from 256 KB to 4 MBstart at \$795**

GENERAL



PSU-82C/SP

Programmable sharing units for both serial/parallel printers,

plotters and PCs. Designed for CAD/CAE, high-level graphics, Desktop publishing or general applications.

- 4 concurrent serial and 4 parallel inputs (SP)
- 8 concurrent serial inputs (C)
- 1 serial and 1 parallel output
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- Separate baud rate, flow control, parity and messages for each port
- Pop-up menu software for easy printer/plotter selection
- Easy menu-driven configuration and set-up
- Prompt and response messages for plotter applications
- Support all laser printers including Post-Script® printers and all types of plotters.

8 inputs; 2 outputs; buffered from 256 KB to 2 MBstart at \$595



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Expansion Module with Printer Select Switch\$149 ea.



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- 6 RS-232 serial inputs - RJ-11 connectors
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- Expandable memory to 2MB using SIMMS
- Input speeds up to 115K baud

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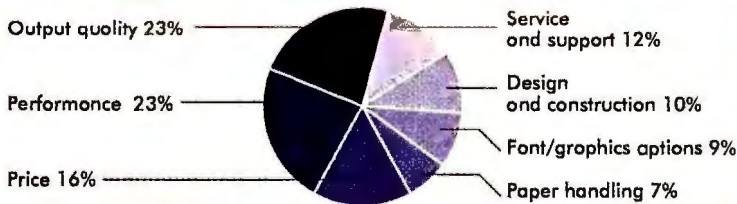
Epson's Ready for Action

Fast, high-quality output for a low price makes the Epson ActionLaser II our Best Buy.



Our Best Buy, the **Epson ActionLaser II**, is an aggressively priced entry in the low-end laser market. Other printers can match its output quality, price, or speed, but none puts them all together in one box. The **C.Itoh ProWriter CI-4**, **Hewlett-Packard LaserJet IIP plus**, and **Star Micronics LaserPrinter 4** were close runners-up, and the **Printer Works LX-2900** is notable as the lowest-priced PostScript-compatible printer on the market.

Key Buying Issues: Percentage of Importance



	Reader service number	Output quality	Performance	Price	Service and support	Design and construction	Font/graphics options	Paper handling	Overall value
C.Itoh ProWriter CI-4	740	☆☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆½	☆☆½	☆☆☆	☆☆☆½
Epson ActionLaser II	741	★★★★	★★★★	★★★★	★★★	★★★	★★★★½	★★½	★★★★
Hewlett-Packard LaserJet IIP plus	742	☆☆☆½	☆☆☆½	☆☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆½	☆☆☆½
Kodak Ektaplus 7008	743	☆☆☆½	☆☆☆☆	☆☆½	☆☆☆½	☆☆½	☆☆½	☆☆☆	☆☆☆
Okidata OL400 LED Page Printer	744	☆☆½	☆☆	☆☆☆☆	☆☆	☆☆	☆☆½	☆☆☆	☆☆
Printer Works LX-29000	745	☆☆☆½	☆☆☆	☆☆½	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆½
Sharp JX-9500	746	☆☆	☆☆☆	☆☆☆½	☆☆☆	☆☆☆½	☆☆	☆☆☆½	☆☆☆
Star Micronics LaserPrinter 4	747	☆☆☆	☆☆☆½	☆☆☆½	☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆½
Texas Instruments microLaser Plus	748	☆☆	☆☆☆☆	☆☆☆	☆☆☆	☆☆☆½	☆☆	☆☆☆½	☆☆☆

Overall value is produced by multiplying each category rating by its weight percentage, summing the results, and grading on a curve to the nearest half number.

WHERE TO BUY

C. Itoh ProWriter CI-4
C-Tech Electronics
2515 McCabe Way
Irvine, CA 92713
800/347-4017
LIST PRICE: \$1245
ACCESSORIES: 1MB
RAM upgrade \$230;
toner cartridge \$29.50
Reader service no. 740

Epson ActionLaser II
Epson America
20770 Madrona Ave.
Torrance, CA 90503
800/922-8911
LIST PRICE: \$999
ACCESSORIES: memory
expansion board \$65;
toner cartridge \$125
Reader service no. 741

Hewlett-Packard LaserJet IIP plus
Hewlett-Packard
19310 Pruneridge Ave.
Cupertino, CA 95014
800/752-0900
LIST PRICE: \$1249
ACCESSORIES: 1MB
RAM upgrade \$230,
toner cartridge \$95
Reader service no. 742

Kodak Ektaplus 7008
Eastman Kodak
901 Elmgrove Rd.
Rochester, NY 14650
800/344-0006
LIST PRICE: \$1395
ACCESSORIES: 1MB
RAM upgrade \$250;

toner cartridge \$25
Reader service no. 743
Okidata OL400 LED Page Printer
Okidata
532 Fellowship Rd.
Mount Laurel, NJ 08054
800/654-3282
LIST PRICE: \$999
ACCESSORIES: 1MB
RAM upgrade \$239;
toner cartridge \$33
Reader service no. 744

Printer Works LX-29000
The Printer Works Inc.
3481 Arden Rd.
Hayward, CA 94545
800/225-6116

LIST PRICE: \$1295
ACCESSORIES: 1MB
upgrade \$300; toner
cartridge \$77
Reader service no. 745
Sharp JX-9500
Sharp Electronics
Sharp Plaza
Mahwah, NJ 07430
800/237-4277
LIST PRICE: \$1399
ACCESSORIES: 1.5MB
RAM upgrade \$519;
toner cartridge \$59
Reader service no. 746

Star Micronics LaserPrinter 4
Star Micronics America
420 Lexington Ave.

New York, NY 10170
800/447-4700
LIST PRICE: \$1395
ACCESSORIES: 1MB
RAM upgrade \$299;
toner cartridge \$95
Reader service no. 747

Texas Instruments microLaser Plus
Texas Instruments
P.O. Box 202230
Austin, TX 78714
800/527-3500,
800/847-2787
LIST PRICE: \$999
ACCESSORIES: 1MB
RAM upgrade \$239;
toner cartridge \$42
Reader service no. 748

The Internationally Proven Language Translation Software.

As businesses seek to expand into the European markets, there has been an explosion in language translation software. No wonder! — this massive market of European countries tops 350 million (compared to only about 290 million in the United States) and will require communication, at some point, in these languages. Forget books and foreign language dictionaries! The power of the computer makes learning, writing and understanding other languages faster and easier than ever before. Here at Tiger, we've seen a dramatic rise in interest for these products in anticipation of the 1992 "common market" revolution. So, we went to work testing several packages.

Our results are conclusive: Collins On-Line is the superior system, whether you have experience with a foreign language or have none at all.

The reason for this distinct advantage is the quality of proprietary HarperCollins bilingual dictionaries built into this product. These extensive dictionaries are combined with exceptional technology that allows instant access to translations of any word or phrase from within your word processor — with just a keystroke. The software provided with Collins On-Line is so flexible, it actually becomes an extension of your word processor! Translate back and forth with over 35,000 translations each way (more than any other source), perform quick look-up and instant paste, get help with selecting just the right translations (that accurately match context), helpful usage notes, and more. It is the easiest to use, by a wide margin, that's of particular importance with foreign language products.

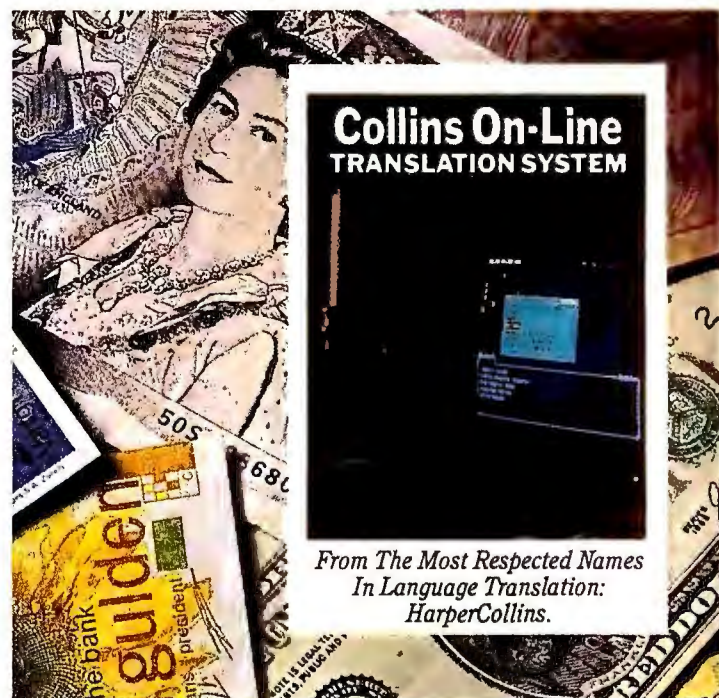
With Collins On-Line, second-language writing and communication becomes a pleasure! If you intend to compete internationally, this is a must purchase. It's also an excellent tool for students, just

starting out with a second language, or anyone who has ever studied a foreign language and now would like to use it.

Collins On-Line vs. The Competition.

Our tests resulted in three sources for fast, accurate translations: 1. Hiring a professional, accredited human translator; 2. Using Collins On-Line and doing it yourself; and 3. Using another translation software. In our head to head tests, we ran Collins On-Line against MicroTac.

We found that in many cases, where time is critical, a human translator is the best way to go. Just fax them the English document and they fax back the translation. Our first international Tiger ads were prepared that way. However, when we began doing the translations in-house, we found nothing touches Collins On-Line. Its dictionaries are more complete, and the usage notes make it more accurate. With Collins On-Line you do not risk the embarrassment of sending out unreadable, machine translation in a foreign language. Collins On-Line has no machine translation of whole sentences and paragraphs or other gimmicks. Collins On-Line simply provides fast and easy access to the best bilingual dictionaries available today. MicroTac contains dictionaries far less in size and contains weak context and usage information. It's no surprise. The HarperCollins technology grew from a merger between Collins, the highly respected European dictionaries, and Harper & Row, the U.S. publishing giant, known for their educational and linguistic books. This enormous bilingual database has been incorporated into this remarkable software title.



From The Most Respected Names
In Language Translation:
HarperCollins.

Languages Available...

English/Spanish & Spanish/English
English/French & French/English
English/German & German/English
English/Italian & Italian/English
French/Spanish & Spanish/French
French/German & German/French

Coming Soon... Collins On-Line companion products

COLLINS ON-LINE

BBD4310 Collins On-Line \$79.95
Add on dictionary for \$39.95.

MULTIMEDIA

Interactive, Full-Motion Digital Sound CD-ROM!

Combining Stereo Sound, FM Synthesizers, MIDI Sequencers and Interactive CD Graphics!

REVIEWER'S NOTEBOOK: The impact of combined sight, sound and movement is dramatic and not easily forgotten. If you make presentations or conduct training, the ability to communicate effectively can be enhanced with this hot new technology: featuring FULL-MOTION VIDEO. More Multimedia CD titles are being released every day. These discs are packed with show-stopping, integrated sound with photo-quality images, language instruction with spoken lessons and pronunciation — along with explosive games and entertainment software. To run MPC-approved Multimedia, you need a PC, a CD-ROM reader, an audio board, Windows (with Multimedia Extensions) and speakers or headphones.

Multimedia will change the way people use their computers. As the power of the PC catches up to man's ability to dream, create and inform, the introduction of sound will have the same impact as the "talkies" did on silent movies. It unleashes another sense.

In learning, the ability to mix audio instruction with visual reinforcement is a powerful tool. The PC becomes a skilled educator with the addition of sound. With multimedia comes the interactivity that full-motion video provides, giving the user a "feeling of being there." The training and presentation possibilities are endless for Multimedia. Create full-motion catalogs, parts lists, databases and demonstrations. Create your own Multimedia images, logos and designs.

The NEC MPC CD-ROM readers are the best built in the industry, with advanced design and workmanship to deliver high-performance, TV-quality video. Plus, you get compact disc-quality sound — not fuzzy, inaudible monotones. Spoken words are crisp and lifelike; instruments and effects sound like master recordings. Fast data access and state-of-the-art components are the trademarks of the NEC MPC readers. After all, NEC is a founding member of the MPC consortium, a driving force in developing and establishing MPC standards.

TigerSoftware is proud to be among the first to have these amazing instruments. Turn your ordinary PC into a wonderfully creative tool.



NEC MPC CD-ROM READERS

	BBD8436 CDR-36M MPC External Drive	BBD8473 CDR-73M MPC External Drive	BBD8483 CDR-83M MPC Internal Drive
Here's What You Get...			
CD-ROM CD-ROM Reader	\$449.00	\$ 675.00	\$599.00
Complete Interface MPC kit w/Audio Board and CD-ROM SCSI Interface ..	428.00	428.00	428.00
Multimedia World Atlas	149.00	149.00	149.00
Toolworks Illustrated Encyclopedia ..	395.00	395.00	395.00
Toolworks Reference Library	149.95	149.95	149.95
Time Compact Almanac	199.95	199.95	199.95
World & U.S. Atlas	109.95	109.95	109.95
Guinness Disc of World Records	79.95	79.95	79.95
Mammals	149.00	149.00	149.00
Toolworks Game Pack	79.95	79.95	79.95
Family Doctor	149.95	149.95	149.95
Britannica Family Choice CD	604.00	604.00	604.00
CD Launch and Play Menu Disc	99.95	99.95	99.95
U.S. History	395.00	395.00	395.00
TOTAL RETAIL VALUE	\$3,438.65	\$3,664.65	\$3,588.65
YOUR COST...	\$999.00	\$1198.00	\$1149.00

TIGERSOFTWARE

To Order Call Toll-Free: **1-800-888-4437**

We Accept:

Circle 259 on reader service card

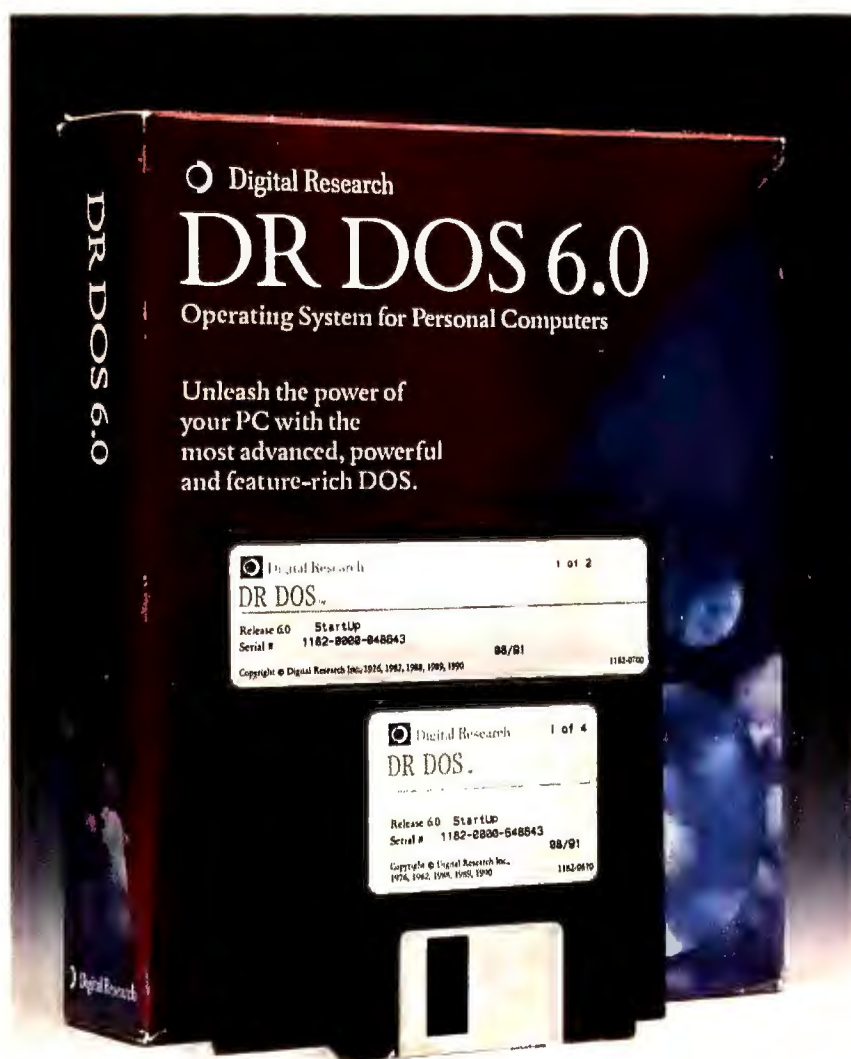
DR DOS VS MS-DOS

VERSION 6 VERSION 5

DR DOS DOMINATES!

REVIEWER'S NOTEBOOK: *Number two tries harder. If you want to run your DOS, Windows and networking applications faster and easier, while maximizing your hard disk's performance, Digital Research has the answer: DR DOS 6.0. InfoWorld awarded DR DOS 6.0 its Buyer's Assurance Seal, eclipsing MS-DOS 5.0 and virtually running away with the scoring. High marks everywhere for this software masterpiece, particular superiority in disk management, task switching and Windows support.*

The new MemoryMAX feature moves DR DOS, buffers, drivers, TSRs and network software outside your 640K, leaving DOS, network and Windows plenty of elbow room. The more powerful your machine, the more memory you'll reclaim. For us, this was the most compelling feature. We also applaud DiskMAX, a collection of unmatched disk utilities: disk optimization, compression and state-of-the-art disk caching. All integrated, all ready to use. TaskMAX, another advanced feature, allows you to load up to 20 applications at a time — then switch from one to another instantly. Cut and paste between these applications. TaskMAX automatically switches to extended or expanded memory; switching between programs is instantaneous. Extensive testing proves that DR DOS 6.0 clearly outperforms MS-DOS 5. It's the disk operating system that Microsoft doesn't want you to know about...



DR DOS 6.0 is DOS without the drawbacks, designed specifically to overcome the flaws that MS-DOS users have complained about from the beginning. And while MS-DOS 5 has come a long way, it's still not as fast, as easy or as rich in useful features as DR DOS.

InfoWorld and *BYTE* agree. DR DOS 6.0 brings a new level of memory management to the disk operating system, taking full advantage of high and upper memory — even on PCs and XT's. You'll get up to 627K on i386 and i486 machines (up to 629K on 286s, and 8086/8088 machines will see up to 621K). MS-DOS 5 still requires a memory manager to perform competent loading and memory enhancement.

Enjoy up to double the hard disk capacity with the new DiskMAX utilities (including defragmentation) and a dramatic increase in speed with DR DOS's high-performance caching. A note here: DR DOS 6.0 includes SuperStor as part of its DiskMAX utility collection. SuperStor increases the storage capacity of your hard disk with advanced file compression technology. Unlike conventional file compression software, SuperStor employs sophisticated "on-the-fly" compression algorithms to expand the storage capacity of your drives (hard disk or floppy) by up to 300% — and in many cases more! You can store 2 to 3 times more on your hard drive without giving up the speed with this new technology. Now your 40 Mb drive can store 80-120 Mb. As a standalone product SuperStor

is a \$119.95 value!

And with DR DOS, you can instantly recover deleted files, include password protection for files, directories, disk partitions and the system itself. The ViewMAX Graphical Shell provides an easy point-and-select interface for access to DR DOS functions, data and applications. The handy FileLINK quickly moves files from PC to PC via a serial cable. And the full-screen text editor includes a set of word processing tools that are always at your disposal.

MemoryMAX Advanced Memory Management

DR DOS 6.0 is the only operating system that can move TSRs, buffers, drivers, networking software, and the operating system itself outside of the conventional 640K memory area on 8086/8088, 80286, i386, and i486-based PCs. The result is more memory for your DOS, Windows, and networking applications:

- Up to 612K on 8086/8088-based systems with LIM 4.0.
- Up to 621K on 80286 systems with LIM 4.0.
- Up to 628K on 80286 systems using the NeAT, LeAP, or SCAT chipsets.
- Up to 627K on i386 and i486 systems.

DiskMAX Disk Optimization

At your option, DR DOS 6.0 uses dynamic file compression technology to compress hard disk partitions, resulting in a potential doubling of the data ca-

capacity of the typical disk partition. Once installed, disk compression is fully automatic and transparent — the only difference you'll see is a dramatic increase in available hard disk space.

DR DOS 6.0 defragments hard disks by gathering together parts of files that have become scattered over the disk as a result of typical PC use. When files are stored in contiguous blocks instead of being fragmented, your applications take less time to read and write to your hard disk — resulting in faster performance.

DR DOS 6.0 dramatically boosts the performance of DOS and Windows 3.X applications with the industry's leading high-performance disk caching program, Super PC-Kwik. Disk caching saves valuable time by storing data frequently used in memory, thereby reducing the need for programs to retrieve data from disk.

TaskMAX Task Switching

TaskMAX lets you load up to 20 applications at the same time, quickly switch between tasks, and copy and paste text and numerical data from one to another. You can run TaskMAX from the ViewMAX graphical shell or from the command line. TaskMAX can also be located outside of conventional memory, thereby maximizing the memory space available for each of the tasks being switched.

Unlike other task switchers, TaskMAX switches tasks by using extended or expanded memory, a virtual disk, or a hard disk — resulting in the

fastest switching possible. Because most users will routinely want to switch between the same tasks, TaskMAX can automatically preload a specified list of tasks at startup time.

Security Features

DR DOS has several levels of security to safeguard your system and data, including power-on password protection; temporary keyboard locking; and password-protection partitions, directories, and files. For maximum flexibility, access to password-protected files and directories can be provided at different read/write/delete privilege levels.

Data Recovery

With DR DOS 6.0, information that once would have been lost is easy to recover. When a file has been accidentally deleted, "undelete" lets you recover it, even after intensive disk use, by reserving the space occupied by deleted files until a disk is filled up.

INCLUDES FREE
FormTool Gold
WHEN YOU BUY DR DOS 6.0

DR DOS 6.0

BBD3095 DR DOS 6.0 \$89.95
IBM PC or PS/2 compatible using Intel 8086/8088, 80286, i386, or i486 microprocessor; minimum of 512K RAM; two floppy disk drives, or one floppy and one hard drive (installation from a: drive required); monochrome or color display using VGA, EGA, CGA, MCGA, or Hercules graphics adapter.

Increase Your Disk Capacity (On The Fly) By Up To 300%...

This unique product, unlike conventional file compression software, employs sophisticated "on-the-fly" compression algorithms to expand the storage capacity of your drives (hard disk or floppy) by up to 300% — and in many cases more!

SuperStor is simple to install and is 100 percent guaranteed for safety. You don't have to buy any new hardware, fiddle with jumpers, switches, hardware interrupts or even open your computer! Just slip in the diskette and you'll instantly notice significant increases in capacity and speed.

SuperStor is perfect for all applications, including your word processor, spreadsheet, database, graphics and CAD/CAM systems. Specialized applications with highly compressible data can achieve an increase in capacity as much as 8 times — 800%. It supports DOS 3.2 and up including DOS 5.0, Dr. DOS, and Windows 3.0, and allows DOS 3.2 and 3.3 users to easily break the annoying 32 megabyte limitation.

Even with all this high-tech efficiency going on around you, SuperStor does not change the way you work. All compression and decompression occurs without your help. SuperStor's automatic operation eliminates the need to learn special commands or use spe-

cially created logic disks. You don't even have to hit one keystroke for this amazing product to work its magic. Just use your computer and applications like you always have.

Your Word Processor And Spreadsheet Will Run As Fast As Ever!

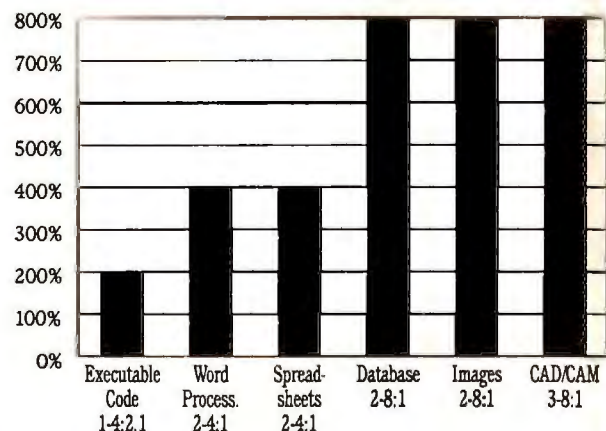
SuperStor is the fastest data compression product on the market today, resulting in no measurable loss in your system's overall performance. All of your applications will run just as fast as they ever have. In fact, in some cases SuperStor will actually increase your system speed! SuperStor even includes a caching system that adds additional speed. How's that for power?

A little exploration into the easy-to-understand manual can reap some powerful rewards. For example, with just a couple of keystrokes you can create your own compression configuration. Compress your entire disk, or any portion of it, to maximize ease of use, compression efficiency and overall system performance. In just a few minutes, you can become an advanced SuperStor user.

How Much Space Can I Really Save?

The exact amount of compression you'll achieve depends on the data in the files you store on your computer. Files which use a limited number of characters or contain repeated sequences of characters will compress better than those containing purely random data. While this is true for many compression programs, SuperStor's advanced

technology increases storage capacity even more. And SuperStor is the only compression system we've seen that compresses executable code. In addition to compressing the data in your files, SuperStor's ingenious file management techniques saves space on your disk by reducing the number of reserved byte units. Normally, these savings will amount to 4 to 8 times less space on your disk, regardless of the data in the file.



Reduce Time & Cost of Backing Up.

Since your data is now occupying less disk space, you'll find that backups now require less media. In fact, an average savings of 50% on the number of floppies is normal for SuperStor. And, of course, your backups are much faster. In addition, you can write on floppies in compressed mode for backups or, for exchange with other systems, in regular DOS format.

SUPERSTOR

BBD3865 SuperStor 5¼" & 3½" \$119.95
Requires 512K memory.



Stunning Fonts For Your Printed Page.

High Quality Scalable Fonts

Don't just print plain text — fashion creative works of art that bond themselves to the reader. Impress upon the printed page aesthetic, stunning communications that magnetically draw readers to them. This is what professional "Desktop Publishing" is all about. This is what Publisher's Powerpak can do for your word processor.

You absolutely must have Freedom of Font Choice. Whether you print on a dot-matrix, inkjet or LaserJet-compatible printer, Publisher's Powerpak delivers the finest-quality fonts your money can buy.

Why Scalable?

Publisher's Powerpak uses advanced scalable-font technology. When you need a font, you pick a size, and the needed letters are created instantly. The letters are scaled "on the fly" — as you need them. Scalable fonts use virtually no hard disk space — only 50K for an entire typeface family, which includes every size you'll want.

I used to use old-technology fonts (before the new scalable fonts came out). I had only 7 different typefaces. Each typeface had five sizes: 12, 14, 18, 24 and 36 point. My limited selection of fonts took up 10 megabytes of hard disk space!

Now I use Publisher's Powerpak. I have over 114 different typefaces to choose from. In any size I want, from 4 to 1,000 points (Word and Works limits point size to 127). With this seemingly unlimited selection of font choices, I actually use only 1½ megabytes on my hard disk. If I wanted this selection with bit-mapped fonts, I'd have to buy a 200 Mb hard disk!

Quality Fonts

Not all fonts are created equal. There are cheapies out there that print jagged letters and have strange character-spacing. That's why you want to stay with the choice of the pros. PC World recently declared Publisher's Powerpak the "Best Buy" of font software, and gave Powerpak's printer and screen fonts the highest quality rating — Excellent.



Super Font Pack, Volume 1 FREE — with every Publisher's Powerpak! A \$150.00 value — FREE! 84 typefaces in normal, bold, italic, bold italic, thin, condensed, wide, expanded, and hollow.

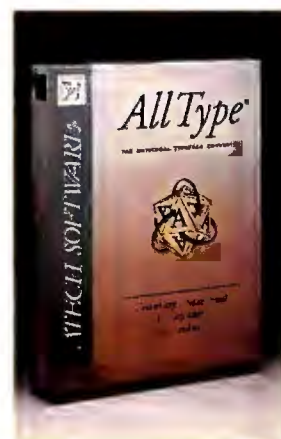
Add-on Font Packs

Publisher's Powerpak includes 30 typefaces for an outstanding font-value. (Other font-makers charge \$100 to \$200 per typeface!) But that's just the beginning. There's an entire library of over 800 typefaces available for you to choose from. Plus foreign languages from Greek to Hebrew to Korean. When you're ready to add to your library, Atech font packs are filled with beautiful assortments of type-

faces — two per pack for only \$29.95 per package.

NEW! Convert and Use Any Font

If you have fonts, you'll love this new technological breakthrough. Now you can convert any font to any other font format! I changed all my Adobe PostScript fonts to Publisher's Powerpak fonts. When TrueType fonts arrive with Windows 3.1, I'll convert all those fonts too. With



Atech's AllType, you can convert to and from all these font formats: **Adobe PostScript Type 1, Adobe PostScript Type 3, Atech Fast Fonts, Microsoft TrueType, Agfa Intellifont, GeoWorks Ensemble, DTC Nimbus Q, CoreIDRAW! and from Bitstream, Fontware.**

It's so simple to install and use, and you can rename fonts in the process. Don't be fooled — this is high-quality stuff, AllType even converts "hinting" information, which changes spacing and other characteristics for certain font sizes. (Very important for small fonts.) You can create variations like bold, compressed, expanded, hollow and thousands of other variations all from your original typefaces.

PUBLISHER'S POWERPAK

BBD4095-3 Powerpak for WordPerfect 3½" . \$69.95
BBD4095-5 Powerpak for WordPerfect 5¼" . \$69.95
BBD4330 Powerpak for Windows Dual . . . \$69.95
BBD4094 AllType Dual \$79.00
Requires hard disk.

Modify And Convert Your Adobe, Agfa, Bitstream, HP And Other Fonts!

The Fast, Easy Typeface Enhancement Program For Windows!

REVIEWER'S NOTEBOOK: If you're into desktop publishing, or work extensively with a word processor, chances are you've got all kinds of fonts that you've purchased from different sources. Here at Tiger, we've got hundreds of fonts from different manufacturers: dozens of Agfa Compugraphic fonts, a slew of Adobe fonts, scores from Digital Typeface Corp., Nimbus Q and of course True Type. Then we've got some Bitstream fonts and some others that we never use for one reason or another. We've got quite a library, but we've also got a problem: these fonts are all in different formats. There's PostScript Type 1 (Adobe, Digital), PostScript Type 3 (Bitstream Fontware), and Intellifonts (HP and Agfa). FontMonger is the answer. It allows us to convert all of our various-format fonts in either direction to any other format! Our readers have been clamoring for just such a capability — now it's here.

But that's just the beginning of our love for this amazing new product. FontMonger also allows us to actually modify existing typefaces to produce an unlimited array of customized new faces for use in virtually any publishing or graphics application. How about this: You'll have access to unencoded characters (some of which we never knew existed) and have the unique ability to produce custom small caps and oblique characters, superscript and subscript characters, along with bar and slash fractions. Business users will love FontMonger's ability to create frequently used fractions or superior numbers (like pricing) and place them directly into a font. Take a regular typeface and instantly transform it into an oblique face or true small caps of any slant or size. FontMonger is one of the most useful — and fun — typographic tools we've ever seen, a must for type aficionados.

The Windows 3.1 Type Dilemma

With the introduction of Microsoft Windows 3.1, users will be introduced to full-scale use of True Type. True Type's debut came in Apple's System 7. Today, as PostScript and True Type become the leading page and type description languages, many other type formats are left in the dust. That's why FontMonger is such an important product. It protects your investment in fonts by allowing complete conversion of anything you've got — to any other format. These converted fonts can be exported in Encapsulated PostScript (EPS) or Adobe Illustrator file formats, as well as Windows Metafile, so outlines can be modified in CorelDraw, Micrographx designer and a host of other graphics applications. Graphics and type can then be combined and merged back into a font.

Conversions are fast and simple, just select the typeface and click on the format you want it converted to — FontMonger does the rest. That's it. And the typefaces produced by FontMonger are compatible with all applications that run under Windows 3.0 or 3.1, as well as Adobe Type Manager, Intellifont for Windows, CorelDraw, ZSoft SoftType, GeoWorks Ensemble — even the Macintosh, NeXT and PenPoint operating systems. How's that for versatility?

FontMonger was developed by a group of experienced typographic specialists who saw the vast incompatibilities between type formats, and who were themselves frustrated by the inability to use some of their fonts in many of their applications. They set out to create a conversion that would allow any type to be used anywhere. For the record, you can convert (in either direction) fonts by Adobe, Agfa Compugraphic, Bitstream, Casady & Greene, Digital Typeface Corp.,

Hewlett-Packard, Image Club, Linotype-Hell, Monotype, Nimbus Q, True Type, URW and ZSoft.

Customize Like Crazy!

...Combine characters from various type families into a single font! Have instant access to frequently used characters right from the keyboard! Create customized small cap and oblique characters to your exact specifications — you select the height and width proportions and the degree of slant! Want more? Create inferior and superior characters for mathematical and scientific formulas, advertisements, pricing guides and dozens of other specific uses. Every custom character you create can be installed quickly into a font.

With FontMonger, you have complete control of your type to open a world of creative possibilities.

Questions, Anyone?...

Why convert fonts?

With the forthcoming release of Windows 3.1 from Microsoft, users will have the option of working with TrueType fonts directly in their operating system. Instead of having to purchase new fonts to work with TrueType-supported applications, FontMonger lets you simply convert your existing type library into TrueType format.

Why FontMonger?

PC users who are word processing, desktop publishing and presentation applications can benefit from FontMonger's unique ability to mix typefaces within a single font. In addition, fractions can be generated in a specific typeface and installed directly into your keyboard. The numerator and denominator can be separated by either a horizontal line (en fraction) or a slanted line (em fraction).

What are inferior and superior characters?

Superior and inferior characters are smaller characters above and below the normal character baseline. For example, in the price \$99.⁹⁵ the .95 consists of superiors. Or, in the chemical formula H₂O, the 2 is an inferior. FontMonger enables you to create composite characters containing both superior and inferior elements. Composite characters become one key position within a font.

My page layout program already creates small caps. Do I need FontMonger?

Most page layout programs substitute a smaller point size for small caps. This is typographically incorrect, since the width and height of the character should be scaled in different proportions. FontMonger automatically modifies the height and width to create a typographically correct small cap. If you want to create unique small caps, simply specify the height and width proportions. FontMonger does the rest.

Does FontMonger do any other type modifications?

FontMonger lets you generate true oblique or slanted characters. Simply set the degree of slant and direction of slant. FontMonger provides an immediate visual sample of the character. The degree of slant can be set in degrees and retained for future use as a preference setting.

What are unencoded characters?

Unencoded characters are extra characters forming part of the original design of the typeface which are not always accessible from the keyboard. Typical unencoded characters include ligatures, fractions, international character accents, punctuation and currency symbols.

FONTMONGER WINDOWS

BBD4083 FontMonger Windows \$99.95

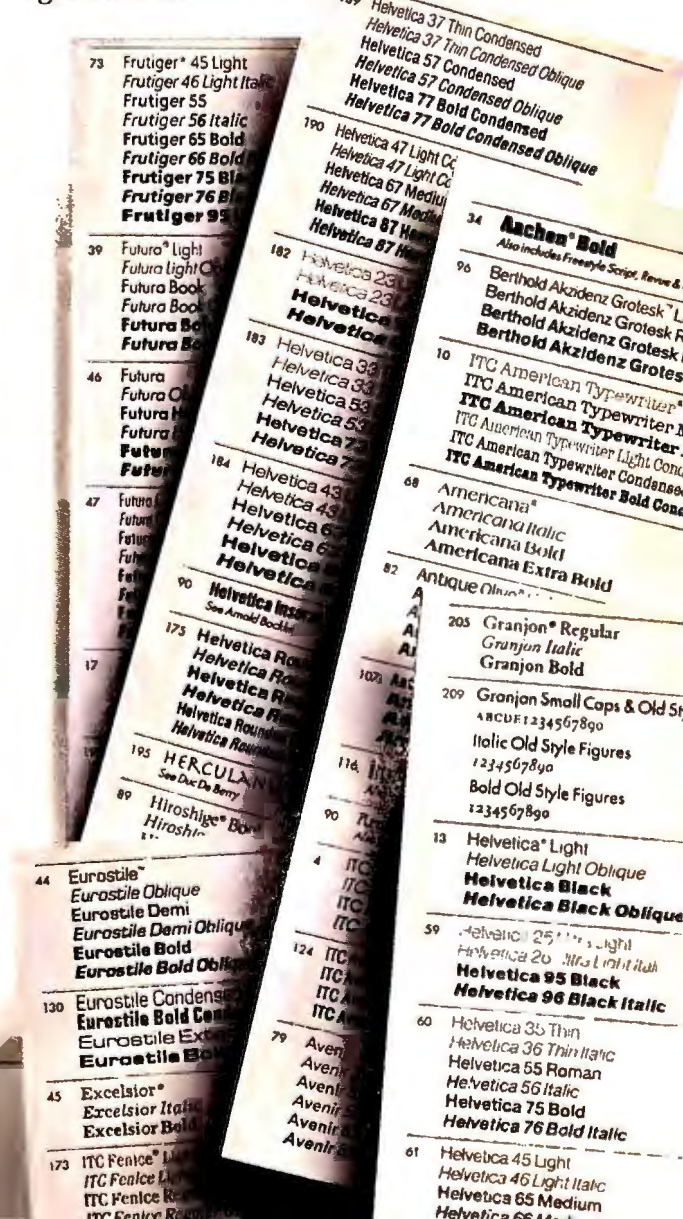
To Order Call Toll-Free: 1-800-888-4437

Circle 259 on reader service card



FREE TYPE BOOK! WHEN YOU BUY FONTMONGER

This handy 12-page guide is packed with tips, techniques and jargon. Prepared by typographers at TigerSoftware, this book fills in all the gaps when working with type. It's called "A Short Course on Working with Type," and it's probably the most informative, concise volume on the subject of type ever printed. It's yours absolutely FREE when you buy FontMonger — only from TigerSoftware.



Logitech Introduces Revolutionary, New Imaging Technology. Scans TWICE The Area Of A Flatbed Scanner!

Seamlessly Assembles Multiple Scans Into Large Single Images. Outperforms Flatbed Scanners.

When we first introduced the ScanMan 256 Grayscale hand scanner last year, it met with a roar of enthusiasm. We published the results of our testing — unbelievably sharp scans, with crisp, rich detail and 256 levels of gray. Scanning photos, illustrations — and text — was instantly taken to a new level. In head to head testing, we found the Logitech ScanMan 256 to be more versatile, faster and capable of producing large crystal-clear images. The 256 levels of gray add more depth and realism to all your scanned images.

Logitech had created the ultimate hand scanner, the hottest new product of the year.

But when you work with Logitech, you come to understand that they never sit still. While the ScanMan 256 was sweeping the industry (*PC Magazine's* "Editor's Choice," *InfoWorld's* 1991 "Product of the Year," *PC Computing's* "Most Valuable Product of 1991"), they were at work designing an enhancement that would catapult it to another level entirely — a completely new category of scanners. The innovation: Virtual Page Scanning. The Technology: the Logitech Auto-stitching feature. It



automatically "stitches" 2, 3, — even 4 scans together (so it can handle TWICE the area of an 8.5 by 11 flatbed scanner!). No other scanner we've ever seen can automatically merge scans into one completely seamless image. We scanned dozens of photos, large illustrations, 11" x 17" posters — each one was perfectly seamed. The ScanMan 256 smooths and de-skews the stitch, while evening the tones across the scans for remarkable images. Scan left to right, top to bottom — any way you like, the powerful ScanMan 256 software takes care of the rest.

The ScanMan 256 is constructed with the highest-quality materials. Of course it features the same "red-beam" technology that produces 7 times more light than conventional technologies, so more information is captured by the scanner, producing professional-quality scans in seconds.

Scan large photos or illustrations — up to 16 inches wide by 22 inches long — the largest scanning-area possible for any desktop scanner. It's fast and easy to use, with the superior engineering and design that goes into every Logitech device. The ScanMan 256 is the smart choice in scanning, replacing the bulky flatbeds, delivering unequalled depth, sharpness and clarity. There's really no reason to even consider any other scanner.

In addition to the ScanMan 256, you get a copy of the FotoTouch Image Editing System, which acts as the host application for the ScanMan 256. Scanned images are automatically transferred directly to FotoTouch for immediate editing, with your choice of great new tools and effects. You'll perform advanced, 256 gray scale editing and allows you to print your images with amazing results on any dot-matrix and laser printers as well as Linotronic typesetters and

other professional equipment.

As scanning text becomes more important in business, ScanMan 256 provides Perceive, one of the industry's highest-rated OCR software. The 256 grayscale support means text of any size, with any background color or pattern will be captured with precise accuracy. Perceive allows fast, easy capture of text at virtually any size — it's heavy duty OCR!

LOGITECH

BBD2594 ScanMan 256/Perceive \$279.00

Call for requirements.

Amazing Scans!
Scan an area
twice the size of
even flatbed
scanners!



Includes
FotoTouch
image retouch-
ing software.
Modify your
digital photos
with a wide
array of special
effects and
specialized
enhancement
tools.

Instant Digital Snapshots! Introducing The Incredible New Logitech FotoMan...

REVIEWER'S NOTEBOOK: *What is it? In short, it's a portable, digital camera — for your computer. FotoMan takes great pictures with amazing clarity and 256 grayscale richness — then allows you to instantly download them to your PC. It includes a slew of image editing tools that open a world of creative opportunity, and is compatible with virtually all desktop publishing programs. The applications for this new technology are enormous. Insurance and real estate professionals are using it to expedite claims and transmit photographs of neighborhoods and homes. Manufacturers use FotoMan to quickly catalog products and parts, while law enforcement officials are using it to photograph suspects, crime scenes and evidence — without the time and expense of film, processing and prints. Digital images are instantly captured and merged into documents, or stored as a permanent record. Up to 32 images can be shot and stored on the FotoMan's RAM chip, then transferred via serial port to FotoTouch — or previewed on your screen.*

There are hundreds of practical uses for this new product, but we found FotoMan was a lot of fun. Fast and easy, it comes with an automatic flash, one-button operation and a field of focus from three feet to infinity. Includes FotoTouch for image editing, including 256 grayscale editing.



One of the hottest new ideas in computing: the digital photograph — taken by a small, portable and easy to use camera that allows instant transfer to your computer — without a digitizing board or any other hardware.

In the past, getting a photograph into your PC meant using a traditional film method. The film would first be processed into either slides or prints then scanned or stripped into your document. Now, just snap a photo of a new employee, for example, and send it directly to the corporate database. Once you've got your shot on-screen, the FotoTouch software allows you to easily make modifications. Then save your image in either TIFF, CCIT, BMP, PCX or EPS format. There's no film, no developing and no waiting!

Real Estate professionals can send pictures of homes to prospective buyers, editing out undesirable objects like garbage cans. Or images can be put together — like different shots of landscaping to create a custom layout. FotoMan and FotoTouch are like having a complete darkroom in your PC. The possibilities are endless.

Use FotoMan images for multimedia and presentations. Produce personalized stationery, letters, invitations and anything else where you want to add real-life images to your computer documents.

It's portable! FotoMan packs all its power in a rugged unit that's small, lightweight and battery-operated, so you can take pictures anywhere.

Take pictures indoors and outdoors — Fotoman includes a built-in flash for indoor use and a neutral density filter for perfect use outdoors, too.

LOGITECH

BBD2592 FotoMan \$599.00

Call for requirements.



Stop Hard Disk Death! (Even After It's Too Late)

REVIEWER'S NOTEBOOK: *It's plain and simple: If you have a hard disk, you absolutely must have and use SpinRite II. You don't need to know how your hard disk works (although it will teach you if you like). You don't need to know why DOS just gave you a hard disk error, or why DOS says it can't find your valuable data. All you need to know is your hard disk is like everything else in this universe; it won't last forever. But don't despair; there is something you can do about it. With a little easy maintenance you can make your hard disk last longer, run faster, and run more reliably. Think of a hard disk as a car. Proper maintenance can make a car last indefinitely, and a little fine tuning makes it run so much better. Proper maintenance will do that for your hard disk too. SpinRite is the original in its class, and this all-new SpinRite II is still the world's finest.*

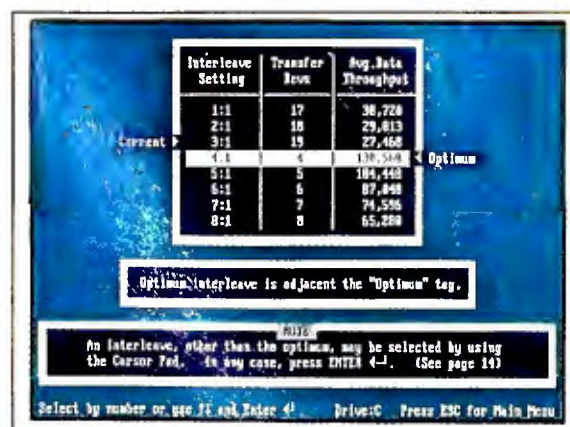
Byte Magazine summed it up best when they wrote, "SpinRite is what the word MUST was invented for." This vital maintenance software will give you years of extra hard disk life. It will recover your valuable data even after DOS says it can't be found. It will make your hard disk faster (400 to 500% increases have been reported). And best of all, SpinRite II will do all this automatically and easily.

The user interface and easy-to-read manual are the best in the industry. Not because they're huge, scholarly volumes of intricate

details (they're not), but because they're easy to follow, written in plain English, and the manual is just the right size to read and use. It's quite a relief to finally get your hands on a computer manual you can really understand and put to good use. And that's the overall theme of SpinRite II: easy-to-use. When you couple that with the fact that SpinRite is the world's first and foremost product of its kind, you get an unbeatable combination dedicated to not only the prevention of premature hard disk death, but its miraculous resurrection even after it's 6 feet under.

Hasn't Been Done Since It Left The Factory!

That's right. The most important information on your hard disk hasn't been renewed or changed since it left the factory. What information is that? It's the most vital of all, the identification addresses necessary for finding data on your hard disk. And since information on a hard disk is basically written with magnetized "holes," the magnetic properties can wear and lessen with age. What's more, the mechanical motions of a hard disk over the years (a hard disk continually spins at 3600 rpm) will cause the alignment of the mechanical parts to shift, thereby causing additional problems finding your valuable data. This ends up with a message from DOS saying your data can't be found. (Horrors!)



Hard disk error? Leave it to SpinRite II...

How does SpinRite handle that? It actually rewrites all the original information on the hard disk, including the vital identification addresses. This alone adds years to the life of your hard disk, and all by itself would well be worth the price of SpinRite (but SpinRite does so much more). As a better-than-new bonus, SpinRite rewrites that data in such a way that the hard disk is actually faster than when it left the factory — as much as 500% faster!

Perhaps you're wondering what happens to your data while SpinRite does all this. It might appear that you need to backup your hard disk before SpinRite can "start from scratch." Worry not, because that's the best part. SpinRite does everything without losing your data! It's so automatic, you can start the process, go to lunch, and come back to a hard disk that's better than brand new condition.

SPINRITE II

BBD3285 SpinRite II \$79.95
Requires DOS 2.1 or above.

THE CD-ROM SUPERSTORE

If you've got a CD-ROM reader, here's a brand new collection of incredible new titles that will make your library more enjoyable—and more useful. Choose from art, business, news and late-breaking shareware...

Quick Art Deluxe. Packed with over 3000 top quality images for use with your PC in TIFF and IMG formats. The ultimate desktop publishing art source — in fact, it's the only art collection you'll ever need! Choose from animals, borders, energy, food, holidays, maps, occupations, people, science, sports — hundreds more!

Trade Opportunities. A great business disc! The need for products and services in the international marketplace is exploding — this disc is full of information on how you can take your place in the new global economy. Includes Department of Commerce Trade Opportunities Program (TOP) and Commerce Business Daily (CBD). Also includes External Affairs and International Trade Canada 1991 Companies for World Markets as well as a complete section on how to sell to international markets and a helpful information reference guide. Covers qualification process, bidding procedures and techniques, statistics contacts and much more.

The Wazata World Factbook 1991. Just released! The Wazata World Factbook 1991, based on the CIA World Factbook, is often called the "World Almanac of the Federal Government." This annual publication is jam-packed with extensive examinations of territories, countries, protectorates and disputed land claims worldwide and is the most complete listing of its kind available today. Includes

socio-economic, geo-political, demographic and other country-specific data.

The Washington Times And Insight On The News. The ultimate news reference library on a single CD! Combines the respected journalistic heritage of The Washington Post with the lively weekly coverage of Insight on the News. Total coverage includes events, reports and analysis of topics from January 1990 to June 1991.

Newsbytes International Computing Industry News. The complete archives of the Newsbytes News Network from May 1983 to August 1991. Topics include telecommunications, computing trends, general computing news, government and special articles on IBM, Apple and UNIX.

Night Owl's. All new! Preview over 10,000 of the industry's top software applications. See how they work and if they're right for your needs — before you buy! Includes hot-selling communications, desktop applications, games, development tools, and more — over 600 Mb!

CD-ROM DISCS

BBD9500 QuickArt Del. ... \$199.00
BBD9501 Trade Opportunities
Int'l & Dom. \$199.00
BBD9502 Wayzata World
Factbook 1991 ... \$35.00
BBD9503 Wash. Times & Insight
on the News \$99.00
BBD9504 Newsbytes:
5-83 to 8-91 \$85.00
BBD9505 FPN 1991
(1-91 to 12-91) ... \$99.00
BBD9506 Night Owl's
1-90 to 10-91 PC . \$95.00
BBD9507 Windows Shareware
Gold 3.1 \$120.00

A Railroad On Your Desktop!

It's the most fun I've had on my PC in years! Creating my own railroad line right on my screen — then create my own collection of customized cars! You design the track layout, using special tools that keep curves aligned and precise. You can design tracks of any configuration, including figure-8's and track switches.

And when the track is done, landscape the scene with buildings, trees, rivers, roads, bridges and more. Just select from the graphical menu bar as you design. There's also a complete set of drawing tools to create any type of layout, object or building. Design Your Own Railroad also includes an assort-

ment of sample track layouts to get you going. Then build the ultimate train set! Choose from dozens of classic cars, modify them, colorize them, add logos, designs and more. Then put your design to the test... delivering goods and collecting the revenues.

Design Your Own Railroad

BBD3790 Railroad \$49.95
IBM PC XT, AT, PS/2 or compatibles; DOS 2.0 or later; 512K RAM.

Your Dream House.

Go ahead — design that new addition to your home! Put your imagination to work on the interior, then plan the perfect landscape. Experiment with different layouts, colors, shapes and arrangements using the Design Your Own Home Series. It's fast, easy and fun — the results are clean, precise and professional. These three simple-to-use computer aided design systems include dozens of sample floorplans, pre-drawn furnishings, plants, flowers, trees and shrubs. Modify them to suit your taste, or start from scratch to create just the environment you've been dreaming of. Enough power for professional use.



BUY ALL 3 — SAVE \$30!

Design Your Own Series

BBD3001 Architecture 5 1/4" . \$49.95
BBD3002 Interiors 5 1/4" \$69.95
BBD3003 Landscape 5 1/4" ... \$69.95
Requires 1MB or more; mouse, ImageWriter, LaserWriter. Macintosh versions available.

Create captivating presentations and movies just like the pros — in 3 easy steps.

First create a background in Animation Works or your favorite paint program. Next create the "actors" the same, easy way.

Finally, put it all together with point and click ease. Use hundreds of special effects and sound for state-of-the-art shows!



The Desktop Movie Studio!...

Create Fully Animated Scenes In Just A Few Minutes...

REVIEWER'S NOTEBOOK: This remarkable product allows you to animate — by just drawing lines; in effect, telling the system where to move the objects and how fast. That's it. Quickly defining what the objects, "actors" and backgrounds will look like. Animation Works allows you to create colorful movies for sales presentations, demonstrations, storyboards, video titling and production. It's easy enough for inexperienced users, yet has all the power and features for graphic designers, creative directors and video producers. They love how easy it is too. Great training and educational tool. To create a sequence illustrating how a piston works or how a bird achieves flight would take about twenty minutes. Just draw lines to show Animation Works the path...

Animation is high-impact communication. The ability to deliver messages to an audience, student or prospect with animated sequences along with

sound and text is dynamic. Animation Works makes it simple; that's why it's become one of the most popular PC multi-media products in the business. The concept of "path-based" animation makes moving an object as easy as drawing a line across the screen. Establish different paths for each object in your scene, or attach the motion of one object to that of another, for complex sequences. Animate text to create titles, scrolling credits and feature lists. Quickly add customizable wipes, fades and other intriguing transitions between scenes. Animated mattes allow you to enclose action within a shape for incredible video-like effects. Adding backgrounds, sound, special effects, color and mattes are a mouse click...

The Color Cycling capabilities allow your imagination to explode with animated color effects, giving you four independent color cycle ranges.

The sequence of three frames you see on this page

have been taken from 25 frames that make up the entire animated sequence. Here's how we did it: We first assembled our background (we created the scene in Animation Works, but we could have done it in a paint program), using a variety of shapes, patterns colors and textures. The Film Player you see in the lower right-hand corner of the screen tells us which frame in our movie that we're currently editing.

Animation Works is an innovative new program to create animated sequences — but don't be intimidated! It's easy! You can create your own animations right out of the box! It's one of the most enjoyable products we've seen in years!



ANIMATION WORKS

BBD2702 Animation Works . . . \$120.00

Don't Buy Another Printer—Share The One You Have!

REVIEWER'S NOTEBOOK: The Kansai Printer Sharers eliminate the need for new printers. If you're already sharing printers, you know the time-consuming task of switching cables is not the answer. Manual switches make life a little easier, but are infamous for introducing static interference and noise that can distort printing

(and void your printer warranty). Only the Kansai Printer Sharers allow seamless connection of two or four PCs to every printer. This thing is a tiny miracle, just 4.5 inches square with the ability to eliminate interference that plagues other methods. Simple to install, just plug your cables in, turn everything on and you're ready to print from two or four PCs.

Once installed, the Kansai Printer Sharer directs traffic to the printer, actually sensing when one of the computers is about to send data and immediately connects that computer to your printer. During that printing session, the other computers are locked out automatically, keeping data safe.

And since the printer sharers are electronic, they won't void your printer warranty like a mechanical switch can. When your computers have documents to send to the printer, the Kansai Printer Sharer prints them on a first-come-first-serve basis. When the printer finishes the first job, it automatically checks for more data for

15 or 30 seconds (your choice), then another PC takes over automatically. There are convenient status lights that allow you to monitor the progress of the print jobs, and which PC is currently accessing the printer. On-line indicators for each port help you monitor activity at a glance.

You have complete control of your printer with automatic prioritized switching and the small footprint saves desktop or print-station space. Effectively cuts your printer costs, without loss of productivity or risk to data. Our testing yielded 100% reliability.

Features:

Connect two or four PCs to every printer; convenient on-line indicators for each input port; automatic prioritized switching gives you complete control; electronic design eliminates interference and small footprint design saves space.

Specifications:

No. of Ports:	2 or 4 input ports, 1 output port
Interface:	Centronics Parallel
Switching method:	Automatic prioritization by print request sensation
Switching wait time:	15 seconds or 30 seconds
Indicators:	Power Port Selected
Power Supply:	5V DC, 400mA with constant voltage regulator
Dimensions:	4½" x 4½" x 1¼"

KANSAI

BBD6700 2-Port Printer Sharing Device . . . \$99.00
BBD6702 4-Port Printer Sharing Device . . \$149.95



A Complete Medical Advisor For Your PC!

Do you know how to tell if your child has chicken pox, the mumps or a more serious condition? Do you know what to do if your child accidentally ingests a household cleaner? Do you know what to do in the event of a scuba injury? Your family's health is your responsibility. If an accident occurs, every minute counts — you need to know instantly what to do, and what not to do.

Schueler's Home Medical Advisor is an easy to use, interactive home medical reference system that can answer your medical questions (for both emergencies and non-emergencies) in a number of important categories. Created by a team of Board Certified Emergency Physicians in collaboration with graphics professionals and technicians, The Home Medical Advisor covers all age groups. It is colorful, informative and fast, putting volumes of medical and health information in a fast-access format. All information is easy to understand and emergency instructions are clear and concise.

The Symptom File. From The Home Medical Advisor's Main Menu select Symptom File and view a list of the most common symptom complaints by patients. This file will quickly formulate up to 400 potential diagnoses, employing over 1400 questions and 600 color VGA illustrations (the graphics are incredible!). The Symptom File includes

a listing of 70 of the most common chief complaints, often the worst, or most bothersome symptom. Home Medical Advisor will ask key questions and arrive at possible diagnosis from its vast knowledge base.

The Disease File. The Disease File provides extensive information on over 450 diseases with along with discussions of their causes, common symptoms, physical evaluation and treatments. There are also special sections on pediatrics and problems unique to women.

The Injury File. A listing of over 200 common injuries and treatments. Everything from gunshot wounds, burns, cuts and bruises to acute mountain sickness and broken bones is indexed by body part for fast reference.

The Test File. Diagnostics have advanced by leaps and bounds over the past several years. The Home Medical Advisor's Test File provides a listing of over 140 of the most widely used medical tests. Each section explains exactly how each test is performed, why it is used, its limitations, risks and benefits. Includes a special section on "What to expect."

The Drug File. The list of pharmaceutical agents grows longer every year. The Home Medical Advisor includes a listing of over 600 medications (prescription and nonprescription) with exhaustive information on their uses, potential side effects and drug interactions.

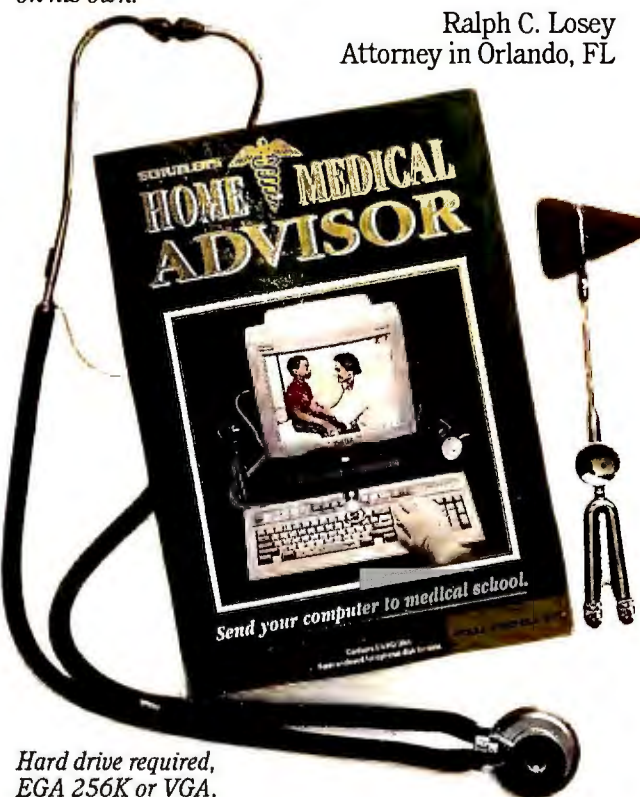
The Poison File. An important section for households with small children. Although many poisons today are supplied in child-proof containers, accidents can happen. The Poison File contains a list of over 500 poisonings and exposures. This file will tell you exactly what to do and who to see for a variety of plant, medicinal and household ingestions.

The Referral File. When you register

your copy of Home Medical Advisor, you'll be eligible to receive a listing of Board Certified physicians, hospitals and specialty clinics in your area. Registered users will be eligible for updates (every 10-12 months).

Complete and easy to understand, this is one of the most important NEW titles on the market today. "The program was interesting and detailed enough to fascinate me, yet easy enough for my 8 year old to run on his own."

Ralph C. Losey
Attorney in Orlando, FL



Hard drive required,
EGA 256K or VGA.

Home Medical Advisor

BBD3860 Home Medical Advisor 5 1/4" \$69.95

Premium Quality Memory Upgrades At Shockingly Modest Prices!

If you use a computer, you know the benefit of more memory. With a few more megabytes of memory you not only load it, you see it snap and pop onscreen with lighting speed.

We're proud to present the highest quality, most reliable memory available. Offered directly from the manufacturer, Z-COM Micro Electronics, you get top quality for practically wholesale prices.

Can You Do It?

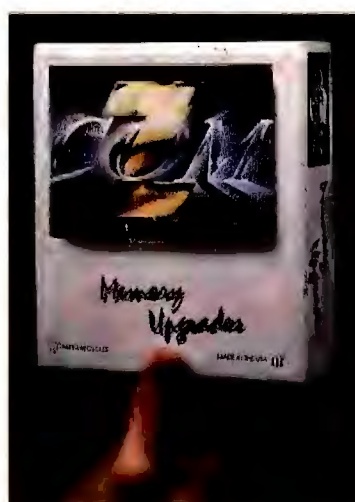
Think adding memory is over your head? It's not so hard really. Your computer manual will tell you what kind of memory chips you need. And it will even show you a picture of where to plug them in.

For PCs and all compatibles, we offer three sizes of SIMMs, which stands for Single Inline Memory Module. A SIMM is a small board with memory chips on it. You simply plug the board inside your computer. Very easy to install. Each SIMM comes in either 256KB, 1MB, or 4MB size, to fit the right size your computer needs. And these chips are fast! Most others sell 100ns (nano-second) chips. But our 256KB SIMM has 80ns chips, and 1MB and 4MB SIMMs have 70ns chips. That's fast! You'll get quicker calculations and eye-popping graphics.

Laser Printers.

Ever tried to print a full page of graphics on your stock laser printer? If so, all you ended up with is a half-drawn image. Stock laser printers just don't have enough memory to complete a full page. But the solution is simple. A memory card you slip into the side upgrades your printer for full page graphics and all the fonts you could ever want. There are additional sizes available.

Z-COM has been producing memory upgrade



products for the past six years and manufactures standard as well as proprietary memory upgrade products for Apple, AST, AT&T, Canon, Compaq, Epson, Everex, Hewlett Packard, IBM, NCR, Okidata, Panasonic, Sharp, Sun, Texas Instruments, Toshiba and Zenith computers, workstations, and laser printers. Z-COM currently manufactures memory upgrade products for over 20 manufacturers and currently has over 200 line items.

Z-COM designs, assembles, tests, and packages their memory upgrade products. With a multi-million-dollar assembly facility, including a Class-100,000 Clean Room. All Z-COM products are manufactured using the highest quality equipment under the tightest tolerances and the strictest controls. Z-COM's manufacturing process begins with having all products run through their incoming inspection process. Everything is double checked, from board tolerance and thickness, to the consistency of the solder paste. Z-COM controls the manufacturing process from the moment the ICs arrive at our facility, through the manufacturing process, up to the final packaging.

INCLUDES FREE BOOK!

When you purchase Z-Com memory, we'll include "A Very Basic Guide to Memory" from the Tiger Editors. This is a complete explanation of how memory works and how to easily upgrade.

Z-COM

BBD6430	SIMMS 256 x 9 80ns	\$14.00
BBD6431	SIMMS 1 x 9 80ns	\$49.00
BBD6432	SIMMS 1 x 9 70ns	\$49.00
BBD6433	SIMMS 1 x 9 60ns	\$52.00
BBD6434	SIMMS 4 x 9 80ns	\$178.00
BBD6435	SIMMS 4 x 9 70ns	\$179.00
BBD6436	SIMMS 4 x 9 60ns	\$199.00

Z-COM MEMORY UPGRADES

For AST Systems

BBD6437	1Mb for AST Premium 386C, 386/16	\$99.00
BBD6438	1Mb for AST Premium II 386SX20, 386SX16, Cupid-21, AST Premium 386; 25 & 33	\$59.00
BBD6439	1Mb for any AST Executive Notebook	\$72.00

For Compaq DeskPro's 4 Laptops

BBD6440	1Mb for DeskPro 386/20e, 20, 25e & 25	\$80.00
BBD6441	1Mb for SLT/286	\$89.00
BBD6442	1Mb for Portable LTE/286	\$93.00
BBD6443	1Mb for Portable 368S/20	\$179.00

For Hewlett Packard LaserJets

BBD6444	1Mb for LaserJet II & IID	\$85.00
BBD6445	1Mb for LaserJet IIP, III & IIID	\$80.00

For IBM PS/2

BBD6446	2-14Mb Xpand w/2Mb for Models 50, 50Z, 55SX, 60, 65SX	\$267.00
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For Toshiba Laptops

BBD6447	1Mb for Portable T1000SE, LE & XE	\$119.00
BBD6448	2Mb for Portable T3100SX	\$119.00
BBD6449	2Mb for Portable T3100E	\$119.00
BBD6450	2Mb for Portable T3200SX	\$119.00
BBD6451	2Mb for Portable T5100	\$119.00

SIMM Modules have a 5-year warranty; all other memory at lifetime warranty. Call for additional items. 100ns RAM also available.

Automate Car Care with Your PC...

Introducing the World's Only Car Care Software...

REVIEWER'S NOTEBOOK: The business of owning (or leasing) an automobile: controlling insurance costs, increasing your car's resale value, prolonging its life, paying less tax and keeping up with the details. You can make light work of your car's care and feeding with a unique new product called ROAD SCHOLAR. Let's face it, a car is a big expense and you've got to take good care of it or else you pay dearly at trade-in time. Besides keeping track of maintenance and safety issues, ROAD SCHOLAR reminds you of license and insurance renewals, inspections, warranty expirations and more. Business drivers can print accurate reports for tax deductions, tracking expenses to the penny. Miles-per-gallon and cost-per-mile figures, maintenance history, graphs and charts on vehicle performance, stores all vehicle documentation, more! Any type of vehicle: car, mo-

tor home, truck, motorcycle — even golf carts! Wouldn't it be nice to have someone remind you that you're due for an oil change? How about instant information on vehicle fluid capacities, insurance requirements or market value of an automobile. How about complete listings of phone numbers of manufacturer's representatives.

Easy to install, fun and fast to use. ROAD SCHOLAR takes care of all the details — no more scrambling for maintenance records, insurance papers and other documentation.

An excellent tool for business drivers and auto enthusiasts. New car buyers will love to chart the miles-per-gallon and cost-per-mile performance of their new car versus that old trade in. For the IRS, ROAD SCHOLAR maintains a continuous tax record of monthly and annual Business vs. Personal mileage, tracking deductible expenses automatically. You'll get the maximum tax benefit and get concise support documentation.

Users report higher resale value, thanks to ROAD SCHOLAR's accurate historical maintenance, repair and expense information. We tracked the operating-only cost of four different types of cars: A Corvette, a Cutlass Supreme, a Mazda Miata and a SAAB 900 Turbo over a four-week period. While the Mazda was the least expensive to run over that period, we were surprised to learn that the SAAB was more expensive to operate than the Corvette.

Road Scholar handles every aspect of owning a car: Warranty, Safety, Steering & Suspension, Tires, Wheels, Brakes, Title, Tags and all Permits. It also includes a helpful warning system that helps you keep track of important



Quickly track cost-per-mile!

dates and avoid unnecessary expense and road problems. The Preventive Maintenance alert always takes a priority with Road Scholar.

Road Scholar alerts you to other important dates as well, including your Warranty expiration dates, Inspection dates, License expiration dates (including tags, title and permits). It also alerts you as to the due date of your next insurance premium and your gasoline credit card payment dates. How many times have you lost track of warranty expiration and ended up paying for work that WOULD have been covered? That will never happen with Road Scholar.

The Vehicle Inventory Information section of Road Scholar can save you money on insurance by recording things like anti-lock brakes, anti-theft alarm and passive restraints. Recording this information as it applies gives you instant access to information on eligibility for insurance premium discounts. Many of these discounts are substantial.

Whether you're an auto enthusiast or just want to get the lowest cost-per-mile, Road Scholar is the perfect tool. One of the most original new products.

ROAD SCHOLAR

BBD3345A ROAD SCHOLAR \$59.95

Automatically Turn On Your PC By Modem!

REVIEWER'S NOTEBOOK: This best-seller is a must for anyone who uses a computer on the road or at home, as well as the office. With the price of pocket-sized, very fast modems coming down, remote computing is becoming a business standard. Now you can call from any phone and turn on any remote computer (or any other equipment), without the wear and tear or maintenance cost of leaving the equipment running full time.

With pcAnywhere, Carbon Copy, Commute or any other remote communication software you'll have total control over your remote computer. Then, when you hang up, the equipment is turned off — all remotely and automatically.

Remote Power On/Off works like this: Just connect the Remote Power On/Off unit to your office PC. Then, from your home or remote location, actually turn on the office PC and begin work. With remote communication software, you can access and use software applications, perform lightning fast data transfers, even use printers and other peripherals connected to the office PC. And here's the enormous benefit: the office PC does not have to be running 24 hours

a day. You'll see significant savings in energy costs (estimates suggest that running a PC and laser printer 24 hours a day can cost an extra \$50 each month) and over time, you'll reduce wear on the equipment

Network An Office In Less Than An Hour!

No Experience Required! Share Printers, Send Messages and More.

Easy Office Network makes connecting PCs as easy as plugging in a new phone.

It seems everyone wants to connect up their computers lately. Being able to share an expensive laser printer or a high-speed, costly modem is a big money-saver. Not to mention the increased productivity gained by sending electronic messages between PCs. Then there's the advantage of quickly and easily transferring files. (What's worse than having to transfer a file too large to fit on a disk?)

Reap the benefits of networked computers without the little-known hassles. Expensive networks like Novell require expert (read in "high-paid") technicians to do the simplest of everyday tasks. And big networks require special versions of your existing software. (That's a big hidden cost — new WordPerfects, 1-2-3s, etc.) You could spend thousands of dollars to connect just a handful of PCs.

But with Easy Office Network, there's nothing extra to buy. Everything you need — cables, connectors, etc. — comes complete in one easy-to-use package. Anyone can quickly install Easy Office Network. It's as simple as plugging in a telephone. (In fact, they use the same kind of wire and plug.) After one fast, initial installation, Easy Office takes care of itself with no further attention from you. You'll be reaping the benefits of networking — without the hassles!

- Share Serial and Parallel Printers with Disk Spooling.
- Share Expensive Modems.
- Send Messages Between PCs.
- Run Remote Applications.
- Transfer Files Between PCs.

When you throw in password security, file locking, and a host of other features, Easy Office Network



becomes a vital business solution.

Start with the 4-PC or 8-PC kit, then add on when the need arrives. Multiple Easy Office Networks easily link together to support 16, 24 or 32 PCs. And don't worry about memory — Easy Office Network uses only a scant 48k.

All you do is plug the Easy Office Network connector into the serial port (which every PC has), and run the simple installation program. No boards or other hardware to install. No expansion slots taken up, and no conflicts with other boards. This product really lives up to its name: Easy.

SERVER TECHNOLOGY

BBD6300 Remote Power On/Off	\$149.95
BBD6301A Easy Office for 4 PCs	\$399.95
BBD6301B Easy Office for 8 PCs	\$495.00
BBD6301C Upgrade from 4 to 8 PCs	\$229.00
Remote On/Off: IBM PC, XT, AT and compatibles with 256K RAM.	
Easy Office Network: Requires 1 serial port for each PC.	

The Fastest, Easiest Windows Networking...

Share Files, Printers, Data And Applications (Inexpensively!)

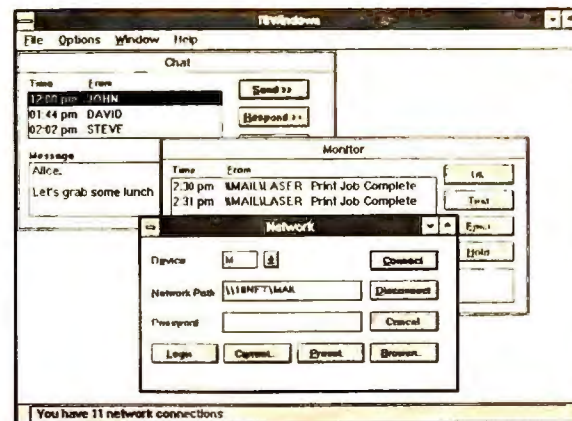
REVIEWER'S NOTEBOOK: Do you run Windows and need a way to share files, printers and keep your applications and pool of data just a keystroke away? You need a network. But finding the right network and investing in the technology you really need is a muddy issue — especially under Windows. That's why 10NET LAN has skyrocketed into popularity with small businesses, medium-size-but-growing businesses and departments within large corporations. Since 10NET LAN is peer-to-peer, no server is required — and you buy just the connections you'll use today, and add on as you need in the future. And 10NET LAN adheres strictly to the highest industry standards of compatibility, reliability and interoperability. It's a fast, easy network that gets you going in about ten minutes. Just plug the network adapters of your choice into your computers, run easy-to-install cables between them, insert a 10NET diskette and type install. That's it. Your computers are connected and you can run all of your applications exactly the way you used to. Only now you have access to all the resources anywhere on the network. Everyone connected gets more done — and they don't have to change the way they work. 10NET LAN is a speedster, with higher throughput rates than Lantastic 4.0 and NetWare Lite 1.0 in PC Magazine Benchmark tests. Highly compatible, highly flexible. Great LAN solution. 1-, 3-, and 10-node packs available.

This product holds the answer to costly, inflexible networks. 10NET LAN makes greatest possible use of your network — and your computers. Zippy throughput and instant access are the trademarks of this program, and it is the most compatible we've seen. Standards-based, 10NET LAN gives you high

levels of reliability and expandability, far beyond any product on the market today — without the need for a dedicated server. 10NET LAN supports the SMB protocol, developed by Microsoft, IBM and 3COM, and provides full interoperability with SMB-based LANs such as Microsoft LAN Manager and IBM LAN Server. 10NET LAN is not an off-the-wall attempt at connecting computers; it has been developed according to industry standards.



The issue of expandability is critical. Without the ability to quickly add members to your network, you could be headed for major problems down the road. 10NET offers expansion kits by as many nodes as you need, and supports Ethernet (thin, thick and 10BASE-T), Arcnet and Token Ring. Don't worry — 10NET LAN will easily work with your existing PCs, peripherals and software. This flexible architecture means that you'll never be out of touch with emerging standards and new versions.



PRINTER RESOURCES: 10NET LAN gives you more ways to use your printer — without making anyone wait! Advanced print sharing (spooling) technology is built into 10NET LAN that allows you to keep on working while you print. Share printers between several users, without costly bottlenecks. Prioritize "hot" print jobs and print them first. This feature alone is worth the price of 10NET LAN. Printer tie-ups are one of the most aggravating side effects. 10NET LAN ends those problems forever.

NO SECURITY RISKS: Networks must have a definitive security system. 10NET LAN's security options protect sensitive data from unauthorized access with a strategy so complete, it's in use at many government agencies today. Choose from a full menu of security options for complete customization.

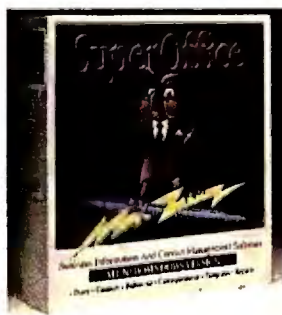
10WINDOWS for 10NET (provided free with 10NET 5.0) provides access to network functions from within Windows.

10NET LAN

BBD3280A 10NET LAN 1-node pack * \$85.00
BBD3280B 10NET LAN 3-node pack \$199.00
BBD3280C 10NET LAN 10-node pack \$525.00
*1-Node Pack requires a 3- or 10-Node Pack for complete software and documentation.

Simple, Intuitive Contact, Time, Client and Communication Tracking.

REVIEWER'S NOTEBOOK: A must for businesspeople who need to track dozens of commitments, outside contacts and opportunities. Provides fast, easy sales and marketing information management. As information changes and grows, the SuperOffice database is updated, allowing instant access to all kinds of useful combinations, perfect for the rigors of this environment. Excellent reporting, a great set of tools for easy customer/client management, comprehensive customer tracking, direct mail demystification, telemarketing tracking, lead management (how many of those do you burn?), sales forecasting and much more. In-depth contact management and follow-up tools.



"The Information Law" states that knowledge must be accessible to everyone — including the managers and executives that are responsible for the company's success. If not, then "Murphy's Law" automatically kicks in and you could be headed for trouble. Managers and executives require a unique set of figures, indicators and reports. They need raw power behind their information and contact management efforts. While computers are used for a variety of "back-office" tasks; word processing, accounting, orders, billing and payroll, they sometimes hold information about customers, markets and trends hostage. SuperOffice is the first product we've seen that combines dozens of important features used often in fast-paced environments, with an easy-to-use operation — that won't change the way you work.

You get timely information about your customers and clients, sales activity and tracking, direct mail, lead and inquiry management, sales forecasts, employee activity reporting/tracking and more.

SuperOffice allows employees at any level of expertise to become productive instantly. Work loads are more easily handled and time isn't wasted, vital information doesn't sit untouched or lost and efficiency is boosted with little effort. This remarkable product puts four powerful, easy-to-use office management tools — client contact directory; daily schedule planner; follow-up tracking and correspondence templates — together with a shared database! So vital, up-to-the-second data is at everyone's fingertips.

All of the individual tools are fully integrated for streamlined operation, and can be used as a single- or multi-user database system.

Diary. Included in the Diary is the Agenda, an advanced time planner that allows complete control over daily schedules. References include customer names and notes detailing the activity. Privacy encourages use of program for all scheduling, eliminating the need to maintain multiple calendars and ensuring that action items are not overlooked.

Follow-Up. Follow-up provides a comprehensive overview of past and planned activities by account and provides key information about the types of services you are providing your customers and clients. When a customer calls, anyone within the organization can scan all past and planned activities and be of immediate service.

Customers. The Customers' file stores all data about your customers, clients and prospects, including address, phone, fax, and key contacts. An unlimited number of customers and contacts can be entered, with room for notes about each person. Be-

cause SuperOffice utilizes a shared database, all users can edit any record.

Letter, Fax and Spreadsheet Templates. SuperOffice simplifies correspondence by providing a direct link between a selected customer record and various pre-designed letter and fax templates, which work with most popular word processing software. By searching for a specific account and choosing a template, the company's mailing address, contact person and date are automatically inserted.



Specifically designed to track the kinds of information needed by business people dealing with clients or the public.

SUPEROFFICE

BBD3794 SuperOffice Competitive Upg. ... \$99.95
BBD3795A SuperOffice Single User \$295.00
BBD3795B SuperOffice 5 User \$1295.00
BBD3795C SuperOffice 10 User \$1795.00
Requires 286 or higher, Windows 3.0, min. 2MB RAM; monochrome, gray scale or VGA monitor; only laser or dot matrix printer
Call for further information on Macintosh Version.

Turn Your Black-And-White Hand Scanner Into An Explosive, True COLOR Scanner!

REVIEWER'S NOTEBOOK: I own a 256 grayscale hand scanner and often scan photos or illustrations for use in the TigerSoftware catalog. I don't own a color scanner (they are very nice, but very expensive), however a color scanner would sure come in handy sometimes. I could use color to create color slide shows, presentations, newsletters — and posters of the kids. That's why I was particularly intrigued with the CAT Color Converter. It actually converts my B&W hand scanner into a true color scanner! Just attach your 4" wide hand scanner to the CAT Color Converter and scan your color photo 3 times, using the built-in colored filters. When you've completed your scans, the CAT software combines the images into a fully balanced, true color image automatically. A legitimate alternative to a color scanner, with top-notch quality.



The CAT Color Converter works with all leading B&W scanners.

The CAT Color Converter allows you to capture thousands of colors and if you have a grayscale hand scanner, you'll get up to 16 million vibrant colors. If you've got a VGA display adapter, the optimal 256 colors will be automatically selected for scans with lifelike color and rich detail. The powerful CAT Color Converter software (included free) allows you to easily adjust the color palettes, brightness and contrast. Using this powerful software, you can create exportable .PCX and .TIF files in RGB format for use in desktop publishing, draw and paint programs (I work extensively in PC Paintbrush, DeluxePaint and ColorRIX, CorelDRAW! and Designer) to combine text, graphics, special effects and more. Everything you need is in the package: The CAT Color Converter scanning guide (12" x 10" x 1"), with built-in color filters, light source and hand scanner mounting de-

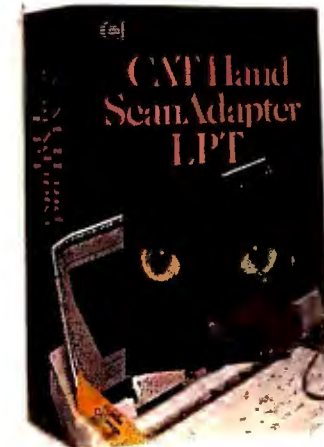
vice. You also get the CAT Color Converter image processing software, power adapter and complete documentation.

CAT Color Converter Supported Hand Scanners: The Complete Hand Scanner 200/400/GS; DFI Handy Scanners HS-2000/3000/3000 Plus; GeniScan GS-2000 Plus/4000/4500/B105G; Logitech ScanMan/ScanMan Plus/ScanMan 32/ScanMan 256; Marstek Mars 105/105 Plus/800; Mouse Systems PageBrush/32; Niscan/Niscan GS; Primax SE-400/SE-800.

Use Your Scanner With Your Laptop! Scan On The Road, At A Meeting Or At The Library!

A perfect match. Your portable or notebook PC and your hand scanner. The CAT Hand ScanAdapter LPT connects directly to your computer's parallel port and allows you to capture any information, photo or design—anywhere. The small, pocket-sized

device slips into your briefcase and comes complete with CAT Image Enhancer software which automatically converts hand-scanned, dithered images into 16 levels of gray. It also allows you to create files for use in professional graphics manipulation. It's simple, fast and very convenient. Works beautifully with all leading black & white hand scanners that we tested: The Complete Hand Scanner and half-page scanner, Logitech, Marstek, DFI Handy Scanner and Geniscan. Allows direct output to Epson dot-matrix, HP LaserJet and DeskJet, supports Hercules, CGA, EGA and VGA display, allows automatic image scaling and cropping and more.



CAT Hand ScanAdapter LPT Supported Scanners: The Complete Hand Scanner 200/400; The Complete Half-Page Scanner 200/400; DFI Handy Scanners HS-1000/2000/3000/3000 Plus; GeniScan GS-2000/2000 Plus/4000/4500; Logitech ScanMan/ScanMan Plus; Marstek Mars Scanners.

CAT

BBD3120 CAT Color Converter \$159.95
BBD3121 CAT Hand ScanAdapter LPT \$139.95
IBM PC XT, AT or compatible; VGA or SuperVGA graphics adapter; 640K RAM Memory with hard drive; PC-DOS or MS-DOS 3.1 or higher; supported hand scanner.

Watch TV — On Your Computer!

Full Audio And Video — 119 Channels And Cable — Right On Your PC!

I always wanted to do this! I'm often working at my computer, preparing a spreadsheet or working on a word processing file, and thinking "I wonder who's on Oprah today?" During baseball season, it would be nice to catch a couple of innings of a daytime doubleheader from Fenway Park or tune in for CNN's Headline News. Now, Desktop TV puts a TV set inside my computer that lets me watch my favorite shows! I

can return to my spreadsheet at anytime and continue to listen to the audio of the news, Good Morning America or Donohue. If the conversation gets wild, one keystroke switches me back to television.

Desktop TV supports both DOS and Windows 3.0 environments, without any reconfiguration. And I can even watch TV while my computer prints, does backups — anything that doesn't require my monitor. Desktop TV has no adverse effect on my monitor, it runs as it always does.

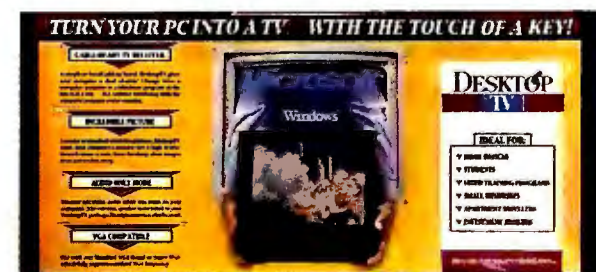
This is one of the hottest new innovations to come along this year, delivering a great picture on my PC screen just like my TV at home (PC displays provide more dots per inch, and Desktop TV delivers VGA-level quality). I get full 119-channel compatibility (including cable, VHF, UHF, VCR, video camera and videodisc) and great sound, with Desktop TV's superb speaker system. Desktop TV advanced technology shatters the barrier between high-quality analog video and computer-based information. Everything is controlled from my keyboard: video source, channel selection, volume control, audio monitoring and even memory settings for your favorite channels!

How Does It Work?

It's simple. The Desktop TV board installs in seconds into a standard PC expansion slot. It comes complete with cables, control software and speaker system. Just connect a standard coaxial cable, external antenna or rabbit ears to the card and you're done. Desktop TV hooks up just like your TV at home. I'll never miss a World Series game again!

It's Fun, But There Are Serious Applications As Well...

I love my Desktop TV system. I can watch the news, the closing stock reports and more without leaving my office. But the potential uses of this



system are unlimited. Firms with internal broadcast facilities can use Desktop TV to distribute material throughout their offices without moving their staff to viewing rooms. By attaching a PC to a VCR, corporations of all sizes can conduct on-screen training sessions using pre-recorded videocassettes (many software vendors include tapes in their packages). In fact, using a video camera, you can turn your PC into a video monitoring station for security.

Special Features:

- Full Screen Video on a computer monitor.
- Quality color picture.
- One touch PC to TV switching.
- 119 channel TV tuner.
- Full keyboard control.
- Audio monitoring mode.
- RF Video input: F Connector; for VHF, UHF and Cable TV, VCR, videodisk, or network supporting RF modulated NTSC video signal.
- Audio output: Mini phone jack, for connection to a speaker or headphones; external speaker included.
- Video graphics adaptor: VG1 model requires a VGA board; MF1 model supports EGA & VGA boards.

DESKTOP TV

BBD3882 Desktop TV 5¼" & 3½" \$299.00
IBM XT/AT (286/386) or compatible; MS-DOS 3.1 or higher; controls available either through DOS, a TSR or Windows 3.0.
Call for further details.



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Add Thunderous Pro-Quality Sound To Your PC!

What's it all about — MultiMedia? Audio boards? Sound effects and mixing? How about this new generation of games that include monstrous audio effects? How do I get those capabilities on my PC? It's easy, and not just for professionals anymore! Now, with Media Vision's easy-to-use, low cost audio systems, you'll hear the blast of rockets, the screech of tires, the jingling of keys and the screams of the latest victim. Some games are so audio intensive, they're nothing with the sound to accompany the video (think about the last movie, commercial or TV show you saw and how the music played such an important part). Listen to soundtracks and special effects built into other software programs as well with the awesome Thunder Board. Just slip in into your PC and start hearing your software in full stereo sound. Thunder Board is completely compatible with AdLib and Sound Blaster, so you can play games that support synthesized music.

But when you're ready to move to a higher level of audio presentation, the Pro AudioSpectrum has more features and value packed into an easy-to-use system than anything else around. Record and playback soundtracks for presentations, perform fast MIDI sequencing, automated mixing and more. Choose from a library of sound effects.

The Awesome Thunder Board.

Pop in the latest PC game software and hold on to your seat. Thunder Board explodes with full stereo sound for your PC. It allows up to 22KHz digital audio sampling to take full advantage of the blistering new games, dynamic filtering for crisp sound and an 11 voice synthesizer for great reproduction of musical sequences. Thunder Board even provides you with free software samples: NOVA 9 (the sequel to Stellar 7, an audio classic), Lemmings and Lexi Cross, three of the hottest new entertainment prod-

uct on the market today. Each takes you for a ride on the most incredible sound system you can buy for the PC. There's more, like the Thunder Master software that's included free. It allows you to record and playback your own sound files. Use a microphone or another sound source. Mix pre-recorded sound files, and add special effects to your audio selections. Find out what you've been missing — get a Thunder Board.


Pro AudioSpectrum

Let's say you were giving a presentation to 50 people. You had incredible overhead transparencies. You had quotes that endorsed your product, typeset and used as part of your presentation. That would have impact. But what if you could present your customer's actual voice endorsing your product. That's more impact. You can do it with Pro AudioSpectrum, and sync it precisely with your visuals. What if you added a musical score to your presentation? More impact still. Pro AudioSpectrum turns your PC into a recording studio, with full MIDI capabilities, so musical compositions sound like the composers intended them to. Or, add ambient background sounds to your presentations — a ball park, crowds, sirens, singing birds and rustling leaves. Then, a special effect or

two, to explode at the perfect spot, pops, pings, or the resonant sweep of white noise. That would really drive your point home!

The Multi-Media Performer

This single audio card transforms your computer into a full Microsoft Level 1 multimedia platform. One card — mega sound, with plenty of built-in instrument sounds, noise reduction features, studio and special effects, mixing features, output amplification — even a music clip library (jazz, pop, rock, classical and more!). And you can do it! It's fast, easy and fun. Record soundtracks, voice overs and more from a variety of stereo sources.



MEDIAVISION

BBD6816 Thunder Board	\$169.00
BBD6818 Pro AudioSpectrum Dual	\$389.00

Create Realistic, 3-D Landscapes That May Cause Vertigo! Or View The Heavens In An On-Screen, Digitized Planetarium!


REVIEWER'S NOTEBOOK: *Amazingly realistic electronic landscapes that put you on the edge of your seat. Using new VistaPro is like hiring a helicopter and flying over some of the world's most picturesque natural wonders: Mt. St. Helens — before and after the eruption, legendary Half Dome and El Capitan in Yosemite, Crater Lake in Oregon and the Cauldera area of Olympus Mons — Mars! You can create your own scenes from the billions of randomly generated fractal landscapes built-in — and adjust camera angle, focal length, lens power and more. Assemble animated sequences and incredible dreamscapes with VistaPro's powerful animation engine. The result is stunningly realistic images that can move you right into the landscape.*

We were also impressed with VistaPro's sister product, Distant Suns. This is a fascinating astronomical playground for students, amateur astronomers and curious spectators. It displays the night sky with precise accuracy for any part of the world, including 9100 stars, 450 galaxies, nebulae and star clusters. Add up to 3,000 custom objects to the sky. Click on any object and bring up detailed information, including your choice of over 200 photos.

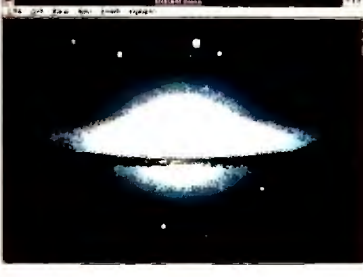
Arthur C. Clark, author of 2001: A Space Odyssey says "I'm really boggled, it's beautiful, especially when all the lights are off. I'm totally awed by what you have done!"

VistaPro.

Create 256-color images with high-quality resolution in true 3-D. Produce animated "flights" over custom landscapes, with several modes of coloring and shading and fractal image detail. Add trees and mountains, snow, waves, haze, rivers and cliffs. Zoom in, swoop in or swing out for a broader view.




Allows you to paint your landscapes to produce thousands of possible effects. Light your scenes the way you want — daytime, midnight, sunrise or sunset, produce lifelike shadow detail and natural movement. You'll create images that trick your brain into thinking they're real! Also includes a special bonus program that creates landscapes from Mandelbrot, Julia and Lyapunov sets — bringing their wonderful work to 3-D life! Don't miss the animated flyby of Mars (and the Martian version of the Grand Canyon)!



Distant Suns Windows.

A time machine and a telescope! Distant Suns Windows

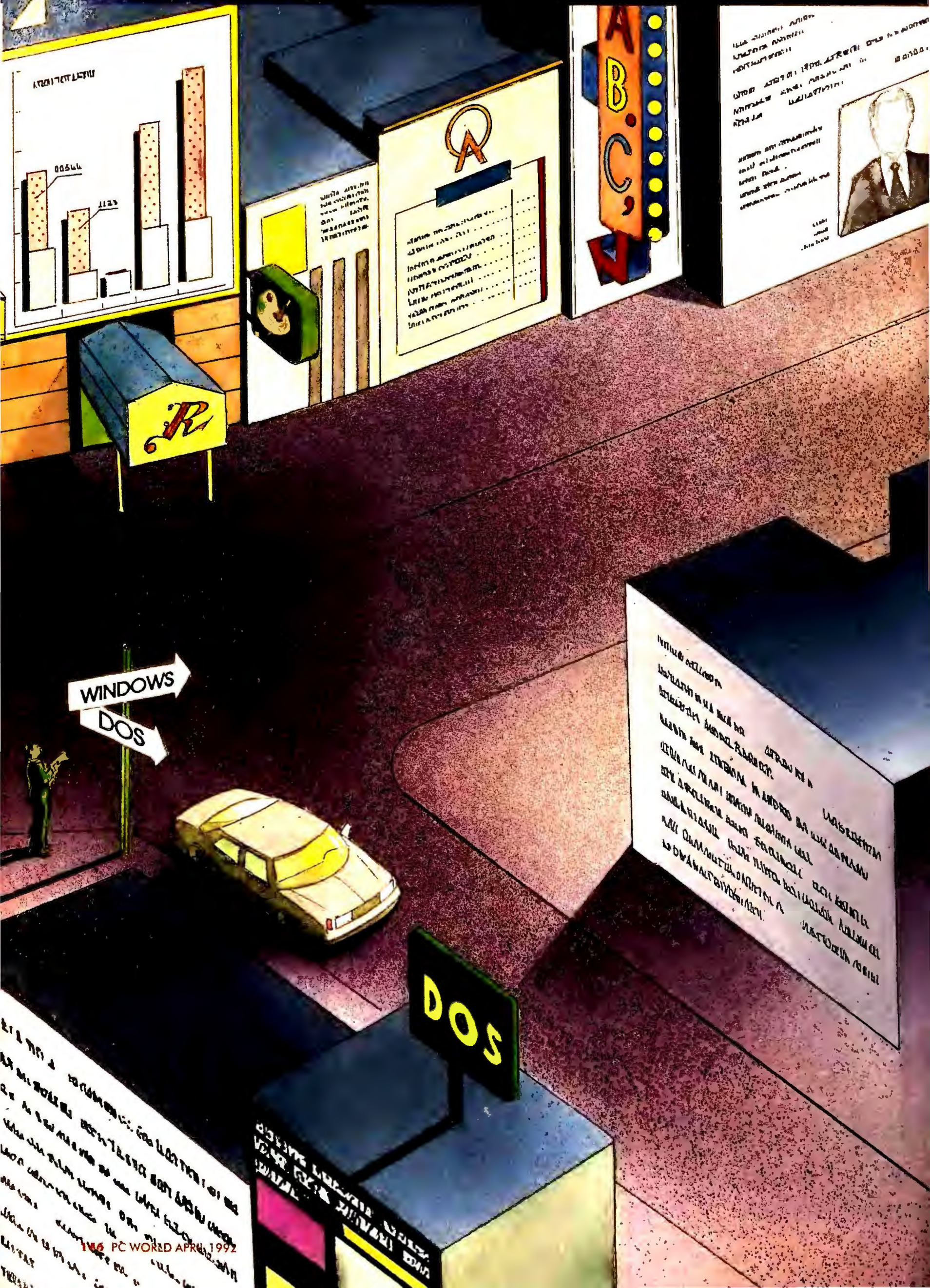
allows you to travel to any date and see the unique view of the sky. The changing phases of the Moon, the planets and the stars, the constellations and more. Travel 1,000 years back in time and observe the exact sky that inspired the ancient Anasazi astronomers. Or discover how the Egyptian Pharaohs built the pyramids eternally aligned with distant suns. See the mysterious movement of Mercury and Venus, rare planetary eclipses, stellar occultations and witness instellar dust forming nebulas.



VIRTUAL REALITY LABS

BBD3283 VistaPro	\$89.95
BBD3284 Distant Suns	\$89.95
BBD3282-5 Distant Suns & VistaPro Bundle 5 1/4"	Save \$20
BBD3282-3 Distant Suns & VistaPro Bundle 3 1/2"	Save \$20

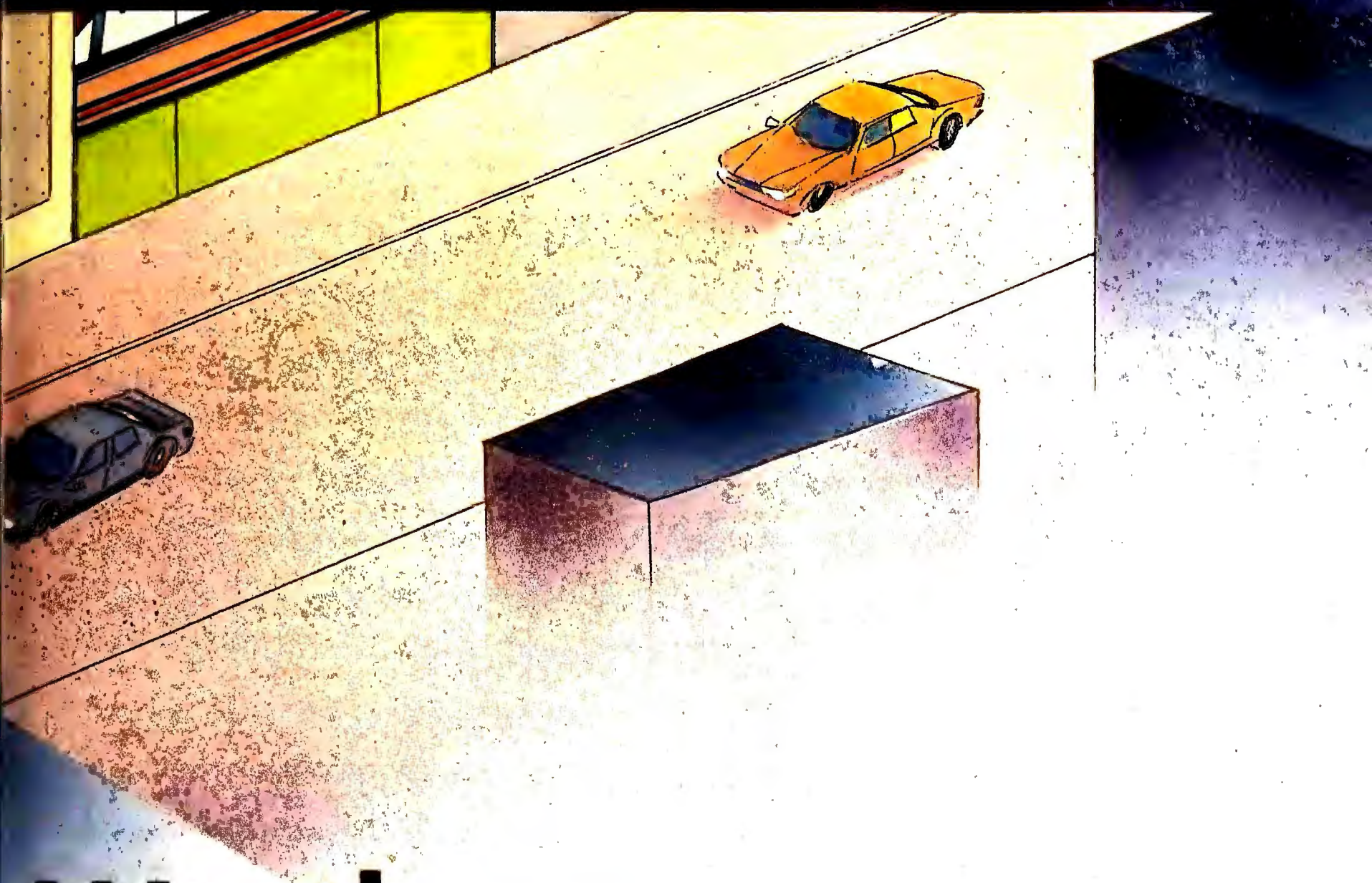
VistaPro: 640k RAM w/540k free, hard disk w/3Mb free, VGA/SVGA graphics card (VESA driver), and driver. Distant Suns: Microsoft Windows, 286 or greater, EGA or VGA and hard drive.



WINDOWS

DOS

DOS



Windows Word Processors

IF EASE OF USE AND THE WEALTH OF FONTS IN THESE WORD PROCESSORS CAN'T CONVINCE YOU WINDOWS IS WORTHWHILE, NOTHING WILL.

BY GEORGE CAMPBELL

In today's rugged economic landscape, anything you can do to improve your image is not just a good idea—it's critical. The latest visually oriented *Windows* word processors make it much easier to produce documents with the impact you need. The combination of fast-formatting, accurate page layouts that you can see on your monitor, and the capability to link to other *Windows* programs has made *Windows* the environment of choice for document preparation.

It could easily take you weeks or months to explore and master any of these six feature-packed word processors, but the best of them let you get started in a hurry, and you can learn the fundamentals more quickly than with DOS-based *Word* or *WordPerfect*. These *Windows* packages sport fast,

icon-based commands, one-click style sheets, seamless document conversions, and simple integration of graphics and charts. Using fonts, designing multicolumn pages, and creating complex documents such as newsletters and advertising materials is now commonplace for *Windows* users.

You no longer have to leave your word processor to access spreadsheets, data bases, and other applications. Dynamic Data Exchange and the new Object Linking and Embedding links let you incorporate all this data into your documents, making your word processor your control center.

Even if *Windows* itself doesn't light your fire, you'll discover that if you want all the latest, greatest tools and tricks, you'll find them only in *Windows* word processors—software publishers are clearly devoting their best efforts to the *Windows* arena. While all three of the *Windows* programs in our

DeScribe 3.0

PROS: Excellent kerning and tracking, stretch and shrink text, automatic drop caps, powerful undo **CONS:** Fairly difficult interface, poor group editing and long-document features, limited mail merge, hogs resources

Formerly available only for OS/2, *DeScribe* now runs under *Windows*. Although the program adds a few nice desktop publishing tricks such as special text effects, its editing features more closely resemble the lower priced *Pro Write Plus* and *JustWrite*. It's recommended only for OS/2 work groups that have already standardized on *DeScribe* and want to move gradually to *Windows*.

DeScribe's basic interface is pretty standard *Windows* fare, but it's still more difficult to learn. The users' manual lacks an index, and the indexed reference manual is topic oriented rather than the more efficient command-oriented organization. Menus are illogical. For example, page layout tools are in the Object menu, while you use the Edit menu to insert page breaks. Where the other programs' dialogs let you modify values for margins and other variables by clicking on a scroll bar, *DeScribe* makes you type them in.

DeScribe's keyboard shortcuts aren't easy to remember. For example, <Ctrl>-B runs a backward search, rather than boldfacing text as is typical. As with *WinWord*, when you finish an operation, selected text remains selected. That in itself is okay, but unlike *WinWord*, clicking elsewhere doesn't remove the highlight, so you can easily end up deleting highlighted text when you don't mean to.

When using font-scaling software like *Adobe Type Manager*—you'll want to with any *Windows* word processor in order to make on-screen text look presentable at large and small point sizes—*DeScribe*'s screen display often falls behind your typing, and there's no fast-draft editing mode to escape to. What's worse, *DeScribe* uses more

Windows resources than it should, making it difficult to run other applications simultaneously.

Formatting is also tough. Like the other programs here, *DeScribe* offers icons for quick access to formatting, but instead of placing them off the page, *DeScribe* puts them in a floating toolbox that obscures the text or menus. The right mouse button hides and displays the toolbox, but it's still obtrusive and you can't slap them onto any side of the screen as you can with *Ami Pro* or *WordPerfect for Windows*. Also, you're limited to formatting icons only.

DeScribe is adequate for simple letters and other short, uncomplicated documents, but it fell down in our other tests. Our long business report was difficult to create without master document, outlining, or group editing tools. Group workers will also miss the ability to insert notes or comments in documents, and footnotes are completely manual, without even the simple convenience of auto-numbering.

DeScribe delivers some helpful publishing features, such as automatic dropped capitals and stretched or compressed text. Kerning and tracking are superior and, although *DeScribe* lacks

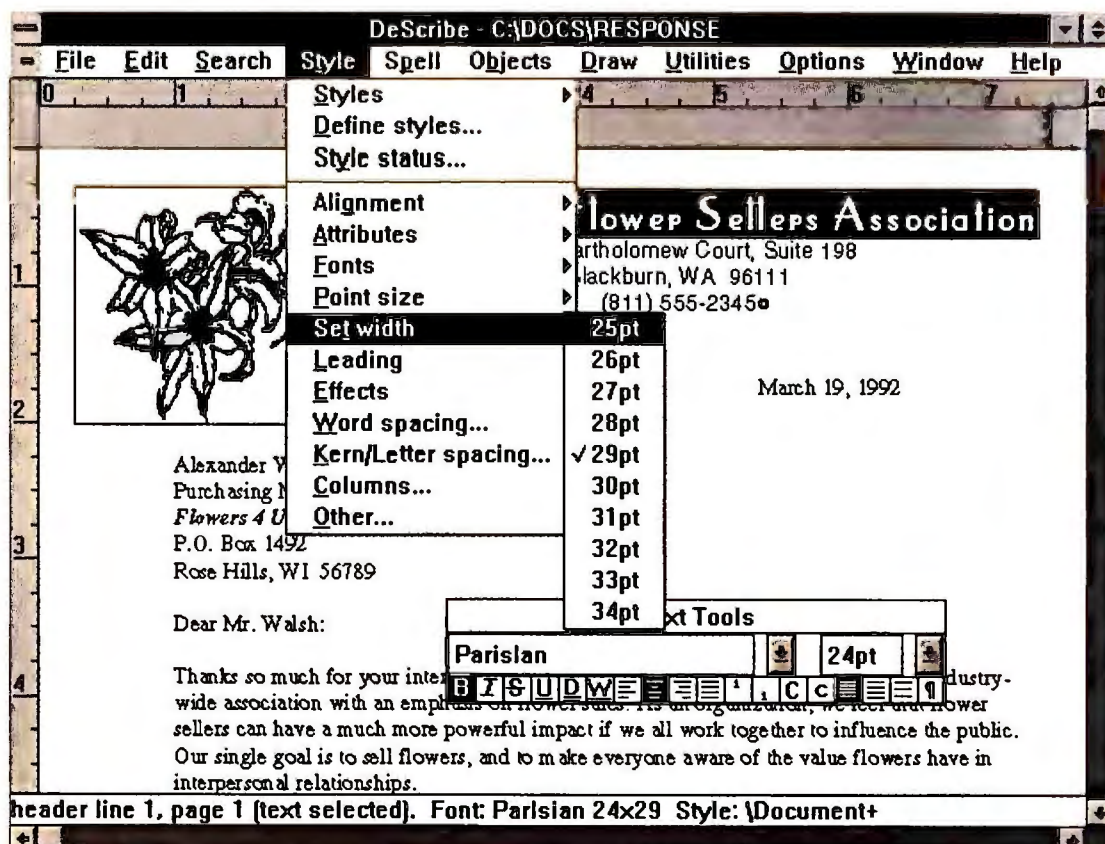
charting, you do get a drawing module. Creating our advertising flier and newsletter were complicated, however, by a lack of text frame linking, snap-to grids, and the inability to create styles from preformatted text.

Mail merges are hampered by a lack of *dBASE III* file support, and you're forced to insert merge fields by typing them in. Worse, the program offers no

DeScribe delivers some helpful publishing features, but it fell down in our long-document tests.

conditional merge commands, so you can't customize your documents based on the merge data. *DeScribe* does include a capable BASIC-like macro language.

DeScribe 3.0 falls short of the mark in almost every area. You can do better with any of the other word processing programs reviewed here.





Unique to *DeScribe* is the capability to stretch and shrink text horizontally. This feature allows you to manipulate headlines to suit your needs.

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go, a great-looking
ordPerfect document!

Fred H. Hutchison
President
F.H. Hutchison & Co.
Washington, D.C.

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Kraft General Foods
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Kathy Lettenmaier
Sr. Records Clerk, AT&T
Basking Ridge, N.J.

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CONVINCED!**

**Boyd Savage
System Administrator
Roberts & DiPaola, P.A.
West Palm Beach, Florida**

Had No Idea My Dot
Matrix Printer Could
Pump Out Type Like This.

KENNETH ARNOLD
CONSULTANT
KINDRED SYSTEMS
TUCSON, AZ

After all, who'd resist a utility that gives you 16 award-winning Bitstream® typefaces in 2-500 point sizes by simply pressing 'Ctrl-F8' in WordPerfect? Who'd pass up the chance to instantly produce top-quality type from almost any LaserJet,® dot matrix or inkjet printer? Who'd miss out on all this, knowing that FaceLift 1.5 for WordPerfect needs just a fraction of your hard disk space, and takes only 10 minutes to install?

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Monospace 821

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Formal Script 421

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Brush Script™

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150 Symbols Proportional

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"FaceLift's output was the most impressive of all (font) packages tested..."

PC Week 8/26/91

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ITC Zapf Dingbats is a registered trademark of
International Typeface Corporation. LaserJet is a
registered trademark of Hewlett-Packard Company

Round-The-Clock Protection



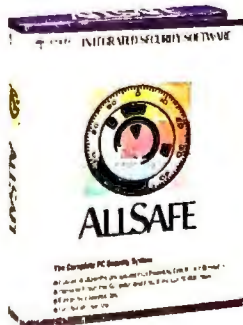
But the clock will run out on our \$60 savings offer.

Now you can protect your computer against both viruses and intruders 24-hours a day for just \$69, but only if you order by April 30, 1992.

More than one out of every ten PCs were crippled by viruses last year, according to *ISPNews* (June 1991). And the frustration and financial loss brought on by hackers is beyond calculation.

AllSafe™, from XTree Company, is the most powerful protection program available. First, AllSafe contains ViruSafe™, the most effective medicine for the prevention, detection and elimination of known or unknown viruses, whatever their alias or mutation.

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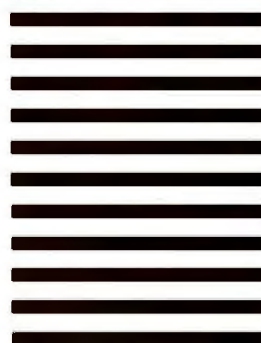
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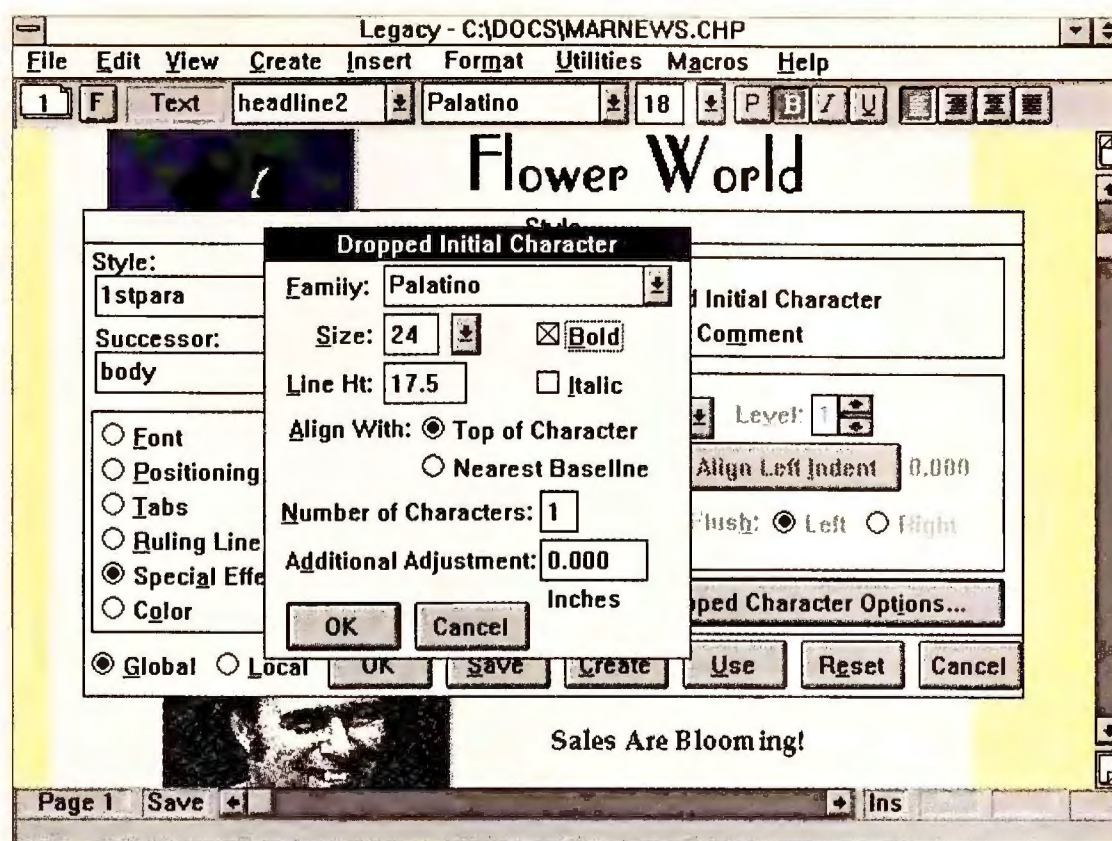
Legacy 2.0

PROS: Text flow between frames, snap-to grids, excellent kerning and tracking, brightness/contrast controls **CONS:** No conditional mail merge, no redlining, no math functions, weak outliner, saps resources

Slowly but surely NBI's *Legacy* is evolving into a very capable word processor, especially for people who create complex, graphics-laden documents. Version 2.0 adds customization features and gives a much-needed boost to ease of use, while retaining its considerable desktop publishing skills.

Learning this complex program is simplified by an interactive tutorial, and the well-indexed manual offers a task-oriented layout. But *Legacy*'s interface is still a tough nut. Menu logic is flawed—for example, you must use three menus to create and edit styles. When working with frames, you must click a button on the icon bar to switch from editing a frame's layout to editing the contents of the frame.

Basic editing is simple, however. Cut and paste uses normal *Windows* commands. A number of editing views, including a custom-sized view, are available, although you're limited to working with a single document at a time.



Features such as Legacy's automated drop cap tool help make it a good platform for creating newsletters and other desktop publishing documents.

Formatting text is just as easy, using simple keyboard shortcuts, handy icon bar commands, or menu commands. You can't alter the icon commands as you can with *Ami Pro*, but you can assign macros from the powerful new macro language. Other drawbacks include style sheets that won't let you create a style based on an actual example and a tab ruler that doesn't appear during normal editing.

Creating letters is easy but takes a long time. Group-edited documents are touchier and there are no master documents, bookmarks, or redlining tools to simplify the task. The revision tracking and document summary tools can't make up the difference. Plus, *Legacy* is the worst resource hog of the group.

If you're doing mail merge, you'll wish NBI had included conditional operators. *Legacy* can read *dBASE III* files directly, however, letting you insert merge fields from a pick list.

Legacy comes into its own with desktop publishing. A snap-to layout grid helps align frames to add precision. Best of all, though, you can link multiple frames even across pages. Text in one frame automatically flows into other linked frames, making multipage jobs easy. Graphic support is excellent, with good handling of TIFF files and a competent drawing program, but no charting module. Automatic dropped capitals and bulleted lists are nice extras.

If you require heavy desktop publishing, *Legacy 2.0* is a good choice. It comes closer to programs like *Ventura Publisher* than any other program here. But for general document preparation chores, you'll want an easier program.

Running the Gauntlet

To make our evaluations mirror the real world, we tested these programs with several types of documents, each linked to different work scenarios.

Letter or fax (two pages): Focusing on simple editing and formatting, this test applies to everyone who does word processing.

Advertising flier (one page): Combining text and graphics, this document gave desktop publishing and formatting tools a workout.

Newsletter (six pages): Newsletters require powerful desktop publishing, typographical, and formatting tools, plus graphical tools.

Business report (100 pages): This report measured text manipulation, spreadsheet data, graphics, charts, and tables, as well as long-document and group editing tools.

Mail-merge letter (two pages): Using a *dBASE III* address list, this test examined editing and formatting tools, along with the capability to merge data to create an effective mass mailing.

Buying Smart: A Clear Window on Word Processing

Because the best of today's Windows word processors can serve as a control center for all your work, making the right choice can be key. Ease of use plus editing and formatting tools should be your highest priorities, with customization and automation, graphics handling, and performance close behind.



EASE OF USE

Look for logical, well-conceived menus that group related commands and easy keyboard shortcuts. In a Windows word processor, effective use of the mouse is vital—for example, dialog boxes should be designed so you can increment values by clicking on a button rather than typing in numbers. Icons can speed many tasks, but look for a program that lets you select a subset of icons and arrange them on screen. You should be able to assign macros to an icon and add macros as menu items. You'll learn a new program faster if it includes an interactive tutorial and provides help making the transition from your old word processor. *Word for Windows* is the easiest program reviewed here.



EDITING

Each of these packages offers the ease of Windows text-editing tools, including quick cut and paste, search-and-replace tools, fast text selection for block operations, and undo commands. The ability to move text with your mouse is a plus. Your program should be able to edit more than one document at a time, and should let you edit your report in magnified and reduced-size views that show the exact page layout. You'll also need a fast-draft mode for quick text

entry. More advanced editing tools fall into three categories:

Writing aids You'll find context-based spelling checkers in all these programs, and *Legacy*, *Word for Windows*, and *WordStar for Windows* also include grammar checkers. Each has a thesaurus, but some are better than others: *Ami Pro*, *DeScribe*, *Legacy*, and *WordStar for Windows* all use a version of the Merriam-Webster Thesaurus, which is extremely sexist. For the word "woman" it offers: mistress, girlfriend, inamorata, lover, paramour. Look up "man" and you see: human, being, individual, person. For large projects, you'll need an automatic outliner with the capability to expand and contract—the best ones let you hide a document's actual text within the outline, so you can quickly navigate a large document.

Long-document options The capability to generate a table of contents and an index is a minimum requirement. You'll benefit if a program can build a table of contents based on heading styles. Bookmarks let you jump to fixed locations in your document, and automatic cross-referencing is valuable. You should look for a master document feature that allows you to assemble a document from smaller sections. Automatic footnotes and endnotes and equation editors are essential for academic and financial users.

Group editing tools LAN users who work with complex documents created by different authors need annotations for comments passed among users. Redlining automatically tracks and marks changes in a document, allowing editors to make changes while keeping the original text in place. Then, when all

changes are approved, they can become permanent with one command. Document comparison and revision-tracking tools also monitor changes and help keep complex documents current. Document summary features maintain editing and revision records and allow quick file location using keywords to identify files. E-mail support allows groups to communicate without leaving their word processors. All in all, *Word for Windows* offers the best mix of basic and advanced editing tools.



FORMATTING

The days of simple documents printed in one fixed-width column are long gone, and good riddance. You'll need a complete set of text, paragraph, and page-formatting tools to do the job today. Multiple columns with the capability to create columns with different widths are a must, and you'll need quick font selection and text formatting. Full support of scalable fonts, either printer-based or using font-scaling software such as *Adobe Type Manager* or *FaceLift* is a must.

With style sheets you can quickly format documents with character and paragraph attributes. If you can save style sheets separately from the document, you can maintain several standard layouts and apply them at will. You'll also need the capability to import and export files from other word processors while keeping basic formatting in place. *WordPerfect for Windows* and *WinWord* both recognize a file's format and don't force you to confirm file type when you import text—a real timesaver if your associates use different programs.

For desktop published documents, you'll want kerning (let-

terspacing) and tracking (wordspacing) controls, plus the ability to link two or more frames with automatic text flow between them—especially handy for newsletter stories that continue on another page. Special text effects, such as stretching, shrinking, or bending text around curves can help punch up printouts. *Ami Pro*, *Word for Windows*, and *WordPerfect for Windows* all tie for first place in formatting.



PERFORMANCE

Speed is always important, but all these programs work at a good pace as long as you have a 20-MHz 386 CPU or faster. *WinWord* delivers the best overall scores but each program shines in one or more individual areas. Printing speed is the big separator. If you want to start a print job then get back to work on another document or application, look for a program such as *AmiPro* that has its own print utility.



CUSTOMIZATION AND AUTOMATION

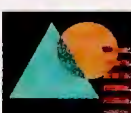
A programmable macro language is valuable for customizing your program to perform typical, yet complex maneuvers with a single keystroke or mouse click. The capability to create macros by recording keystrokes is a must, but some users will also want to edit more advanced macros with a complete macro language. Corporate users will enjoy a program that can make automated templates, which create preformatted documents that prompt users.

If you ever send mass mailings with personalized letters, you'll want competent mail-merge tools. You

should be able to use native files from *dBASE* or other data base managers and choose merge fields from a menu list. Conditional commands let you customize mail-merge letters by inserting text based on the contents of your data.

Because *Windows* is a multitasking environment, you'll want links to other applications so you can work without constantly switching programs. Two-way DDE (Dynamic Data Exchange) links, which automatically pass data between programs, are a must, but the new OLE (Object Linking and Embedding) links are easier to use. OLE links let you run the program that created an embedded object, such as a chart or worksheet, by simply double-clicking on the object.

If you'd rather create worksheets with your word processor, all these programs include easy-to-use table editors. Once again, *Word for Windows* is the winner at these advanced corporate features.



GRAPHICS

A picture paints a thousand words, and so do good graphics capabilities. Your program should be able to import all the popular graphics formats, and with built-in drawing and charting tools, you won't have to jump to another application to create or edit images and graphs.

Since all these programs offer framing tools for text and graphics, look for a program that lets you position, scale, and move frames without accessing a dialog box. If you need very precise layouts, you'll want to have snap-to grids on screen. With

its advanced handling of scanned TIFF images, *Ami Pro* is still the wizard of graphics.



PRICE

All six programs cost \$495, with street prices ranging anywhere from \$250 to \$350. These prices seem quite reasonable for the many jobs that these programs can handle. If you're using another major word processor, check with the vendor for special competitive upgrade pricing.



SERVICE AND SUPPORT

Service policies vary greatly from product to product, but you should at least insist on unlimited free support. Toll-free telephone numbers and extended hours are a real plus. If you use on-line services, check for support forums. Finally, fax support can eliminate the possibility of busy signals and holding patterns.

To evaluate technical support, we made three calls to each company at different times of day. The calls involved asking a simple installation question, a query on how to change the program's default font, then a tough question about setting up a mail-merge letter.

We evaluated the accuracy and clarity of the answers we received, and factored in the time needed to get an answer, wait on hold, and wait for a return call, if needed. If top-notch support is crucial for you, *WordPerfect for Windows* will make your day. Check with the vendor for special upgrade pricing. Most offer competitive upgrade packages for \$150 or less.

Word for Windows 2.0

PROS: Easy to use, handy envelope printer, automated mail merge, OLE links, long-document and group editing features, fastest in roundup **CONS:** No image enhancement tools, no text flow between frames



Clearly at the top of its class, *Word for Windows 2.0* adds the charting and graphics tools missing in version 1.1, then dazzles you with exciting new interface touches. It also offers the fastest performance overall. The result is a Best Buy that's not only the most powerful word processor the world has ever seen, but also one of the easiest to use.

An excellent tutorial guides new users through the program, step by step, shortening the learning process. Former *WordPerfect* users also get a hand; they can use their familiar keystrokes while *WinWord* teaches its own, more powerful, system. This transitional help even beats *WordPerfect for Windows*' tools.

Editing in *WinWord* is child's play. You can select text with the mouse, then drag it to a new spot in the document for the easiest text moves ever. Only *WinWord* has it. Version 2.0 also adds multiple editing views, including a customizable view.

Formatting is also simple; use the menus, style bar, or click on an icon. You can create icons for any command or macro, but the bar isn't movable like *Ami Pro*'s. *WinWord* also has excellent style sheets (now saved separately), and you can set columns and margins by dragging markers on the ruler.

One of the handiest new features is a unique envelope-printing icon that grabs addresses, then sends them to the printer. An equation editor similar to *Ami Pro*'s lets you pick symbols from a chart, then paste them into the document. A similar tool inserts foreign language and symbol characters. Font

sizes, however, are limited to 127 points maximum. That sounds like a lot, but it's only about an inch and a half—not enough for desktop publishers doing special headlines and ad type.

Printing gets a boost with fine support for font-scaling software. As with *Legacy*, you can print landscape and portrait pages in the same document. Graphics tools now include drawing and charting modules, plus *WordArt*, which lets you rotate, shade, and shadow text, or bend it around curves.

Group edited and long documents benefit from an outstanding, all-inclusive outliner. Indexing, tables of contents, cross-references, and footnotes work seamlessly, and you get a complete set of group-editing tools, as well. Document management is superb, with complete text searching tools and document summaries. You can even preview text and graphics files, saving valuable time when hunting for the right graphic or text file. Like *Ami Pro*, the program offers flawless OLE links for *Excel* and other OLE-capable programs by double-clicking on a screen object. Corporate programmers will love *WinWord*'s powerful macro language, as well as its automated templates, which help make

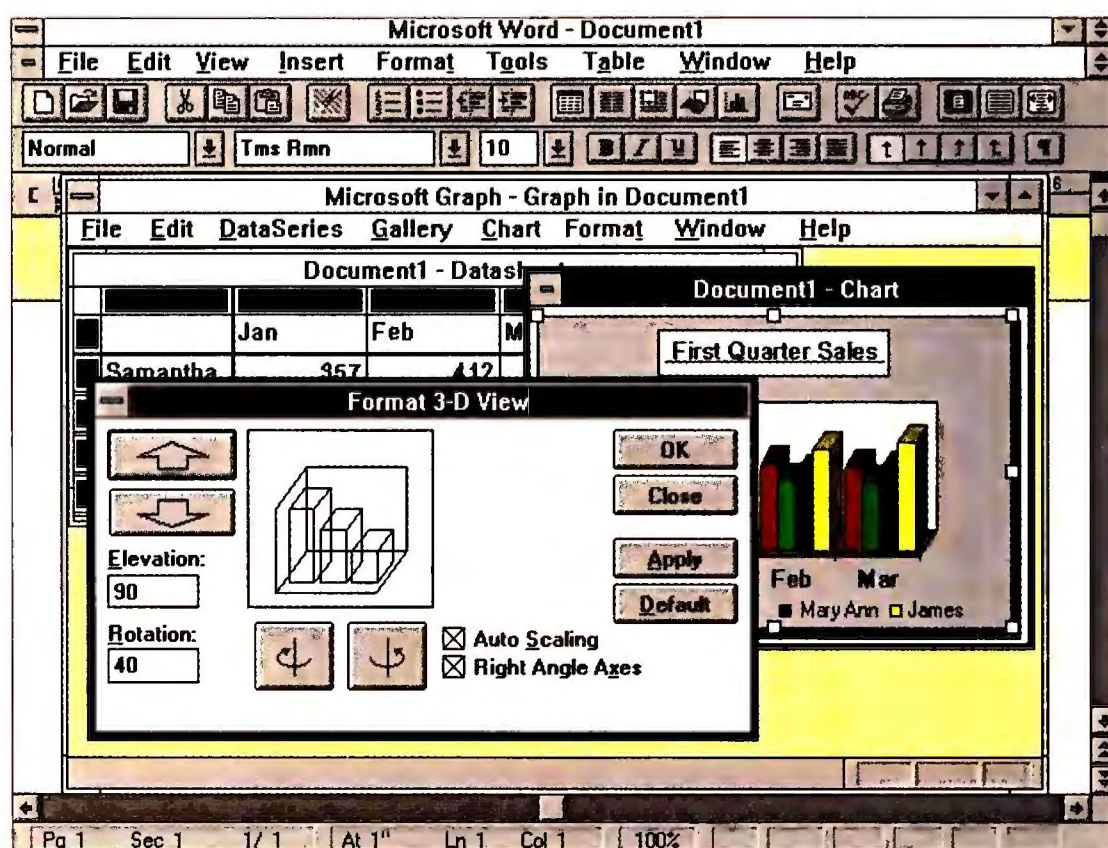
forms come alive with prompts and cross-references.

If you do mass mailings, *WinWord* is the answer. It not only offers the most sophisticated mail merge, it's also the easiest. *WinWord*'s prompts lead you through data file selection, including native *dBASE III* files, then help you select fields and conditional commands and preview before printing.

Select text with the mouse, then drag it to a new spot for the easiest text moves ever.

Desktop publishing features work well, too. You get automatic bulleted lists, variable-width columns, plus leading, kerning, and tracking controls. *Legacy*'s linked text frames and automatic dropped capitals are missing.

Whatever your word processing chores, you'll hit the mark with *Word for Windows 2.0*. *Ami Pro*'s handling of scanned images is superior to *WinWord*'s, but overall *WinWord*'s power and ease of use make it your Best Buy.



Word for Windows 2.0 includes a powerful business graphics module that can even rotate graphs to give you a completely different perspective.

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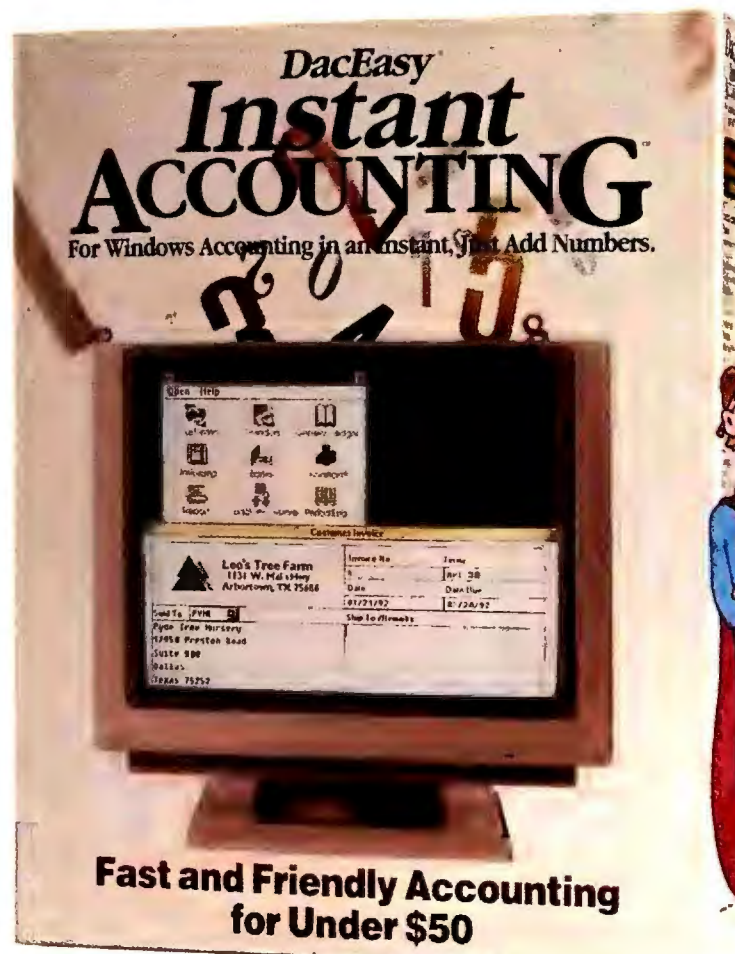
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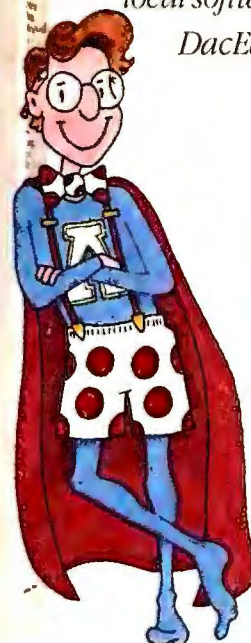
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WordPerfect 5.1 for Windows

PROS: Easy to use, shares file formats with WordPerfect 5.1, can use WordPerfect 5.1 keystrokes **CONS:** Only one graphical editing view, no drawing or charting, difficult mail merge, no macro language documentation, no font matching in preview

Is *WordPerfect for Windows* the best *Windows* word processor? No. Both *Ami Pro* and *Word for Windows* are better. Is it the best for *WordPerfect* users? Maybe. But only if you don't need charting or drawing, and if your graphics handling, desktop publishing, and mail merge needs are limited. *Word for Windows* has the edge in all these areas, is easier to use, and gives optional *WordPerfect* keystroke compatibility to boot. Still, *WordPerfect for Windows* should be a popular upgrade. It drapes an easy-to-use interface on a capable feature set that's almost identical to *WordPerfect 5.1* for DOS, plus you get *WordPerfect*'s legendary support.

WordPerfect users are in for an eye-opening change with the flashy icon-based interface, but there's still enough familiar furniture to help you get your bearings. If you're switching from the DOS version, you can use most of your old keystrokes. You can also convert simple macros, and the program shares file formats with *WordPerfect* so there's no extra file conversion chores.

Unlike *Word for Windows*, however, you don't get instructions on the *Windows* interface as you work, and there's no on-line tutorial. There is, however, an excellent help system that lets you point at any screen object to pop up immediate context-sensitive help. All in all, the program is pretty easy to use—you get plenty of keyboard shortcuts, and a movable icon bar holds a customizable set of icons showing pictures, text, or both. As with *Ami Pro*, you can add icons for your macros or commands. If you're not a *WordPerfect* devotee, however, you may find the menu logic a bit

faulty. For example, when setting up user preferences, you won't find a one-stop dialog box as in *WinWord*—you set each item in different menus.

You're limited to just one graphical editing view, but noneditable print previews offer several magnifications. Unfortunately, previews don't display your actual fonts and don't reflect the true appearance of your printouts.

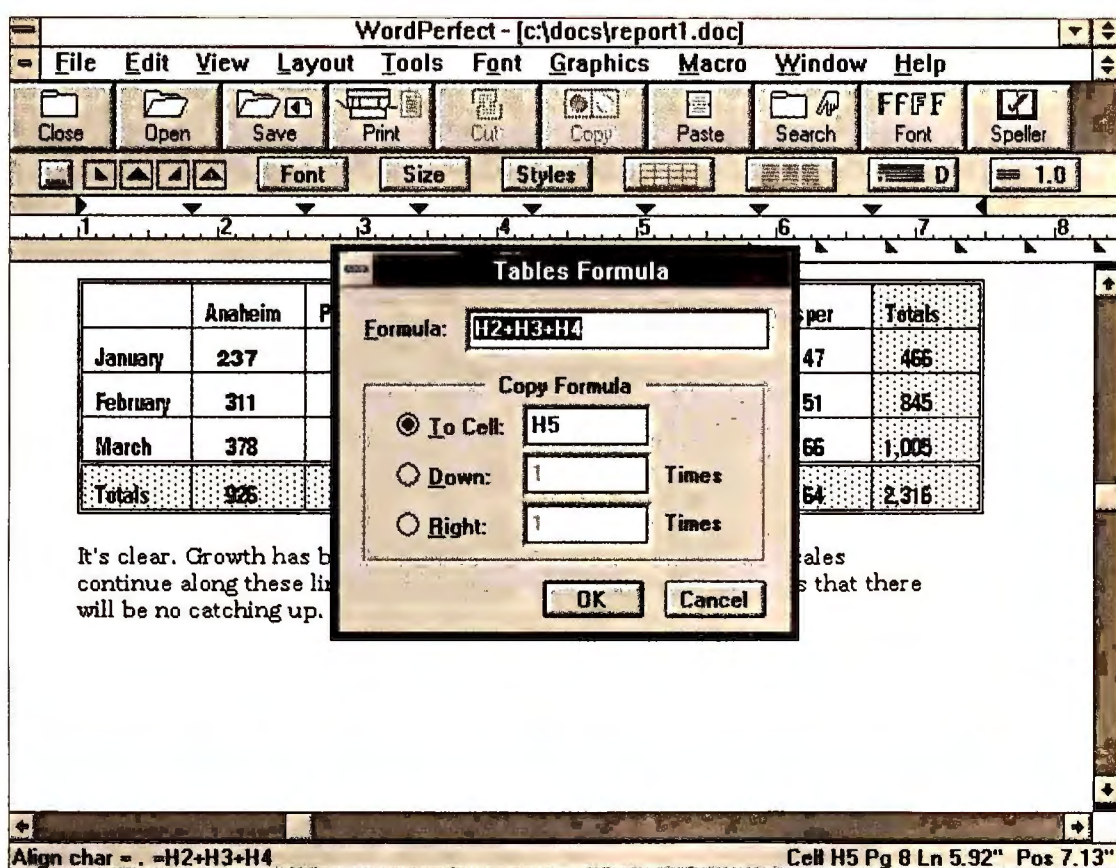
Formatting is fairly easy. One style per file is stored, which complicates template creation, but a pulldown list makes selection easy. There are no sample styles or templates, but you can move column, tab, and margin markers. Unlike half the programs here, *WordPerfect for Windows* has an equation editor. It's usable, but can't hold a candle to *WinWord* or *Ami Pro*. You also get a collapsible outliner, but it's limited.

Work group and long-document tools are as good as *Winword*'s, and bookmarks, cross-referencing, and master-document tools are equal to any of these programs. Work groups will like the powerful redlining, annotation, and revision tracking tools, and the file manager is so good you may want to run it as a separate application to control all your *Windows* files.

When you dig deeper, however, you come up empty. The macro language is less powerful than *WinWord*'s, and you'll need the \$19.95 macro manual to do programming. *WordPerfect*'s DDE links are one way only, with *WordPerfect* as the client, and there's no OLE support. Mail-merge tools are the same as in the DOS version—clumsy, but powerful. There's no support for native *dBASE III* files and no pick list method for inserting fields in documents.

The desktop publishing tools are barely adequate. Instead of frames, you must choose from graphics, table, and text boxes. And as with the old version, you have to type in the coordinates in a dialog box before you can freely manipulate the box with your mouse. Line and box drawing tools are part of the package, and you can select special graphics-based characters, but there are no complete drawing or charting modules.

WordPerfect 5.1 for DOS users will need to decide how much word processing firepower they need and how important *WinWord*'s file and macro compatibility is. This program is clearly a contender and a good value, but if desktop publishing and mail-merge features are important, you should look elsewhere.



By inserting simple formulas into table cells, you can treat a *WordPerfect* for *Windows* table like a mini-spreadsheet. Shading, fonts, and other customized features make your tables stand out.

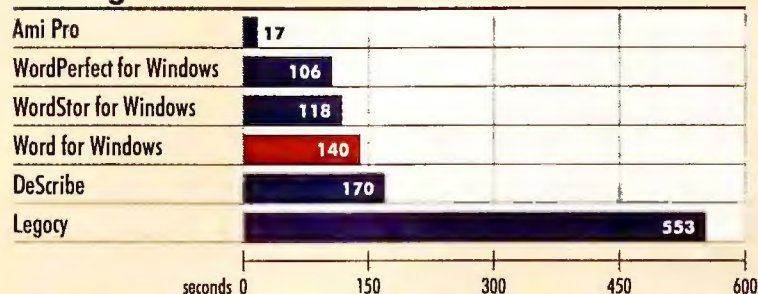
PC WORLD TEST REPORT

WinWord, Ami Pro Speed Past WordPerfect

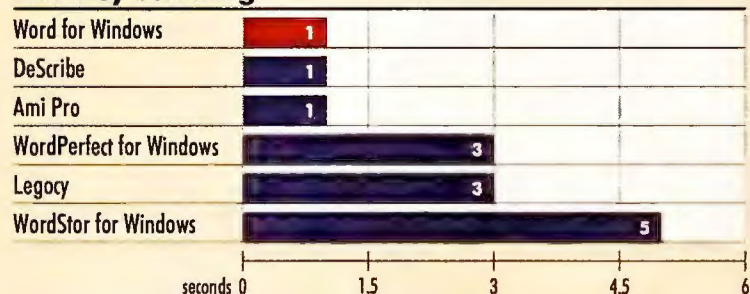
Word for Windows is the fastest program here, turning in solid scores on nearly every test.

BEST BUY

Printing



Hot-key scrolling



Methodology

Our test platform is a 25-MHz 386 with 8MB RAM, a 200MB hard disk, and 640 by 480 VGA. Test files are printed on an HP LaserJet Series II with 2.5MB of memory. All tests are conducted using Adobe Type Monoger fonts.

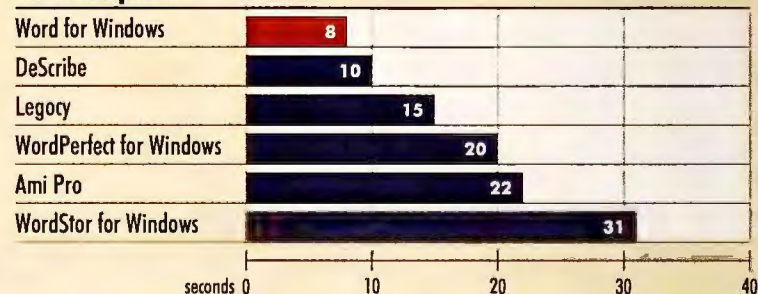
Printing

We print a one-page document containing two text columns and a TIFF image. We record time needed to return cursor control to the user.

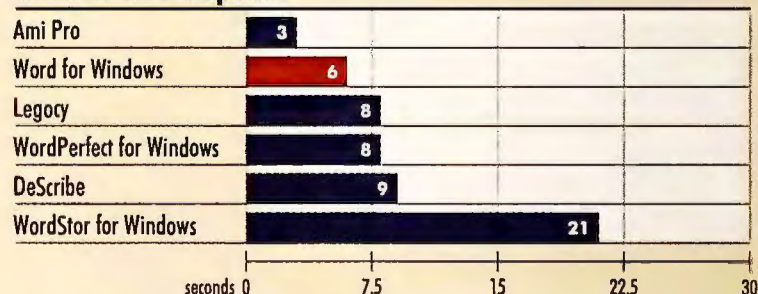
Text import

We import a 100K ASCII file and record time until cursor control returns to user.

Text import



Search and replace



Hot-key scrolling

We move the cursor from top to bottom of a 100K document using each program's hot-key sequence.

Search and replace

We measure the time needed to search and replace 609 occurrences of a single word in a 100K file.

Data based on tests designed and conducted by PC World Test Center. All rights reserved.

The Executives: Windows Word Processing Bargains

You may not need all the features of a word processing giant like our Best Buy, *Word for Windows 2.0*. If your budget doesn't include the price of a do-it-all program, don't despair; there are plenty of lower priced executive word processors for Windows 3.0. Keep in mind that just because a program offers fewer features doesn't mean it's easier. Assuming the interface and other ease-of-use issues are equal, however, fewer features usually means a lower learning curve. Here are the most prominent Windows executives:

CA-Textor 1.0

This \$225 package features a customizable icon toolbar, along with mail-merge tools that read native *dBASE III* files.

Its spelling checker supports English and French, and it offers math features for table calculations. Another plus is a full document summary feature that lets you track revisions. Computer Associates Int'l, 516/227-3300, 516/227-3937 (fax) Reader service no. 845

JustWrite 1.0

Selling for only \$199, Symantec's *JustWrite* offers excellent speed in a package with most of the essential features. You'll find easy style sheets, DDE links, mail merge, a table editor, plus support for most document and graphics files. If you work with multiple file formats, you'll love *JustWrite's* capability to recognize and convert most foreign files automatical-

EXECUTIVE SUMMARY

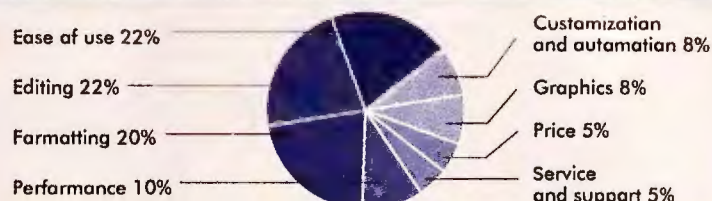
Word for Windows 2.0 Puts It All Together

With potent new editing and graphics features, version 2.0 of Word for Windows is now nearly as adept as Ami Pro, and it's exceptionally easy to use.



Some great choices await in Windows word processing, starting with our Best Buy, **Word for Windows**. Building on a powerful arsenal of editing tools, Microsoft adds improved graphics handling, WordPerfect training wheels, and innovative ease-of-use touches. **Ami Pro** lags only slightly behind, and it's still the best at graphics. Many WordPerfect users will profit from an upgrade to **WordPerfect for Windows**.

Key Buying Issues: Percentage of Importance



		Render service number	Ease of use	Editing	Formatting	Performance	Customization and automation	Graphics	Price	Service and support	Overall value
Excellent	★★★★										
Good	★★★										
Fair	★★										
Poor	★										
Ami Pro 2.0		601	☆☆☆½	☆☆☆½	☆☆☆½	☆☆☆½	☆☆☆½	☆☆☆☆	☆☆☆	☆☆☆½	★★★★½
DeScribe 3.0		602	☆☆½	☆☆½	☆☆½	☆☆½	☆☆	☆☆½	☆☆☆	☆☆	★★
Legacy 2.0		603	☆☆	☆☆☆	☆☆☆	☆☆½	☆☆½	☆☆☆½	☆☆☆	☆☆☆½	★★★
Word for Windows 2.0		604	★★★★	★★★★	★★★★½	★★★★	★★★★	★★★★½	★★★★	★★★★½	★★★★
WordPerfect 5.1 for Windows		605	☆☆☆	☆☆☆	☆☆☆½	☆☆☆	☆☆½	☆☆½	☆☆☆	☆☆☆☆	★★★
WordStar for Windows 1.0		606	☆☆	☆☆☆	☆☆½	☆☆½	☆☆½	☆☆	☆☆☆	☆☆☆	★★½

Overall value is calculated by multiplying each category rating by the category's weight percentage, summing the results, and rounding to the nearest half number.

ly. However, missing features, such as drawing and charting modules and a macro language, separate this bargain from the big names.

Symantec Corp., 408/253-9600, 408/253-4092 (fax)
Reader service no. 846

Lotus Write 2.0

Based on the same engine that drives *Ami Pro 2.0*, this \$199 package replaces the original low-end *Ami Pro* package. *Lotus Write* offers many of the same features as its sibling *Ami Pro*, including SmartIcons, OLE links, and E-mail links to cc:Mail and Lotus Notes. It comes bundled with Adobe Type Manager, and offers a \$149 upgrade path to *Ami Pro*. You won't find *Ami Pro*'s macros, drawing and charting tools, or long-document features in this lower-priced program.

Lotus Development Corp., 800/831-9679
Reader service no. 847

Pro Write Plus 1.0

Software Publishing's \$249 Windows word processor is based on an earlier release of *Ami Pro*. It features a grammar checker and direct support for MHS E-mail, letting you communicate quickly with everyone on your NetWare LAN. Multiple editing views, pop-up notes, and easy footnoting add additional power. As with the rest of these programs, though, there are no macro, drawing, or charting tools.

Software Publishing Corp., 408/988-7518, 408/980-0729 (fax)
Reader service no. 848

FEATURES EVALUATION

Windows Word Processors—The New Integrated Packages?

With Word for Windows and Ami Pro, you can chart, draw, and create tables without leaving your word processor.

● Yes ○ No
◐ Deficient
▼ Limited only by available memory

	Ami Pro 2.0	DeScribe 3.0	Legacy 2.0	Word for Windows 2.0	WordPerfect 5.1	WordStar for Windows 1.0
Standard features						
Price	\$495	\$495	\$495	\$495	\$495	\$495
RAM required (MB)	2	3	1-2	2	4	2
Disk space required/recommended (MB)	6/11	2/8.25	4/10	5/15	6/12	5/10
Editing						
Basic editing						
Fast-draft mode	●	○	●	●	●	●
Multiple graphical views	●	●	●	●	○	●
Custom views	●	●	●	●	○	●
Maximum windows	9	▼	1	9	9	1
Math functions	●	○	○	●	●	○
Undo levels	4	▼	1	1	3 ¹	1
Mouse moves text	◐ ²	○	○	●	○	○
Vertical ruler	●	●	●	●	○	●
Shows recently loaded files	●	●	●	●	●	○
On-line tutorial	○	○	●	●	○	●
Writing aids						
Spelling checker/thesaurus	●	●	●	●	●	●
Outliner	●	○	◐ ³	●	◐ ³	○
Grammar checker	○	○	●	●	○	●

BEST BUY

	Ami Pro 2.0	DeScribe 3.0	Legacy 2.0	Word for Windows 2.0	WordPerfect 5.1	WordStar for Windows 1.0
Long-document options						
Index/TOC	●	●	●	●	●	●
Bookmarks	●	●	○	●	●	●
Cross-referencing	●	◐ ⁴	●	●	●	●
Footnotes/endnotes	●	○	●	●	●	●
Master document	●	○	○	●	●	○
Group editing tools						
Annotations	●	○	●	●	●	◐ ⁵
Redlining	●	○	○	●	●	○
Document summaries/revision tracking	●	○	●	●	●	○
E-mail support	●	●	○	●	○	○
Formatting						
Basic formatting						
Style sheets	●	●	●	●	●	●
Style by example	●	○	○	●	●	○
Conditional breaks	●	●	○	●	●	○
Uneven columns	●	○	●	●	●	●
Customizable icons	●	●	●	●	●	●
Preview files	○	○	○	●	●	○
Text-format imports	20	32	22	14	15	23
Text-format exports	20	32	19	15	15	23

BEST BUY

Stable Characters—Word 5.5 and WordPerfect 5.1

Windows isn't for everyone. If you have an 8088 machine, these Windows word processors won't run at all, and they're

terminally sluggish on most 286 machines. Even on capable 386 systems, the slight delays caused by screen redraws can drive some users batty.

No wonder character-based word processors are still selling

well. Michael McCoy, a Washington, D.C.-based software consultant and trainer, says, "Windows word processors are far too slow for the day-to-day text entry and editing that I do. The huge bulk of my work is straight text with minimal graphics. When Windows 3.1 comes out, I'll reevaluate."

If you don't need or want the on-screen formatting power and graphical tools of a Windows word processor, take a look at Microsoft Word or WordPerfect. These mature, \$495 programs are by far the best choices in the high-end character-based arena. While Word's interface appeals to many users, WordPerfect's uncluttered screen has helped make it the number one word processor. If you want more information,

	Microsoft Word 5.5	WordPerfect 5.1
Mouse support	Yes	Yes
Drop-down menus	Yes	Yes
Page preview	Yes	Yes
Macro language	Yes	Yes
Long-document tools	Yes	Yes
Table editor	No	Yes
Equation editor	No	Yes
Style sheets	Yes	No
Icon-based shortcuts	Yes	No
Outliner includes text	Yes	No

	Ami Pro 2.0	Describe 3.0	Legacy 2.0	Word for Windows 2.0	WordPerfect 5.1 for Windows	WordStar for Windows 1.0
Desktop publishing						
Kerning and tracking	● ⁶	●	●	●	●	●
Special text effects	● ⁷	●	● ⁷	●	○	● ⁷
Text frame linking	○	○	●	●	○	●
Auto drop caps	○	●	●	●	○	●
Printing						
Supports font scaler	●	●	●	●	●	● ⁸
Includes font scaler	●	○	○	●	○	●
Portrait/landscape in same document	○	○	●	●	● ⁹	○

Customization and automation

Programmable macros	●	●	●	●	●	○
Macro learn mode	●	●	●	●	●	○
Use native dBASE files in mail merge	● ¹⁰	○	●	●	○	●
Select mail merge fields	●	○	●	●	○	●
Conditional mail merge	●	○	○	●	●	○
DDE links	●	●	●	●	● ¹¹	●
OLE links	●	○	○	●	○	○
Table editor	●	●	●	●	●	●
Equation editor	●	○	○	●	●	○
Automated templates	●	○	○	●	○	○

Graphics

Move, size, crop	●	●	●	●	●	●
Flow text around	●	●	●	●	●	●
Graphics/text frames	●	●	●	●	●	●
Snap-to grid for frames	○	○	●	●	○	●

**BEST
BUY**

Graphics (cont'd)

Lines, boxes, borders	●	●	●	●	●	●
Drawing program	●	●	●	●	○	●
Charting module	●	○	○	●	○	○
TIFF brightness/contrast	●	○	●	●	○	○
Overlays text on graphics	●	●	●	●	●	●
Graphic-format imports	12	20	11	25	16	10

Support

Unlimited free support	●	● ¹²	●	●	●	●
Toll-free number	○	● ¹³	●	●	●	○
Daily support hours	11	9	10	12	24	9
On-line support	●	●	●	●	●	●
Fax support	○	○ ¹⁴	●	●	●	○

**BEST
BUY**

¹ Three undelete levels but only one undo level on commands.

² One keystroke (<Ctrl>-right mouse button) required.

³ Does not include document text in outline.

⁴ In indexes only.

⁵ Displays only in draft mode; is not marked or formatted as a separate note.

⁶ Limited to loose and tight paragraph text.

⁷ Only in separate draw module.

⁸ Adobe Type Manager limited to approximately 80 fonts.

⁹ Only when running WordPerfect's drivers, not using Windows drivers.

¹⁰ dBASE support not automatic; requires special description file.

¹¹ One-way DDE only; WordPerfect must be client application.

¹² Free for 90 days.

¹³ Only for extra-cast support customers.

¹⁴ Only for customers outside the United States.

check out our June 1991 roundup—neither program has received an upgrade since then.

Microsoft Word 5.5 **PROS:** View bold and italics on screen, Windows-like interface, powerful macros, excellent outliner **CONS:** No table or equation editors

A Best Buy in our last roundup, Word offers blazing speed with a Windows-like interface. You'll find dialog boxes, graphical page previews, full mouse support, and even icon shortcuts. It handles graphics better than WordPerfect, but not nearly as conveniently as Word for Windows.

A complete, powerful macro language and style sheets fill out the program's power. Some users will miss WordPerfect

5.1's table and equation editors, but Word's outliner is outstanding, letting you instantly switch between the outline and the full document. If your tasks mainly involve pure text and basic formatting, Word 5.5 is an excellent choice.

WordPerfect 5.1 **PROS:** Excellent support, fast, clean screen appearance, equation and table editors **CONS:** Unconventional keyboard commands, weak outliner

The most widely used word processing program of all time, WordPerfect's character-based version shares all the power features of Word 5.5. It's fast, and the pull-down menus and mouse support added in version 5.1 make it easier to use. WordPerfect also offers superb toll-free technical support, as well as informal support from a legion of users.

Doing Documents With DOS

If you can't—or won't—use Windows 3.0, you still have plenty of word processing choices in the character-based DOS world. Most of the action is happening in the low-end executive class. Designed for ease of use, these programs lack advanced features such as macro languages, charting modules, and equation editors, but they fit the bill for busy executives and users with simpler word processing needs.

Not much is shaking in the world of high-end DOS word processors, but *Microsoft Word 5.5* and *WordPerfect 5.1* aren't the only players around (see "Stable Characters—Word 5.5 and WordPerfect 5.1"). Here's a survey of the upper and lower echelons of the character-based scene:

Executive Word Processors for DOS

DacEasy Word 3.0

The lowest-priced executive word processor at \$49.95, *DacEasy Word* offers easy menus, plenty of powerful keyboard shortcuts, and excellent on-line help. Formatting tools are limited, though, making the program better suited for simple documents. DacEasy, 800/877-8088

PC-Write Standard Level

A shareware classic from QuickSoft, the new, \$129 *Standard Level* received a major facelift with pull-down menus, multiple windows, context-sensitive help, and mouse support. It also adds import and export filters for a number of programs. Best of all, you can try before you buy—the shareware version resides on many on-line services and BBS's. Quicksoft, 206/282-0452

PFS:Write 2.0

Spinnaker's \$129 executive entry has an edge: You can edit in a graphical view that shows your printed page complete with fonts and graphics. It uses a Windows-like interface, with the bundled *Publisher's Powerpak* providing scalable fonts, but you don't need Windows 3.0—only DOS. Other tempting features include a clip-art library, *Grammatik*-based grammar checking, and the capability to edit two documents at once. Spinnaker Software, 800/826-0706

Pro Write 2.2

This \$249 character-based version of Software Publishing's *Pro Write Plus* for Windows offers pulldown menus, a grammar checker, a built-in address book, and import tools for major word processors. Printer support includes several font cartridges for laser printers. Software Publishing Corp., 408/988-7518, 408/980-0729 (fax)

Q&A Write

This \$199 executive word processor from Symantec offers easy, menu-driven commands, and specializes at mail merge. But it's weak at formatting. An even more stripped-down version is available on Q&A. Symantec Corp., 408/253-9600, 408/253-4092 (fax)

High-end Word Processors for DOS

DisplayWrite 5

IBM's \$495 word cruncher has a well-deserved reputation for slowness and an awkward interface. But it continues to sell well, based on its huge installed base. It's used primarily for corporate word processing. IBM Corp., 800/426-7699

MultiMate 4.0

Like *WordStar 6.0*, the \$495 *MultiMate*, now a Borland product, has a broad installed base for word processing pools and offers strong group editing tools. Still, its slow operation, confusing interface, and lack of macro capabilities limit its appeal for most users. Borland Int'l, 800/331-0877

Signature 1.0

This unique new word processor was developed by Xyquest, briefly acquired by IBM, then returned to Xyquest when IBM abandoned its application software efforts. While it uses a Windows-like interface, complete with editing views that represent the printed page, it runs under DOS. Like *XyWrite III Plus*, *Signature* offers excellent customization tools and adds an extended foreign language character set, plus a table editor, memo pad, and text and graphics frames for \$495. Future versions will run under Windows and OS/2. Xyquest, 508/671-0888

WordStar 6.0

Loyal users keep this \$495 character-based legend rolling. Its hands-on-the-keyboard operation makes it a capable editing tool, but formatting is rough. *WordStar* recently updated the program with a bevy of writing aids, including a grammar checker. *WordStar* Int'l, 800/344-6044

XyWrite III Plus 3.57

A favorite among academicians and professional writers, the \$445 *Signature* is notable for its blazing speed, flexible customization options, and handy editing tools. Xyquest, 508/671-0888

THIS NEWSLETTER WAS CREATED ON LEGACY 2.0 IN JUST 17 MINUTES BY A GUY WITH ONLY 1.5 HOURS EXPERIENCE.



I IMPORTED THIS LOGO AND
SCALED IT TO FIT THE FRAME
IN A MATTER OF SECONDS

Integrated Graphics

- Micrografx™
Drawing Tools**
- Rotate Text and Graphics
 - Proportional Scaling
 - Cropping

- Image
Processing**
- 256 Color or Grayscale
 - Black and White
 - Halftones

**Import and
Edit Images
From Popular
Graphic
Packages**

**Dynamic Data
Exchange**

TAKE CONTROL WITH LEGACY

The Word Processor with the most Desktop Publishing

More Word Processing Control

I'll bet you're thinking this newsletter was created by someone with a background in graphics design. No! I'm an average person who learned to use Legacy on my own. The beauty of Legacy is that it's incredibly powerful, yet amazingly easy to learn. In no time, you too will be able to easily create high-impact documents like this.

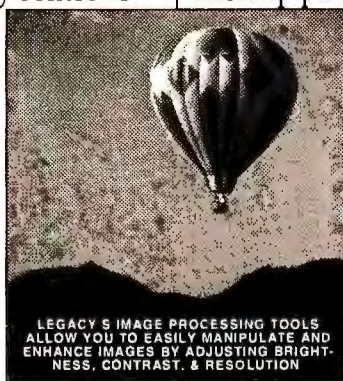
Legacy combines the advantages of a powerful word processor—grammar and spell checker, thesaurus, and macros—with the

layout flexibility of a full-blown desktop publisher—extensive

typographic control, image processing, and the ability to edit and manipulate imported tables and graphics.

Special effects like this dropped cap are amazingly simple. Just a few clicks of the mouse, using Legacy's pull-down

menus and dialog boxes, and there it is, just like you see it here. And Legacy's ability to link frames lets you flow text and tables easily and smoothly from one page to another... (Cont. on page 2)



More Desktop Publishing Control

LEGACY not only allows you to design high-impact documents with ease and efficiency, but also provides a series of templates for common business materials such as newsletters, proposals, reports, and letters.

Importing this table from a spreadsheet program was incredibly easy. Legacy automatically determined the

LEGACY IMPORTS	
TEXT	GRAPHICS
WORD PERFECT	MICROGRAFX
MICROSOFT WORD	COREL DRAW
WORDSTAR	ARTS & LETTERS
DISPLAYWRITE	WINDOWS METAFILE
MULTIMATE	MACPAINT
AMI PRO	LOTUS PIC
MICROSOFT RFT	HARVARD GRAPHICS
SMARTWARE	FREELANCE PLUS
PROFESSIONAL WRITE	DRAW PERFECT
NBI LEGACY	WINDOWS PAINT
WORDSTAR LEGACY	TIFF
DEC DX	PCX
NAVY DIF	HP-GL
ASCII	CGM
DIF	EPS
WK1 & WK2	BMP

number of rows and columns, so all I had to do was assign a style. No reformatting or rearranging necessary.

As you can see by the table, Legacy is designed to import virtually all existing software formats, so it can easily accommodate and enhance your favorite graphics, spreadsheet, and word processing programs.

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Circle 195 on reader service card

WordStar for Windows 1.0

PROS: WordStar keyboard compatibility, text flow between frames, grammar checker, font-scaling software **CONS:** Awkward interface, no conditional mail-merge commands, difficulty with Adobe Type Manager

WordStar for Windows attempts a starring role at desktop publishing, while offering current *WordStar* devotees the option of using most of their familiar keystrokes. However, it retains many of the shortcomings of the program it was based on—the old version 1.0 of *Legacy*.

An interactive tutorial and good help screens streamline the learning process. Like *Legacy 2.0*, however, *WordStar for Windows* is a bit more difficult to use than most of its rivals. Menus change as you perform different tasks, and when you work with frames, you have to click icons to switch between editing properties and contents.

Unless you choose the optional *WordStar* keystrokes, editing follows normal *Windows* conventions, and you get a variety of views ranging from full page to customized magnifications. Icons provide shortcuts for various formatting elements from fonts to tabs. Style sheets attach to documents, as in *Legacy*. So if you use a set of styles as a template, you must remember to employ the *Save As* command religiously or risk overwriting your template file.

Since *WordStar for Windows* has no

group editing tools, work groups will have a tough time assembling documents. Even on your own, long documents can be a struggle. Indexing works, but you can't base your table of contents tools on heading styles. Outlining tools are missing, and there's no master document feature.

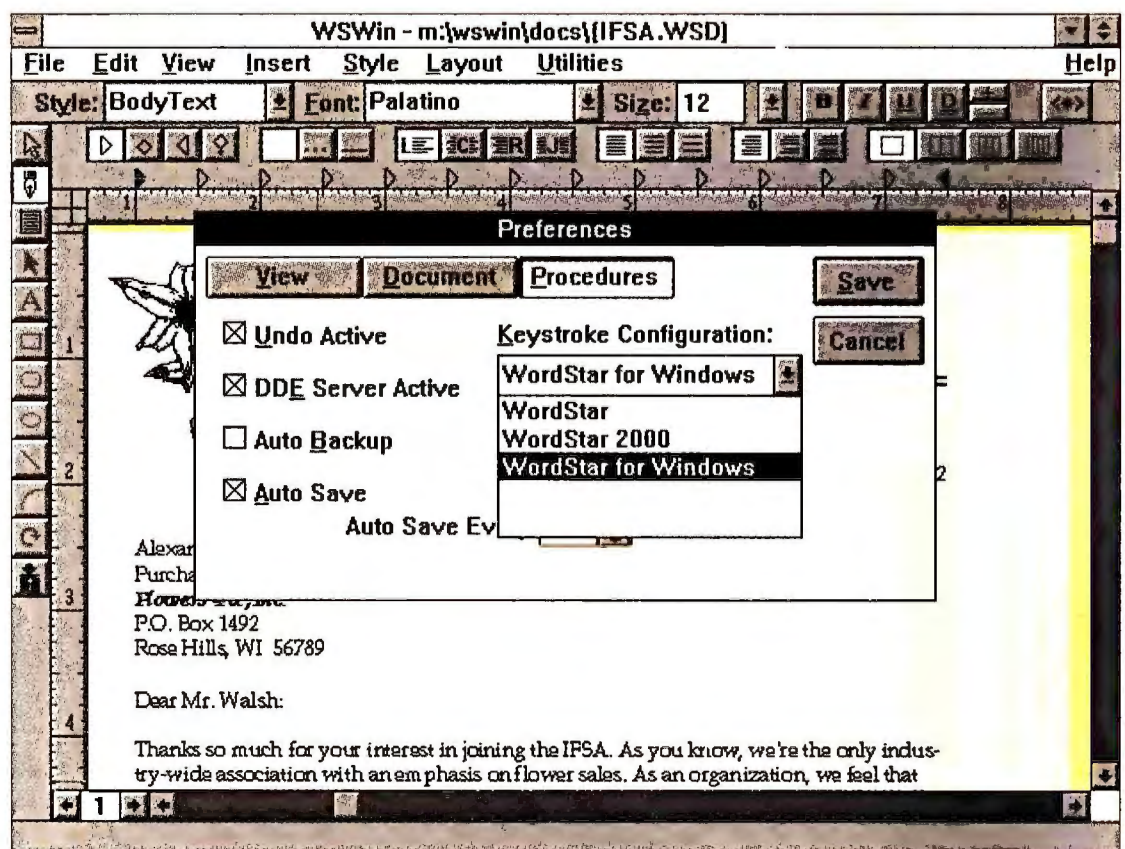
Mail-merge letters can use native *dBASE III* data files, and you can pick fields from a list, but there are no conditional commands, which keeps you from using text for different addressees.

Unfortunately, *WordStar for Windows* is devoid of macros, recorded or otherwise. This forces you to use the unreliable *Windows Recorder*, which

can only record commands. The program includes Bitstream's *FaceLift* font scaler, but if you opt to use *Adobe Type Manager*, you'll be limited to about 80 fonts; the program won't run with more.

For desktop publishing jobs, you'll enjoy *WordStar for Windows*' drawing tools, snap-to layout grids, and the capability to flow text between linked frames. You'll miss charting, though, and there are no TIFF enhancement controls as in *Legacy* or *Ami Pro*.

Dyed-in-the-wool *WordStar* users may want to use *WordStar for Windows* to keep their familiar keyboard diamond. Most other users will desire a more powerful program. ☹



If you're a WordStar or WordStar 2000 loyalist, you can hang on to your old keystrokes, including the famous WordStar cursor-control diamond.

WHERE TO BUY

Ami Pro 2.0

Lotus Development Corp.
5600 Glenridge Dr.
Atlanta, GA 30342
404/256-2272,
404/851-0007
LIST PRICE: \$495;
upgrade: for Ami Pro
purchased after March
1, 1991 \$49, Ami Pro
upgrade \$99

Reader service no. 601

DeScribe 3.0

DeScribe, Inc.
4047 N. Freeway Blvd.
Sacramento, CA 95834
916/646-1111,
916/923-3447 (fax)
LIST PRICE: \$495;
upgrade: free (docu-
mentation upgrade costs
\$90); if previous version
purchased before
August 1, 1991 \$50

Reader service no. 602

Legacy 2.0

NBI, Inc.
3375 Mitchell Ln.
Boulder, CO 80301
800/624-1111,
303/440-9168 (fax)
LIST PRICE: \$495;
upgrade: \$129

Reader service no. 603

Word for Windows 2.0

Microsoft Corp.
One Microsoft Way

Redmond, WA 98052-
6399
800/426-9400,
206/882-8080
LIST PRICE: \$495

Reader service no. 604

WordPerfect 5.1 for Windows

WordPerfect Corp.
1555 N. Technology
Way
Orem, UT 84057
800/451-5151,
801/225-5000

LIST PRICE: \$495;
upgrade from Word-
Perfect for DOS \$99
Reader service no. 605

WordStar for Windows 1.0

WordStar Int'l, Inc.
201 Alameda del Prado
Novato, CA 94948
800/344-6044,
415/382-8000
LIST PRICE: \$495
Reader service no. 606

A high-contrast, low-key photograph of a still life on a red table. A white ceramic mug is positioned in the upper left, casting a shadow. To its right, a silver spoon rests on a white rectangular napkin. Further right is a small, clear glass salt shaker with a metal top. The background is dark, and the lighting creates strong highlights and deep shadows, emphasizing the textures and forms of the objects.

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HAS AN IMPORTANT
ANNOUNCEMENT FOR PEOPLE
WHOSE WORK TAKES THEM
OFF THE BEATEN PATH.**



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And at \$1,995 the DECpc 320P Notebook is *priced* to go. Fast.

We put it all on the table. The 20MHz DECpc 320P

Notebook Personal Computer is the most comfortable to use on the market today, while the components inside are the hottest. We started with the Intel[™] 386sx[™] processor and the built-in 2400 baud modem (optional data/FAX modem). Because we don't believe you should have to sacrifice power for portability.

Next, we made the standard 2MB memory expandable to 8MB—plenty of room for running multiple Windows applications. For extra oomph in spreadsheet recalcs, we made room for an optional 80387sx[™] Math Coprocessor. Then we added a 40MB (optional 80MB) hard drive and a 3.5" Floppy diskette drive for ample storage—with DOS[™] 5.0 and Windows 3.0 pre-installed. We topped off the chassis with the Triple Super Twist (TST) Backlit VGA display—that puts Windows on-screen without an aggravating blur. We built an AC adapter to weigh less than a pound—so it's easy to carry around—and we added the Logitech[™] TrackMan[®] Portable, for FREE.

We even included a three-hour plus battery life to keep you up and running even when you're away from it all.

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LEADER OF

The **DECpc** 320P Notebook



Includes:
Microprocessor: Intel i386sx running at 20MHz
Memory: 2MB
Storage: 40MB IDE Hard Disk Drive
3.5" 1.44MB Floppy
Display: TST Backlit VGA
Modem: 2400 bps Data
Keyboard: 84-key Keyboard
Mouse: Logitech TrackMan
Portable
Operating Systems: MS-DOS 5.0 and
MS-Windows 3.0
(factory installed)

(Carrying case included)

Special Package Price **\$1,995**
FR-PCP11-AA



The **DECpc** 316sx



Includes:
Microprocessor: Intel i386sx running at 16MHz
Memory: 1MB, 80ns Memory Kit
Storage: 52MB IDE Hard Disk Drive
3.5" 1.44MB Floppy
Resolution Mode: 1024 X 768 SVGA
Adapter
Display: 14" Multi-sync VGA Color
Monitor
Keyboard: 101-key Keyboard
Mouse: Three-button Mouse
Operating Systems: MS-DOS 5.0 and
MS-Windows 3.0

Special Package Price **\$1,749**
DJ-PC444-05



The **DECstation** 325c



Includes:
Microprocessor: Intel i386 running at 25MHz
Memory: 4MB, 80ns Memory Kit
Storage: 52MB IDE Hard Disk Drive
3.5" 1.44MB Floppy
1.2" dd Floppy
Resolution Mode: 1024 X 768 SVGA
Adapter
Display: 14" VGA Color Monitor
Keyboard: 101-key Keyboard
Mouse: Three-button Mouse
Operating Systems: MS-DOS 5.0 and
MS-Windows 3.0

Special Package Price **\$2,179**
DJ-PC462-04



THE PACKS.

The **DEC**pc 320P Notebook



Includes:

Microprocessor: Intel i386sx running at 20MHz

Memory: 2MB

Storage: 80MB IDE Hard Disk Drive
3.5" 1.44MB Floppy

Display: TST Backlit VGA

Modem: 2400 bps Data

Keyboard: 84-key Keyboard

Mouse: Logitech TrackMan Portable

Operating Systems: MS-DOS 5.0 and MS-Windows 3.0 (factory installed)

(Carrying case included)

Special Package Price **\$2,495**

FR-PCP11-FA

The **DEC**station™ 320sx



Includes:

Microprocessor: Intel i386sx running at 20MHz

Memory: 1MB, 80ns Memory Kit

Storage: 52MB IDE Hard Disk Drive

Resolution Mode: 1024 X 768 SVGA Adapter

Display: 14" Multi-sync VGA Color Monitor

Keyboard: 101-key Keyboard

Mouse: Three-button Mouse

Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$1,849**

DJ-PC443-05



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The **DEC**pc 433 Workstation



Includes:

Microprocessor: Intel i486 running at 33MHz

Memory: 8MB, 70ns Memory Kit

Storage: 40MB IDE Hard Disk Drive
3.5" 1.44MB Floppy

Resolution Mode: 1280 X 1024 TIGA Adapter

Display: 20" Color Monitor

Keyboard: 101-key Keyboard

Mouse: Three-button Mouse

Operating Systems: MS-DOS 5.0 and MS-Windows 3.0

Special Package Price **\$4,999**

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Circle 60 on reader service card

Your Name _____

Title _____

Company Name _____

Address _____

City _____ State _____ Zip _____

Your Telephone No. _____ Your FAX No. _____

I'd like information on:

- ☐ DECpc i386 and i386sx based systems
- ☐ DECpc i486 and i486sx based systems
- ☐ The DECpc 320P Notebook
- ☐ The Catalog

Customization Worksheet

Your base system is a: ☐ 286 ☐ 386 ☐ 486 ☐ Other

How many applications will your PC(s) run in a typical workday? _____

What best describes the type of work the system will be used for?

(Check all that apply)

- | | | |
|--|---|--|
| <input type="checkbox"/> Word Processing | <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Scientific Research |
| <input type="checkbox"/> Order-entry | <input type="checkbox"/> Education | <input type="checkbox"/> Software Development |
| <input type="checkbox"/> Database (filing records) | <input type="checkbox"/> Design (CAD/CAM) | <input type="checkbox"/> E-Mail |
| <input type="checkbox"/> Financial Calculations | <input type="checkbox"/> Engineering | <input type="checkbox"/> Other industry-specific |
| <input type="checkbox"/> Retail Store Management | <input type="checkbox"/> Industrial Process Control | applications (please specify) |

How many people work in your group, department or small business?

☐ Less than 10 ☐ 10-20 ☐ 20-35 ☐ More

Is your operating system:

☐ DOS ☐ DOS with Windows ☐ OS/2 ☐ MAC ☐ UNIX™ ☐ Other

Which of the following graphics-oriented applications best describes your needs?

(Check all that apply)

- | | | |
|---|--|--|
| <input type="checkbox"/> Desktop Publishing | <input type="checkbox"/> Realtime Modeling | <input type="checkbox"/> AutoCad |
| <input type="checkbox"/> CAD/CAM | <input type="checkbox"/> Animation | <input type="checkbox"/> Business Graphics |
| | <input type="checkbox"/> Image Processing | |

LAN Communication

How many PCs do you have installed? _____ From how many manufacturers? _____

What kinds of connections does your PC(s) require? (Check all that apply)

- ☐ Links with other PCs in the immediate surroundings
- ☐ Connection to the local area network (LAN) throughout a building
- ☐ A line to a host system in a remote location

What kind of media (cable) is used in your LANs today? _____

What is the networking software now being used in your company? _____

What kind of host system will your PC communicate with?

☐ DEC ☐ IBM ☐ Other _____

What Kind of Service Do You Really Need?

- ☐ On-site Hardware Support ☐ Software Support ☐ Telephone Support
- ☐ Training ☐ FAX Hotline

How many of your users take portables on the road? _____

Do you currently have a service contract(s) for your PCs? ☐ How many? _____

1-800 PC BY DEC (1-800-722-9332)

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MAIL-ORDER 386 SYSTEMS

BY JOHN WALKENBACH

Everyone knows you can't get any cheaper than mail order, but these days, support

The natives are restless—you can look across the office and see them struggling, their underpowered PCs straining under new graphical applications. Each day the requests for more powerful 386 machines grow louder, but what can you do? With cost cut-

ting directives coming every day, your hands are tied, right?

Perhaps not. In ever-growing numbers, PC buyers are turning to mail order. In a recent survey, 25 percent of *PC World* subscribers indi-

cated their companies were likely to purchase systems by mail order in 1992, and the figure jumped to 48 percent for personal purchases. To cash in on incredible savings in the current economy, buyers are willing to take the small risks involved in buying a system sight unseen from an often unknown vendor. These days you can set up a workstation with a speedy RAM-packed 33-MHz 386 for around \$2000, less than you'd pay for a 386SX from Compaq or IBM.

DANIEL PELAVIN



and service may also beat dealers' offerings.

One hundred new 33-MHz systems are only a phone call away.

In the past, mail order was strictly for buyers who liked to live on the edge: Dubious merchandise, suspect support, and fly-by-night companies waited like sharks among the shoals. But times have changed, and today there's not much difference in quality from a dealer or a mail-order vendor. Problems, when they occur, tend to surface either in the first couple of months, when the warranty still obtains, or toward the end of the four-to five-year life cycle, when the system is probably obsolete anyway.

Mail-order service and support used to be a joke, but in the nineties, mail-order firms often give you free or low-cost on-site service. Also, the telephone support personnel are often more knowledgeable about their systems than a dealer sales rep who has to keep up-to-date on a number of vendors' products.

But the best news about mail order is the old news: bargain-basement prices. With the savings, you can equip each PC with extras like more RAM, enhanced video, and additional software. There are still some mail-order horror stories out there, but as long as you follow a few basic rules and resist the deals that seem too good to be true, your initial mail-order experience may be just the first of many. (See "Buyer Be Prepared: Mail-Order Checklist" for tips on making a safe, satisfying mail-order purchase.)

386/33S: THE MORE THE MERRIER

In this buyers' guide, we've focused on 33-MHz 386 systems simply because this class of system offers the best performance for

the money. The reason is twofold: Because there's a huge number of vendors selling 386/33s, the competition drives the price down, and because Intel is trying to phase out the 386 line with the help of the 486SX chip, lower prices on 486SX systems force the price of 386/33s down even further.

Many of the mail-order vendors listed here also sell 20-MHz 486SX systems. Although those newcomers run about 30 percent faster than the 386/33s, their prices run about \$500 to \$1000 higher. Many of the same vendors also sell slower 25-MHz 386 systems, but the price difference is often only a few hundred dollars.

We found no fewer than 100 mail-order 386/33 systems, and that was only by limiting our list to companies that offer at least on-site service, toll-free technical support, or weekend support. We priced systems with a minimum configuration of 4MB RAM, 1.2MB or 1.44MB floppy drive, 80MB to 125MB hard disk, one parallel and two serial ports, VGA card and color monitor, 101-key keyboard, mouse, and DOS 3.3 or later. The average price of the systems listed here is \$1823—they range from \$1120 (Netis Technology) on up to \$2898 (Dell Computer).

Because all these systems are sold direct, the price listed in our table is pretty much the price you'll pay (plus shipping and sales tax, if applicable). Prices continue to drop, however, and will probably be even lower by the time you read this. On top of that, savvy mail-order buyers aren't afraid to do a little haggling. The reces-

Mail-Order Companies Show Up Strong on Support



These figures from the product table show why customers are no longer afraid to shop by mail.

sion's hitting everyone, and many companies will forgo a few bucks of profit rather than lose a sale. If they won't budge on the price, maybe they'll toss in a free modem or a complimentary copy of *Windows*.

KICKING THE TIRES FROM AFAR

One thing missing from mail order is the personal contact—you can't look a dealer rep in the eye and ask for a hands-on demonstration. So it's vital you know exactly what you're looking for. Fortunately, more and more extras are now standard on even the smallest, most obscure clones. For example, every 386DX listed in the table accepts standard SIMMs for adding RAM, and surprisingly, all let you add at least 16MB of fast RAM, plenty for today's applications. Most of the systems offer a convenient ROM-based setup utility, all have

tilt-and-swivel monitors, and all sport at least one parallel and two serial ports.

Another sign of increasing sophistication: 13 of the 386s listed have an IDE interface for the hard disk drive built onto the motherboard. This arrangement not only frees up an expansion slot but also increases drive speed from 10 to 15 percent. For the same reasons, two machines—CompuAdd and Dell—also build their VGA adapters onto the motherboard.

Aside from reading reviews with trustworthy benchmarks, one of the few ways you have to gauge performance is the size and type of RAM cache. A RAM cache is a small amount of fast, expensive static memory that sits between the CPU and system RAM. Using a RAM cache lets manufacturers use slower, cheaper system RAM without losing much performance. RAM cache size varies from 32K to 128K, but more important is how the cache controller works. Ask for memory cache that uses a two- or, even better, four-way "set associative" caching algorithm. Then go for size.

The speed of the hard disk, controller, video board, and other design details also play a part in a system's overall speed. It's difficult to judge video performance from specs alone, but you can get a rough idea of hard disk speed—the shorter the average access time, measured in milliseconds (ms), the faster the drive will usually perform. You'll probably want to avoid drives slower than 25ms. Also, a drive with an IDE, SCSI, or ESDI interface offers a higher maximum through-

put than one with an old-fashioned MFM controller.

All the vendors offer a choice of hard disk sizes. With today's prices, don't bother buying anything less than 80MB. Look for at least a 100MB drive if you run a lot of disk-hogging *Windows* applications, and at least 300MB if you're buying a 386/33 to act as your network file server. Many of these systems offer 1.2-gigabyte drives for heavy-duty network file storage.

Look for plenty of drive bays, especially externally accessible bays, which you'll need for floppy and tape backup drives. At least three accessible and one internal bay should do the trick for a basic business system that includes a hard drive, tape backup, and both 5¼- and 3½-inch drives; if you want to add a CD ROM drive to this mix, you'll want at least four front-accessible bays and one internal bay.

Also pay attention to the number of free expansion card slots on the motherboard, especially if you want to enhance your system with a CD ROM or SCSI drive, a MIDI adapter, a sound card, an internal modem, or a fax board.

About a quarter of these 386 systems offer a CPU upgrade option so you can move up to a more powerful system without scrapping your PC. In some cases, you replace the CPU with a faster chip and move a jumper to speed up the clock, but in most cases the upgrade is an expansion card CPU that converts your 386 into a 33-MHz 486DX. These latter upgrades cost anywhere from \$800 to \$1750.

MAIL-ORDER SERVICE AND SUPPORT: LOOK BEFORE YOU LEAP

The companies surveyed vary widely in the support they offer. Most have toll-free technical support numbers and extend support after hours—some even 24 hours a day.

A solid service policy is a key factor when buying hardware. While no company warrants products for fewer than 12 months, getting service if something does go wrong is a different story. All these vendors will repair your system during the warranty period as long as you send it back to them, but check to see if the company pays shipping costs. Many have turnaround policies ranging from 48 hours to one

week, but these policies are not legally binding; if you can't afford downtime, ask the company if it offers replacement units for lengthy repairs.

You'll probably want on-site service instead of shipping your PC through the mail. While most of these vendors offer on-site service, only 45 percent provide it free—and sometimes only for a year or less. Charges for on-site service are usually under \$100, but sometimes they're a percentage of the unit cost, typically from 5 to 12 percent. This can add up if you've treated yourself to an extra the likes of a big-screen monitor or a super-large hard disk.

Make sure you ask very specific questions about

service policy. Some companies offer on-site service within a limited distance; others provide it only with volume purchases, usually four or more units.

With most of these systems, you should be very satisfied with the service and support you receive. A mail-order company lives or dies by its reputation, and most will go to extremes to earn your good recommendation. ☺

John Walkenbach is a contributing editor for PC World and coauthor of the PC World 1-2-3 for Windows Complete Handbook (IDG Books, San Mateo, California, 1991). He can be reached on PC World Online (see page 8 for more information).



Buyer Be Prepared: Mail-Order Checklist

You've decided to save some money and buy mail order. Now how do you keep from getting burned? The majority of mail-order vendors play fair, but even if you buy from a user-friendly vendor, a deal can turn sour unless you're specific about details. By following these tips, you can make your mail-order buy as risk-free as possible.

- ☐ Read the ads carefully, and prepare a list of questions before you start calling. Set up a spreadsheet for a point-by-point comparison of the various manufacturers you call.
- ☐ Write down the name of your salesperson and take copious notes. Don't be afraid to ask questions.
- ☐ Be wary of systems priced far below others in their class. Usually these are not fully configured, or they include small hard drives or monochrome monitors.
- ☐ Make sure the equipment you order is in stock, and verify the

shipping date and cost.

- ☐ In case the company goes out of business before you receive the product, your chances of recouping your investment are better if you pay by credit card. But some companies make you pay a surcharge for credit card sales, usually 3 percent. If you plan to pay by credit card, ask about a credit surcharge, and verify that your credit card will not be billed until the merchandise is shipped.
- ☐ Understand your rights if you decide to return the equipment. Is there a restocking fee? What pays return shipping fees?
- ☐ Ask about sales tax. If you're purchasing from a company located outside the state to which the unit is being shipped, you should not be charged sales tax.
- ☐ When the goods arrive, examine them carefully for signs of previous use, and ensure that they're actually what you ordered.



MAIL-ORDER 386 SYSTEMS

Manufacturer	Product	Price ¹	Memory cache (K)	Free slots (32/16/8 bit)	Externally accessible/internal drive bays	Largest hard disk option
Aberdeen	AN333C	\$1499	64	0/3/2	3/2	430MB
Absec Research	AB 386/33	\$1711 ³	64	0/4/1	5/0	1.2GB
Accel	Nobel 386/33	\$1895 ³	64	2/3/0	2/2	1.2GB
Acma Computers	Acma 386/33	\$1995 ³	64	0/6/2	4/0	1.2GB
American Computer Express	ACE 386-33	\$1695 ^{3,4}	64	0/6/0	3/2	340MB
American Research	ARC 386/33C	\$2375	64	0/6/2	3/2	675MB
AMS	AMS 386-33C	\$1699 ⁴	64	1/4/0	5/2	340MB
Ares Microdevelopment	386-33 Sonic	\$2300 ³	64	1/5/0	3/1	425MB
Arlington Computer Products	ACP 386-33	\$1649	32	1/3/1	4/0	211MB
A-Tronic Computer	ATC 386-33	\$1395 ³	64	1/6/1	4/0	200MB
Automated Computer Technology	ACT 386-33C Cache System	\$2355	64	1/7/0	3/2	1.2GB
Binary Technology	BTI System 386-33C	\$1795 ³	64	1/5/2	4/1	1.2GB
BitWise Designs	DeskStation Model 333C	\$1995	64	1/5/0	4/1	1.2GB
Blackship Computer Systems	BLK 386/33	\$1995 ³	64	1/4/0	3/2	1.4GB
Blue Circle Group	BCG 386/33	\$1779 ³	64	0/4/2	5/0	1.2GB
Blue Dolphin Computers	386DX-33 Cache	\$1759 ³	64	1/5/0	4/1	670MB
Blue Star Computers	Blue Star 386DX-33	\$1969 ³	64	1/4/1	4/1	1.4GB
Bulldog Computer Products	Bulldog 386-33	\$1389	128	0/6/2	3/2	700MB
C2 MicroSystems	386/33 Warrior	\$1895	64	1/4/0	3/2	1.2GB
CIN	CIN 3033 CSV Enterprise 33C	\$1645 ³	64	0/3/3	4/1	330MB
Club American Technologies	Falcon 333	\$2356	64	0/5/0	3/2	1.2GB
CompuAdd Computer	CompuAdd 333	\$2715	128	0/4/1	4/0	1.2GB
Compudyne	Compudyne 386/33 DX	\$1998	32	0/4/2	3/2	2.4GB
Computer Market Place	Ultra 386-33C	\$1799 ^{3,4}	64	1/4/0	3/2	1GB
Computer Square	Kandu 386-33	\$1549 ³	64	1/6/2	6/0	340MB
CompuTrend Systems	CompuTrend 386-33	\$1804 ^{3,4}	64	1/3/0	3/2	300MB
Comtrade Electronics USA	Comtrade 386/33	\$1725 ^{3,4}	128	1/4/1	4/1	1GB
CTI	386DX/33 CTI	\$1350	64	0/7/1	5/0	1.6GB
CUI	Advantage 386-33 CX	\$1770	64	0/6/2	4/2	1.2GB
Dataworld	Data 386i-33	\$2100	64	2/4/0	3/2	2.5GB
DEICO Electronics	DEICO System 386DX-33	\$2584	128	0/5/1	4/1	400MB
Dell Computer	Dell System 333P	\$2898	32	0/3/0	2/1	500MB
Destiny Computer	Destiny 386/33	\$1399	64	1/3/2	5/0	200MB
Diamond Technologies	DT 386-33	\$1644 ³	64	1/4/1	4/2	700MB
Dynamic Decisions	386-33C	\$2170	64	0/8/0	5/0	1.2GB
EPS Technologies	EPS 386-33	\$1895 ³	128	1/4/1	4/2	1.2GB
FastMicro	FastData 386/33	\$1868 ³	64	0/4/2	5/0	1.2GB
First Computer Systems	FCS 386-33	\$1699 ³	64	1/4/1	6/1	660MB
Gateway 2000	Gateway 2000 386/33	\$2395 ^{3,4}	64	1/6/0	3/2	1.2GB
G.C.H. Systems	EiSys 386-33	\$1795	64	0/5/0	4/1	200MB
HD Computers	HD386-33C	\$1545	64	1/6/1	6/0	1GB
High Quality Systems	HIQ 333 DX	\$1599 ³	64	0/3/3	5/0	650MB
High Tech Supply	HTS 386 Deluxe System	\$1620 ³	64	1/5/1	4/1	200MB
Insight Computer	Insight 386-33 Cache	\$1895 ^{3,4}	64	0/6/0	5/0	4GB
Intelec	INT 386-33	\$1789 ³	64	1/4/1	4/2	245MB
International Data Systems	IDS 333i	\$1985 ³	64	1/5/0	3/2	2GB
International Instrumentation	Blue Max 386/330	\$1797	64	1/4/2	3/3	1.6GB
Iverson Computer	Iverson 386/33	\$1629	64	1/4/0	4/2	1.2GB
JCC Systems	JCC 386-33	\$1739 ^{3,4}	64	1/4/2	4/0	1.2GB
Kenosha Computer Center	KCC 386-33	\$1749	64	0/6/1	4/0	1.2GB

¹ Price based on 4MB RAM, 1.2MB or 1.44MB floppy drive, 80MB to 120MB hard disk, one parallel and two serial ports, VGA controller and color monitor, 101-key keyboard, mouse, and

Fast-RAM capacity (MB)	Upgradable CPU	Switch-less setup	Compact footprint ²	Front-panel on/off switch	Front panel reset	IDE connect-or on motherboard	Warranty (months)	On-site service	On-site service less than \$100	Free on-site service	Toll-free technical support	Daily support hours	Weekend support	Technical support BBS/fax	Reader service number
64	Y	Y	Y	Y	Y	N	12	N	N	N	Y	9	N	N/Y	639
32	N	Y	Y	Y	Y	N	24	Y	Y	Y	Y	11	Y	N/N	640
32	N	Y	N	Y	Y	N	24	Y	Y	N	Y	8.5	Y	N/Y	641
32	N	Y	Y	N	Y	N	12	Y	Y	Y	Y	11	Y	Y/Y	642
32	N	Y	Y	Y	Y	N	12	Y	Y	N	Y	10	Y	N/Y	643
32	N	Y	N	Y	Y	N	12	Y	Y	N	Y	11	N	N/Y	644
16	N	Y	Y	Y	Y	N	12	Y	Y	Y	Y	10	N	N/Y	645
64	N	Y	N	Y	Y	N	24	Y	Y	Y	Y	24	Y	N/Y	646
32	N	Y	N	N	Y	N	12	Y	Y	Y	Y	8	N	N/N	647
25	N	Y	Y	Y	Y	N	12	Y	Y	N	N	8	Y	N/N	648
32	N	N	N	Y	Y	N	12	Y	Y	Y	Y	10	Y	N/Y	649
64	Y	Y	Y	Y	Y	N	12	Y	Y	Y	Y	10	Y	N/Y	650
32	N	Y	Y	Y	Y	N	12	Y	Y	N	Y	10	Y	N/Y	651
32	N	Y	Y	Y	Y	N	12	Y	Y	Y	Y	10	N	N/Y	652
32	N	Y	Y	Y	Y	N	24	Y	Y	N	Y	11	Y	N/N	653
64	Y	Y	Y	Y	Y	N	12	N	N	N	Y	12	Y	N/N	654
32	Y	Y	Y	Y	Y	N	12	Y	Y	N	Y	24	Y	N/Y	655
16	N	N	N	Y	Y	Y	12	Y	Y	Y	Y	9	N	N/Y	656
64	N	Y	Y	Y	Y	N	12	Y	Y	Y	N	10	N	N/N	657
32	Y	Y	Y	Y	Y	N	12	N	N	N	Y	8.5	Y	N/Y	658
64	Y	Y	N	N	Y	N	12	Y	Y	Y	Y	12	N	N/Y	659
32	N	Y	N	N	N	Y	12	Y	Y	N	Y	11	N	Y/Y	660
16	N	Y	Y	Y	N	Y	12	Y	Y	Y	Y	8	N	Y/Y	662
32	N	Y	Y	Y	Y	N	12	Y	Y	N	Y	10	Y	Y/Y	663
32	N	Y	Y	Y	Y	N	12	N	N	N	N	10	Y	N/Y	664
32	N	Y	Y	N	Y	N	12	Y	Y	Y	Y	8.5	N	N/N	665
32	Y	Y	Y	Y	Y	N	12	Y	Y	N	Y	12	Y	N/Y	666
32	N	N	Y	Y	Y	N	12	Y	Y	N	N	9	Y	Y/Y	667
32	N	Y	Y	Y	Y	N	12	Y	Y	N	Y	9	N	Y/Y	668
40	N	Y	N	Y	Y	Y	12	Y	Y	Y	Y	11	Y	Y/Y	669
32	Y	Y	Y	Y	Y	Y	12	Y	Y	N	Y	10.5	N	Y/N	670
16	Y	Y	Y	Y	N	Y	12	Y	Y	Y	Y	15	Y	Y/Y	671
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32	N	Y	Y	Y	Y	N	24	Y	Y	N	Y	9	N	N/Y	673
32	Y	Y	N	Y	Y	Y	12	Y	Y	Y	Y	8	N	N/N	674
64	N	Y	Y	Y	Y	N	12	Y	Y	Y	Y	12	Y	Y/Y	675
32	N	N	N	Y	Y	N	12	Y	Y	Y	Y	9	Y	Y/Y	676
32	Y	Y	N	Y	Y	N	24	Y	Y	N	Y	8	Y	N/Y	677
64	N	Y	N	Y	Y	N	12	Y	Y	Y	Y	18	Y	Y/Y	678
32	N	Y	Y	Y	N	N	24	Y	Y	N	Y	10	N	N/Y	679
32	N	Y	Y	Y	Y	N	24	Y	Y	N	Y	9.5	Y	N/N	680
64	N	Y	Y	Y	Y	N	24	Y	Y	N	Y	11	Y	N/N	681
32	N	Y	Y	Y	Y	N	12	N	N	N	Y	9	Y	N/N	682
64	N	Y	N	Y	Y	N	12	N	N	N	Y	15	Y	Y/Y	683
32	N	Y	N	Y	Y	N	12	N	N	N	Y	9	Y	N/Y	684
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32	N	Y	Y	Y	Y	N	12	Y	Y	Y	Y	10	Y	Y/Y	686
16	N	Y	N	Y	Y	N	12	Y	Y	Y	Y	10.5	N	N/N	687
16	N	Y	Y	Y	Y	N	12	Y	Y	Y	Y	8	N	N/N	688
32	N	Y	Y	Y	Y	N	12	Y	Y	Y	Y	10	N	N/N	842

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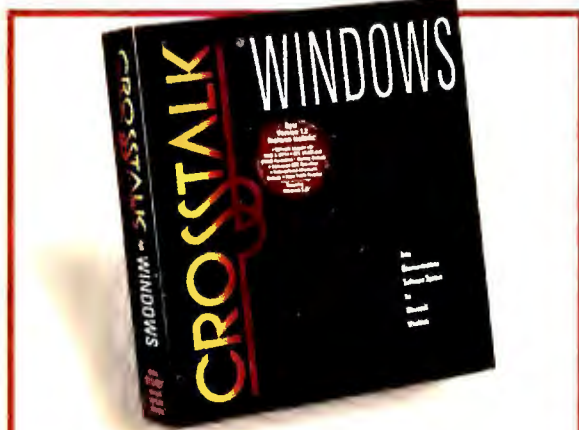
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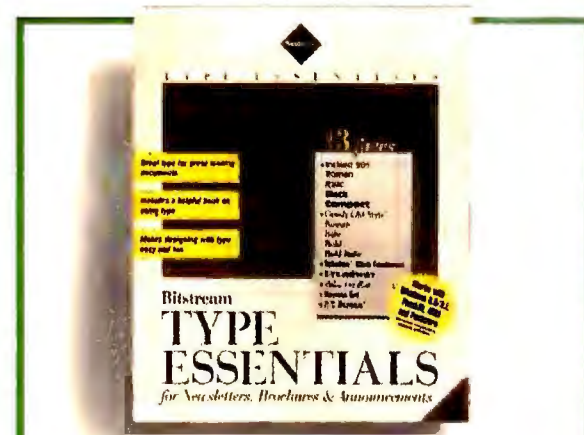
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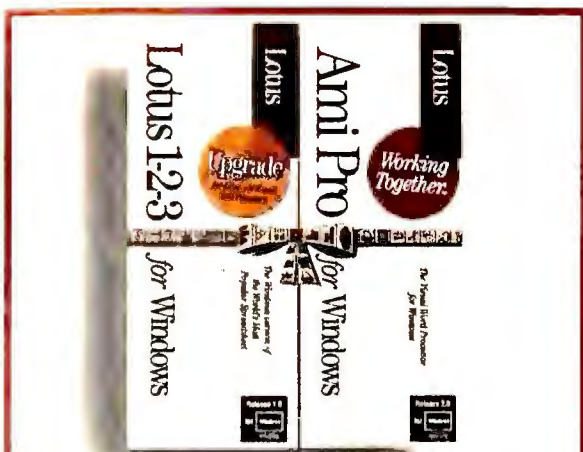
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2749 ☐ cc:mail 25 user Pack 399.
M-USA Business Systems ... NCP
3408 ☐ Pacioli 2000 (Accounting software) 32.
MacroMind-Paracomp ... NCP
3484 ☐ Action! 1.0 349.
MECA ... NCP
2798 ☐ Managing Your Money 8.0 99.
4603 ☐ Tobias' Tax Cut 1040 1991 39.
Microcom ... NCP
4408 ☐ Micro Courier 1.0 59.
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Micro Logic Software ... NCP
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2904 ☐ Works 2.0 95.
2735 ☐ Works 1.0 for Windows 129.
3337 ☐ Publisher 1.0 for Windows 129.
7387 ☐ PowerPoint 2.0 for Windows 309.
6195 ☐ Word 2.0 for Windows 309.
2856 ☐ Excel 3.0 for Windows 309.
8137 ☐ Office 2.0 for Windows 479.
1620 ☐ MS-DOS 5 Upgrade 49.
1624 ☐ Visual Basic 1.0 129.
Multisoft ... NCP
4925 ☐ PC-Kwik Power Pak 2.1 75.

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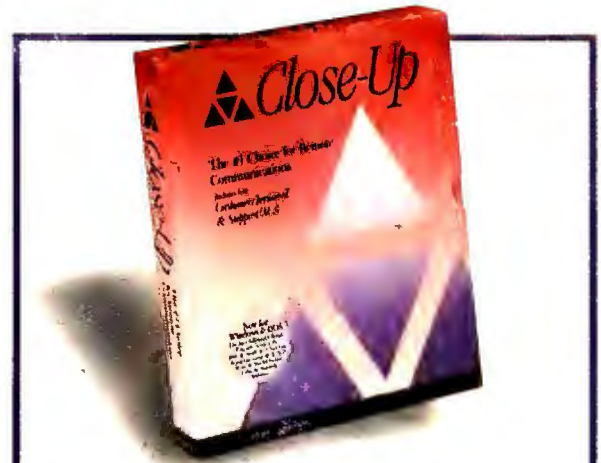
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2753 ☐ Close-Up for Windows & DOS Dual Pack 4.0—PC Magazine's Editors' Choice (2/92). Take control of PCs miles away by modem. View & operate any Windows, DOS or VGA/EGA program.... intro. price until 6/30/92 \$129.

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Panacea ... NCP

- 2413 ☐ WinSpeed 1.0 (Windows accelerator) .. 55.

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- 5900 ☐ PC USA 2.0 32.

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- 4384 ☐ Ultravision 2.0 79.

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- 7858 ☐ Express Publisher 2.0 99.

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- 6572 ☐ WealthBuilder 1.1 95.

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- 7483 ☐ Grammatik for Windows 2.0 59.

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- 8162 ☐ ABC Flowcharter 1.1 189.

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- 1415 ☐ PFS: WindowWorks 1.0 129.

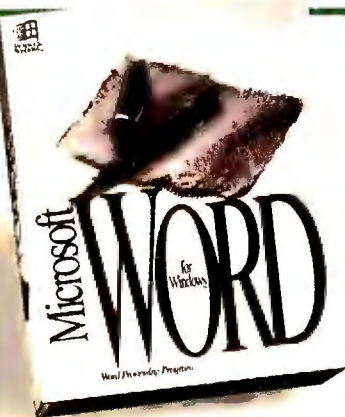
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- 1409 ☐ Stacker 2.0 89.

- 3524 ☐ Stacker 2.0 w/16-bit Coprocessor Card 185.

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- 3146 ☐ The Norton Utilities 6.0 115.
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- 7999 ☐ Norton Anti-Virus 1.5 84.
- 2359 ☐ The Norton Desktop 1.0 for Windows 99.
- 8378 ☐ PC Anywhere IV 4.5 119.
- 4688 ☐ Zortech C++ 3.0 479.

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- 9046 ☐ The Writer's Toolkit 2.0 (DOS) 79.
- 3949 ☐ The Writer's Toolkit 2.0 for Windows 79.

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- 9847 ☒ M.Y.O.B. for Windows 139.

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- 5037 ☐ TimeSheet Pro for Windows 135.

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- 3863 WinTools for Windows 1.0 (3 1/2" only) 125.

Touchstone Software ... NCP

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Travelling Software ... NCP

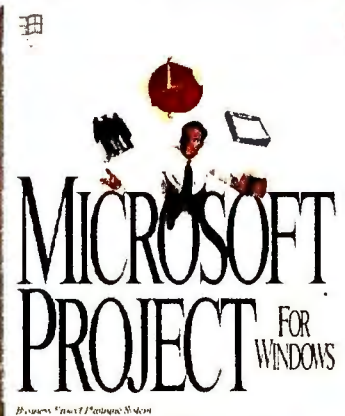
- 4407 ☒ LapLink Pro 4.0 95.

WordPerfect Corporation ... NCP

- 7781 ☒ LetterPerfect 1.0 129.
- 4214 ☒ WordPerfect Office PC 89.
- 3804 ☐ WordPerfect 5.1 265.
- 3494 ☐ WordPerfect 5.1 for Windows 279.
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- 1836 ☒ Where in America's Past is Carmen 39.
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- 4388 ☐ SimAnt from Maxis 39.
- 4411 ☒ SimEarth for Windows from Maxis 45.

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- 4183 ☒ KidWorks 29.

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- 2858 ☐ Flight Simulator 4.0 39.

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Sierra ... CP

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- 3193 ☐ Police Quest III (VGA) 45.

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- 3294 ☒ Game Pak (5 games in one) 32.
- 5032 ☒ Miracle (piano teacher) (incl. kybd.) 339.

Spectrum Holobyte ... NCP

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- 4833 ☒ Super Tetris for Windows 29.

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- 7674 ☒ Nemesis Go Master 5.0 35.

True BASIC, Inc. ... NCP

- ☒ Kemeny/Kurtz Math Series ea. 45.

Walt Disney Computer Software ... CP

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- 2624 ☒ Mickey's ABC's 29.
- 4398 ☒ The Animation Studio 79.
- 4416 ☒ Sound Source 29.

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- 7105 Smart UPS 600 425.
- 3858 Back-UPS 400 185.
- 3823 Back-UPS 600 299.

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- 2480 Mouse Pen Pro PC 62.

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- 9985 VGA Integra (1024 x 768, 16 colors) 95.
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- 9822 8514/Ultra (with 1 MB) (requires VGA) 419.
- 2012 Graphics Ultra with VGA (with 1 MB) 479.
- 1825 2400etc/i Modem (with 9600 SendFax) 139.
- 9620 9600etc/e Modem 369.
- 3902 Stereo•F/X 149.
- 3900 VGA Stereo•F/X (w/512K, upgrd. to 1 MB) 329.

Boca Research ... 5 years

- 7150 BOCARAM/AT PLUS (2 MB) 209.
- 7139 (4 MB) 319. 7138 (8 MB) 529.
- 6998 I/O Board for AT 49.
- 6999 I/O Board for Microchannel (S/S/P) 95.
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- 8381 SuperVGA (1 MB, 1024 x 768) 119.
- 3859 2400 Internal Modem (V.42, MNP Level 5) 85.
- 2502 2400 Internal Modem 49.

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- 7400 2 Position Laser Compatible Switch Box 109.

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- 8578 Creative Labs Sound Blaster 109.
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- 8158 Typist Plus Graphics 389.

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- 7896 BJ-10ex Sheet Feeder 75.

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- 1132 386-SX-16 Motherboard ØK 279.
- 1197 386-SX-25 Motherboard ØK 349.
- 2721 VGA732 True Color Ultra VGA Card 185.
- 1480 Cardinal 9600 Internal Modem 329.
- 2783 Cardinal 9600 External Modem 349.

CH Products ... 1 year

- 7935 Game Card III Auto 33. 7341 MCA 49.
- 7801 FlightStick with Falcon 49.

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4518	101 Plus Keyboard	99.
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Kraft ... 5 years

5801	Game Card (2 ports)	27.
5813	Game Card with Thunderstick	49.
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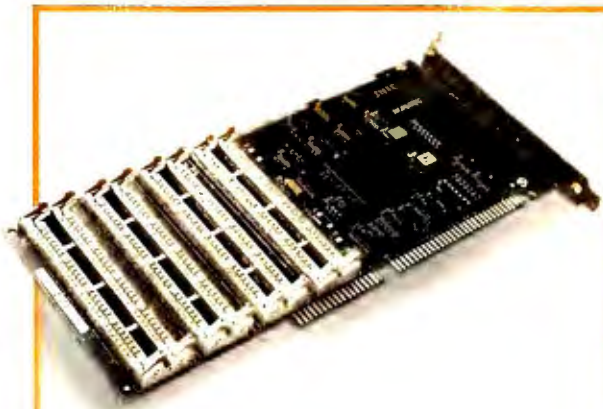
6029	Trackman serial	69.
2343	Trackman Portable	99.
7975	ScanMan 256	289.
1322	FotoMan (camera for your PC)	549.
4727	Kids Mouse	45.
3295	MouseMan (combo)	69. 9766 (cordless)

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3020	T224FM 96/24 Pocket Fax Modem	249.
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 Great performance with a great price to match.
 EMS 4.0 compatibility built in to the hardware
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1708	Ruby-Plus SPF-2+	65.
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2358	LQ-570 (80 col., 252 cps)	289.
2361	LQ-870 (80 col., 330 cps)	489.
2357	LQ-1170 (136 col., 330 cps)	669.
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1683	Tempo LX Notebook (5 MB, 60 MB HD)	call
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5024	ULTRA 144 Modem	799.
1345	OPTIMA 24 Modem	155.
3522	OPTIMA 96 Modem	389.
9884	Pocket Edition 2400	119.

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3957	LaserJet IIP Plus (with toner)	879.
9993	LaserJet IIIP (with toner)	1099.
6754	LaserJet III (with toner)	1599.

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6421	2400B MNP Internal Modem	189.
6420	2400EX MNP Modem	225.
7880	9600EX Modem	469.
5336	Above Board Plus 8 2 MB	429.
5342	Above Board Plus 8 I/O 2 MB	459.
1086	Matched Memory Classic Memory Brd. OK	139.
7782	SatisFAXtion (fax board)	389.
8903	Matched Memory 4 MB (PS/2)	239.
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3076	Snap-In 386 (for PS/2 50/60)	389.
3358	Power Pak (Snap-In 386 & Above Board Microchannel 4 MB)	925.

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6830	80387SX-20 (20 MHz 80386SX CPU's)	139.
5409	80387-33 (80386DX CPU's)	219.



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1345 OPTIMA 24 Modem—An affordable high-speed V.42bis modem with the reliability and quality that made Hayes famous. Supports throughput up to 9600 bps. Incl. Smartcom EZ communication software \$155.

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2898	Mouse with Windows 3.0 (bus or serial)	149.
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8994	2400 Baud External Modem (V.42 bis)	199.
4542	2400 Baud Internal Modem for PS/2	229.
8132	PM2400 Pocket Modem	109.
2266	PM9600 Internal Modem	399.
7934	PM9600SA Modem	469.
2264	PM2400FX96 (int. modem/fax board)	95.
2425	PM14400FXSA Modem/Fax	399.
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1222	ProModem Ultima Home Office	489.
Targus ... lifetime		
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5828	TheComplete Communicator	299.
Tripp Lite ... 2 years		
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6201	Isobar 8-12 (8 outlets, Gold Seal Warranty)	69.
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9768	VRAM II VGA 1 MB	329.
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1181	2400 Baud V.42 bis Modem (2 year)	115.
3574	Ext. 2400 Baud V.42/9600 Baud Fax	145.
1167	2400 Baud Internal Modem	65.
1166	2400 Baud External Modem	69.
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4400	24/96 Int. Fax Modem/WinFax Pro Bundle	155.
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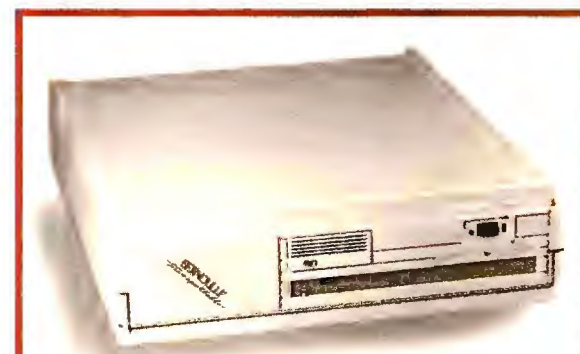
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2616	Internal 90 MB Bernoulli	799.
2500	PC2B Controller	199.
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2467	90 MB Cartridge Tripak	439.
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2239	3 1/2" HD Disks Color (Qty. 10)	18.
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3292	5 1/4" HD Disks (Qty. 10)	12.

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Continental US:

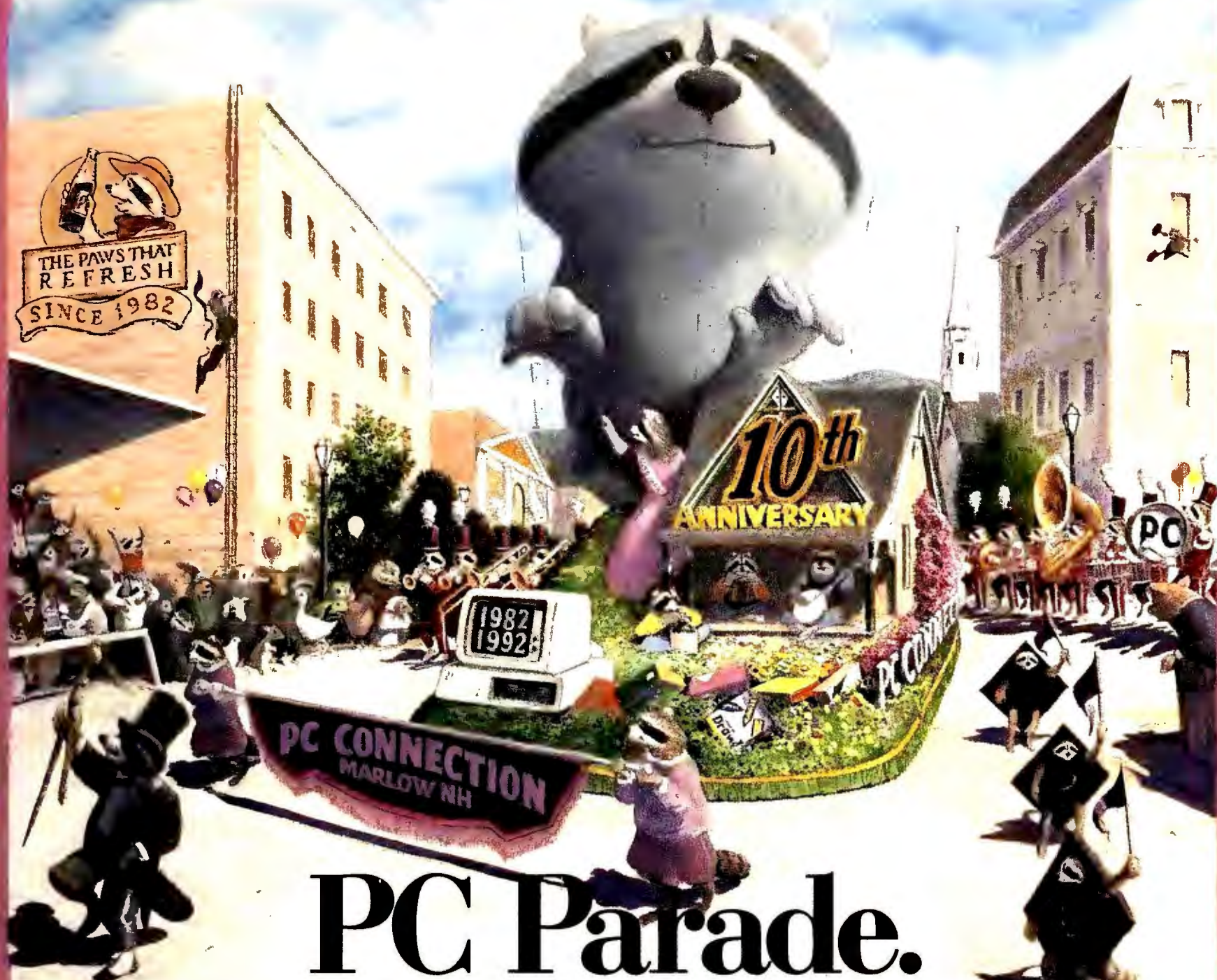
- For heavy hardware items such as printers, monitors, Bernoulli Boxes, etc. pay actual charges. Call for UPS 2nd-Day & Next-Day-Air.
- For all other items, add \$3 per order to cover UPS Shipping. For such items, we automatically use Airborne Express at no extra charge if you are more than 2 days from us by UPS ground.

Hawaii:

- For monitors, printers, Bernoullis, 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.



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Over the last ten years, we've

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FULL-PAGE SCANNER

WHETHER YOU WANT TO ADD A PHOTO TO A PROPOSAL OR TURN A STACK OF DOCUMENTS INTO ASCII TEXT, ONE OF THESE 38 DESKTOP SCANNERS CAN DO THE JOB FOR LESS MONEY THAN YOU THINK.

Once an expensive piece of exotica for graphic artists, the desktop scanner is beginning to pop up everywhere. A couple years ago, a 300-dpi gray-scale scanner cost more than \$2000, but today you can buy a 400-dpi full-color scanner on the street for just over \$1000, and a 300-dpi gray-scale scanner can be had for about \$800.

Most of the desktop scanners listed here are flatbed scanners. They operate much like personal copiers—you lift the hood, place a piece of paper on the glass, close the hood, and scan. Moments later an identical facsimile appears as an image file on your PC's hard disk, ready to be edited, popped into a document, or converted into editable ASCII text. The few sheet-fed scanners included here operate in the same way, except you insert the page into a roller mechanism similar to a fax machine's. With the exception of the Niscan Spectra, all the scanners listed here come with an expansion board, so make sure your PC has a free slot for it.

Scanners are a multitalented lot—your work group may end up using one for a number of different applications. The main

LANCE JACKSON/LAX SYNTAX



WINNERS

BY PATRICK
MARSHALL

task is to convert photographs and artwork into electronic images for use in desktop-published documents, slide presentations, or multimedia applications. The other chief occupation is to transform hard copy text into editable documents via optical character recognition (OCR) software. OCR lets you convert documents created by typewriter or archaic computers, as well as turn faxes and mail into live copy (see "OCR: Image Into Words").

But desktop publishing and OCR are just the beginning. As mass storage devices grow cheaper, many businesses that rely on paper forms, such as insurance companies, are finding they can save money on labor, storage, and office space by scanning all their important documents onto a file server's optical disk or large hard disk. Retrieving an electronically archived document is much faster than sending a clerk to hunt through the files, and image management packages let you use a variety of search tools and tag documents with text annotations.

The increasing use of PC-based fax also provides an opening for scanners. If you equip your computers with fax boards, a

shared scanner can eliminate the need for a fax machine altogether. And the higher resolution scanners will result in higher quality faxed images. Sharing both scanner and fax with a networked fax gateway is especially cost effective.

BLACK AND WHITE, GRAY SCALE, OR COLOR?

One of the first questions a scanner buyer needs to ask is whether to go with a black-and-white scanner, a gray-scale unit, or a color scanner. If you won't be using a color printer or sending scanned images to 35mm slides or multimedia, there's little reason to pay extra for a color unit; if you won't be scanning color originals there's no reason for it. But if you're not sure, you may as well go with color—the price is not much higher, and all color units are also capable of handling 256 shades of gray.

The same reasoning holds true for those interested in OCR. If all you're going to scan is text, a black-and-white scanner will do. But if you want more flexibility, opt for a gray-scale or color scan-



ner and buy an OCR package that will work on the unit. After all, at \$1295 the most expensive of the 300-dpi black-and-white scanners is actually \$300 more than the least expensive of the 300-dpi full-page color scanners. Price differences among scanners often depend on extras such as bundled OCR and image editing software and accessories such as sheet feeders.

A PLAN TO SCAN

The scanner features you need to look for depend on whether you're doing desktop publishing, fax, OCR, or another application.

SHEET FEEDER. If you plan to do a lot of text scanning, you'll want a system that offers a sheet feeder. With this \$500 to \$700 accessory, you can set a stack of pages in an input tray instead of having to insert, align, and remove each original. The black-and-white scanners from Microtek and New Dest and the gray-scale scanner from Prime Option include sheet feeders standard, but because they lack a flatbed

option, you can't scan oversize pages or irregularly shaped objects, such as bound books. The only flatbed scanner that comes standard with a sheet feeder is the SIIG AV800.

RESOLUTION. The resolution of scanners is measured in dots per inch (dpi). Most scanners have a maximum resolution of 300 dpi, though a few go up to 400 dpi. The general rule is, the higher the scanning resolution, the better the output, at least until you've reached the resolution limit of the output device.

If you plan to output on a 300-dpi device, higher scanning resolutions are generally wasted. One exception: If you're enlarging a scanned image before you print, scanning at 400 dpi means you'll be able to enlarge without losing as much output sharpness.

If you're using a higher resolution imagesetter, such as a 1200-dpi Linotronic, you'll want to check out one of the 400-dpi units listed here—or get a high-priced, professional-quality scanner with 600-dpi resolution or higher. Simi-

larly, if you need high-quality scanned images for slides, 300-dpi probably won't cut it.

Keep in mind that when you scan at higher resolutions, the image file takes up much more disk space, and scanning and printing take longer. The more choices of resolution available, the more you can fine-tune the compromise between image quality and file size.

Some units increase apparent resolution without increasing file size through a technique called *interpolation*. Interpolation software (bundled on disk or built into the unit itself) employs a mathematical algorithm that fills in the gaps between dots, smoothing curves that would otherwise appear jagged. Many scanner vendors claim an "effective" resolution of 600 dpi for their 300-dpi scanners using interpolation. The quality isn't quite the same as it would be if you bought a true 600-dpi scanner, and it isn't much better than that of a true 400-dpi scanner that lacks interpolation. However, interpolation can be a cost-

effective way to improve image quality without losing more hard disk space to images.

GRAY SCALE. If you're scanning line art or text only, a black-and-white scanner is all you need. If you need to print images that approximate photographic quality, you should move up to a scanner that can recognize and translate 64 to 256 shades of gray. As with resolution, more shades mean a larger image file, but they also vastly improve the reproduction of continuous-tone images.

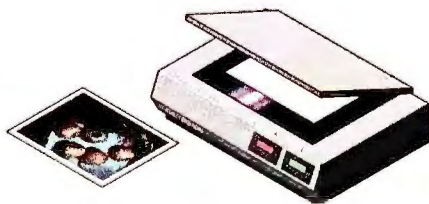
Most of the black-and-white units bundle software that simulate up to 16 or 64 gray shades through a process called *dithering*. This algorithmic technique simulates the halftone cells in a continuous-tone image by applying graded patterns. Certain dithering patterns can provide pleasing visual effects on 300-dpi or lower output devices, though none come close to the quality of shading.

COLOR. Most color scanners can handle nearly 16.8 million hues (24-bit color)—plenty for

DIFFERENT SCANNERS FOR DIFFERENT APPLICATIONS

The right scanner for you depends on how you plan to use it. Desktop publishing, OCR, and other jobs require different features.

High-end desktop publishing



600-dpi color/gray-scale scanner



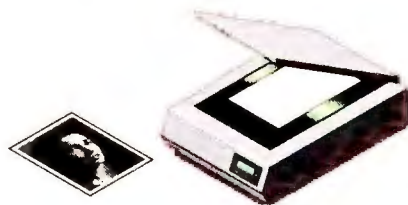
Desktop publishing application



1200/2400-dpi imagesetter



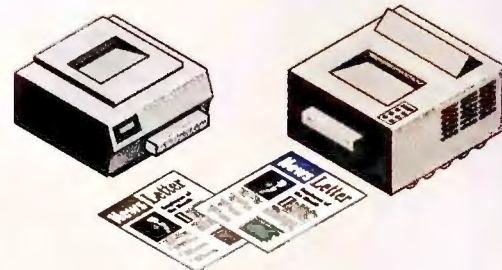
Low-end desktop publishing



300-dpi color/gray-scale scanner



Desktop publishing or word processing application



300-dpi laser or color thermal-transfer printer

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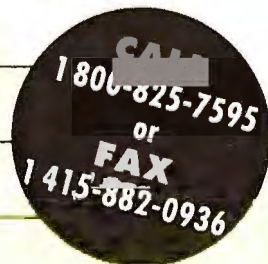
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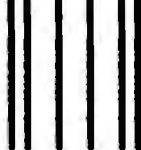
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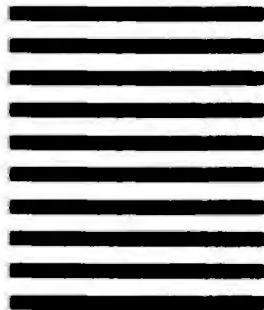
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HOW ABOUT HAND SCANNERS?



Before you look into a desktop scanner, you may want to consider a hand scanner (see "Buyers' Guide: Hand Scanners," November 1991). A 256 gray-scale unit that can handle resolutions up to 400 dots per inch (dpi) costs as little as \$300—

compared to about \$900 to \$1000 for a similar desktop unit. Besides being very affordable, a hand-held scanner doesn't take up desk space.

Still, hand scanners have their drawbacks. First, since you must move it across the image, you need a steady hand to avoid frequent rescans. And because hand units are only 4 inches wide, you'll have to go through the tricky process of merging multiple scans in order to capture large images. Hand scanners are great for scanning small images for publishing or for scanning the occasional published article for conversion by OCR software. But if you plan to do a lot of scanning, especially of larger images, or if you perform regular OCR work, the extra price for a desktop unit is worth it.

any job. A color scanner is simply a gray-scale scanner with color filters, so it doubles as a gray-scale scanner. Another advantage of color: If you're scanning color images with a gray-scale scanner, certain colors tend to drop out (usually a shade of yellow or green). But with a color scanner, there's no dropout, so

you'll get better output even on a black-and-white printer by printing the color file.

Some color scanners have multiple scanning lamps, so you can perform a color scan in a single pass. Others rely on a single lamp that shines through red, green, and blue filters in successive passes. Debate about whether single-

pass or three-pass scanners provide better color registrations is ongoing, but our experience shows you can't judge the quality simply based on the scanning technique. Because they must perform three scans, however, three-pass scanners take longer to process a page.

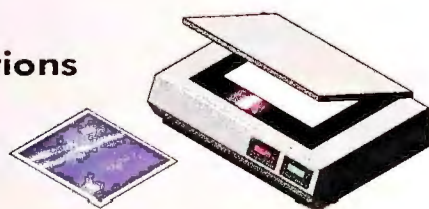
SPEED. Beware of speed

claims made by vendors. The speed of a scan depends primarily on resolution and the number of gray shades or colors—the harder you make your scanner work, the slower it will scan. Some manufacturers report only their fastest scan, and some report only their highest resolution speed.

PRESCAN CONTROLS. Most scanners bundle a single package that covers both the pre-scan utility used to control the actual scan and postscan image-editing software. With most of the units, the prescan software determines whether you can adjust the brightness and contrast of an image before you scan and whether you have prescan commands to flip or scale images. You can always make such adjustments in postscan editing, but doing it before is faster and easier.

POSTSCAN EDITING. Postscan editing is a concern primarily for desktop publishers. Most of the bundled image editors provide basic painting tools for altering images, cleaning up errant pixels, adjusting contrast, performing cut and

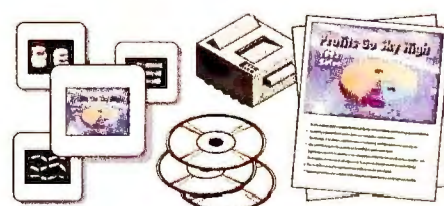
Presentations



600-dpi color/gray-scale scanner

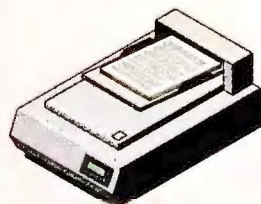


Business presentations or multimedia package



35mm slides or CD ROM, 300-dpi color thermal-transfer printer

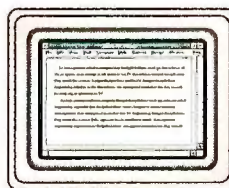
OCR



300-to-400-dpi black-and-white scanner with sheet feeder

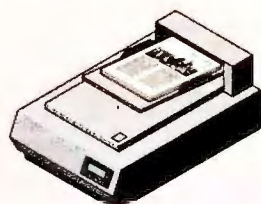


OCR application



Word processing application

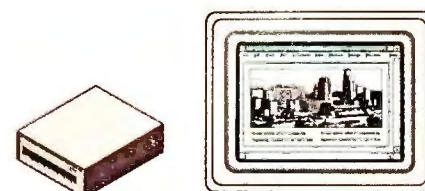
Document storage and retrieval



300-dpi black-and-white scanner with sheet feeder



Document/image management package



Read/write optical disk

FULL-PAGE SCANNERS

Manufacturer	Product	Price	Maximum scan size (inches)	Sheet-feeder cost	Sheet-feeder capacity (sheets)	Optical resolution (dpi) ¹	Maximum resolution with interpolation (dpi)	Shades of gray	Colors
BLACK-AND-WHITE									
THE COMPLETE PC	The Complete Page Scanner	\$899	8.5 x 14	n/a	n/a	200-300	n/a	n/a	n/a
EVEREX SYSTEMS (ABATON)	TranScribe 300	\$1095	8.5 x 11.75	\$495	20	72-300	n/a	n/a	n/a
MICROTEK LAB	MS-II	\$995	8.5 x 14	free	50	75-300	600	n/a	n/a
NEW DEST	Personal Scan 100	\$995	8.5 x 14	free	1	100-400	n/a	n/a	n/a
PANASONIC	FX-RS505U	\$1149	8.5 x 14	n/a	n/a	200-400	n/a	n/a	n/a
UMAX TECHNOLOGIES	UF32	\$1295	8.5 x 14	\$495	25	3-300	n/a	n/a	n/a
	UF42	\$1650	8.5 x 14	\$495	25	4-400	n/a	n/a	n/a
GRAY SCALE									
ADVANCED VISION RESEARCH	3000 GS Plus	\$1590	8.5 x 14	\$795	100	4-300	600	256	n/a
	8000 GSX	\$1690	8.5 x 14	\$795	100	4-400	600	256	n/a
ALPS AMERICA	PSX300g	\$1795	8.5 x 14	\$695	100	12-300	600	256	n/a
CANON USA	IX-30F	\$1545	8.5 x 12 ⁶	\$595	20	75-300	n/a	256	n/a
THE COMPLETE PC	The Complete Flatbed Scanner	\$1599	8.5 x 14	n/a	n/a	75-300	n/a	256	n/a
EVEREX SYSTEMS (ABATON)	Scan 300/GS	\$1595	8.5 x 14	\$595	50	72-300	n/a	256	n/a
HEWLETT-PACKARD	ScanJet Plus	\$1590	8.5 x 11.7	\$595	20	12-300	600	256	n/a
MICROTEK LAB	ScanMaker 600G	\$1199	8.5 x 13.5	\$699	100	75-300	600	256	n/a
NEW DEST	PC Scan 3000	\$1575	8.5 x 11.7	\$695	25	38-300	600	256	n/a
PANASONIC	FX-RS506U	\$1299	8.5 x 14	\$649	30	50-400	n/a	16	n/a
	FX-RS307U	\$1299	8.5 x 14	\$649	30	50-300	600	256	n/a
PENTAX	Pentax IQ Scan (SB-L301)	\$995	8.5 x 14	\$695	30	39-300	n/a	16	n/a
PRIME OPTION	Phovos 600GS	\$1995	8.5 x 14	free	30	40-600	1400	256	n/a
UMAX TECHNOLOGIES	UG630	\$1555	8.5 x 14	\$495	25	1-300	600	256	n/a
COLOR									
ADVANCED VISION RESEARCH	3000 CL Plus	\$1890	8.5 x 14	\$795	100	3-300	1600	256	16.8 mil.
	8000 CLX	\$2190	8.5 x 14	\$795	100	4-400	1600	256	16.8 mil.
CHINON AMERICA	DS-3000	\$995	8.5 x 11	n/a	n/a	75-300 ⁷	n/a	256	4096
EPSON AMERICA	ES-300C	\$2194	8.5 x 11.7	n/a	n/a	50-300	600	256	16.8 mil.
EVEREX SYSTEMS (ABATON)	Scan 300/Color	\$1995	8.5 x 14	\$595	50	72-300	n/a	256	16.8 mil.
HEWLETT-PACKARD	ScanJet IIc	\$2195	8.5 x 14	\$695	50	12-400	800	256	16.8 mil.
HOWTEK	Personal Color Scanner	\$1295	8.5 x 14	n/a	n/a	50-300	600	256	16.8 mil.
MARSTEK	MFS-3000C	\$1295 ⁹	8.5 x 14	n/a	n/a	100-300	n/a	256	16.8 mil.
	MFS-6000C	\$1695 ¹⁰	8.5 x 14	n/a	n/a	100-300	600	256	16.8 mil.
MICROTEK LAB	ScanMaker 600Z	\$1995	8.5 x 13.5	\$699	100	75-300	600	256	16.8 mil.
NISCA	Niscan Spectra	\$995	4 x 6	n/a	n/a	50-400	n/a	256	16.8 mil.
OUR BUSINESS MACHINES	PS-3000/OCR	\$995	8.5 x 14	n/a	n/a	75-300	n/a	256	16.8 mil.
PRIME OPTION	Phovos 300C	\$1495	8.5 x 11	n/a	n/a	50-300	600	256	16.8 mil.
SHARP ELECTRONICS	JX-320	\$2195 ⁴	8.5 x 11	n/a	n/a	30-300	600	256	16.8 mil.
SIIG	AV800	\$2195	8.5 x 11 ⁶	free	50	0-300	n/a	256	256
ULTIMA ELECTRONICS	Artec A4000C	\$1300	8.5 x 14	\$600	50	70-300	n/a	256	16.8 mil.
UMAX TECHNOLOGIES	UC630	\$1995	8.5 x 14	\$495	25	1-300	600	256	16.8 mil.

¹ Units that offer 600 dpi and above through interpolation actually have an optical resolution of 600 dpi or higher on one axis but are limited to the indicated resolution on the other axis.

² One-page scan at maximum optical resolution; shades, and colors unless otherwise noted.

³ At 300 dpi.

⁴ Windows version.

⁵ Extra-cost option.

⁶ 8.5 by 14 with feeder.

Number of passes for color scan	Vendor-rated speeds ² (minutes:seconds)	HP ScanJet emulation	Scanning/image-editing software	PRESCAN			POSTSCAN				Warranty	Reader service number
				Brightness/contrast controls	Flip/reverse image	Scale	Color separation	Filters	Merge scans	OCR software		
n/a	15	N	proprietary	Y	N	N	N	N	N	WordScan	1 year	791
n/a	10	N	N	Y	n/a	n/a	n/a	n/a	n/a	OmniType	1 year	792
n/a	10	N	N	n/a	n/a	n/a	n/a	n/a	n/a	OmniType	1 year	793
n/a	12 ³	N	Image-In ⁴	Y	N	N	N	Y	Y	Recognize	1 year	794
n/a	19 ³	N	Scan-Do ⁴	N	N	Y	N	N	N	N	1 year	795
n/a	10	N	MicroArt II	Y	N	Y	N	N	Y	WordScan ⁵	1 year	796
n/a	18	N	MicroArt II	Y	N	Y	N	N	Y	WordScan ⁵	1 year	796
n/a	30	Y	Picture Publisher 3.0, ⁴ EasyScan	Y	Y	Y	Y	Y	Y	Perceive	2 years	797
n/a	30	Y	Picture Publisher 3.0, ⁴ EasyScan	Y	Y	Y	Y	Y	Y	Perceive	2 years	797
n/a	18	Y	Image-In ⁴	Y	Y	Y	N	Y	Y	Perceive	1 year	798
n/a	10	N	Scan-Do ⁴	Y	Y	Y	N	N	N	N	1 year	799
n/a	18	Y	Picture Publisher 3.0 ⁴	Y	Y	Y	Y	Y	Y	N	1 year	800
n/a	60	N	Picture Publisher 3.0 ⁴	Y	Y	Y	Y	Y	Y	OmniPage ⁵	1 year	801
n/a	10	N	HP Scanning Gallery, ⁴ PC PaintBrush ⁴	Y	Y	Y	N	N	Y	AccuScan ⁵	1 year	802
n/a	10	N	PhotoStyler ⁴	Y	Y	Y	Y	Y	Y	N	1 year	803
n/a	10.5	N	Image-In ⁴	Y	Y	N	Y	N	Y	Recognize ⁵	1 year	804
n/a	19 ³	N	Scan-Do ⁴	Y	Y	Y	N	N	N	ReadRight ⁴	1 year	805
n/a	19 ³	N	PanaScan ⁴	Y	Y	Y	N	N	N	N	1 year	805
n/a	17	Y	N	Y	Y	Y	n/a	n/a	n/a	WordScan	1 year	806
n/a	10	N	Picture Publisher 3.0 ⁴	Y	Y	Y	Y	Y	Y	WordScan	90 days	807
n/a	22	N	Picture Publisher 3.0 ⁴	Y	Y	Y	Y	Y	Y	WordScan ⁵	1 year	808
3	30	Y	Picture Publisher 3.0, ⁴ EasyScan	Y	Y	Y	Y	Y	N	N	2 years	809
3	30	Y	Picture Publisher 3.0, ⁴ EasyScan	Y	Y	Y	Y	Y	N	N	2 years	809
3	1:30 ⁸	N	Colorset	Y	N	N	N	Y	N	WordScan ⁵	1 year	810
1	n/a	N	Image-In, Picture Publisher 3.0 ⁴	Y	Y	Y	N	Y	N	N	1 year	811
3	6	N	ColorLab ⁴	Y	Y	Y	N	Y	N	OmniPage ⁵	1 year	812
1	15 ³	N	HP DeskScan II, ⁴ Publisher's Paintbrush ⁴	Y	Y	Y	N	Y	Y	N	1 year	813
3	1:30	N	Picture Publisher 3.0, ⁴ ColorLab, ⁴ Tempra Pro	Y	N	Y	Y	Y	Y	WordScan ⁵	1 year	814
3	2	N	Picture Publisher 3.0 ⁴	Y	Y	N	N	Y	N	Perceive	1 year	815
3	2:30	N	Picture Publisher 3.0 ⁴	Y	Y	N	N	Y	N	Perceive	1 year	815
3	2:30 ¹¹	N	PhotoStyler ⁴	Y	Y	Y	Y	Y	Y	N	1 year	816
1	45 ⁸	N	ColorLab, ⁴ ScanRIX/ColorRIX	Y	N	Y	N	N	Y	N	1 year	817
1	5:18	Y	WinRix ⁴	Y	Y	Y	Y	Y	Y	WordScan	1 year	818
1	1:30	N	Picture Publisher 3.0 ⁴	Y	Y	N	N	Y	N	N	90 days	819
1	2	N	Tempra Pro, Image-In Color ⁴	Y	Y	Y	N	Y	Y	N	90 days	820
3	5 ¹²	Y	N	n/a	n/a	n/a	n/a	n/a	n/a	N	1 year	821
3	1:36	N	FAScinator 2.0	Y	Y	Y	Y	Y	Y	FAScinator OCR ⁴	1 year	822
3	2 ¹¹	N	Picture Publisher 3.0 ⁴	Y	Y	N	N	Y	N	WordScan ⁵	1 year	823

⁷ 75 dpi maximum for color.

⁸ At 75 dpi.

⁹ \$1395 for PS/2.

¹⁰ \$1795 for PS/2.

¹¹ At 600 dpi.

¹² Black-and-white.

For more information about all products in this table, circle reader service no. 905.

paste, and so forth. These tools are all you need for preparing a fax or scanning in some line art. A very few packages, such as Aldus's *PhotoStyler*, offer special-effects filters, support for color separations, and other prepress controls. Make sure the editor supports the file formats you use in your application. If you plan to buy the software separately, make sure it supports the scanner you'll buy or a scanner that the unit emulates (usually the HP ScanJet).

If you feel tempted to reach for one of the top-of-line units but you don't quite have the money, be patient. Prices have been falling steadily over the past couple years and should continue to drop. If you don't need color, you'll find some real steals.

Patrick Marshall is a freelance writer in Silver Spring, Maryland.

SCANNERS HELP YOU GET THE PICTURE



The Hewlett-Packard ScanJet IIc (the color version of the HP ScanJet Plus) and the Epson ES-300C are both capable of sharp, 24-bit color, and 256-gray-scale scans. Image quality improves if you reduce the image after scanning. The gray-scale image on the left was scanned on the Epson ES-300C and reduced 32 percent. The ScanJet IIc's color scan was reduced 44 percent. A black-and-white scanner like Everex's TranScribe 300 is fine for text or line art (upper right).

OCR: IMAGE INTO WORDS

OPTICAL CHARACTER RECOGNITION (OCR) SOFTWARE CAN REDUCE YOUR CLERICAL COSTS BY LETTING YOU SCAN IN PAPER DOCUMENTS AND TURN THEM INTO EDITABLE FILES.

BY PATRICK MARSHALL

More than half the text we type has already been typed at least once. As companies put more and more of their business on PCs, we end up retyping reams of typewritten documents, published materials, and text files created in old, incompatible data formats.

But now you can give those typists a rest. With optical character recognition software you can scan in text and

convert it into editable ASCII text. Although OCR technology has been around for years, only recently have fast, affordable, reasonably accurate OCR packages been available.

A few scanners are optimized for OCR. The Hewlett-Packard ScanJet IIc, for example, preprocesses text, removing stains or background colors, before turning it over to Caere's *OmniPage*

Professional software for recognition. However, in most cases the scanner itself has little to do with OCR. Scanning text is no different from scanning black-and-white line art.

Still, you should keep a few hardware factors in mind. Obviously, you'll need to make sure the OCR software you want works with the scanner you plan to buy. A 300-dpi scanner is fine for most type, but if you're scanning smaller fonts or irregular type (such as dot matrix draft output), you'll encounter fewer errors and unrecognized characters at 400 dpi, so your scanner and software should both support 400 dpi. Finally, you'll probably want a sheet feeder that holds as much paper as possible. Scanning speed is not a

big factor. Scanning a page of text takes only 5 to 10 seconds, whereas processing that page—even on a fast 386—may take a minute or more.

TRAINABLE VS. OMNIFONT

OCR software comes in two varieties: trainable and omnifont. Trainable software, such as *Advantex* and *Read-It*, matches the scanned-in patterns to a model of the font contained in the software. If the software doesn't recognize a character, it notifies you and asks you to teach it how. Sometimes, you can teach the software a new font after showing it only three or four characters, but even this process can be time-consuming. With some programs you have to go

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303/460-1628 (fax)

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Santa Clara, CA 95054
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Xerox Imaging Systems Inc.

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Peabody, MA 01960
800/248-6550,
508/977-2000

through another training session each time you scan a new size or family of the same font.

Omnifont programs, such as Calera's *WordScan* and Caere's *OmniPage*, are usually more expensive, but they tend to be more powerful and easier to use. They break down each scanned character into the lines, curves, and breaks that comprise it, and then compare those features to an internal data base of character traits. You don't have to train omnifont packages, they're pretty flexible at handling different fonts, and the size of the font is no problem. Still, omnifont packages can get duped by script, italic, and underlined type as well as irregular printing. Some omnifont programs, such as

OmniPage Professional, also provide a trainable mode, so when you run into trouble you can always train the software manually as a last resort.

Here are other features to check for in an OCR package.

ACCURACY. High-end packages like Calera's *WordScan Plus* and Caere's *OmniPage Professional* turn out copy with a 99 percent accuracy rating. Most others are in the high 90s, but a 1 percent decrease in accuracy could mean ten errors per page instead of five. Also note that vendor accuracy estimates themselves can vary in accuracy.

AUTOMATIC PAGE DECOMPOSITION. Many OCR packages are confused by irregular layouts such as tables, text wrapped around images, and headers

and footers. The better programs recognize and isolate these formatting objects—for example, translating snaking columns into a page of continuous text.

DEFERRED PROCESSING. Even the best OCR software is relatively slow, so look for a program that lets you scan multiple pages first and process them later as a group.

ZONING. Sometimes you don't need all the text on a page; zoning lets you process only selected blocks. Zoning templates let you scan selected blocks that always appear in the same location of similar pages—useful for scanning form data into a data base.

JOBS. Most OCR packages let you save sequential pages in one OCR file, but for scan-

ning a lot of text, you'll also want a job separator—usually a blank page—to signal the software to start a new file. That way you can put three 25-page articles in the sheet feeder separated by blank pages, and the program will automatically create three files.

STYLE SHEETS. Some programs let you save style sheets that tell the program how to format documents just as you want them for the destination application, complete with indentations or justification.

SPELLING CHECKERS. Many programs include spelling dictionaries and flag suspicious words. They're especially sensitive to the types of errors to which OCR programs are prone, such as mistaking *t*'s for *l*'s and *c*'s for *e*'s.

VERIFICATION WINDOW. When you run into an error, you don't want to have to find the original document to check the word. With a verification window, you can pop up a window to view the actual scanned image of the document in order to check the word. This feature is a real time-saver.

FAX TRANSLATION. A fax you receive on your fax board is essentially the same as a scanned image. Some OCR packages let you translate fax text into ASCII characters. Calera has even introduced a \$149 add-on called *FaxGrabber* that automatically converts faxes from certain fax boards into ASCII text.

OCR has finally arrived at the point where it's worth the trouble. Each new version of these programs improves their accuracy and increases their speed. And for you, that means less time wasted doing tedious retyping. ●

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 Minneapolis, MN 55420
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OmniPage Professional 2.0
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 Los Gatos, CA 95030
 408/395-7000
 LIST PRICE: \$995
Reader service no. 855

PC-OCR
 Essex Software Publishing
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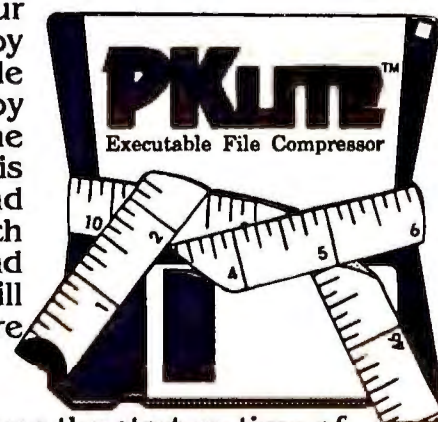
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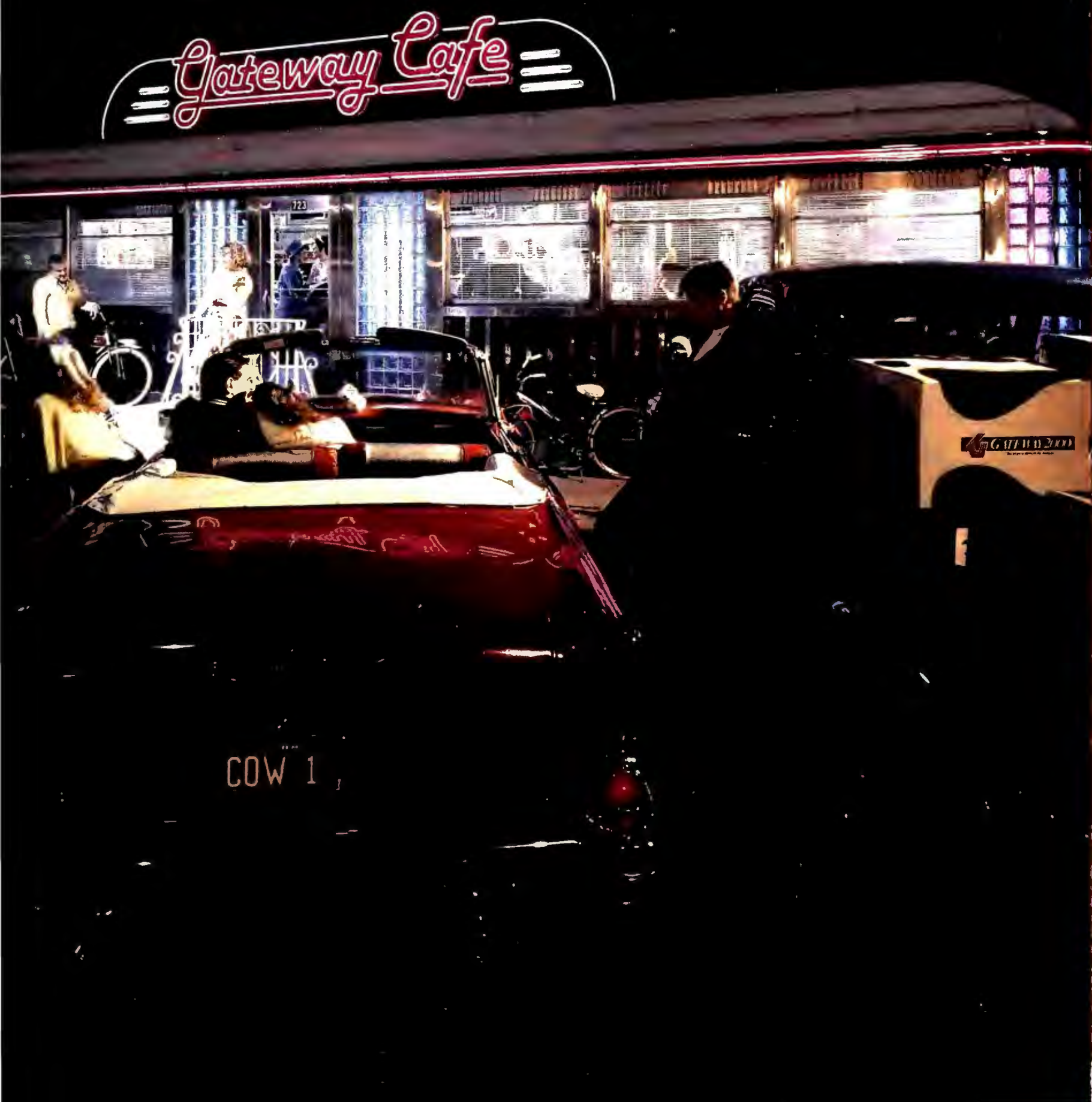
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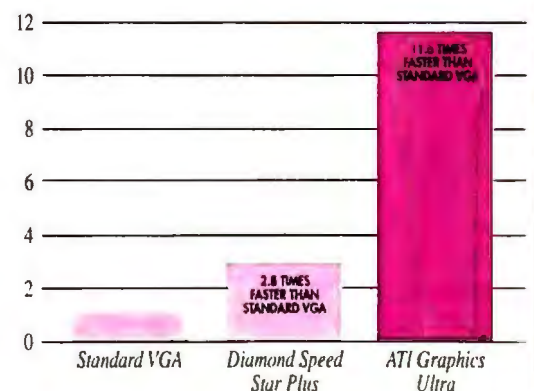


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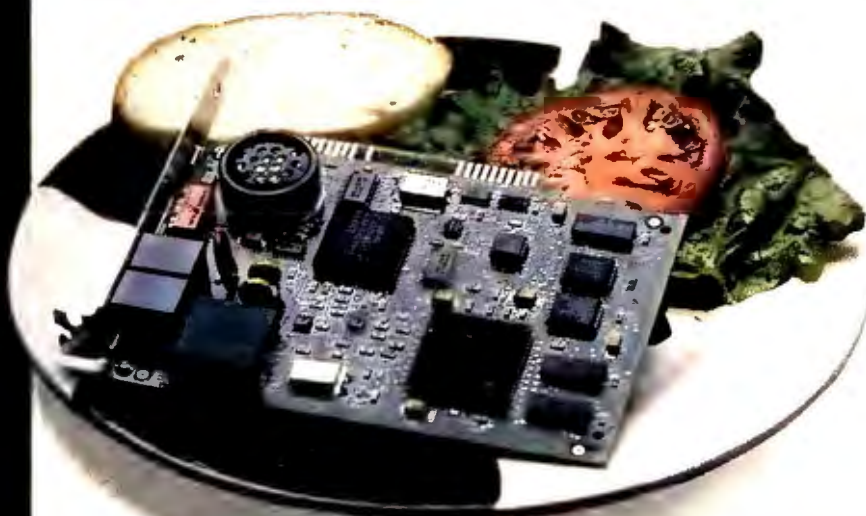
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Figures computed on a 486DX/33 and provided by ATI Technologies Inc.



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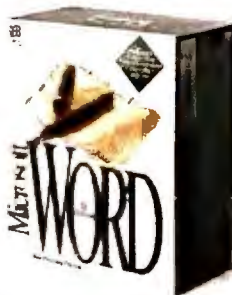


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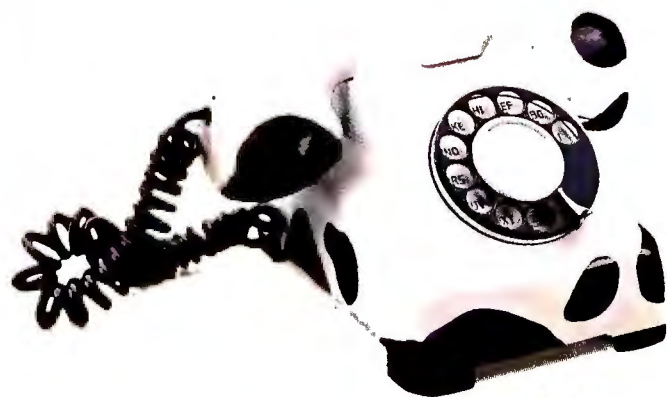
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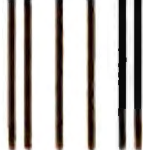
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BY RICHARD SCOVILLE



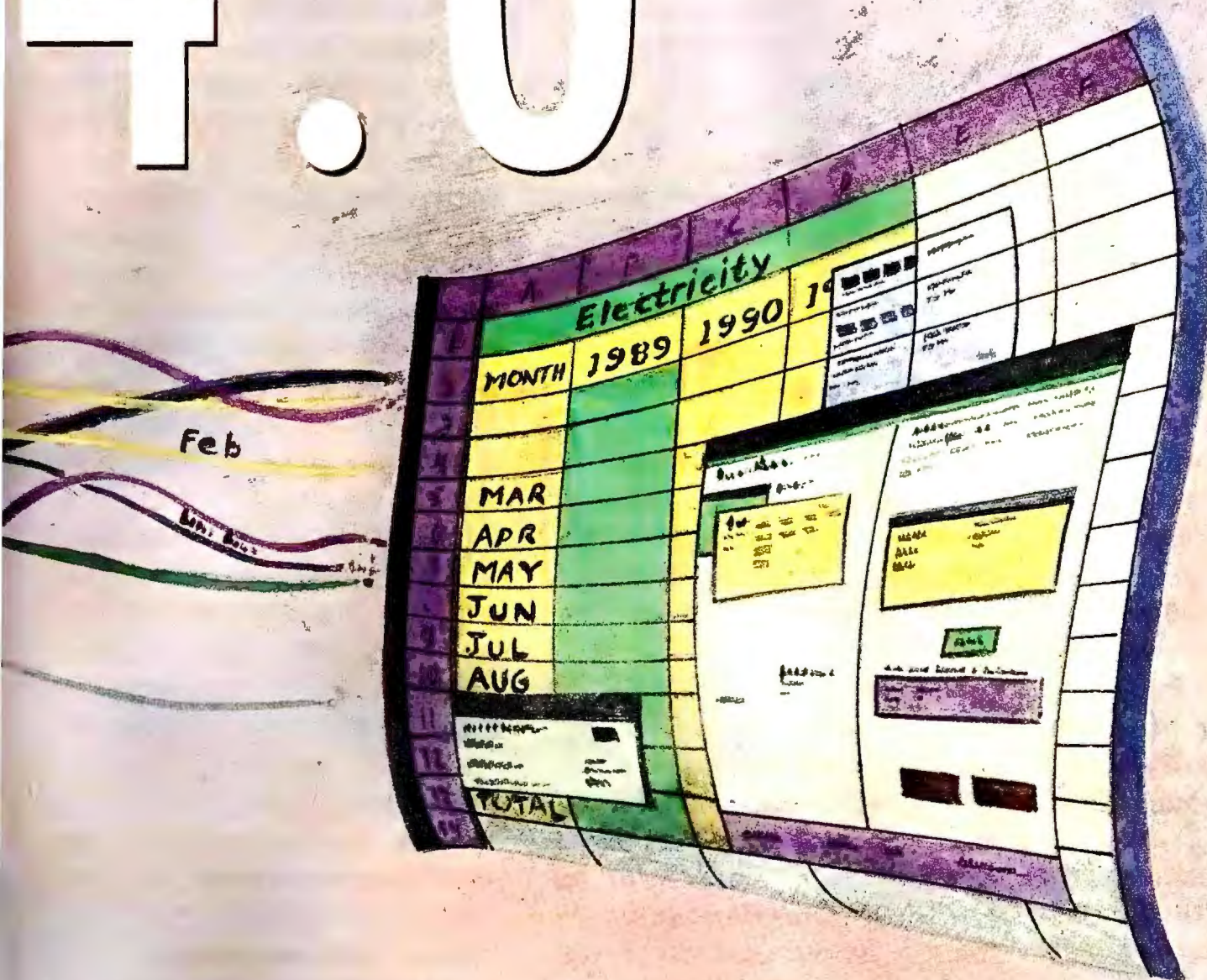
Excel 4.0 so soon? What could Microsoft possibly add to *Excel 3.0*, just 15 months later, to justify a new release?

The answer: plenty. Last year I called *Excel 3.0* "the best application running on PCs today." Well, the more things change, the more they stay the same. *Excel 4.0*, due out this month, is a stunning combination of subtle refinement and revolutionary innovation that confirms *Excel* as the all-but-uncatchable leader in spreadsheet technology. So what do you get for the trouble and expense of yet another upgrade to this premium *Windows* package (\$495, \$129 for competitive upgrade, \$99 for version upgrade until July 31, \$129 thereafter)?

GREG RAGLAND

4.0

We thought Microsoft
could never top Excel 3.0.
We were wrong.



How about unprecedented ease of use, much-needed organizational tools, 1-2-3 macro compatibility, and powerful new analytical features.

The new *Excel* takes a "show me once" approach to basic spreadsheet tasks, which means fewer trips to the menus as you build worksheets. For instance, when you need to move things around the worksheet, forget about Cut and Paste; just select a range, grab it with the mouse pointer, and drag it to a new location. Hold down the Control key as you drag and drop, and it copies the selection; hold the Shift key, and it inserts the selection instead of writing over existing cells.

But be mindful of the dangers inher-

ent in moving spreadsheet data values. It's a simple fact that moving cells changes the underlying structure of the worksheet, and when you move the cells that a formula refers to, you change the structure of the formula. Drag and drop makes moving cells so easy and "intuitive" that a naive or careless user could wreak havoc on a spreadsheet's formulas and produce dangerous errors without even noticing.

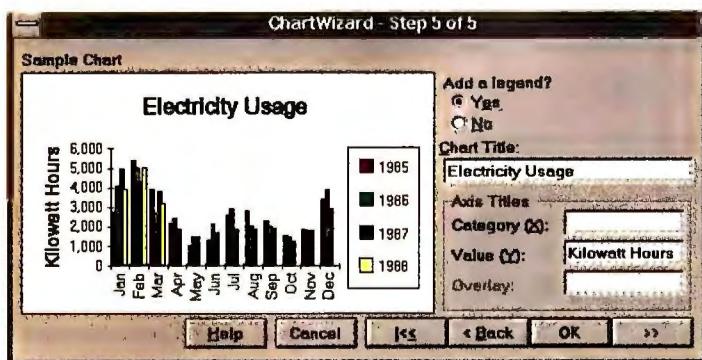
When you need a menu command or dialog box, they're closer at hand than ever before. Select an object such as a cell or a graph data series, click the right mouse button, and you get a set of menu selections specific to that object. For a cell, the menus include Insert,

Delete, Clear, Format Number, and Format Alignment. Click on a graph axis, and the menu displays options for Axes, Ticks, Font, Text, and so on. As with 3.0, if you double-click on an object, such as a graph axis, you get a dialog box for formatting it.

Tired of entering and copying a repetitive series of labels or values? *Excel*'s Autofill feature looks at your first entry and completes the thought for you. Type 'January' into a cell, for example, grab the small, square handle at the lower-right corner of *Excel* 4.0's cell pointer, and drag it across the row or down the column. When you let go, *Excel* fills the selected cells with 'February,' 'March,' and so on. And it

also works with days of the week, dates, financial quarters, and any linear numeric series. If you auto-fill a formula, you get standard copies without going to any menus.

Excel 4.0's new tool bars—shortcut buttons that execute frequently used commands—will also help you steer clear of menus. Sure, *Excel 3.0* has a



Wizards guide you step-by-step through complex procedures. The chart Wizard prompts you to select chart data, choose a chart type, specify axis details, and enter titles.

tool bar, as do a host of other new *Windows* programs, but *4.0's* approach is the most flexible and intuitive thus far. It provides a standard set of task-oriented tool bars for formatting, drawing, macros, charts, and so on. You can customize the standard tool bars and easily create your own by simply dragging new icons into it.

As elsewhere in this release, it's the attention to small details and the subtle visual cues that really make the tool bar feature shine. For instance, if you drag a tool bar to the middle of the screen, it floats on the worksheet surface; drag it to the edge of the window, and it merges with the frame. You can group the icons inside the tool bar into functional subgroups, which makes them surprisingly easier to work with. If you resize a floating tool bar, the icons arrange themselves by subgroup.

Many users never explore the more sophisticated features of their spreadsheet program because the procedures seem too confusing. To make such tasks more accessible, *Excel 4.0* introduces the Wizard, a scripted set of reminders that walks you through the procedure. To create a graph, start by clicking the graph Wizard icon. A dialog box

appears, prompting you to select the range containing the graph data. The next two boxes prompt you to select a graph type, and the last two let you add text and configure the axes. In each dialog box, explanatory text and a draft view of the graph keep you abreast of your progress.

Other nifty gadgets abound. To gain perspective or zoom in on details, you can scale your view of the worksheet from 10 percent to 400 percent, a trick that's especially useful when projecting a spreadsheet image for overhead viewing. There's a reasonably quick spelling checker. And an outrageously cybernetic Auto-format feature lets you select from 14 standard

spreadsheet formatting schemes, ranging from conservative Classic 1 to trendy Colorful 3.

LET'S GET ORGANIZED

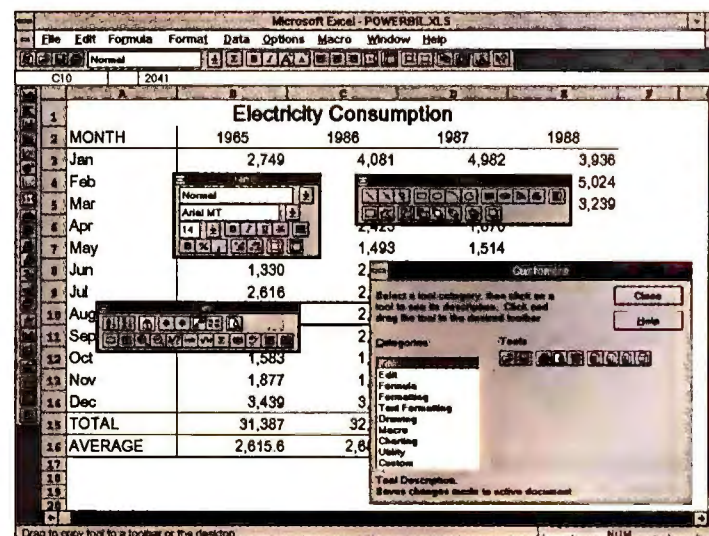
Controlling, standardizing, and managing large, complex worksheets is a major concern for organizations that rely on them for mission-critical information processing. Locating specific data or results in a spreadsheet can be frustrating if you don't know where to look. User-built spreadsheets often suffer from dangerous disorganization, in part because vendors have provided few tools, other than range names, for keeping things in order. *1-2-3 3.x's* 3-D worksheets are a notable exception, but even they can be tough to navigate. Happily, *Excel 4.0* tackles the problem head-on, with three new organizational features: workbooks, views, and named reports.

Excel 4.0's workbook feature supplants the old File Workspace command, which allowed you only to save a set of related spreadsheet

files under one group name. By contrast, a workbook lets you organize your applications efficiently by binding a set of sheets together into a single DOS file. Clicking an icon lets you "turn pages," moving from one sheet to the next; another icon takes you to a table of contents, where you can select any sheet you wish to see. You can give each bound sheet a long name (up to 31 characters), and by assigning each its own window, you can view the sheets side by side. There's even a group-editing command that lets you make the same formatting changes to several sheets at once. *Excel* workbooks do not, however, duplicate all the capabilities of *1-2-3 3.0*; for instance, you can't define or manipulate 3-D ranges. But for most *1-2-3* users, 3-D is primarily an organizational device, and in this respect *Excel* goes *1-2-3* one better.

Excel keeps you organized by using a *view*, which is a kind of named snapshot of the worksheet: It stores the current window—its size, position, and current print settings—in a list, then lets you restore that exact appearance later by selecting the view. Similarly, a *named report* stores a series of views, each with its own print settings, then lets you print a multipage report without resorting to a print macro.

Excel has always played *Avis* to *1-2-3's* Hertz, so *1-2-3* compatibility is a top priority for *Excel's* programming



Excel's floating tool bars are organized by typical worksheet tasks: charting, editing, and so on. You can customize a tool bar or create your own, as shown here by dragging icons from the *Customize Library*.

team. While 3.0 wooed 1-2-3 users with a help system expressly designed to ease their transition to *Excel*, macro compatibility remained a stumbling block for organizations with a heavy investment in Lotus applications.

That final obstacle is now beginning to crumble. *Excel 4.0's* 1-2-3 macro interpreter runs release 2.01 macros just fine, thank you, and by the time you read this, Microsoft hopes to have conquered the 2.2 macros as well. (The beta software I ran couldn't handle some 2.2 commands, much less new ones that appeared in 2.3 and 3.x.) But for the many macros it does handle, this interpreter is great. You just open the WK1 file, and if the macro is named \P, you press <Ctrl>-P to run it.

And does it ever! My 1-2-3 macros run faster in *Excel 4.0* than they do in 1-2-3 for Windows. In *Excel 4.0* a macro-generated menu appears as a mousable dialog box, unlike 1-2-3 for Windows' rickety, unmousable classic menu. As you gain experience with your new spreadsheet, you can even embed *Excel* macro-function calls within your 1-2-3 macro code.

Finally, *Excel 4.0* reads and responds to *Allways* and Wysiwyg formatting and opens a 3-D WK3 file from 1-2-3 release 3.x as a multisheet workbook. While it preserves external formula references in these files, it sheds data structures such as 3-D range names or 3-D data tables along the way. Apparently, Microsoft doesn't expect heavy competition from *Quattro Pro*: *Excel 4.0* can't read its WQ1 files, and while it's easy to open them via WK1 format, you'll lose any fancy formatting.

CHARTS, GRAPHS, AND REPORTS

The improvements here range from the sublime (print to fit, an indispensable option that shrinks a large print range onto a single page, now works on non-PostScript printers) to the ridiculous (à la *Quattro Pro*, there's a slide-show generator complete with silly sound effects to accompany image transitions). The chart gallery offers radar

charts, 3-D surface charts, and 3-D horizontal bar charts, and you can rotate a 3-D graph by grabbing it with the mouse. The overall usability of the charting program has been improved in other ways, too: The chart Wizard, a chart tool bar, and the right mouse button all make working with charts a lot easier.

In addition to the named reports described above, you can create multiline headers and footers, and the redesigned dialog box makes it a lot easier to embed the date, time, and other special codes in them. There's even an option in the Page Setup dialog box that lets you suppress cell colors when you print so you don't have to reformat the worksheet in order to print it on a black-and-white printer.

Excel's Scenario Manager elevates the art of what-if analysis to a new plane. It lets you prepare and name sets of alternative values for input cells, then switch easily from one set to another to see their effects on formulas. *Excel* maintains a list of named scenarios and lets you generate a summary table of their results. The Solver now has a Save Scenario function that lets you store a solution as a scenario.

The new Crosstabs add-in, complete with its own guiding Wizard, lets you generate a summary table of data base information to show, for example, subtotals or averages by department. It can also tally the records in each category to show, for instance, the number of employees in each age group.

Microsoft claims that 15 to 20 percent of *Excel's* current users are scientists or engineers. To please these influential customers, and to wow their unpersuaded colleagues, *Excel 4.0* offers an Analysis Tools add-in that provides a host of advanced procedures, from analysis of variance and random sampling to Fourier analysis. To accom-

The screenshot shows the Microsoft Excel 4.0 interface. A menu box is open, displaying options: RUN, PRINT, EDIT, AGING, and QUIT. The background spreadsheet shows a table with columns: INV_NO, DATE, COMPANY, AMOUNT, PAID, DUE, AGE. The data includes entries for various companies like East Boron Condo, AAbrac, Hoohaa, and Sonny's Supply. A totals row at the top right shows 4,630.78, 0.00, and 1,707.09.

INV_NO	DATE	COMPANY	AMOUNT	PAID	DUE	AGE
91-001	06/21/91	East Boron Condo	176.40	Y	0.00	
91-002	06/23/91	AAbrac			0.00	
91-003	06/23/91	Hoohaa			0.00	
91-004	07/01/91	AAbrac			0.00	
91-005	07/13/91	Nevermore			0.00	
91-006	07/14/91	New Hope			0.00	
91-007	07/15/91	Sonny's			01.61	106
91-008	07/17/91	Hoohaa			0.00	
91-009	07/22/91	East B			0.00	
91-010	07/29/91	Sonny's			23.91	92
91-011	07/31/91	Nevermore Funeral Ho	423.00	Y	0.00	
91-012	08/02/91	New Hope Freewill As	427.87	Y	0.00	
91-013	08/08/91	Sonny's Supply	21.54		21.54	82
91-014	08/13/91	Hoohaa Farms	43.87	Y	0.00	
91-015	08/14/91	East Boron Condo	23.73		23.73	76
91-016	08/18/91	Sonny's Supply	132.76		132.76	72
91-017	08/29/91	Nevermore Funeral Ho	345.76	Y	0.00	
91-018	09/05/91	Sonny's Supply	14.23		14.23	54

Excel's new 1-2-3 macro interpreter executes standard release 2.01 macros without modifications.

pany them, 4.0 introduces 140 new functions, such as binomial, chi-square, and normal distribution statistics. Many users who used to have to transfer spreadsheet data into a statistical analysis program like *Statgraphics* can now do the whole job in *Excel*.

ROLL UP YOUR SLEEVES

In my many years of training users on spreadsheet software, I've shared their frustration at the time required to master the simple, repetitive tasks—moving, copying, and formatting—before moving on to advanced features. And as vendors loaded more and more features into the same old interfaces, users' frustration intensified. That's why *Excel's* attention to fit-and-finish details and emphasis on direct manipulation are such welcome developments. For more sophisticated users, new organizational tools, such as workbooks, pursue a similar goal by making it easier to manage complex applications. So what are you waiting for? Get to work! ☺

Richard Scoville is a contributing editor for PC World and a software training consultant in Durham, North Carolina. He can be reached on PC World Online (see page 8 for more information).

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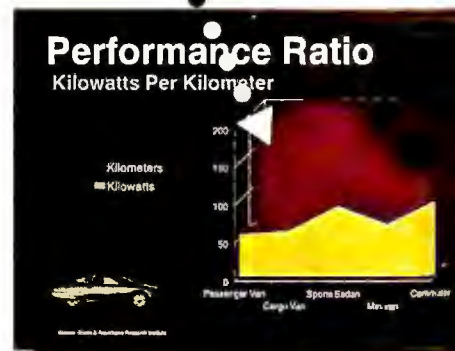
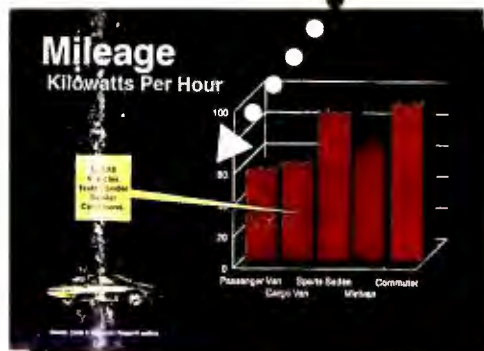
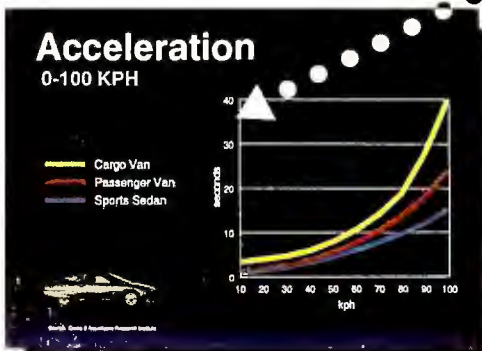
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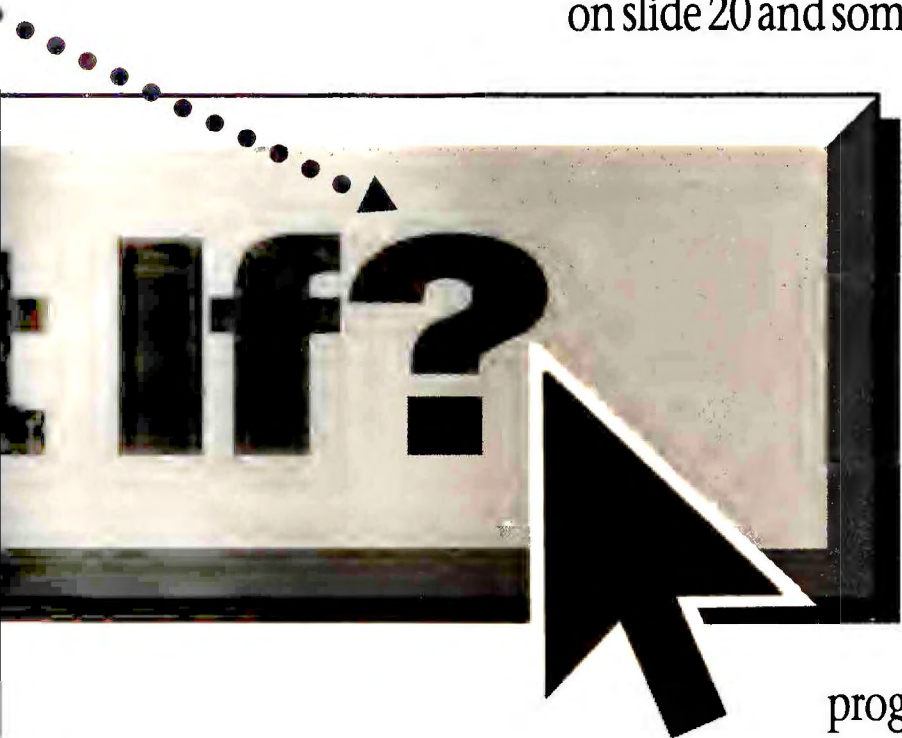
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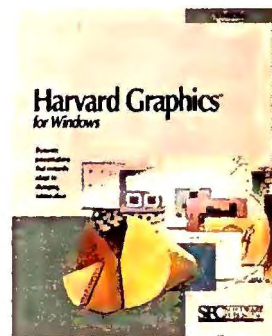
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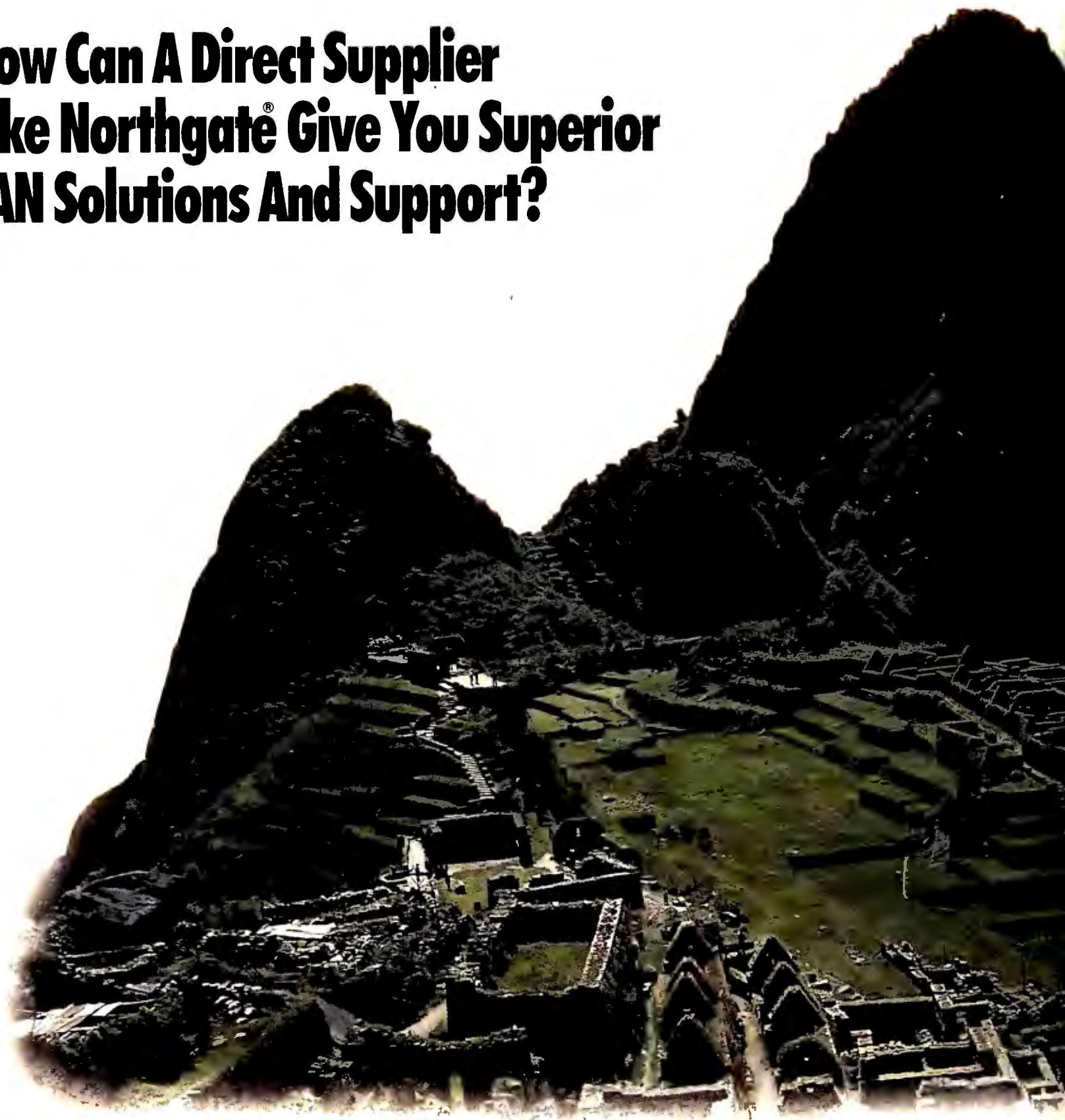


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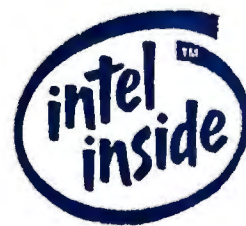
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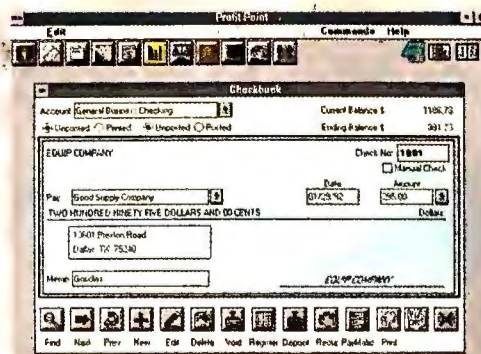
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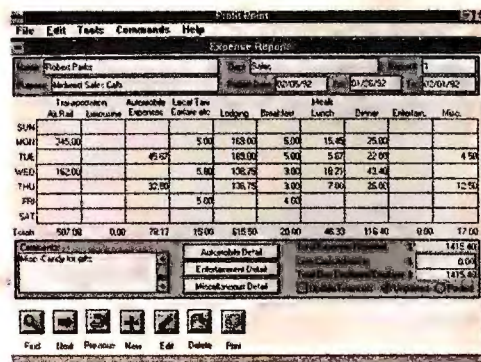
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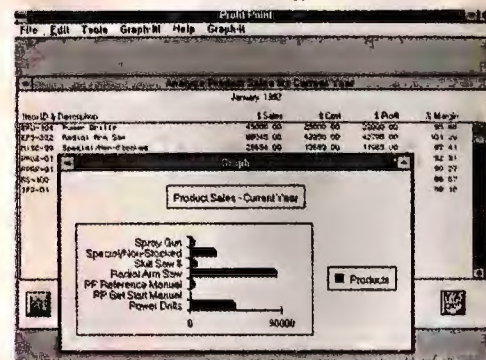
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DOS vs DOS

*DR DOS, the world's
premier DOS clone,
provides more features
and frees up more
conventional memory
than DOS 5.0. But will it
work with everything?*

BY SCOTT SPANBAUER

DOS 3.3 was great for its time, but now that you're itching to move up, MS-DOS 5.0 looks like the obvious upgrade, right? Not so fast. Digital Research Incorporated's DR DOS 6.0—a DOS clone with superior memory management, a host of bundled utilities, and the same \$99 price tag as Microsoft's DOS 5.0 upgrade—is here. And it's a strong contender for your upgrade dollar.

Plenty of users are finding DRI's alternative to MS-DOS attractive. According to International Data Corporation analyst Nancy McSharry,

the upstart operating system is giving Microsoft a run for its U.S. market, claiming 6 percent of the OS pie as of December 1991.

"Considering what they're up against, DRI is doing incredibly well," says McSharry. DR DOS could become even more alluring to users once DRI's new owner, network powerhouse Novell, puts its stamp on the product. Novell has announced plans to modify future versions of DR DOS so that it will be more tightly integrated with NetWare, allowing for easier network management and simpler network installation.

Is It Compatible?

Network integration, however, is still just a notion. A more important consideration is compatibility with existing software. Since MS-DOS

is the standard, software developers make sure their applications are fully compatible with it. As long as MS-DOS is compatible with earlier versions of itself, there's little to worry about. DR DOS, on the other hand, needs to be compatible with MS-DOS as well as with every other piece of software available—a nearly impossible task. Some of the bundled utilities—one of DR DOS's advantages over MS-DOS—have caused problems. When DR DOS is installed with the disk caching utility enabled, for example, it's possible to corrupt existing DOS files. Some users have reported that DR DOS's file compression utility may be incompatible with certain third-party utilities such as defraggers, and DRI concedes that some of the program's security features don't work on certain IBM PS/2s. More surprising, DR DOS has shown incompatibilities with parent company Novell's NetWare Lite LAN operating system, particularly when users run DR DOS's disk compression utility on a NetWare Lite server.

To correct these and other reported incompatibilities, DRI began in December of last year to ship an update plus a 50-page configuration and optimization guide to all registered DR DOS owners. Incompatibility problems could be compounded, however, by *Windows 3.1*, not yet released at press time. Digital Research promises to correct any future *Windows* incompatibilities, but doubts linger, and they won't be answered definitively until *3.1* arrives, probably sometime this month.

The 3.1 release will answer other

questions too—such as how Microsoft intends to play the game. Microsoft's redesign of *Windows*—specifically the virtual device interface, which connects *Windows* to external memory management systems—will likely make it incompatible with DR DOS. And Microsoft has already stated its unwillingness to help DRI fix any *Windows 3.1*—DR DOS incompatibilities. You can't

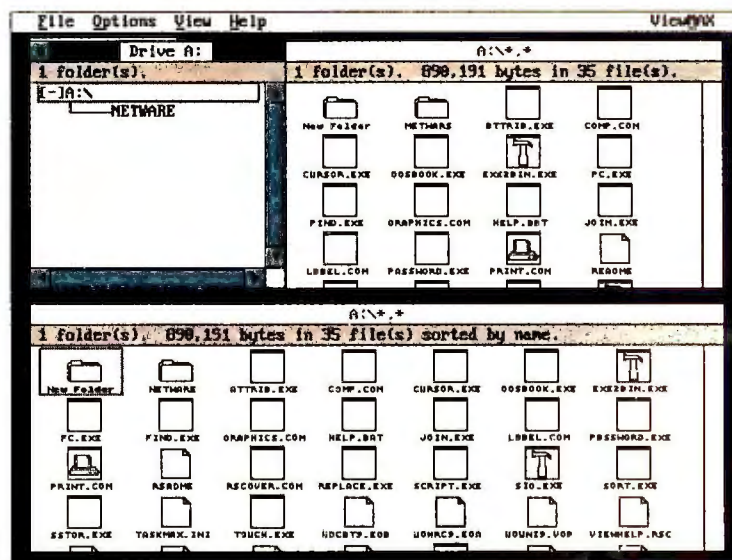
blame Microsoft for not wanting to share the operating system market, but by stonewalling DRI, Microsoft is playing hardball with its customers, forcing them to use MS-DOS. Such a decision could come back to haunt Microsoft; Novell could retaliate by building links into NetWare so that only DR DOS would be fully NetWare compatible.

Bundles of Features

For those willing to risk incompatibilities, DR DOS holds many loyalty-inspiring features MS-DOS lacks. One is optional password protection for files, subdirectories, hard disk volumes, and the entire system—crucial for keeping unwanted network and late-night office snoops out of your data. Another is “interactive boot processing,” which makes life easier for folks who need to change system configurations frequently (DR DOS asks whether to load selected drivers and programs at start-up—there's no need to store and rename

multiple CONFIG.SYS and AUTOEXEC.BAT files). DR DOS's most obvious advantage is its new task switcher, which runs from the shell or the command line and can handle 20 programs at once.

Not content to outdazzle the competition at the nitty-gritty level, DRI

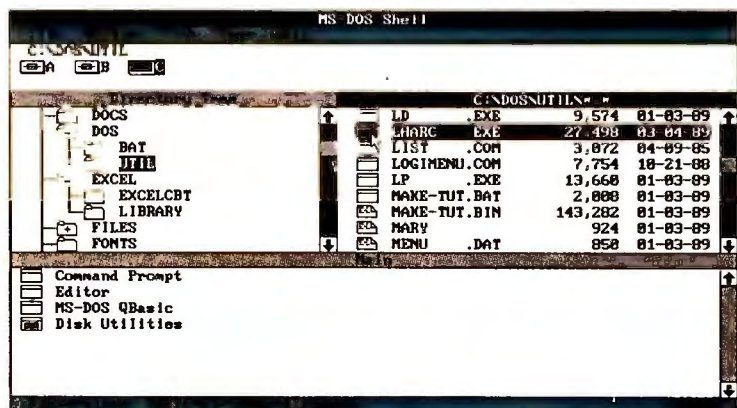


DR DOS's shell looks surprisingly Mac-like, but its real inspiration is the GEM operating system.

also throws in some utilities you'd normally have to go out and pay good money for. DR DOS has incorporated a serial file transfer utility—something Microsoft planned to include in MS-DOS 5.0 but pulled shortly before release. If you've been planning to purchase a program like *Lap-Link* or *Brooklyn Bridge*, DR DOS will save you the cost.

More important to those of us living in a universe of ever-expanding files, DR DOS now comes with an on-the-fly file compression program that can double hard disk capacity, and a disk optimizer that defragments files, speeding hard disk reads and writes. Of course, task-specific commercial utilities may offer better features and performance than DRI's collection, but the company is hoping the low cost of admission will entice the idly curious.

DRI claims that DR DOS's disk caching utility (a version of our February 1990 Best Buy *Super PC-Kwik*) works better with both DOS programs and *Windows* than does MS's SmartDrive, the cache included with *Windows* and MS-DOS. Disk caching, which speeds access to data, is a great utility on any computer with spare expanded or extended memory. But gaining that improvement means first installing the driver. Initial versions of DR DOS 6.0 weren't optimized for *Windows* users: The default installation prevented *Super PC-Kwik* from releas-



The DOS 5.0 shell, Microsoft's other version of a graphical interface, shields users from the command line.

ing memory to *Windows*, forcing puzzled users to dig into their manuals. The December update, DRI says, has solved this problem.

About the only add-in DR DOS lacks is a BASIC interpreter like MS-DOS's excellent QBASIC. Although both systems let you recall and edit previously issued commands, DR DOS lacks MS-DOS's ability to store strings of commands as macros—essentially batch files that execute from memory.

Memory Magic

MS-DOS and DR DOS do marvels with memory by loading memory management drivers via the CONFIG.SYS file when you boot up. Both DOS's load part of the operating system plus drivers and programs either into the high memory area (HMA), the first 64K of your system's second megabyte of memory, or into upper memory blocks (UMBs), the unused memory addresses in the area between 640K and 1MB. DR outdoes MS, however, with added UMB and HMA support for 80286- and 8088-based machines equipped with LIM EMS 4.0 memory and support for 80286s equipped with Chips and Technologies' SCAT, NEAT, and Leap memory management chip sets. For a plain vanilla 286 PC, though, MS-DOS releases 621K of conventional memory compared with DR DOS's 619K.

Until MS-DOS acquires similar talents (it does save 80286 users approximately 35K by loading part of the operating system in the HMA), DR DOS has an obvious edge for owners of those Chips and Technologies systems (see "The DOS's Duke It Out"). And for 386 and 486 users who need every last byte, DRI claims its DOS frees up 14K more in the lower 640 than MS-DOS 5.0 does. That 14K can put more resources at *Windows* users' disposal. However, unlike DR DOS, which puts its 27K EMM driver in UMB, MS-DOS puts its driver in extended memory, delivering 32K more free UMB space—128K versus 96K. If you've got over 110K of drivers and TSRs, MS-DOS will let you

load more of them high, resulting in more conventional free space.

In Search of Support

It may not come in the box, but the feature people notice first is support. Many an eyebrow arched last year when Microsoft announced the MS-DOS 5.0 support policy: free for 90 days, \$2-per-minute telephone assistance thereafter. According to Senior Product Manager Rich Tong, Microsoft thinks its customers won't encounter trouble after the 90-day period. "The vast majority of users only have problems getting the product running," he says. "Only those people who call instead of using the manual have to pay."

DRI's policy of free lifetime support certainly seems more generous, though DRI's technical support staff has drawn plenty of fire for being nonresponsive.

DRI product manager Ken Pomper acknowledges there was a problem shortly after the product's introduction but explains that the company has tripled its technical staff and added on-line and fax support since then.

Windows Woes

Fixing support problems was relatively easy. The question of *Windows 3.1* compatibility is more vexing. "We've seen DR DOS 6.0 and *Windows 3.1* work together on some machines but not on others," says Pomper, but DRI's hands are legally tied because Microsoft has denied the firm's application to join the *Windows 3.1* beta program. According to Pomper, however, DRI is "committed to making *Windows 3.1* and DR DOS run together."

Microsoft's Rich Tong refuses to confirm or deny that DR DOS will run

THE DOS'S DUKE IT OUT

	MS-DOS 5.0	DR DOS 6.0
Price	\$99.95	\$99
Support	90 days free; \$2 per minute thereafter	unlimited; toll number
FEATURES		
Available conventional memory		
386s and 486s (+UMB)	613K (+128K)	627K (+96K)
Standard 286s	621K	619K
286s with SCAT, NeAT, or LeAP chip sets	555K	628K
8088s with LIM EMS 4.0 memory	521K	612K
General		
Shells	Y	Y
Task switching from shell	Y	Y
Task switching from command line	N	Y
File, directory, and volume password security ¹	N	Y
Interactive control of CONFIG.SYS and AUTOEXEC.BAT execution	N	Y
On-line help	Y	Y
On-line documentation	N	Y
File undelete	Y	Y
Bundled utilities		
Memory usage viewer	Y	Y
Disk cache	Y	Y
File compression	N	Y
Disk defragger	N	Y
File transfer	N	Y
BASIC interpreter	Y	N

¹ MS-DOS 5.0's shell provides a password for program launching; DR DOS 6.0 password-protects files, directories, and volumes.

Memory Type	Total Bytes (Kbytes)	Available
Conventional	655,360 (640K)	641,056 (626K)
Upper	135,168 (132K)	49,232 (48K)
High	65,520 (64K)	8,240 (8K)
Extended	3,407,872 (3,328K)	0 (0K)
Extended via XMS	N/A	3,129,344 (3,056K)

Total bytes available to programs (Conventional+Upper) : 714864 (698.1K)
 Largest executable program size : 627104 (612.4K)
 Largest available upper memory block : 87120 (85.1K)

3407872 bytes total contiguous extended memory
 0 bytes available contiguous extended memory
 3087360 bytes available XMS memory
 MS-DOS resident in High Memory Area

Both products generate reports showing how memory is allocated. DR DOS (top) frees up slightly more conventional memory. MS-DOS (bottom) gives more upper memory, although it does so at the expense of available XMS.

Windows 3.1, noting that *Windows* was designed to run under MS-DOS. "We can only guarantee the quality of our products when they're running under MS-DOS," he says, adding that it's the "job of any clone maker" to ensure compatibility. Tong also says Microsoft isn't taking any particular steps to ensure DR DOS compatibility with *Windows 3.1*. As to DRI's exclusion from *Windows 3.1* testing, he states flatly, "we don't work with clone vendors."

That policy, according to DRI's Pomper, harms Microsoft's own customers—*Windows* users who happen also to use DR DOS. In addition, Pomper believes that Microsoft has treated DRI unfairly. He claims that Microsoft has changed the *Windows* memory management interface—the way memory managers such as DR DOS's EMM386.SYS work with *Windows*—and that it refuses to provide DRI with the specification. Pomper adds that Microsoft has provided other memory manager manufacturers, such as Qualitas, with the spec.

"They [Qualitas] are our partners," says Brad Silverberg, Microsoft's vice president of personal systems, chief of MS-DOS and *Windows* development. "We have changed the way *Windows* manages protected mode memory," he says, adding "there's no code inside *Windows 3.1* that checks 'is this MS-

DOS?'" Silverberg makes no bones about Microsoft's competitiveness: "Top DRI executives have implied strongly in the press that they are interested in building a *Windows* clone. And I'm going to send them a beta copy?" His advice for DR DOS users concerned about *Windows* compatibility is equally blunt: "It's the same as for people who want to run *Windows* on Macintoshes or Suns—you're on your own."

Crapshoot of the Nineties

Should buyers go with DR DOS, an operating system with loads of extras and a few glitches, or stick with the Microsoft family? It's hard not to like DRI's nice-guy determination and commitment to satisfy its customers. But DRI couldn't have picked a tougher foe than Microsoft, which holds the trump card of DOS's future: *Windows*. "We're certainly investing very heavily in MS-DOS; its success has been phenomenal," says Silverberg. He allows that future versions will offer more support for portable computers as well as closer integration with *Windows*. "There are a number of things we did in *Windows 3.1* to make it work better with MS-DOS. In the future, some *Windows* functions, such as virtual 386 management, will migrate to DOS." And the closer MS-DOS and *Windows* grow, the more likely that DRI will continue to

play catch-up, custom fitting DR DOS to *Windows*' whims.

But DRI may have its own ace in the hole in the form of parent company Novell. According to IDC's McSharry, users have only begun to see the benefits of the merger. "In the future," she says, "as the ability to hook into network services becomes more important to organizations, any cooperation at the systems level is going to be a boon." In the next 18 months or so, McSharry predicts, we'll see a version of DR DOS that's optimized for NetWare performance. Microsoft's Silverberg doubts, however, that the NetWare connection will vault DR DOS to the top of the charts; he believes it's the software, not the network, that determines which operating system you'll choose. "On the client," he says, "applications rule." ●

Scott Spanbauer is a contributing editor for PC World. He can be reached on PC World Online (see page 8 for more information).

WHERE TO BUY

DR DOS 6.0	MS-DOS 5.0
Digital Research, Inc.	Microsoft Corp.
70 Garden Ct.	One Microsoft Way
Box DRI	Redmond, WA
Monterey, CA 93942	98052-6399
800/274-4374,	800/426-9400
408/649-3896	List price: \$99.95
List price: \$99	Reader service no. 638
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*multimedia \mul-ti-med-i-ah\
1: PC applications that incorporate
sound, video, and animation. 2:
hottest buzzword in the PC industry*

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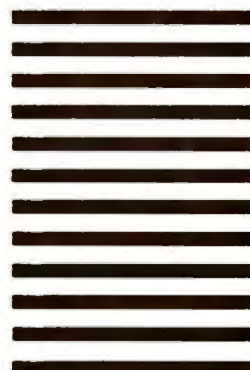
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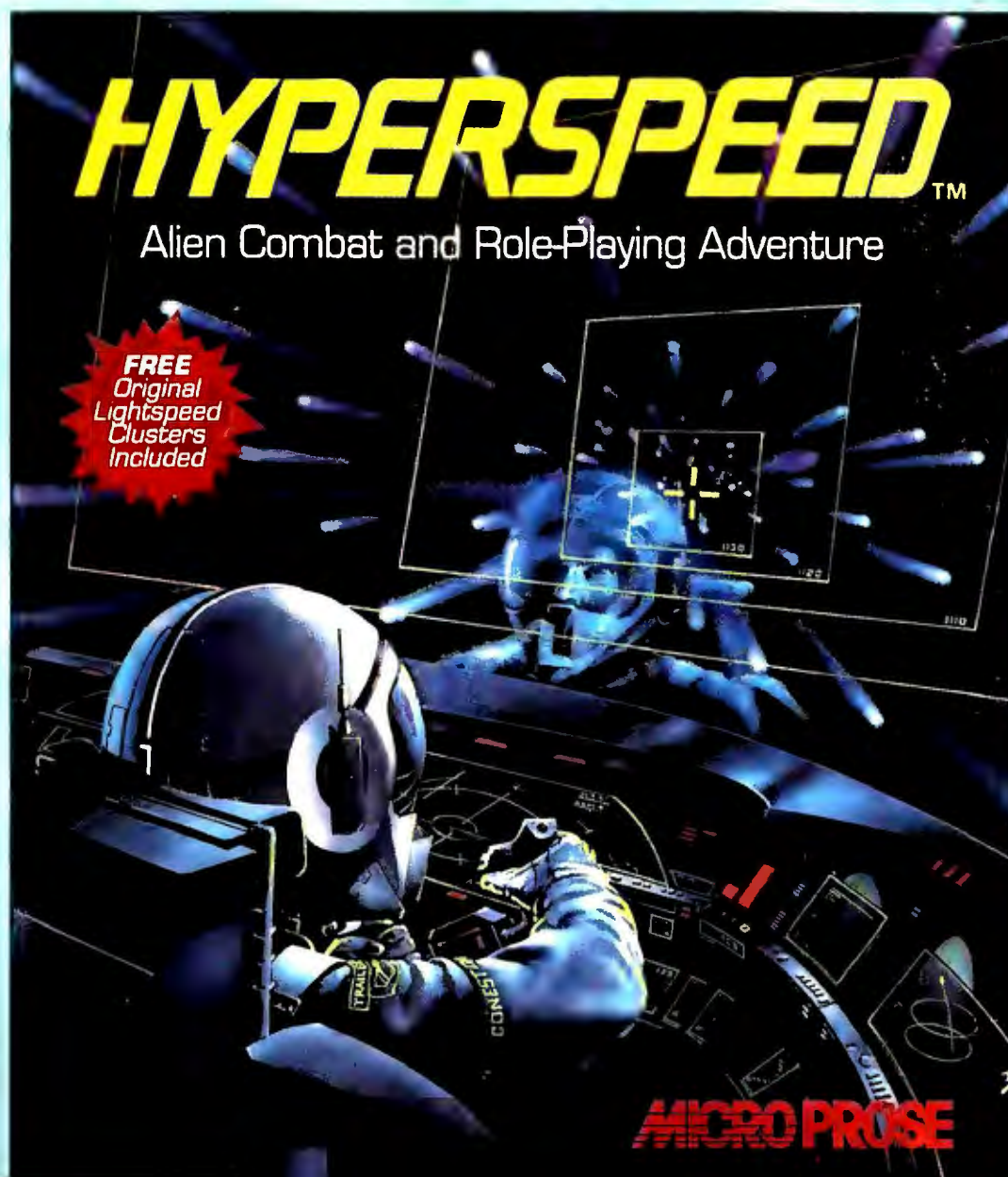
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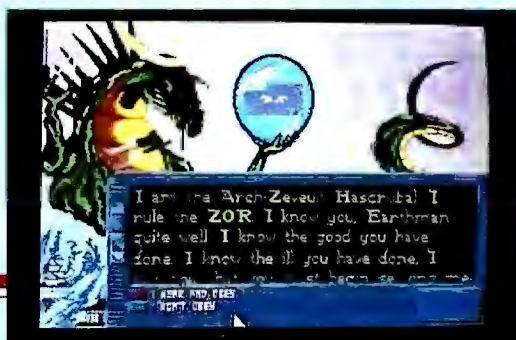
"Aliens approaching... fightercraft launched."



Look for an F-117A Stealth Fighter Demo in specially marked packages of TDK Micro Floppy Disks.




IBM-PC screens shown.



There's no room for error when traveling faster than the speed of light, racing through star systems in a desperate search for a new world to house Mankind. But there are plenty of opportunities for mistakes. Alien races of every conceivable size, shape, temperament and sophistication seek to aid, use, corrupt or destroy you — and you don't know which.

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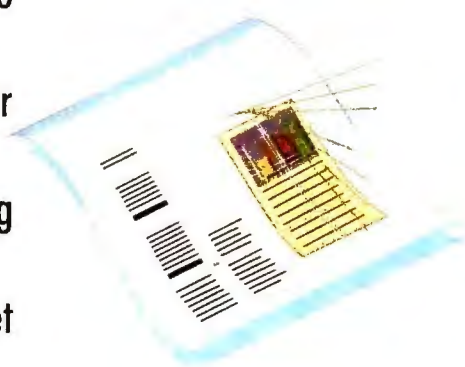
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MICRO PROSETM
ENTERTAINMENT • SOFTWARE

Create reports that get read—and understood. Two experts reveal their secrets for producing documents that get the point across but don't require a degree in design.

MARGARET Y. RABB AND

RICHARD SCOVILLE



TIPS FOR GREAT REPORTS

You work hard, and you're using your PC to do your job faster and better. But does anyone notice? Do the reports you produce still look like they just rolled out of Aunt Gertrude's Selectric?

They don't have to. With just a little effort, you can coax appealing documents from the spreadsheet programs and word processors you use every day. And your HP LaserJet printer stands ready with some classic typefaces to add flair and style to your reports. The trick is knowing how to exploit these features.

Simplicity and consistency. These two principles will help you quickly create documents that look good and get results. In this article, we present a series of five typical business documents to illustrate these essential rules of thumb, along with tips to give your

next project a sense of direction. We used five popular programs—*Word for Windows 1.1*, *WordPerfect 5.1* for DOS, *WordPerfect for Windows*, *Excel*, and *1-2-3* release 2.3—and an HP LaserJet III printer to prepare the documents, which chronicle a formative episode in the career of Dave Richards, marketing executive for the fictional Matrix Mattress Corporation.

Keep it simple. The goal of any business document is to communicate important information to busy people who are not as familiar with the details as you are or as interested in them. To be effective, your report must focus their attention and not waste their time. That means you must distill your material into concise points, organize those points into a hierarchical outline, then make the structure of the information on the

H

Tips for great reports

simplicity and consistency.

These two principles will help you quickly create documents that look good and get results. In this article, we present a series of typical

1

2

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page match the structure of your argument. Use headings and subheads as visual cues to the flow of points in your document.

Start by asking the question, What is this document intended to accomplish? For example, the goal of a proposal is to win support for your project from specific individuals. Next, think carefully

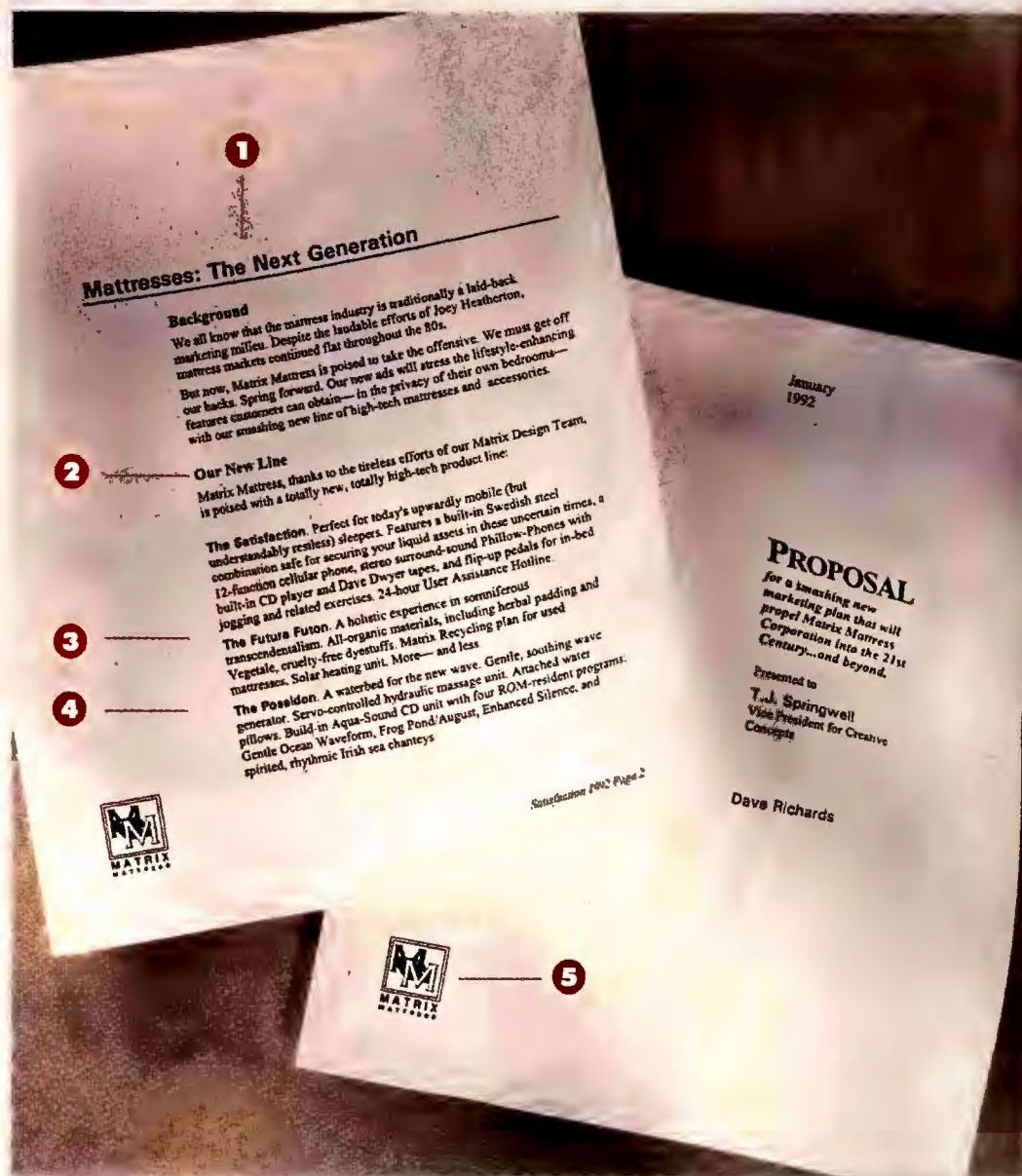
about your audience, the knowledge and predispositions of its members, and the information they'll need to reach the conclusions you want them to. Make an outline and ruthlessly remove any points that don't help your readers reach that conclusion. Remember that while you're intrigued with the details of how you collected and analyzed the

information, your audience is mainly interested in your conclusions.

Keep it simple as you select the ideas, text, figures, and images to go on the page. After you've written the text of a proposal or report, take time to edit it. Look for repetition, and eliminate all but the clearest statement. As in Dave's proposal and letter, use active, colorful,

PROPOSAL

- 1 **Consistent font usage: sans serif Univers for large heading, serif for subheads. Boldface sets heads apart from body text.**
- 2 **Setting subheads closer to following paragraph than preceding one connects them visually to their text.**
- 3 **Extra half-line of spacing between paragraphs lightens page, entices reader with bite-size reading units.**
- 4 **Sans serif typeface draws attention to mattress models but doesn't compete with subheads.**
- 5 **On cover page, strongest element—Matrix logo—anchors first column.**



The Matrix logo in this *Word for Windows 1.1* document was available as a TIFF file on the office network. The cover page features a strong, asymmetrical line at the fifth grid column. The ample white space focuses attention on the word *Proposal* and on the logo. Notice how white space also helps to emphasize Dave's name.

To prepare the document, we set the left, right, and bottom margins at .75 inch, the top margin at 2.7 inches. We set tab stops every inch. On the cover page, we used Format Position to override the top margin for the date. The cover uses Times—bold and bold italic. The names below the elements are in Univers.

Page 2 (left) begins a new Section, with a footer to place the recur-

ring logo. We created three formats: Heading, for the major headings, is 24-point Univers Bold, with a 36-point space before the paragraph and a thick border below. Subheading is 14-point Times Bold, left indent at 2 inches, with an 18-point space above. Body Text is 12-point Times, with a 2-inch left indent and a 5-point space between paragraphs.

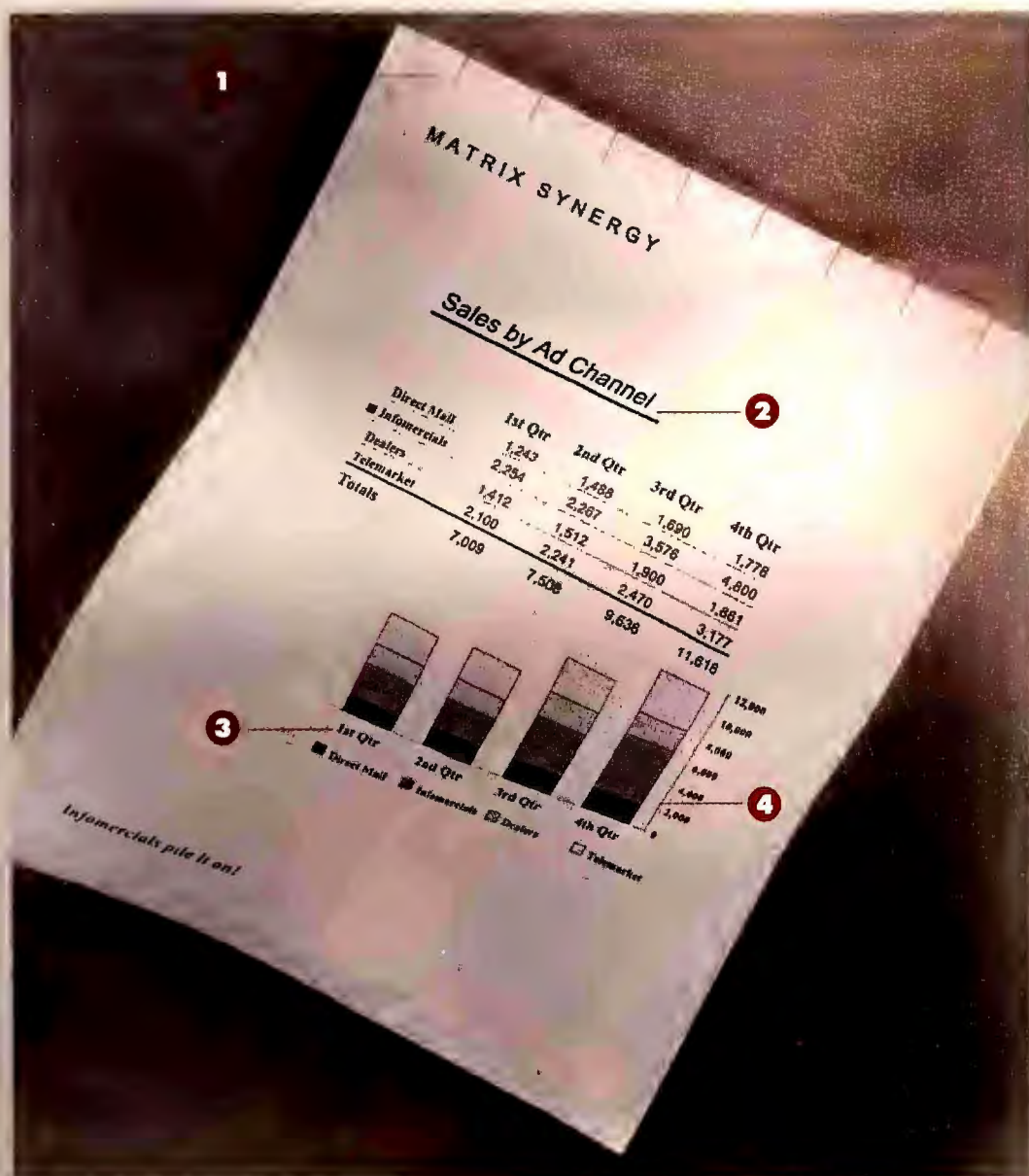
direct language. Avoid the passive voice: instead of “the features will be stressed by our ads,” say “our ads will stress the features.” Use a figure, graph, or diagram in place of a lengthy explanation whenever possible, like the bar chart in the sales report below.

Keep it simple as you format your document. Use plenty of white space to

invite the reader in. When a page starts to get crowded, try to prune the text. Concentrate the white space on one side of the page instead of splitting it evenly; you’ll achieve a more interesting, asymmetrical composition and lighten the appearance of text-heavy documents.

Use just one or two fonts. A simple rule is to use a serif font such as Times,

Century Schoolbook, or Palatino for body text, and a sans serif font like Helvetica or Avant Garde for headings. The letters of a serif type face have little “feet” at the ends of the strokes that improve readability at small sizes; sans serif faces do not. In the documents in this article, we’ve used only Times (a serif face) and Univers (sans serif), both



SALES REPORT

- 1 Seven spreadsheet columns—each 1 inch wide—make a seven-column grid structure.
- 2 Focus of the piece, Sales by Ad Channel, set in Univers Bold, with an underline courtesy of Excel’s Format Borders option.
- 3 Bar spacing in chart matches grid structure. Repeated column headings in the x-axis labels at bottom of chart add clarity.
- 4 For black-and-white laser printer graphs, use shading patterns instead of cross-hatching. Putting darker shades at bottom anchors the bars.

Dave’s proud report on the success of his project takes the form of an *Excel* worksheet. Dave sought to eliminate all extraneous information so his boss will digest its meaning at a glance. The topic of the report is emphasized up front: “Sales by Ad Channel.” The important data is presented in detail

and summarized in a graph, and the bottom-line conclusion is made explicit: “Infomercials pile it on!”

Excel could not import Matrix’s TIFF format logo, so we defined the grid with text elements only. The report employs our standard seven-column grid structure: We set the page margins to .75 inch all around with File Page-Setup; then, since

Excel measures column widths in character units, we used File Print-Preview to set the column widths to 1 inch. The *Matrix Synergy* text at the top is left-aligned in a text box. To make the graph fit the grid, we just stretched it horizontally with the mouse until the bars matched the grid structure.

resident in the LaserJet III.

For body text, select a serif face in the 10-to-12-point range. (Typewriter text is 12 point; the page you're reading is set in 9-point type.) Use variants of your typefaces to distinguish the kinds of information in your document. Use italic for technical and foreign terms, publication titles, and quotations; use

bold for headings and for emphasis. Avoid underlining.

To make blocks of text easier to read, add extra space between paragraphs; double-spacing works, but most programs let you add partial spacing at paragraph breaks as shown in the proposal. Put proportionally more space above a subhead and less between the

subhead and the following text. Fully justified body text (with even left and right margins) gives a finished look, but left-justified body text (ragged right) is often easier to read.

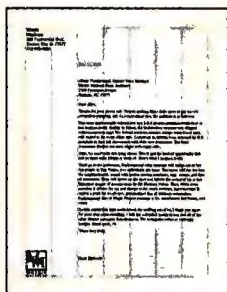
Before you take to the computer, quickly sketch the page, using a simple grid as a skeleton. Use an odd number of columns—five or seven work well—

LETTER

1 Company name at top and graphic element at bottom frame the letter. White space along edges focuses attention on text.

2 Short, punchy paragraphs, with extra space between them, help convey lively, conversational tone.

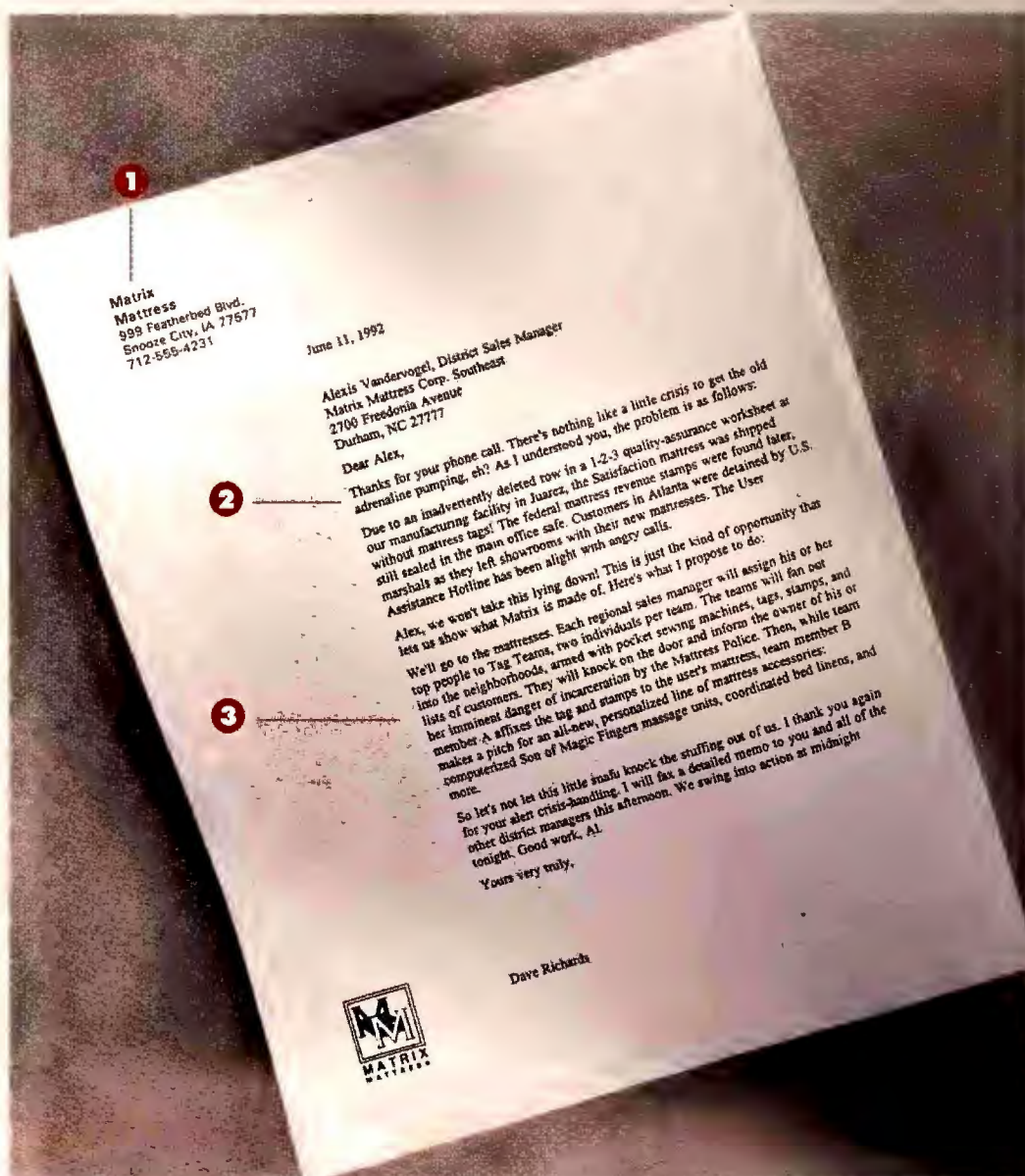
3 Contrasting typefaces make text of letter distinct from letterhead, even in this laser-printed black-and-white design.



The underlying seven-column grid is flexible enough to accommodate nearly any document.

Trouble! A regional sales manager has alerted Dave to a problem, and this letter is Dave's decisive response.

The white space between the name and address at the top and the logo at the bottom sets off the letter. Dave's name gets emphasis from its position to the right of the logo. A letterhead gives you limited space



for design—make the most of it.

This letter was prepared in *WordPerfect for Windows*. Its left margin was set at 2.75 inches, the others at .75 inch. The address is in a page-anchored text box positioned .75 inch from the top and left edges of the page. The logo at the bottom is a page-anchored graphics box embedded in a header, in case the letter continues on additional pages. Both

boxes have text wrap set to 'No.' This keeps the typing screen clean and ensures that you won't have to adjust a left indent as you type. The body text is 11-point Times.

We printed the letter with *Windows'* LaserJet III driver instead of *WordPerfect's* printer driver because it delivers scanned TIFF files with better resolution.

and fit the headings, figures, paragraphs, and other components to the grid lines. The grid organizes the white space; an odd number of columns makes the layout pleasingly asymmetrical.

Most of the documents here use the same seven-column grid (see Dave's letter, left). With .75-inch left and right margins, each column is 1 inch wide,

which is easy to measure in all the programs. In word processors such as *Word* or *WordPerfect*, set the default tabs to 1 inch, so that the tab settings on the page ruler mark the column boundaries. In spreadsheets, set the width of all columns to 1 inch, then arrange labels and values to fit the grid.

If you use your grid structure consis-

tently across a series of documents, and if you use typefaces and graphic elements such as logos consistently, you can easily tie your documents together with a common look that makes your reports identifiable and distinctive. For example, compare the arrangement of text in the letter and the proposal. Each employs the two left columns for the

1 MATRIX SYNERGY

**FY 1992
Balance Sheet**

Assets		Claims on Assets	
Cash	\$50	Payables	
Securities	0	Notes payable	\$60
Receivables	350	Accrued wages	100
Inventories	300	Accrued taxes	10
Total current assets	\$700	Total current liabilities	\$130
Plant & equipment	1,800	First mortgage bonds	500
Less Depreciation	500	Debentures	300
Net plant & equipment	\$1,300	Total long-term debt	\$800
Total assets	\$2,000	Stockholders equity	
		Preferred stock	10
		Common stock	50
		Additional capital	90
		Retained earnings	750
		Total common equity	\$890
		Total equity	\$890
		Total claims on assets	\$2,000

BALANCE SHEET

- 1** Due to nature of material and structure of 1-2-3, column widths don't fit page grid. But wide left margin and graphic elements in first column continue pattern.
- 2** Placing two columns off center enlivens page.
- 3** As in sales report, sans serif Univers used for numbers, serif Times for labels.
- 4** Bold italic treatment of Assets and Claims headings echoed in Total labels at bottom.

Dave's team contemplates with well-earned satisfaction Matrix Mattress's solid position at the end of the fiscal year. We prepared this balance sheet with 1-2-3 release 2.3. Like *Excel*, 1-2-3 cannot import TIFF images, so as with the sales report, we've skipped the Matrix logo and allowed the text to carry the page structure. This spreadsheet

bears other similarities to the sales report, too, particularly in the type treatment. It uses a serif face for text and a sans serif for labels.

For this document only, we broke with the seven-column grid structure to establish two wide columns for text and two narrow ones for numbers; but combined, they're still consistent with the other documents. The bold sans serif label at the top of

the page, for instance, matches that of the *Excel* report and aligns with column one of the grid. The wide left margin gives the page a dynamically asymmetrical look.

We used 1-2-3's Wysiwyg fonts for the balance sheet: Dutch (a Times look-alike) for row headings, and Swiss (a Univers facsimile) for titles, column headings, and numbers.

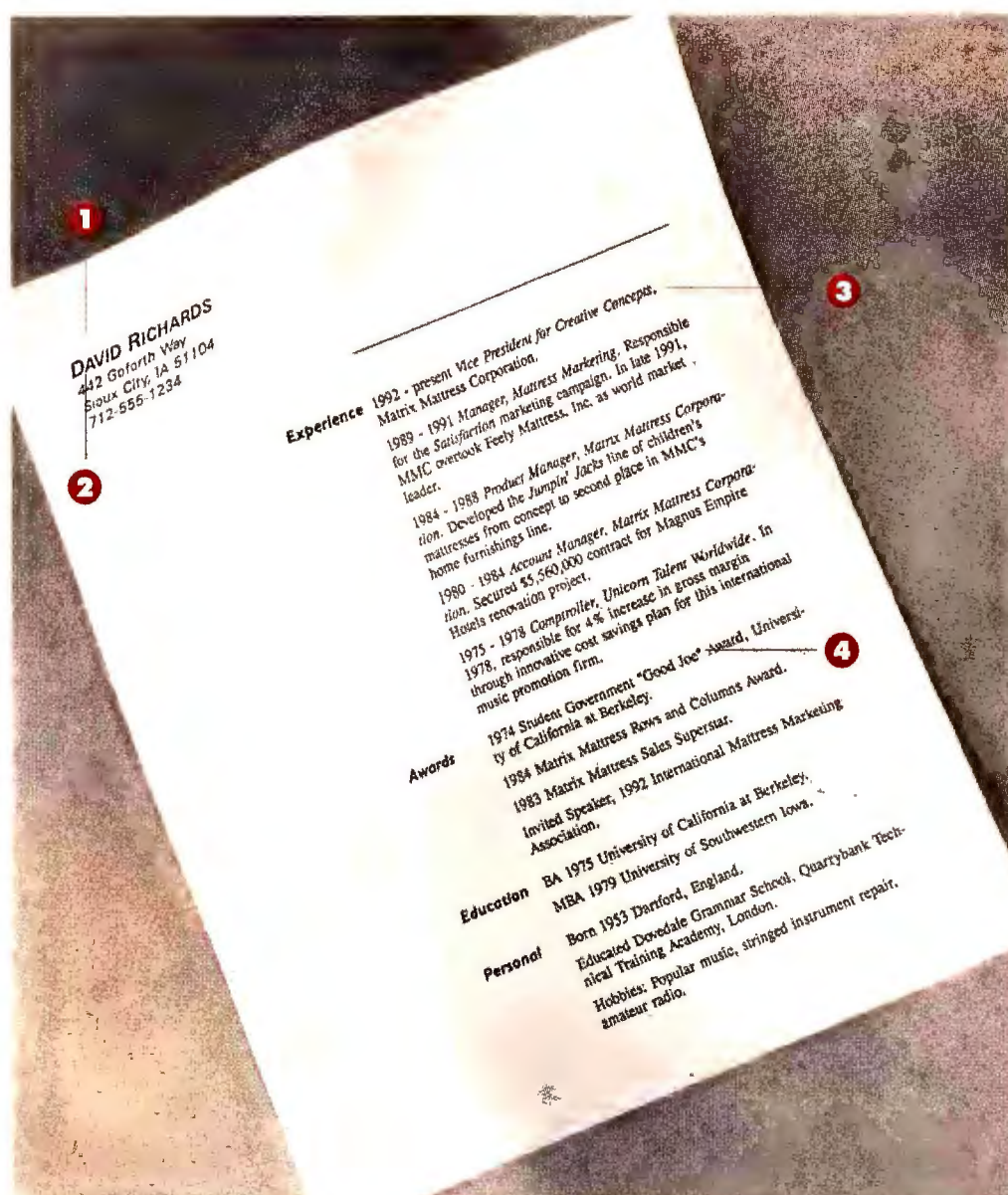
logo and/or header and the right five columns for text. The same pattern is repeated in the résumé, with an additional column reserved for the headings *Experience*, *Awards*, and so on.

Finally, don't be afraid to experiment. Even for the pros, it's a process of "try it and trash it." And don't get discouraged if your attempts take longer

than planned; making it look simple always entails a little extra effort. But with all the programs, you can leverage your efforts by creating a template—an empty document that you repeatedly retrieve and fill with new data. ●

Margaret Y. Rabb is director of design for Southern Media Design and Production

in Chapel Hill, North Carolina. Richard Scoville is a contributing editor for PC World and a software training consultant. They are coauthors, with Johnna Webb, of Fit to Print with Ventura Publisher, to be published in spring by M&T Books (Redwood City, California). Scoville can be reached on PC World Online (see page 8 for more information).



RESUME

- 1** Dave's name is the most important element, so it's big. Large and small caps give an even, balanced appearance.
- 2** We've used WordPerfect's [AdvLft] codes (Shift+ <F8>, Other Advance Left) to compress spacing of the "D," "a," and "v" in Dave's first name.
- 3** Use of italics for job titles provides visual relief and helps the reader scan the page.
- 4** True quotes help the document look professional. To select the opening quote with WordPerfect's typographic character set, press <Ctrl>-V and enter 4,30 for an opening quote.

Mission accomplished. Dave is enjoying his new position at Matrix and dreaming of even bigger and better things elsewhere. This résumé, prepared with *WordPerfect 5.1* for DOS, returns to the seven-column grid. The organization of topics is fairly standard. A good résumé is brief and enticing, meant to secure fur-

ther contact. It will surely be read in a hurry, so it must grab the reader's attention. Details are better left for the interview. The present layout is easy to scan.

All margins were set at .75 inch. Items below the horizontal line are formatted with parallel columns, whose margins at 3.75 inches define the fourth grid column.

The base font for this document

is 12-point Times. We used styles to handle the font changes: Title changes the font to 11-point Univers Oblique for Dave's name and address at the top; Callout makes headings in the third grid column 13-point Univers Narrow Bold Oblique. In addition, we used [VRY LARGE] and [SM CAPS] codes to emphasize Dave's name.

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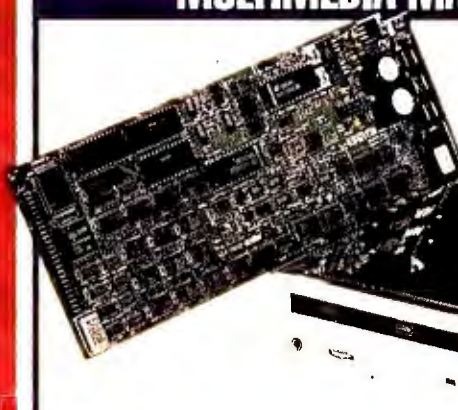
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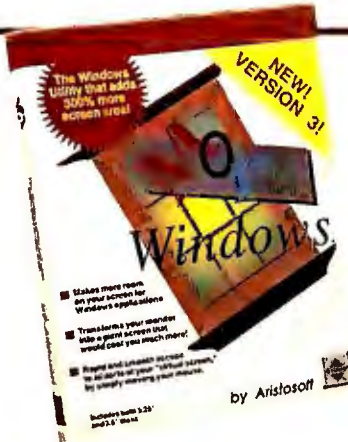
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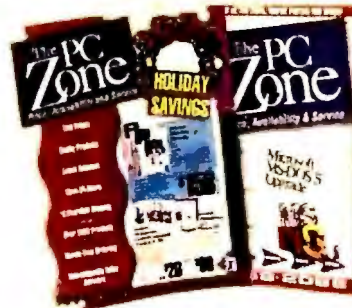
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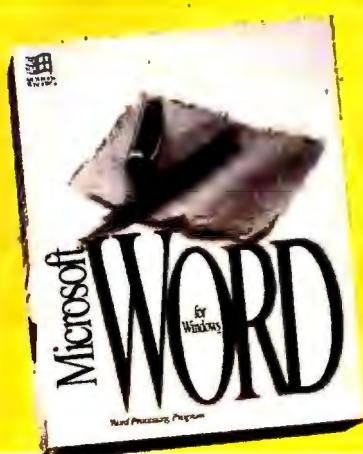
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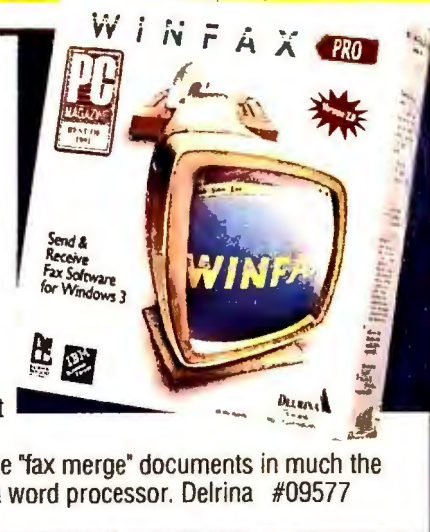
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SPREADSHEETS (A..Z)

Practical tips for building better worksheets

by Richard Scoville

These days, having the right information is only half the battle—you have to make it look good, too. This month we'll show you how to pick fonts with Wysiwyg, the graphics-based formatting add-in that comes bundled with all current versions of 1-2-3.

In a Windows spreadsheet such as Excel, using fonts is straightforward. Once installed, they're available for all your Windows applications. But for 1-2-3 release 2.3 or 3.1, which operate without Windows support, working with fonts is a bit more involved.

1-2-3 comes with three typefaces licensed from Bitstream, a leading font maker—Swiss, Dutch, and Courier—plus a Symbol face that uses graphics symbols instead of regular characters (see row 17 in FIGURE 1). 1-2-3's installation program generates fonts from these typefaces in selected sizes and stores them on your hard disk. These fonts cannot be resized from inside 1-2-3.

Fonts of Wisdom

Let's explore the basic font procedures by building a test worksheet like the one shown in FIGURE 1. In 1-2-3 release 2.3, first make sure the Wysiwyg add-in is

attached: Select /Add-In•Attach (in 3.1, press <Alt>-<F10> and select Load) and choose WYSIWYG.ADN. If Wysiwyg is already attached, you'll get a message to that effect. If not, select No-Key, then Quit. In the commands below, you'll press colon (:) to activate the Wysiwyg menus.

Now choose your printer. For each new worksheet, select :Print•Config•Printer and pick your printer from the list. Then choose 1st Cart or 2nd Cart and select a font cartridge, if you have one. Select Quit•Quit to return to your worksheet.

Now you're ready to define a font palette, eight fonts identified by number. For instance, the default for font number 2 is 'Swiss 14'. When you format a range with font 2, its contents appear in 14-point Swiss; if you assign a different font to number 2, the range will assume the new appearance. Unfor-

matted cells are printed in font 1, 10-point Swiss, by default. This is an easy-to-read choice for your main font, although if you have a lot of information to fit on one page, you might want to consider something smaller.

To include a font in the palette, select :Format•Font•Replace, and pick the font number. Then choose a typeface. The first three menu options are 1-2-3's Bitstream soft fonts, or you can select Other and choose one of your printer-resident or cartridge typefaces. Typefaces for all printers are listed, so make sure you choose one you can print.

Finally, enter the point size. If the typeface you select is scalable (and your printer can scale it), your text will be printed in the size you specify. Otherwise, 1-2-3 and Wysiwyg will substitute the closest available size.

Once you've defined your font palette, you can use it to format the worksheet.

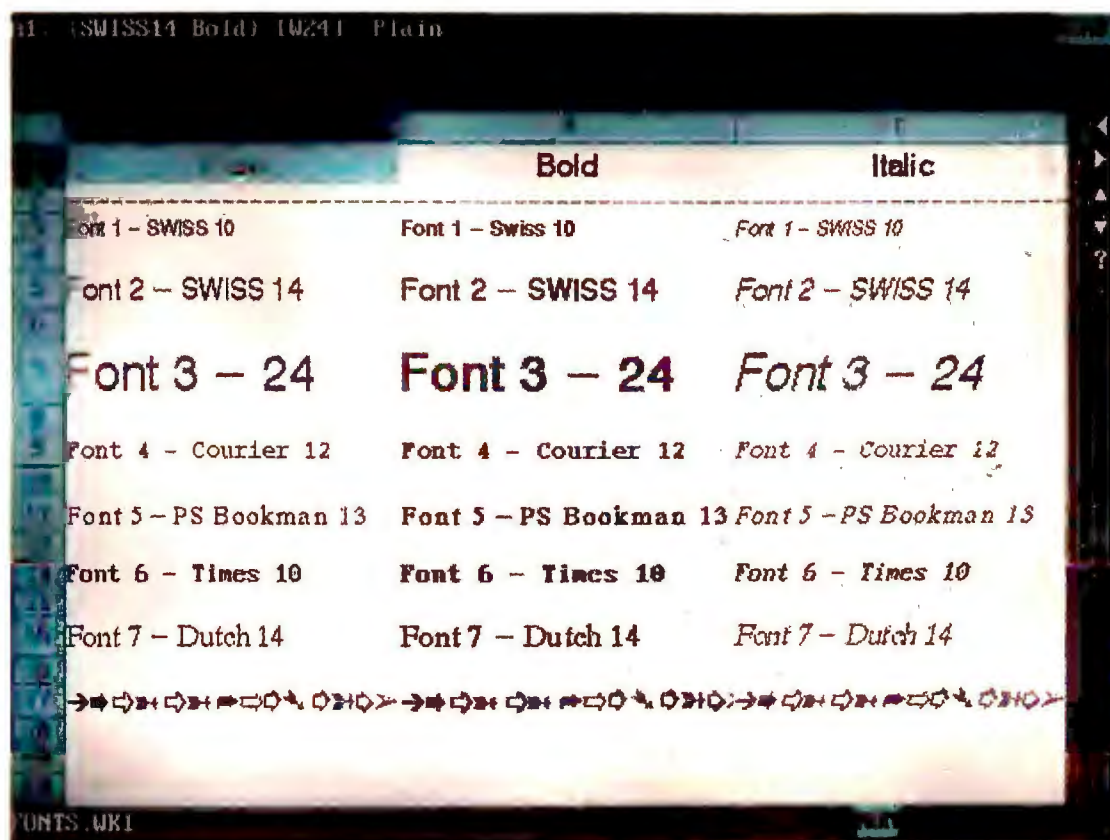


FIGURE 1: When you turn on 1-2-3's bundled add-in, Wysiwyg, you can select, view, and print a wide variety of fonts that can make your worksheet stand out.

Excel Shortcut

Painless Formula Auditing
by Ralph Soucie

Tracking down erroneous cell references doesn't have to be hard work. If you're concerned about a particular formula, simply select the cell containing that formula, then press <Ctrl>-]. Excel will then identify all direct precedents—cells whose addresses appear in your formula. Naturally, these precedents might refer to other cells indirectly referenced by the original formula. To display both direct and indirect precedents, press <Ctrl>-<Shift>-]. To isolate dependent cells (cells

whose results depend on the current cell), press <Ctrl>-] or <Ctrl>-<Shift>-]. Once Excel has highlighted the cells, you can press <Tab> and look at the formulas in the formula bar. Or you can simply display the formulas in the worksheet itself by pressing <Ctrl>-` (that's the backslanting apostrophe on the same key as the tilde [~]); press <Ctrl>-` to redisplay values. To perform these operations through the menu, choose *Formula • Select • Special* and select the desired option from the dialog box.

For example, to assign font number 2 to the range A5..C5, as shown in **FIGURE 1**, select *:Format • Font • 2*, paint the range A5..C5, and press <Enter>. You can combine attributes such as bold and italics with any font. To bold the text in column B, select *:Format • Bold • Set*, highlight the range B3..B17, and press <Enter>.

It's Easier Next Time

Luckily you don't have to define a new font palette for each worksheet—there are three ways to reuse an old palette. If you want to make the current font palette the default for all future spreadsheets, select *:Format • Font • Default • Update*. If you'd like to create several different palettes to use with different types of documents, you can store the current palette on disk and retrieve it later. Use *:Format • Font • Library • Save* and enter a file name. To reuse the palette later, select *:Format • Font • Library • Retrieve* and a library file, or simply appropriate the font palette from another worksheet: Select *:Special • Import • Fonts* and the previous work-

sheet's FMT file (where its Wysiywg formatting information is stored). Fonts are fun, and 1-2-3's font system is not so perplexing once you get the hang of it.

Questionable Spreadsheets Department

Q. *Help! I'm trying to analyze our company's long-distance phone records by day of the week. I have a 1-2-3 spreadsheet that shows the date (a label) when each call was made, and I need a bar graph that shows the number of calls made on Monday, Tuesday, and so on. I've tried data tables, but I can't seem to make them work.*
Marla Cox
Dearborn,
Michigan

A. You're in luck. The Data Distribution command is designed

to perform frequency analyses just like yours. The example in **FIGURE 2** illustrates the solution. In column A, enter a list of dates in the form of labels. For instance, the entry in A3 is '04/26/91'. Column B contains a series of code numbers that indicate the day of the week. **@MOD(@DATEVALUE(A3),7)** is the formula in B3. The **@DATEVALUE()** function converts the label in A3 into a date code number expressed as the number of days that have elapsed since the beginning of 1900. For instance, the date value for April 1, 1992, is 33695. The **@MOD()** function yields the remainder when one number is divided by another. In this case, we divide the date value by 7, the number of days in a week. When the formula returns zero, the date is a Saturday.

As an example of how you can use this day-of-the-week code, check out the formulas in column C. Cell C3 contains the formula **@CHOOSE(B3,"Sat","Sun","Mon","Tue","Wed","Thu","Fri")**. **@CHOOSE()** uses the value of its first argument to select an item from a list made up of its remaining arguments, where the first item is number zero. In this case, when the day-of-the-week code in B3 is zero, the **@CHOOSE()** function selects 'Sat'; when it's 1, the formula yields 'Sun', and so on.

The table at E3..F9 shows the number of calls made on each particular day of the week. Enter the days of the week as labels in column E and as numbers in

	A	B	C	D	E	F	G
1							Calls
2	Date	DOW					per day
3	04/26/91	6 Fri	Sat	0	2		
4	04/26/91	6 Fri	Sun	1	2		
5	04/28/91	1 Sun	Mon	2	0		
6	04/05/91	6 Fri	Tue	3	1		
7	04/29/91	2 Mon	Wed	4	0		
8	04/08/91	2 Mon	Thu	5	2		
9	04/06/91	0 Sat	Fri	6	2		
10	04/03/91	4 Wed					
11	04/01/91	2 Mon					

FIGURE 2: This worksheet uses the Data Distribution command to tell you how many phone calls you've received each day of the week.

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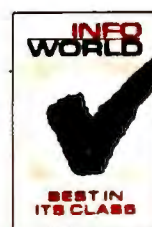
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column F. Then you're ready to use the Data Distribution command, which counts the number of values in a range that are less than or equal to each value in another range. To apply it in this instance, select /Data Distribution, B3..B11 as the values range, and F3..F9 as the bin range.

To represent the results in the form of a bar chart, use the labels in column E as the X values and column G as the A data range.

Send your spreadsheet questions to Richard Scoville, PC World Online; CompuServe 72341,2727; MCI Mail 357-4517; 415/442-1891 (fax); or mail them to Spreadsheets (A..Z), PC World, 501 Second St. #600, San Francisco, CA 94107. PC World pays \$50 for published questions. Sorry, we cannot acknowledge submitted materials. ☿

Richard Scoville and Ralph Soucie are contributing editors for PC World.

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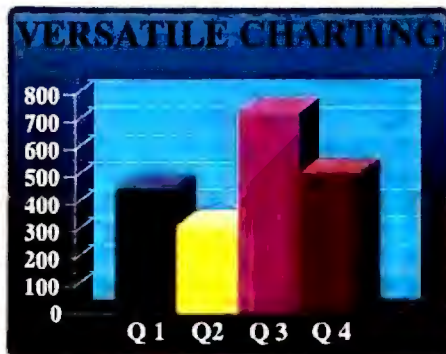
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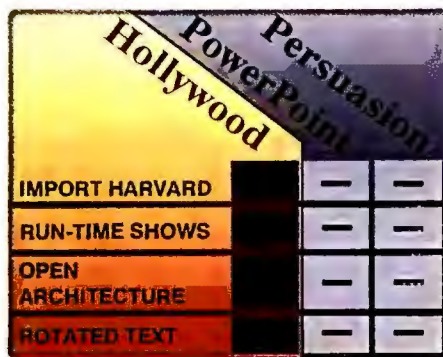
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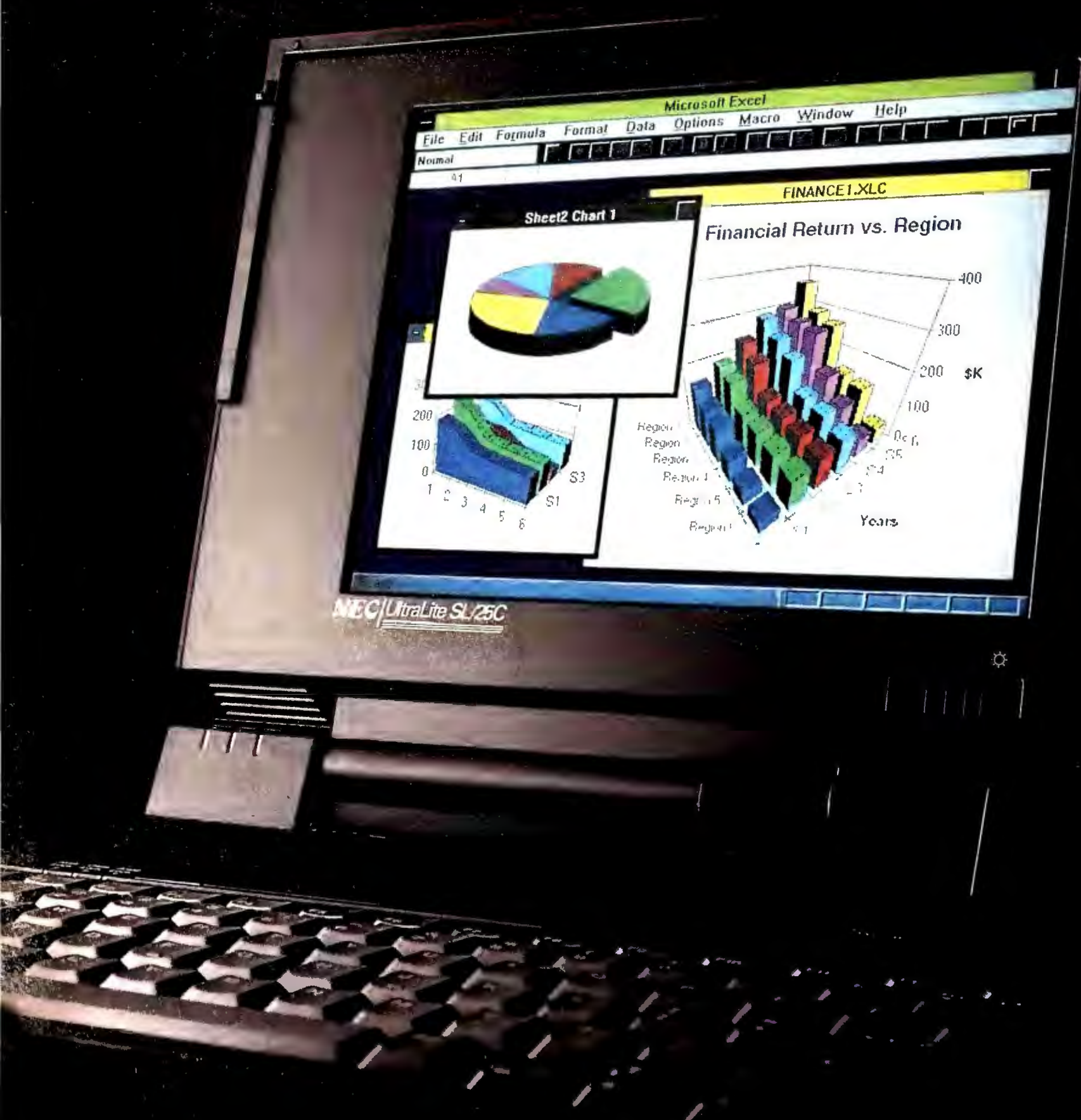


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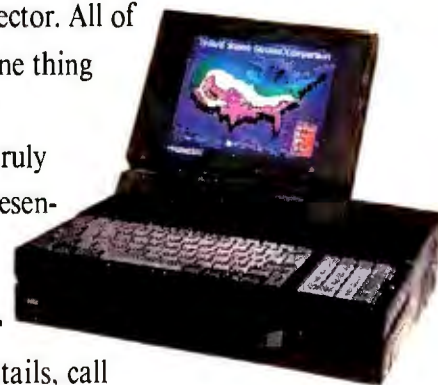
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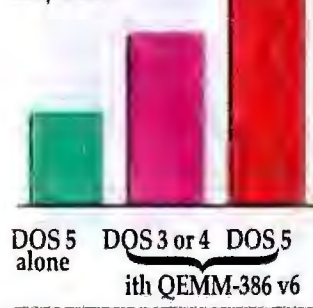
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WORD PROCESSING CLINIC

Tips for getting the most out of your word processor

by George Campbell

Q. I switch between three word processors at different times, WordPerfect 5.1, Word 5.0, and WordStar 6.0. I sometimes need to edit my AUTOEXEC.BAT or other ASCII files. Is there a way I can use these programs to edit files from the DOS command line, while maintaining ASCII formatting?

N. Maida

San Francisco

A. Sure. Loading and saving ASCII files is easy in all the programs you mention.

For WordPerfect 5.1, change to your WordPerfect directory and use a DOS command like **WP C:\AUTOEXEC.BAT**. To save the edited file in ASCII format, press **<Ctrl>-<F5>AG**, type the path and file name, then press **<Enter>**.

In Word 5.0, use **WORD C:\AUTOEXEC.BAT** to edit files. To save, press **<Esc>TS**. Make sure you selected *Text-only*, then press **<Enter>**.

The command format in WordStar 6.0 is **WS C:\AUTOEXEC.BAT /N**. The **/N** opens the file in nondocument mode. Since you opened your file in this mode, normal WordStar commands (**<Ctrl>-KS** or **File•Save**) will save the file.

Q. I'm stuck with some old WordStar 3.3 files that I want to convert into WordPerfect 5.0. I tried retrieving them but got gibberish on my monitor. Any suggestions?

Douglas Nuetzman

Closter, New Jersey

A. You're in luck! WordPerfect 5.x includes a file conversion utility, CONVERT.EXE. If it's not in your WordPerfect directory, add it with WordPerfect's INSTALL.EXE program.

To convert the file, change to your WordPerfect directory, type **CONVERT** at the DOS prompt, and press **<Enter>**. At the prompt, type the path and file name of your WordStar file, press **<Enter>**, and then type a name for the output file and press **<Enter>**. You'll see a menu. Type the number for the WordStar 3.3 to WordPerfect conversion and press **<Enter>**. However, if you should ever

want to convert from WordStar 6.0 or other versions, you'll need to use a third-party conversion program such as Mastersoft's Word for Word.

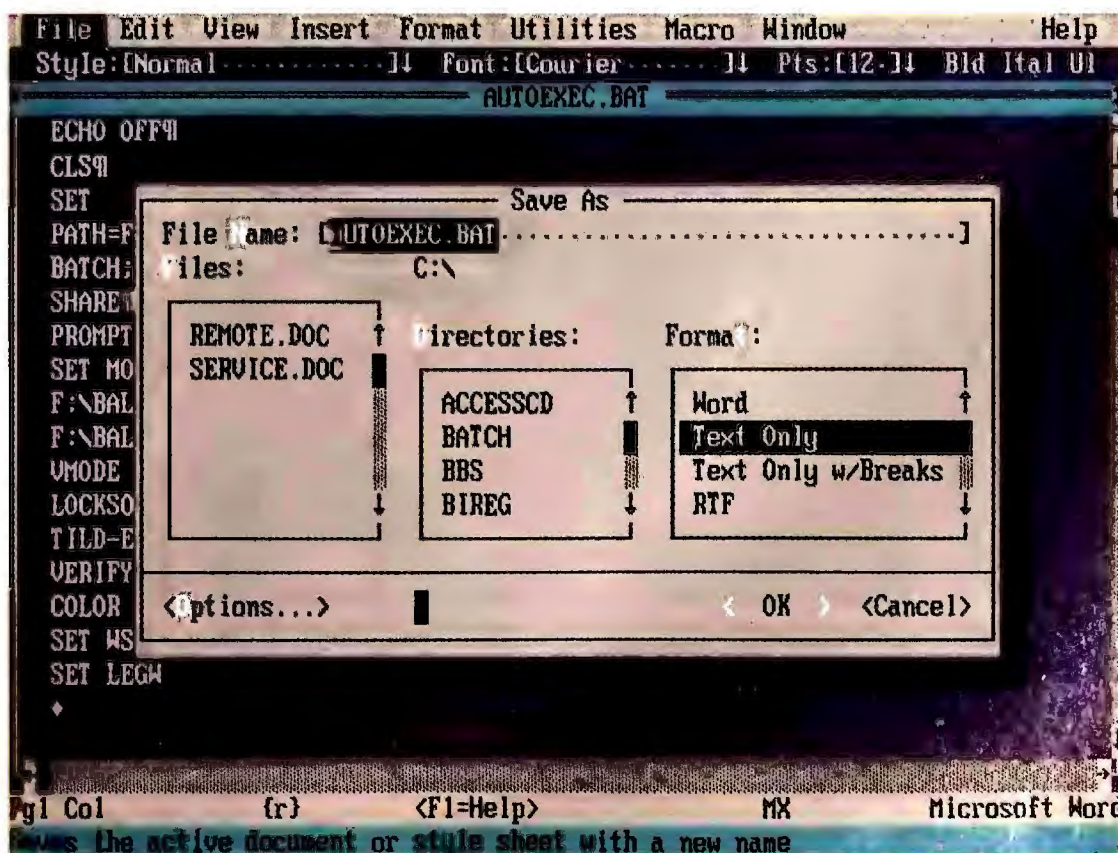
Q. When I use Microsoft Word 5.0, my text sometimes extends off the screen. Is there a way to fix this annoying problem?

Alan North

Providence

A. The problem is that Word's default settings are set to display line endings as they will print, rather than fit them on screen. When you choose a small or proportional font or wide margins, there are too many characters per line, and the characters at the end of a line are forced off the screen. Fortunately, there's a simple solution.

To force Word 5.0 to display all text on the screen, press **<Esc>O**, move the



You can use your word processor as an ASCII text editor. Once you've edited your ASCII file, just save it without formatting, as shown here in Word 5.5.

cursor to the Show Line Breaks: field, then press **N<Enter>**. From now on, this setting will be the default when you start Word. To show line breaks in Word 5.5, press **<Alt>-VE<Alt>-L<Enter>**, or click the View menu command, drag to the Preference command, and click the Line Breaks check box. Then click on OK, and you're set.

Q. When I write to Europeans in their native languages, I need to use special characters. How can I get these characters in WordPerfect 5.1?

George S. Janis
Akron

A. Use WordPerfect's Compose feature. Open your WordPerfect manual to

Appendix P and find the chart titled "Character Set 1 (Multinational 1)."

To insert a foreign character, press **<Ctrl>-V**. At the Key prompt, type the number of the character set (in this case, 1), a comma, and the number of the desired character from the chart, and press **<Enter>**. For example, to insert an Ö, type **<Ctrl>-V1,62<Enter>**. If you often use the same character, consider recording your keystrokes as a macro.

Q. I want to make changes in my WordPerfect 5.1 macros. Can you tell me how to edit them?

Sharon Collins
Newbury Park, California

A. First press **<Ctrl>-<F10>**, type the name of an existing macro, then press **<Enter>E** to access the macro editing screen. Use the cursor keys to move to the part of the macro you want to edit. Macro commands are surrounded by curly brackets (**{ }**); normal keystrokes appear as regular characters.

To change a command, position the cursor on the command, then press **<Delete>** to remove it. Insert keyboard commands by pressing the command keys (for example, press **<Shift>-<F7>** to insert a **{Print}** command). To edit normal characters, use regular editing tools. To see a list of macro language commands, press **<Ctrl>-<Page Up>**. Pick a command with your cursor; then press **<Enter>**. When finished, press **<F7>** to save the macro or **<F1>Y** to abort your changes.

Send your word processing questions to George Campbell, PC World Online, Word Processing Clinic; CompuServe 71571,222; MCI Mail GCAMPBELL; 415/442-1891 (fax); or mail them to Word Processing Clinic, PC World, 501 Second St. #600, San Francisco, CA 94107. PC World pays \$50 for published questions. Sorry, we cannot acknowledge submitted materials. ●

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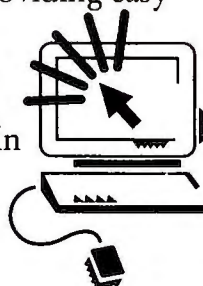
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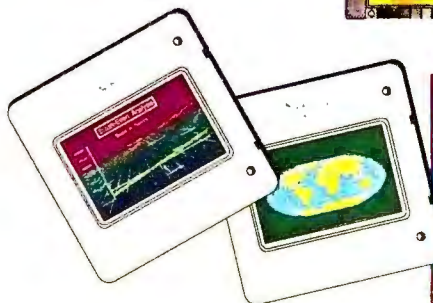
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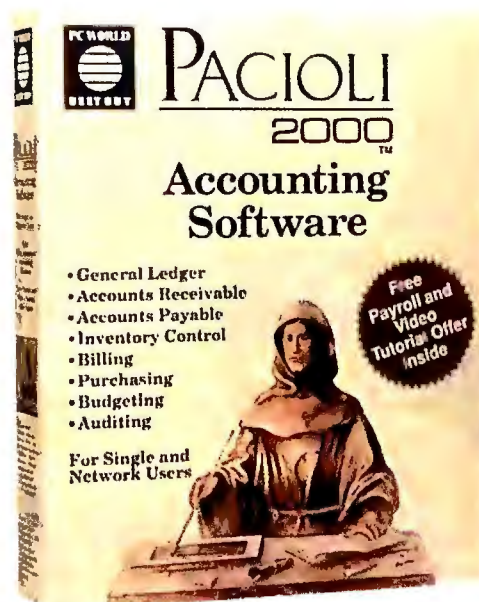
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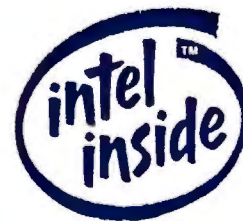
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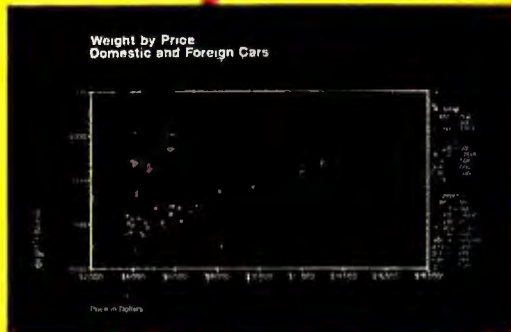
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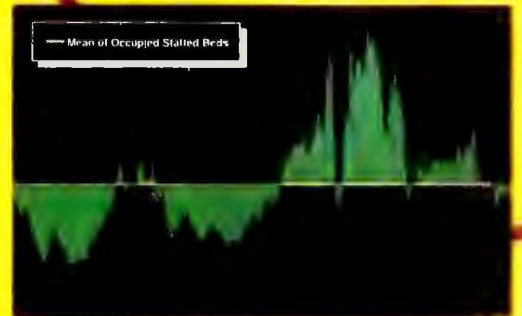
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DATA BASICS

Tips and techniques for managing your data

by Steve Cummings

Q. *I administer a program of required and elective courses for our employees. How should I structure a Paradox data base for tracking students, teachers, and classes?*

*Shaylor Broca
Duluth, Minnesota*

A. A relational data manager like *Paradox* lets you examine data from multiple tables or files as a single unit. Thus, you can store data in the most efficient groups possible, then retrieve it as a unified whole. But you won't get the benefits of a relational system unless you set up the component tables properly. Make sure the tables have plenty of ID fields to help link the files together. The recommendations below will work with any relational data manager, not just *Paradox*.

Students: If your company has an employee data base containing each person's employee ID, name, job classification, and so on, see if you can use that. If the job classification doesn't already contain a field to determine which courses an employee must complete, add one.

Teachers: This table should provide

columns for each teacher's ID, name, address, phone number, and so on.

Classes: You'll need basic info about each class. Include columns for the class ID, category or department, term in which it is offered, schedule, location, and teacher ID. By putting the teacher ID in this table, you'll be able to relate a teacher to each class.

Enrollment: You'll want one record (or row) for each student in each class. The two important fields here are Employee and Class ID, which will let you link this table to Students and Classes—and through Classes, you can link to Teachers. You might also want a field in this table for the student's grade or status. By using Enrollment as the center hub when you create queries, forms, and reports, you'll be able to list all the students in a class or all the classes a student has taken, or pair one student with one class.

Q. *I use Alpha Four to monitor my fire department's response and on-*

*scene times. To do this, I need a calculated field that returns the number of minutes between the initial time, stored in a field called START, and the current time. The expression suggested in the Reference Manual reads: (VAL(SUBSTR(TIME(),1,2)) * 60 + VAL(SUBSTR(TIME(),4,2))) - (VAL(SUBSTR(START,1,2)) * 60 + VAL(SUBSTR(START(),4,2))). This works fine for events that occur within one day but gives an erroneous, negative result if midnight's passed since the time recorded in START. Is there a solution for people who work nights?*

*Thomas R. Schultz
Shepherdsville, Kentucky*

A. You certainly don't want to give the impression that you left before you came! Seriously, keeping track of elapsed time is useful for everyone from auto club dispatchers to plumbers. As long as you're sure that less than 24 hours will elapse between START and the current time, which seems likely in your application, there's a simple way to

Viewing Answer table: Record 1 of 4

Main

ENROLL	Employee ID	Class ID	Grade
	EMPLOY	CLASS	J

CLASSES	Class ID	Title	Department	Term
	CLASS	J		

STUDENTS	Employee ID	First Name	Last Name	Job Classification
	EMPLOY	J	J	C

1	A	Filling Out Forms	Shirley	Yee
2	A	Working Out Your Stress	Robert	Franklin
3	C	Stressing Out Your Workers	Karl	Straus
4	D	Handling Phone Mail	John	Samson

Thanks to *Paradox*'s Ask command, you can see how well Class C employees are doing in the various classes they're taking to further their careers.

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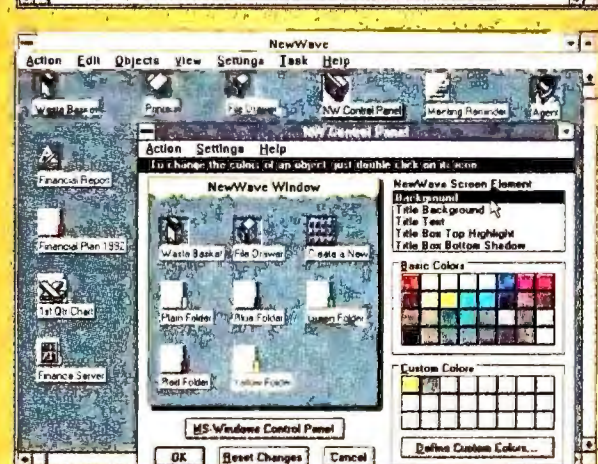
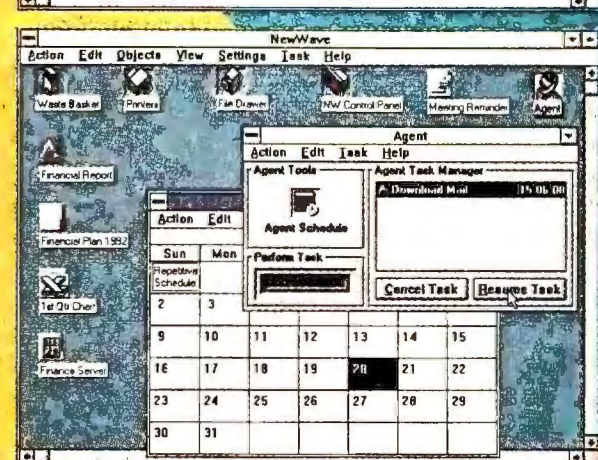
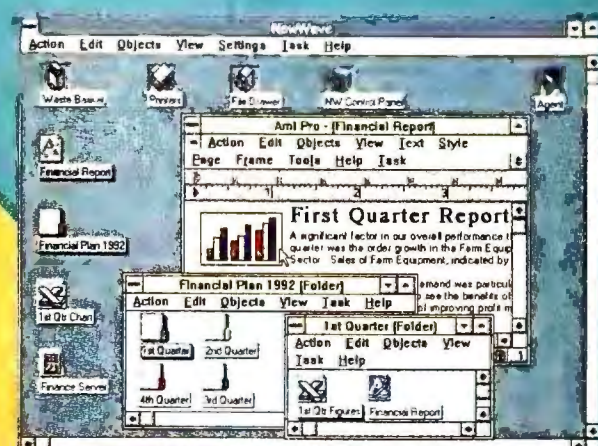
track of all the DOS/*Windows* files and programs in your system. *NewWave's* Desktop Organizer provides unparalleled ease of use in the way it shields you from the complexities of DOS, manages your environment, and helps you organize your work using folders to keep track of projects and documents. *NewWave* raises your productivity to new levels. Begin with WorkGroup Libraries that make it easy to share information throughout a department. Next, save time by using *NewWave* Agents (macros) to automate a variety of tasks you currently perform manually—and preset the times you want them to be performed. *NewWave* will save you valuable time in learning and using your PC. With *NewWave*, you can focus on your job rather than on your computer.

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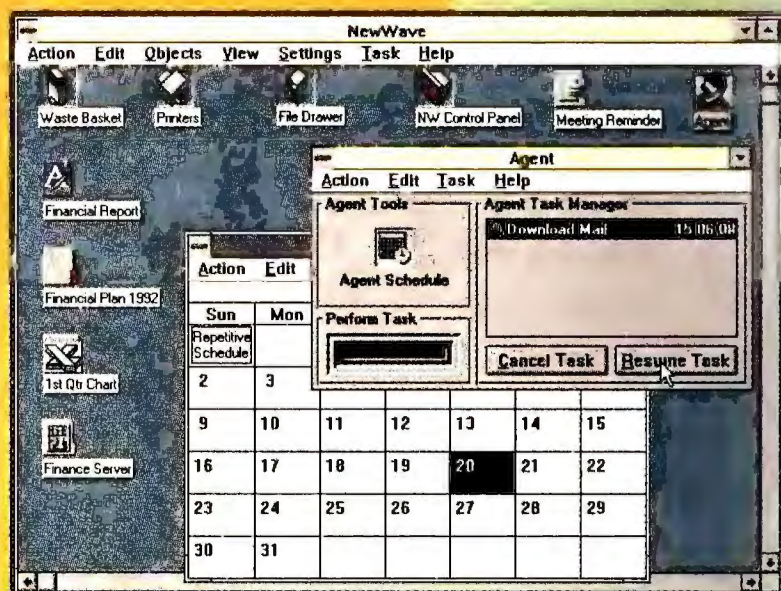
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The 1991 Soft-letter 100 Top 100 Independent Microcomputer Software Publishers and Developers in the U.S. Based on Calendar 1990 Revenues

1	Microsoft Corp. Redmond, WA	1990 Revenues: \$1,447,780,000	Public Company 6769 Employees
Year	Rev. (\$M)	Annual Growth	
1990	\$1,447.8	0%	100%
1989	\$852.8	33%	52%
1988	\$718.6	57%	76%
1987	\$458.7		

2	Lotus Development Corp. Cambridge, MA	1990 Revenues: \$684,500,000	Public Company 3300 Employees
Year	Rev. (\$M)	Annual Growth	
1990	\$684.5	23%	100%
1989	\$558.0	18%	40%
1988	\$468.5		
1987	\$395.6		

3	Novell Provo, UT	1990 Revenues: \$510,000,000	Public Company 2425 Employees
Year	Rev. (\$M)	Annual Growth	
1990	\$510.0	18%	100%
1989	\$430.0	21%	58%
1988	\$355.0		
1987	\$225.0		

4	WordPerfect Corp. Orem, UT	1990 Revenues: \$430,259,000	Private Company 2350 Employees
Year	Rev. (\$M)	Annual Growth	
1990	\$430.3	56%	100%
1989	\$278.0	54%	78%
1988	\$178.7		
1987	\$100.3		

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PUBLISHING & PRESENTATIONS

Expert advice for creating high-impact documents and presentations

by Richard Jantz

Want to improve your organization's image? One of the best ways is to re-vamp your newsletter with an easy-to-read format and a cohesive design. Most often it is the banner, or *nameplate*, displaying the newsletter's title that needs the most help. Because the nameplate conveys the newsletter's look and feel, it is arguably the most important element on the page.

As an example, we've redesigned the first page of an 8½-by-11-inch, four-page newsletter published by the Lee County Division of Planning in Fort Myers, Florida. The bulletin covering local business trends is mailed to select

businesses to promote economic development in the community.

This document's nameplate is too cluttered with text and graphics. Another stumbling block is the scattered look below, especially the figure and table. Our goal was to create a more visually striking, unified appearance.

To create a snazzier nameplate, we discarded the boxes and background pattern used in the original and set the title on a single line using the same typefaces employed for headlines and text. We also cut the Lee County logo, which already appears on the newsletter's mailing side.

Before



Vol. 1 No. 3

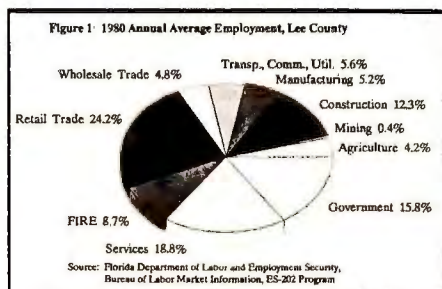
Summer 1991

Retail and Service Sectors are Top County Employers

by Matthew A. Noble

Lee County Division of Planning is currently developing a baseline study of economic conditions in the county. The study, which contains a comprehensive analysis of key economic indicators, will form the foundation for developing a new Economic Element to be included as part of the county's comprehensive plan, known as the "Lee Plan." The new element will provide a framework that will guide economic development by identifying key economic opportunities and constraints. A set of goals, objectives and policies embodying the findings will then be drafted for subsequent adoption into the Lee Plan.

One of the factors examined in the baseline study and a key indicator of local economic conditions is local employment. As part of the study, average annual employment data, taken from the Florida Bureau of Labor Market Information, ES-202 Program, was used to track employment from 1980 through 1989. The data reveals that employment in Lee County has grown by a sizeable 79.9% from a total employment figure of 67,968 in 1980 to 122,263 in 1989. Employment growth during this period even surpassed the impressive population growth seen in



the county, which amounted to 58.1% over the same nine-year period.

Figure 1, which shows 1980 county employment by sector, reveals that the retail trade sector was Lee County's largest employment sector in that year, accounting for 24.2% of total employment. Figure 2, which shows the same data for 1989, reveals that the retail trade sector is still Lee County's largest employment sector, constituting over one-quarter (26.3%) of total county employment.

Table 1: Lee County Retail Employment 1980 & 1989

SIC Code	Industry	Average Monthly Employment		Change	
		1980	1989	Number	Percent
57-59	Retail Trade	16,473	33,127	15,654	95.0%
52	Bldg. Material & Farm Equip.	1,077	1,888	811	87.5%
53	General Merchandise	2,722	3,485	763	28.0%
54	Food Stores	2,754	5,442	2,688	97.6%
55	Auto. Dealers & Service Stations	1,753	3,334	1,581	90.2%
56	Apparel & Accessory Stores	685	1,645	960	140.1%
57	Furniture & Home Furnishings	1,144	2,179	1,035	90.5%
58	Eating & Drinking Places	4,663	10,929	6,266	134.4%
59	Misc. Retail Stores	1,746	3,226	1,480	84.8%

Source: Florida Department of Labor and Employment Security, Bureau of Labor Market Information, ES-202 Program

Closer inspection of the retail trade sector (Table 1) reveals that Eating & Drinking Places accounted for over one-third of all retail trade employment in 1989. This component also has been one of the fastest growing retail trade components over the past decade, with employment expanding by 6,266 jobs from 1980 to 1989, equaling a 134.4% increase. Another important employment growth component has been Apparel & Accessory Stores, which increased by over 140% during the nine-year period. Although this percentage increase was significant, it is important to note that the 1980 base year number of jobs for this component was relatively small at 685 jobs. Thus, the numeric increase in this component yields seemingly impressive percentage gains.

Traditionally, the Lee County economy has been dominated by tourism and retirees and this has produced a substantial number of service-related jobs in the local economy. Indeed, in 1980 nearly one-fifth of all county jobs were service related. Reflecting national trends,

After

The original nameplate is too cluttered and overshadows the headline. A straightforward line of type (set in 30-point Futura Extra Bold and Times Roman) is a more elegant choice.

The old issue identification line (set in 10-point Times Roman) is not distinct. Setting it in reverse type (6-point Futura Bold caps) on a thick black bar creates a stronger, more unified appearance and separates the nameplate from the rest of the page.

The original document lacks attention-getting contrast because it uses only one typeface (Times Roman) for headlines and body text. To enliven the material, we used a contrasting typeface (Futura) for the headline, the large initial cap in the first paragraph, illustration titles, and table heads.



Next we moved the “published by” information to the issue identification line (volume, number, date) below the nameplate. We reset the line in reverse (white) type on a thick black bar to set it apart from the remaining information.

To make the newsletter more inviting, we grouped the two related illustrations (figure and table) together, creating a better flow of text. We also reorganized the figure (pie chart and labels) and table to focus their contents more directly on the subject of the headline. We removed extraneous rules around the byline and in Table 1, and enlarged the point size and changed the typeface

of the lead story headline to emphasize its importance. Finally, we added thick black lines under the boxed illustrations and at the bottom of the page to help define the information.

This month’s document is hardly a design failure. But with a simplified nameplate, more tightly organized layout, and added contrast through typefaces and rules, we think it stands a better chance of being read.

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World Online, Publishing & Presentations; MCI Mail RJANTZ; 415/442-1891 (fax); or mail them to Publishing & Presentations, PC World, 501 Second St. #600, San Francisco, CA 94107. PC World pays \$200 for documents used in a make-over. Sorry, we cannot acknowledge submitted materials. ☉

Contributing Editor Richard Jantz is the author of The PhotoStyler Book (Peachpit Press, Berkeley, California, 1992). Larry Westdal, a graphic designer with Westdal Design Associates in Berkeley, California, also contributed to this article.

LEE COUNTY DATA NEWS BULLETIN

VOLUME 1 NUMBER 1 SUMMER 1991 PUBLISHED BY LEE COUNTY DIVISION OF PLANNING

RETAIL AND SERVICE SECTORS ARE TOP COUNTY EMPLOYERS

by Matthew A. Noble

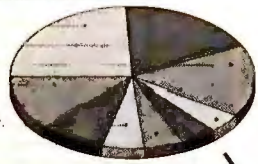
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FIGURE 1: 1980 ANNUAL AVERAGE EMPLOYMENT, LEE COUNTY

24.2% Retail Trade
18.8% Services
15.8% Government
12.3% Construction
08.7% Fire
05.6% Transp., Comm., Util.
05.2% Manufacturing
04.8% Wholesale Trade
04.6% Agriculture, Mining



Source: Florida Department of Labor and Employment Security, Bureau of Labor Market Information, ES-202 Program

TABLE 1: LEE COUNTY RETAIL EMPLOYMENT 1980 & 1989

SEC CODE	INDUSTRY	AVERAGE MONTHLY EMPLOYMENT		CHANGE	
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Source: Florida Department of Labor and Employment Security, Bureau of Labor Market Information, ES-202 Program

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component was relatively small at 685 jobs. Thus, the numeric increase in this component yields seemingly impressive percentage gains.

Traditionally, the Lee County economy has been dominated by tourism and retirees and this has produced a substantial number of service-related jobs in the local economy. Indeed, in 1980 nearly one-fifth of all county jobs were service related. Reflecting national trends, service sector employment in Lee County grew rapidly over the past decade, increasing by over 140%, the largest percentage gain of any sector in the local economy. Service sector jobs now account for over 25% of all jobs in the county.

The various components of the ser-

By grouping the figure and table together, the redesigned page looks less crowded and more cohesive—even though the original newsletter’s three-column format remains unchanged.

The redesigned graphic is carefully organized to focus attention on the most important data—in this case, the retail trade and services sectors, which are the subject of the headline. By arranging the pie chart slices from largest to smallest according to percentage, it’s easier to read and absorb the data.

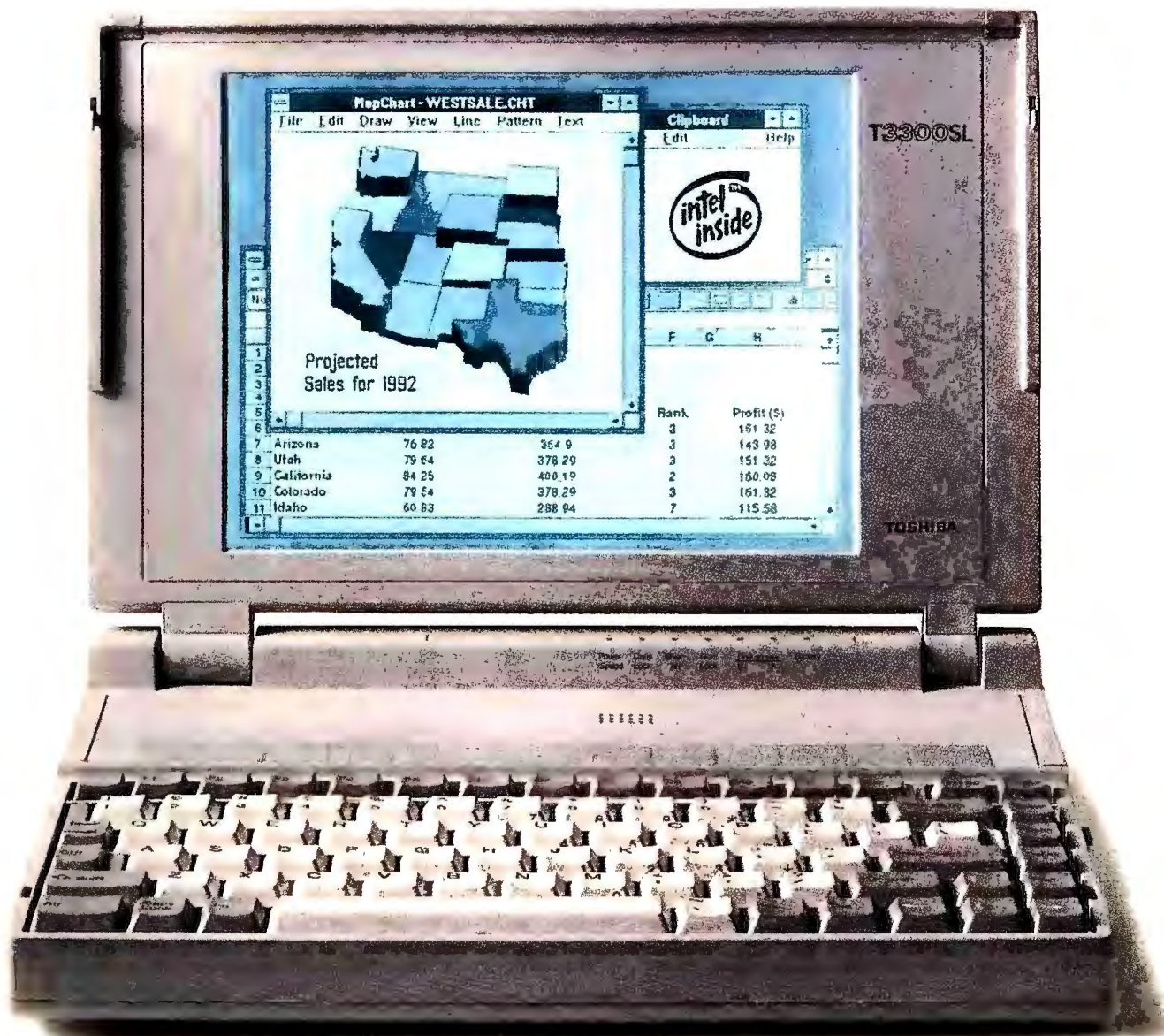
To make the tabular material less imposing, we eliminated the excess vertical and horizontal lines and used lighter dotted lines to help guide the eye. Using Futura Bold for table heads and Times Roman Italic for footnotes added contrast to the text (set in Times Roman).



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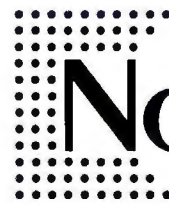
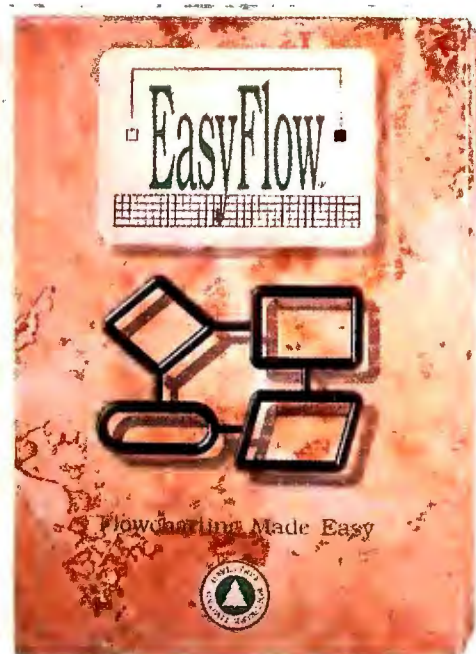
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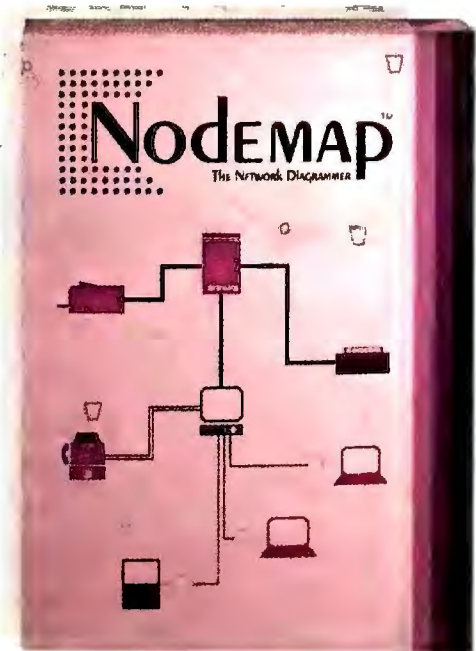
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COMMUNICATIONS Q&A

On-line resources for business and professional users

by Judy Heim

Q. *Is there a way to print the contents of a downloaded ZIP file without unzipping it? —Angela Newgord, Long Beach, California*

A. With the popular file compression utility *PKZip*, you can peek inside a compressed file, learn the names and sizes of individual files within it, and print any text file without unzipping it.

To see inside a zipped file, type **PKZIP filename -VC**. This gives a list of the files, their sizes, and their descriptions, if included. To print the contents of a compressed file without unzipping it, type **PKUNZIP -P ZIPfilename**. To print just one file, say **INSTRUCT.DOC**, inside a compressed file, type **PKUNZIP ZIPfilename INSTRUCT.DOC -P**. You may use wild-card characters, for example, ***.DOC** or ***.TXT** to print all the files inside the zipped file that have a **DOC** or **TXT** extension.

Q. *We're opening an office in Dakar, Senegal. We have access to Internet on this side of the Atlantic. Is there some way we can get low-cost access to Internet in Dakar? —David Quattlebaum, Cary, North Carolina*

Q. *I will be working in Siena, Italy, for nine months. I'd like to exchange E-mail with co-workers back home on Internet. Other than obtaining free access to Internet through a university computer in Siena, what's the cheapest way to do this? —Ian Spence, Toronto, Ontario, Canada*

A. The information age is supposed to transform the global village into a close-knit coffee klatch, but the crazy quilt of communications systems can make sending E-mail to the far corners as prickly as telegraphing from the top of a hill. Tens of thousands of users in more than 40 countries solve the problem with Internet.

For the business user overseas, though, there's a catch: Internet is the private preserve of governments and universities, which means a private citizen, armed only with computer and modem, can't subscribe. But if the home office uses Internet, and you can't gain access to a university computer or other Internet site, don't panic. You can always tap into Internet through commercial services such as CompuServe and MCI Mail, which are not part of Internet proper but are linked to it.

With MCI Mail's "preferred user" plan, for example, \$10 a month buys unlimited E-mail to or from anyplace in the world. You can E-mail not only users of MCI Mail but also users of Internet and many other on-line services in the United States, such as CompuServe. Aside from that \$10 monthly charge, the only other costs will be local telecommunications charges in the country from which you're calling.

In Senegal you'll pay a hefty \$7.89 per month for a subscription fee, 32 cents a minute for the connect charge,

and 29 cents per kilobyte transmitted on the Senegalese government's packet network (packet networks are special phone lines that transmit data). There's also a phone call charge of \$1.97 for 6 minutes. If that's not bad enough, you'll be limited to 1200 bps.

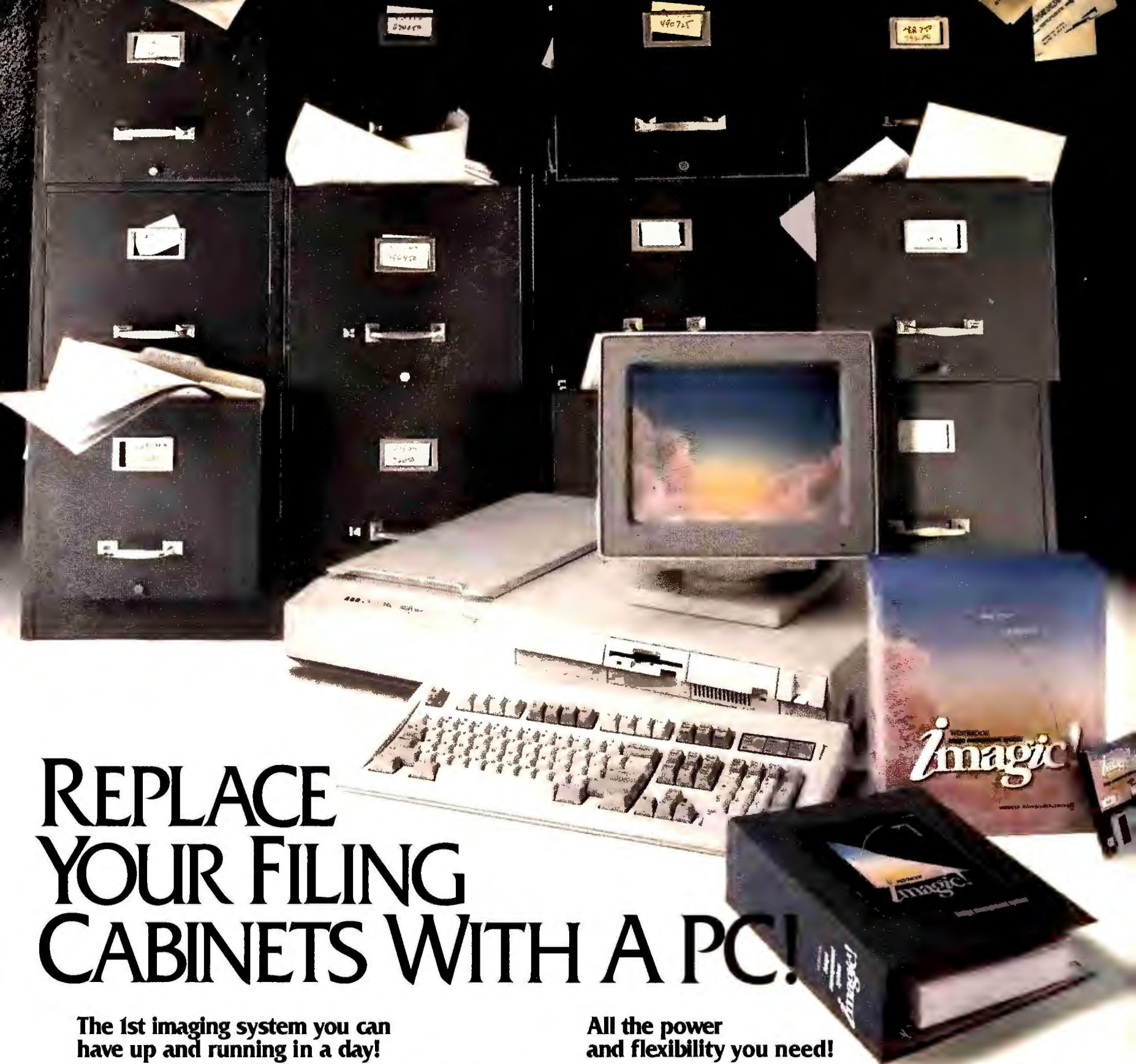
Although you'll also be limited to 1200 bps in Siena, calling rates on the Italian packet network are cheaper than cappuccino at \$4 per month, plus \$1.19 an hour and a penny for each kilobyte transmitted. Unfortunately, you must submit a written request to the local district office of the Italian phone company for access to their packet service, and that can take a month to process.

For details about logging onto MCI Mail abroad, type **vue international** at MCI's main prompt. Enter **scan** for a list of countries, then type **read** followed by the number of the country from which you wish to access MCI Mail.

To route E-mail to Internet, type the name of the recipient on Internet. When you are prompted, choose **EMS** for electronic mail system, then type **Internet**. For a mailbox address, type the person's Internet address.

Send your communications questions to Judy Heim, PC World Online, Communications Q&A; CompuServe 75300, 713; MCI Mail 312-7737; GENie JUDY.HEIM; Internet 3127737@MCIMAIL.COM; 415/442-1891 (fax); or mail them to Communications Q&A, PC World, 501 Second St. #600, San Francisco, CA 94107. PC World pays \$50 for published questions. Sorry, we cannot acknowledge submitted materials. ☹

Judy Heim is a contributing editor for PC World.



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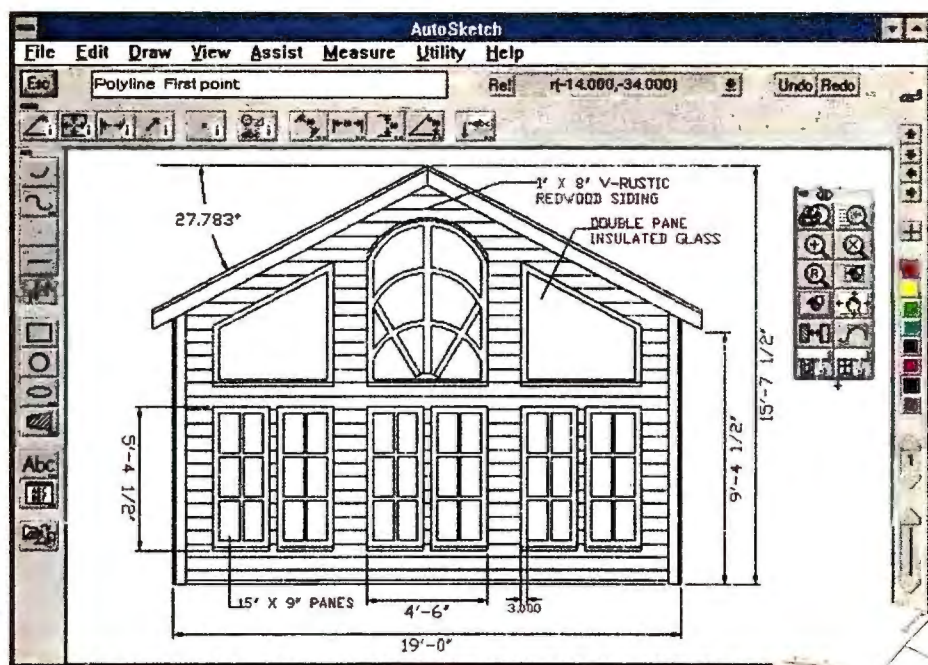
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WINDOWS WORKSHOP

Practical answers to your questions
about Windows

by Jesse Berst and Scott Dunn

Two Printers, One Port

Q. I just purchased a TI microLaser PS17, which offers both PostScript and HP LaserJet II emulations. I like to use LaserJet mode for speedy everyday output and bit maps, and PostScript mode for rendering fancy PostScript fonts. Although Windows' Control Panel lets you connect two printers (or emulations) to a single port, only one can be active. But I can't switch to an inactive printer or emulation from within Word for Windows or other Windows applications. To switch, I must slog all the way back to Control Panel. Is there an easier way?

Efrem Silensky
Vernon Hills, Illinois

A. When you assign a printer or emulation to LPT1, you're not really connecting it to a port, you're connecting it to a port name. So you can create other port names—LPT1.HP and LPT1.PS, for example—and connect printers or emulations to them. When you send output to those new port names, Windows funnels data to the appropriate physical port—in this case, to LPT1.

Open WIN.INI with a text editor.

Locate the [ports] section, and add two new LPT1 port names, each with an extension that makes it easy to identify. For example, to distinguish your HP and PostScript emulations, enter:

LPT1.HP=

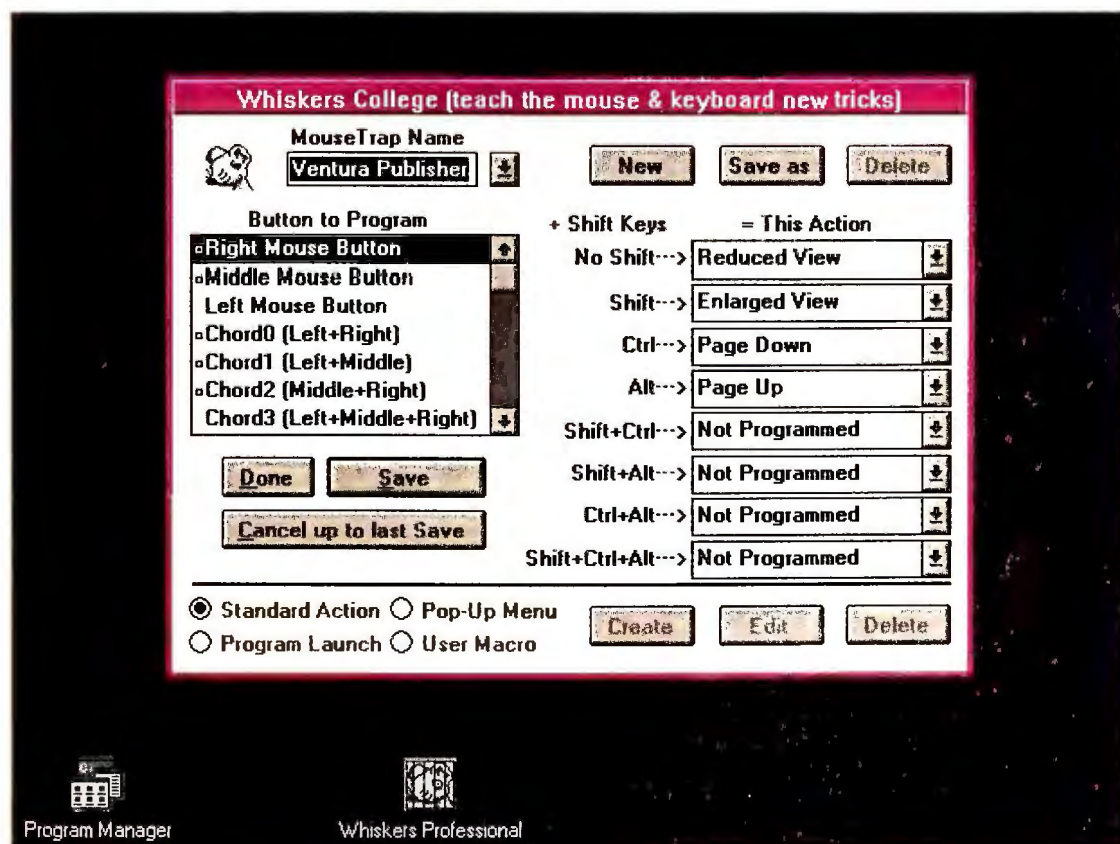
LPT1.PS=

Save WIN.INI, and exit your text editor. Open Control Panel, double-click the Sound icon, and click OK. (This is the fastest way to get Windows to read your WIN.INI changes on the spot.) Double-click the Printers icon, and select the HP driver in the Installed Printers list. Click the Configure button, select the LPT1.HP port in the Ports list, then click the Setup button and ensure all desired options are set.

Click OK twice to return to the Printers dialog box. Your PCL/HP printer emulation should be active. Now select the PostScript emulation from the Installed Printers list, click *Configure*, select the LPT1.PS port, and follow the steps above. Be sure to make this emulation active as well. To make one emulation the default, double-click the appropriate entry in the Installed Printers list. Click OK, and exit Control Panel.

Now when you're in WinWord's Print Setup dialog box, you'll be able to switch between emulations on the same port as if you were switching between different printers connected to different ports. Fortunately, this work-around won't be necessary in Windows 3.1.

Windows Toolbox



Whiskers Professional, a new incarnation of that popular mouse utility, lets you simulate a three-button mouse, assign keystrokes or macros to each mouse button or to any simultaneous two-button click or "chord," create pop-up menus for each key or combo, and make all these options specific to the currently active application. Numbers & Co., Rt. 1, Box 59A, Oroville, WA 98844; 509/476-2216, 509/476-3172 (fax). List price: \$49.95. Reader service no. 739



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Restoring the DOS Icon

Q. While installing a non-Windows application and assigning it an icon, I lost the DOS Prompt icon and can't get it back. I can, of course, just exit Windows, but clicking an icon is easier.

J. J. Gray

Ft. Lauderdale, Florida

A. Not to worry. Open the File menu; select *New•Program Item•OK*. In the Description field, type **DOS Prompt**. In the Command Line field, type **C:\COMMAND.COM**. Click **OK**. The icon will reappear.

Where Is WINA20.386?

Q. After a recent hard disk disaster, I used bootable DOS 5.0 floppies to reformat my C: drive, and put system files on it. I made a DOS directory and copied my DOS files into it. I reinstalled Windows 3.0, but now it won't run in 386-enhanced mode. It says it needs the file WINA20.386 in the root directory of my boot drive, but I can't find it on the original Windows disks.

Eric Wong

Los Angeles, California

A. You'd be surprised how often this happens. You can't find WINA20.386 because it comes with MS-DOS 5.0—not *Windows*. Since DOS 5.0 installs it in the root directory, your bootable disks, copied from your DOS directory, lack this all-important read-only file. The same problem arises when you've erased the file or it's not in the root.

If you've merely moved this file to another directory, moving it back to the root will solve the problem. Otherwise, to find WINA20.38_ (the underscore character indicates a compressed file), you'll have to dig through your original DOS 5.0 floppies; it's usually on disk 5. With the proper floppy disk in drive A:, enter **C:/DOS/EXPAND A:\WINA20.38_ C:\WINA20.386** at the DOS prompt.

If you'd rather keep your root directory clean, you can put the file in a directory such as C:\DOS by adding the following line to your CONFIG.SYS file:
SWITCHES=/W

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Then add a line like this one to the [386Enh] section of the Windows SYSTEM.INI file:

Device=C:\DOS\WINA20.386

Send your Windows questions to Windows Workshop, PC World, 501 Second St. #600, San Francisco, CA 94107-1431; PC World Online, Windows Workshop; CompuServe 74055,412; MCI Mail 179-3813; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge submitted materials. ☺

Jesse Berst is a contributing editor for PC World. He and Scott Dunn are co-authors of 101 Windows Tips (Peachpit Press, Berkeley, California, 1991).

POWER TIP NO. 241

Narrowing Your cc:Mail Search

The reTrieve messages selection from cc:Mail's main menu is powerful if used properly. For example, it gives you quick access to all new messages, even if they're spread out between your in-box and bulletin boards. But when you have a lot of messages in your in-box, bulletin boards, and folders, you can speed the search by narrowing its focus. If you want to retrieve new messages from, say, a particular bulletin board, select reTrieve messages, then retrieve from bboard/Folder. Choose the bulletin board, and select search for New messages to list just the new messages, or to list your messages by another criteria, such as person or keyword.

Rex Farrance
Assistant Editor

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► Profit Report 1991

How We Went About To Market, A Profitable Business, A Detailed Report

Background

The economic downturn in 1991 had a negative impact on much of our traditional customer base. Demand for existing products by our core business slightly declined last year. Despite problems in the business environment, however, we were able to increase profits significantly, gain overall market share, and generate a slight revenue gain. The following suggestions define how we were able to do so.

New Products

Our product development strategy—initiated in 1987—began paying significant dividends last year. Five products introduced in 1989 and 1990 performed well above expectations. Two others have basically covered costs and show potential in 1992 and beyond. One has not met its budget target.

At the forefront in the new year, we've introduced an equipment customer survey in 1991. Results have been promising. Users are reporting significant gains in quality. And

because of our product design, we're able to sell the product profitably at a price significantly below competitors. Revenue last year was \$2.5 million, profit was over \$2 million.

In reviewing the eight new products introduced in the last few years, combined revenue is \$5.1 million with a profit of \$6.2 million (or about 12 percent). These numbers were very important to overall performance in 1991.

Market Penetration

Despite the downturn in the economy and reduced overall spending in our traditional customer base, we were able to increase share for several key products in 1991.

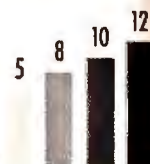
Products added to the construction industry performed in line with the revised industry projection. This is the other sector in which we pursued an aggressive market penetration strategy.

Market Development

With traditional markets impacted by the economic downturn, market

development took on added importance. There's also good news to report on this front.

Our sales team made significant strides in selling to the construction industry. This was no small feat in 1991. But while our sales were off, the demand for products that can increase efficiency is greater than ever. That's what we're selling. In this new market, we were able to generate \$22.4 million in revenue last year. Profit was \$1.2 million. While the margin may look a little low at first glance, it's important to remember the high sales costs involved in market development. The revenue and profit margins we achieved, especially considering our overall body of experience in the same industry.



1991

Profit Review

How We Were Able To Maximize Performance In A Difficult Economic Environment.

Background

The economic downturn in 1991 had a negative impact on much of our traditional Customer base. Demand for existing products by our core buyers slightly declined last year. Despite problems in the business environment, however, we were able to increase profits significantly, gain overall market share, and generate a slight revenue gain.

The following suggestions define how we were able to do so.

New Products

Our product development strategy—initiated in 1987—began paying significant dividends last year. Five products introduced in 1989 and 1990 performed well above expectations. Two others have basically covered costs and show potential in 1992 and beyond. One has met its budget target.

At the forefront is the new gear mechanism introduced to equipment manufacturers in 1989. Results have been outstanding. Users are reporting significant gains in quality. And because of our revolutionary design, we're able to sell the product profitably at a price significantly below competition. Revenue last year was 12.3 million, profit was over \$2 million.

In reviewing the eight new products introduced in the last few years, combined revenue is \$53 million with a profit of \$6.2 million (for about 12 percent). These numbers were very important to overall performance in 1991.

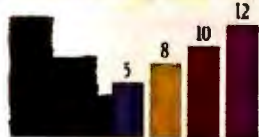
Market Development

With traditional markets impacted by the economic downturn, market development took on added urgency. There's also good news to report on this front.

Our sales team made significant inroads in selling to the automotive industry. This was no small feat in 1991. But while our sales were off, the demand for products that can increase efficiency is greater than ever. That's what we're selling in this new market, we were able to generate \$22.4 million in revenue last year. Profit was \$1.2 million.

While the margin may look a little low at first glance, it's important to remember the high sales costs involved in market development. The revenue and profit margins are almost spectacular considering our overall lack of experience in the auto industry.

Profits Rise As Performance Exceeds



Profit

Objectives: Maximized Performance
Three Keys to Profit Performance

- 1 New Products
- 2 Market Penetration
- 3 Market Development

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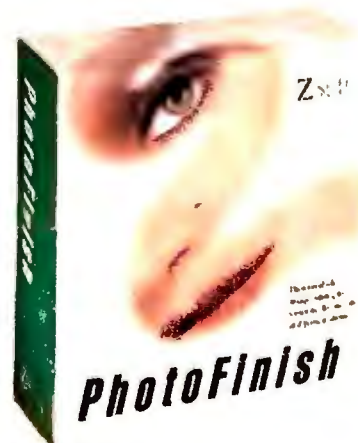
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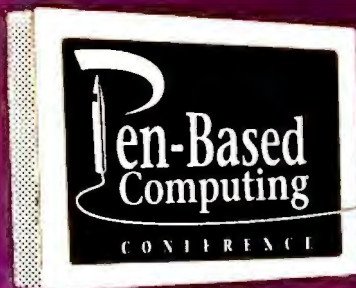


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USER GROUP TIPS

Helpful hints from members of the nation's user groups



FIAN ARROYO

What's Hidden in Your Directory?

In DOS 5.0, the old, outdated DIR command finally received a much-needed overhaul, so you can now get more information with a directory listing. For instance, while the old DIR couldn't show a single hidden file, now you can list all the hidden files on your disk by typing **DIR \ /S /A:H**.

How does it work? The backslash (\) does what it has always done—tells DOS you want a listing of the root directory. But the /S parameter means you want more than just the root directory, you want listings from its subdirectories as well—i.e., from every directory on the disk. /A:H tells DIR to list only files in which the Hidden attribute is turned on.

That's just a start. Suppose you want a list of every file in a directory and its subdirectories, and you want that list to

be easily readable. Try **DIR /P /W /S /A:-D**. As in older versions of DOS, /P pauses the directory listing a screen at a time, and /W gives you a wide listing with more file names per screen. Once again, /S tells DOS to list files in the current directory and its subdirectories. But you needn't list the directory names along with the file names—that's where /A:-D comes in. This variation on the /A (attributes) parameter tells DOS not to include directory names when it lists the file names.

It's worth a little time to see what the DOS 5.0 DIR command has to offer. Type **HELP DIR** or **DIR /?** for a listing of all the new and old DIRectory parameters.

Bob Mackett

CAL-PC

Calgary, Alberta, Canada

Getting Started on the Right Word Macro

It's easy to get *Microsoft Word for DOS 5.x* to run a particular macro every time you load the program. Simply name the macro AutoExec, and save it in your NORMAL.GLY glossary file.

But I prefer to use different opening macros for the various jobs I perform in *Word*. The solution? I maintain a number of GLY files, one for each AutoExec macro I need; I use batch files to turn these GLY files into the default NORMAL.GLY as I need them. For instance, I might create a glossary called MERGE.GLY, with an AutoExec macro that prepares *Word* for merging letters. I'd then create a MERGE.BAT file that looks something like this:

```
c:
cd/word
ren normal.gly hold.gly
ren merge.gly normal.gly
word
```

ren normal.gly merge.gly

ren hold.gly normal.gly

By simply typing **MERGE** at the DOS prompt, I can start my *Word* mail merges automatically.

Steven Friedman

Sacramento PC Users Group

ATM to Order

If you're like me, you go in and out of *Windows* several times each day, and sometimes you want *Adobe Type Manager* on and sometimes you want it off. But if you're out of the *Windows* environment and want to turn ATM off before you enter it again, forget about it! You have to load *Windows*, load the ATM control panel, turn off ATM, then exit and reenter *Windows*.

Luckily, I found a way to turn ATM on and off from outside *Windows*. The setting that governs ATM's status is in an ASCII text file called ATM.INI, located in your WINDOWS subdirectory. To change the setting, load that file into any word processor or text editor and find the command 'ATM=On' or 'ATM=Off' under the [Settings] subheading. By changing this command, you can control whether ATM loads the next time you open *Windows*.

Howard Wexler

Westchester PC Users Group

New York

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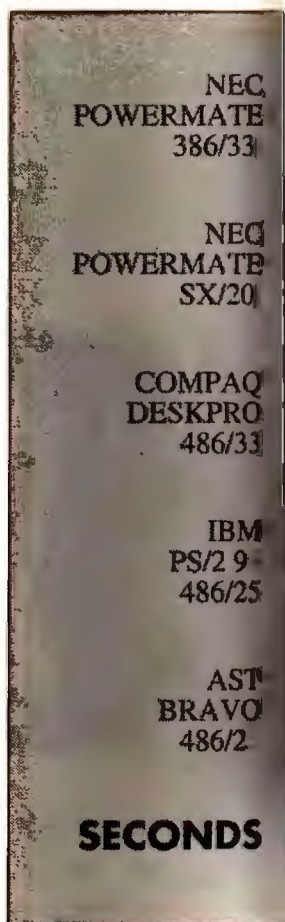


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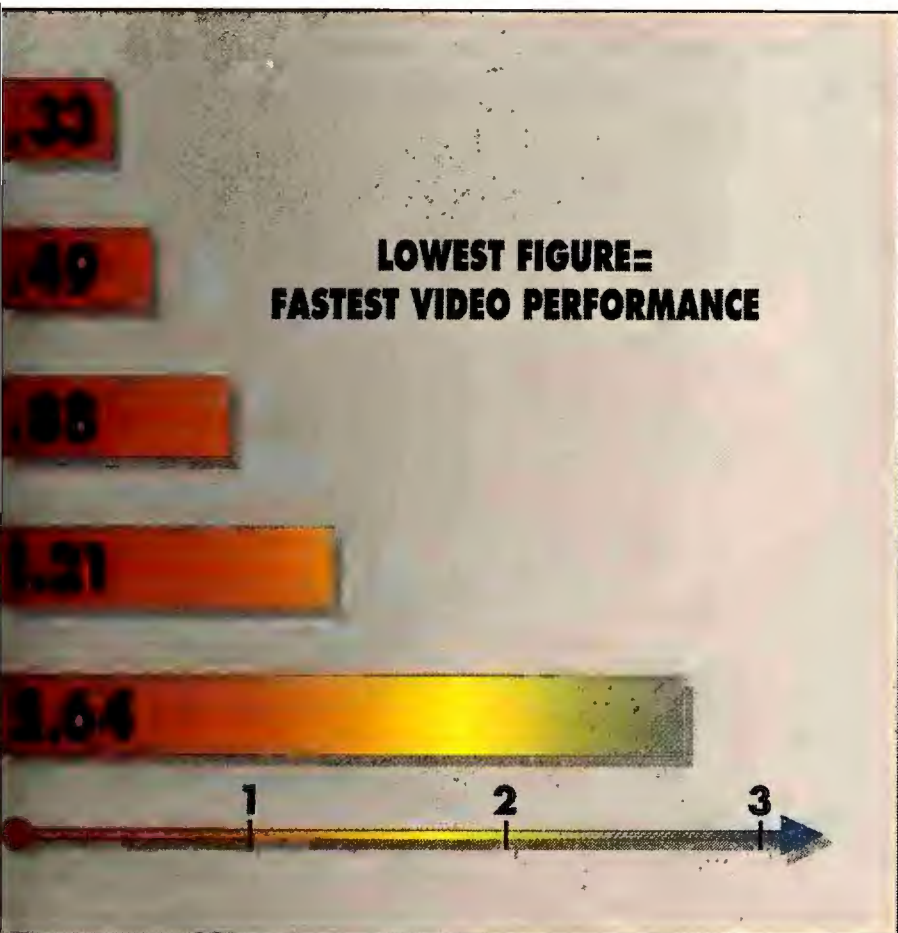
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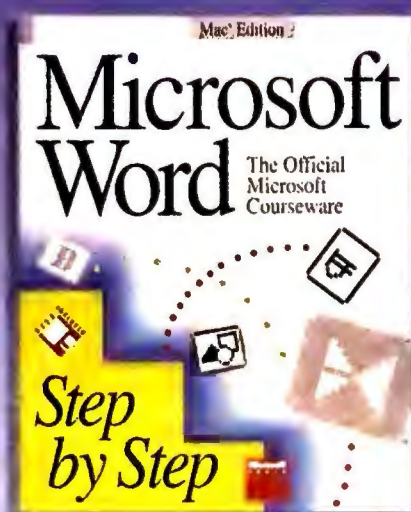
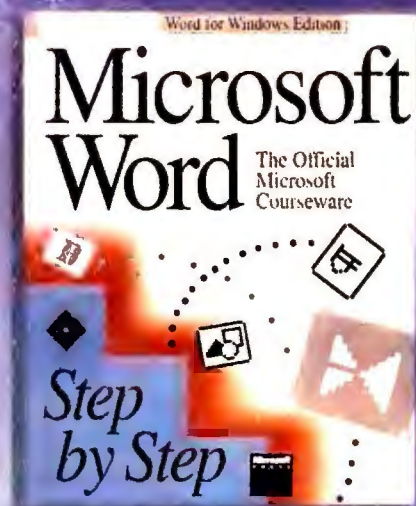
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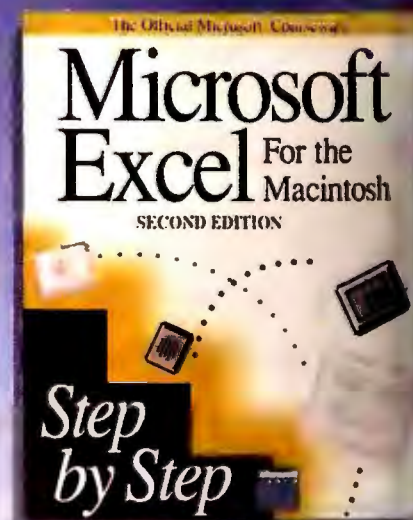
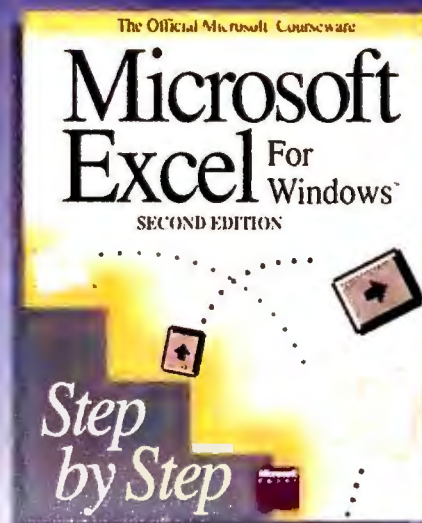
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Edited by Brett Glass

A Better One-a-Day Solution

These days, AUTOEXEC.BAT files are often loaded with programs to run disk checks, virus checks, and all sorts of other checks when their computers are switched on. Some people find this annoying, especially when they're rebooting in the middle of the day. To keep from being annoyed more than once a day, I wrote a program in BASIC called DT.BAS [see **LISTING 1**] that ensures my PC will do these routine checks only once a day.

A typical AUTOEXEC.BAT that uses the program is attached [see **LISTING 2**]. Every time the PC is switched

```
ECHO OFF
PATH=C:\DOS;C:\
PROMPT=$P$G
REM If you're running
REM DOS 5, use
REM QBASIC /RUN DT
REM instead of
REM the following line.
BASICA C:\DT
COPY C:\DT C:\TODAY
DEL C:\DT
CLS
```

LISTING 2: This AUTOEXEC.BAT fragment shows how to use DT.BAS (shown in **LISTING 1**) to run another batch file once a day.

on, the program compares the current date to the date in a file called TODAY. If the date has changed, i.e., if AUTOEXEC.BAT hasn't run today, my program will run another batch file, CHECK.BAT; this is where you put the commands to be run only once a day. DT.BAS, by the way, won't run properly if it can't find CHECK.BAT. When CHECK.BAT and DT.BAS are finished, AUTOEXEC.BAT updates the TODAY file to make sure the batch will run only once.

*P. B. Mohandas
Manama, State of Bahrain*

Editor's note: This solution has an important advantage over others we've published in previous Star-Dot-Star columns and on our PowerBase disks. Some other "one-a-day" schemes stopped working with the advent of DOS 5.0, but this one, because it uses a BASIC program, is more immune to changes in DOS. I've tested it with BASICA and QBASIC, and it runs well with both, meaning that whatever DOS version you have, you should be able to run this program.

```
10 OPEN "0",#1,"C:\DT"
20 D$=DATES$
30 PRINT #1,D$
40 CLOSE
50 OPEN "I",#1,"C:\DT"
60 A$=INPUT$(8,#1)
70 ON ERROR GOTO 120
80 OPEN "I",#2,"C:\TODAY"
90 B$=INPUT$(8,#2)
100 IF A$=B$ THEN GOTO 130
110 CLOSE
120 SHELL "CHECK.BAT"
130 SYSTEM
```

LISTING 1: This BASIC program lets you run a batch file only once a day.

Screen Capture in dBASE and FoxPro

It's always possible to print the screen by pressing <Print Screen>, but what if you want to automate screen printing as part of a dBASE application? How do you press <Print Screen> in your code?

```
n prnscr.bin
a100
int 5
retf

rcx
3
w
q
```

LISTING 3: Run this script through DEBUG to create PRNSCR.BIN, which lets you print the screen from within a dBASE or FoxPro program.

I wrote PRNSCR.BIN [see **LISTING 3**] to do just that. You prepare dBASE or FoxPro to run PRNSCR with the command **LOAD prnscr**, which you can run in a program or at the dot prompt. You then use the command **CALL prnscr** whenever you want to print the screen.

*Yi Jiang
Missoula, Montana*

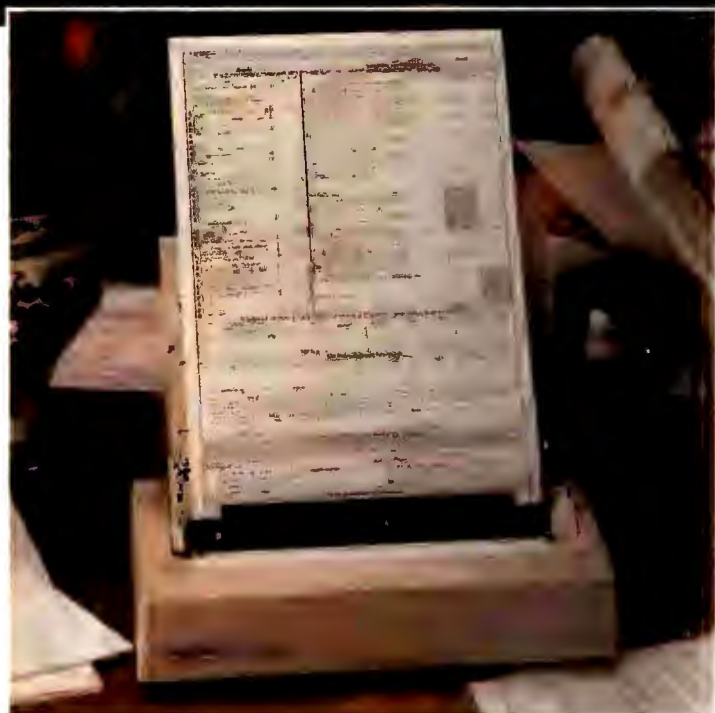
*Editor's note: To create PRNSCR.BIN, copy LISTING 3 to an ASCII text file called PRNSCR.SCR, then type **DEBUG < PRNSCR.SCR** at the DOS prompt. PRNSCR.BIN will appear in the current directory.*

Seeing All Your Files

"File open" dialog boxes often give only a partial listing of a directory (e.g. '*.wri' for Windows Write, '*.pas' for Turbo Pascal, '*.txt' for Windows Notepad, and so on). I got tired of this, so I sat down with *The Norton Utilities*

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and changed the file specs in all my executable files to '*. *'. To do this, make a new copy of the file and search it for the undesirable extension. Type a * and two spaces after the period, and your directory listings will be full of files forever.

Daniel Woo
Huntsville, Alabama

Editor's note: This daring technique can be very useful for applications that default their file browsers to files with certain extensions. It doesn't work with everything, but it should work with a good many programs, including most Windows accessories. However, it's recommended only for those who are bold enough to risk a system crash if something goes awry.

If you're willing to take the chance, here's how to use The Norton Utilities 6.0 Disk Editor to make the patch. We'll use the Windows Notepad as our sample application because its browser shows only files with the TXT exten-

POWER TIP NO. 242

Editing Windows 3.0 Files

Optimizing Windows 3.0's performance generally involves modifying AUTOEX-EC.BAT, CONFIG.SYS, WIN.INI, and SYSTEM.INI. Instead of using Windows' Notepad or your word processor to edit these files, use Windows' System Configuration Editor, SYSEDIT.EXE. To make things easy, create a Program Manager icon for launching SYSEDIT: Select *File New Program item* OK. Name the new item **System Editor**, and use the Browse button to locate SYSEDIT.EXE in the \WINDOWS\SYSTEM subdirectory.

Ron Chatman
New Orleans, Louisiana

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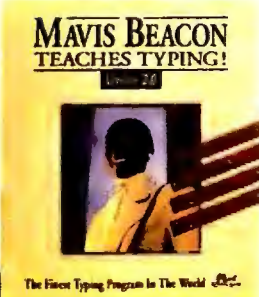
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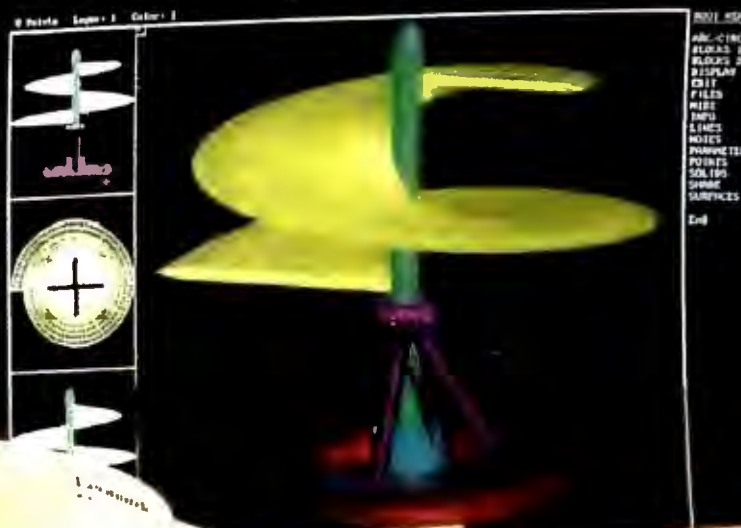
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sion, and text files have many more extensions than that. You must be out of Windows to make this change, because the Disk Editor won't—and shouldn't—run in a multitasking environment.

First, make your WINDOWS directory the current one, and copy **NOTEPAD.EXE** to **NEWNOTE.EXE** in order to avoid losing the original program. Start the Disk Editor with the command **diskedit newnote.exe /w** (depending on how you installed Norton, you may need to type **de** instead of 'diskedit'). The /W switch forces the editor to let you write changes to the file. If you've entered the command correctly, you'll find yourself in the Norton Disk Editor, with the file displayed in hexadecimal on the left and in ASCII on the right.

Press **<Ctrl>-S** to start a search, specify ***.txt** as your search string, and press **<Enter>**. Once the string is found, press **<Right>** to bring up the cursor, and **<Tab>**, if needed, to move it from the hex to the ASCII. Change the ***.TXT** to ***.***, putting two spaces after the second star. (In some programs, you can also shorten the string by placing a zero byte after the second star. However, the spaces work just as well in virtually all programs, and they ensure compatibility.

Next, press **<Ctrl>-G** to confirm that you want to write to disk and to search for more occurrences of the pattern (in the case of Notepad, there will be one more). Finally, leave the disk editor by pressing **<Ctrl>-Q**.

Back at the DOS prompt, type **win newnote** to see what you've done. You should find that the default file search pattern in the program is now ***.***. When you feel confident that the modified program works, rename the original to something like **OLDNOTE.EXE**, and rename the altered version **NOTEPAD.EXE**.

It shouldn't happen with Notepad, but when you modify another program, you may find that rather than changing the default extension for the

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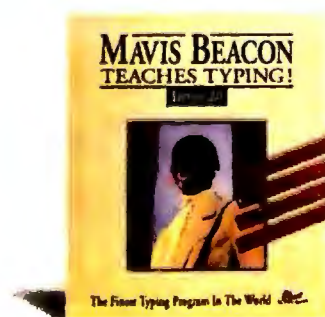
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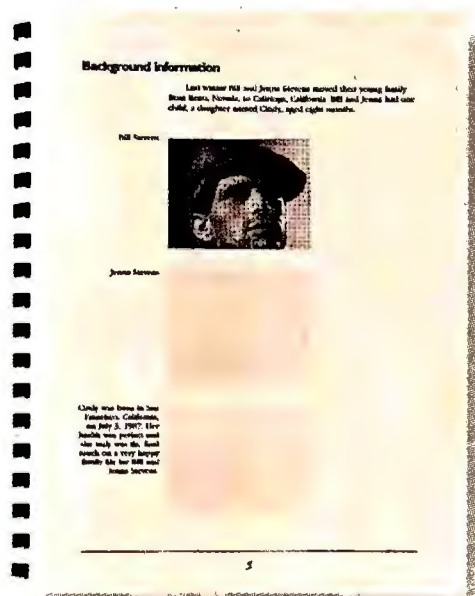
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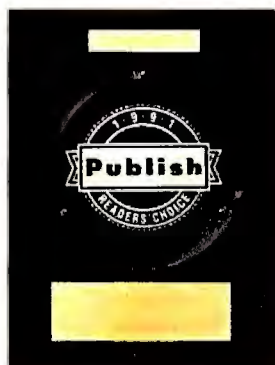
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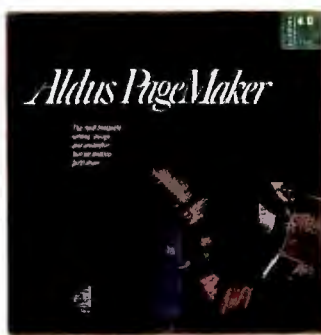
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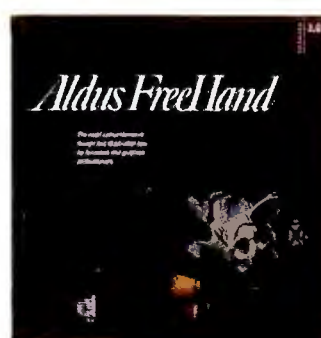
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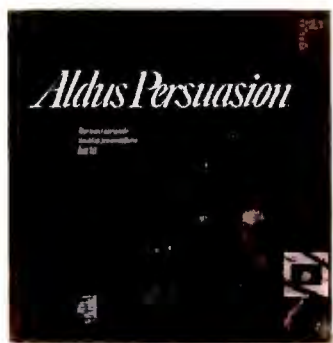
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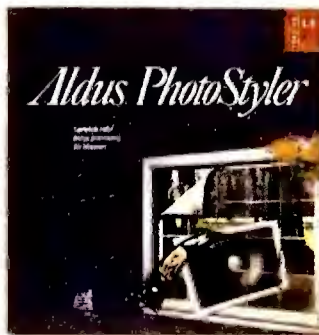


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4	Payment	Pmts	Interest	Monthly	Paid as	Paid as	Balance
5	due on	left	rate	payment	interest	principal	remaining
6	09-Apr-92	6	10.00%	1,715.61	83.33	1,632.28	8,367.72
7	09-May-92	5	10.00%	1,715.61	69.73	1,645.88	6,721.84
8	09-Jun-92	4	10.00%	1,715.61	56.02	1,659.60	5,062.24
9	09-Jul-92	3	17.00%	1,735.45	71.72	1,663.73	3,398.51
10	09-Aug-92	2	17.00%	1,735.45	48.15	1,687.30	1,711.21
11	09-Sep-92	1	17.00%	1,735.45	24.24	1,711.21	0.00

FIGURE 1: This amortization table for a variable-rate loan was created using the @PMT function. The trick: the formula is applied as if the loan starts over each month.

"file open" box, you've unwittingly changed the extension used by a different part of the program. This will cause problems later. So if your change doesn't appear to have worked, revert immediately to the original version of the program. Finally, if your application program checks itself for modifications by viruses, beware: You may find that patching the code sets off a false alarm.

Waxing and Waning Interest in 1-2-3

Loans with variable interest rates can present problems if you're trying to create a table of payments in a spreadsheet. Many books show how to calculate payments for fixed-rate loans using 1-2-3's @PMT() function, but I looked through more than a dozen books on spreadsheets and basic accounting, and I couldn't find one technique for calculating variable-rate payments. So I developed my own.

The @PMT() function—found in most spreadsheets—takes the form @PMT(*principal, interest, term*), where *principal* is the amount of the loan, *interest* is the interest rate per period (usually per month or year), and *term* is the number of payment periods. But @PMT() doesn't take variable interest rates into account; it assumes that the payments remain constant. My solution is to use @PMT() to calculate different payments each month. This is the equivalent of assuming that the loan

starts over again each month, with one less month in the term.

Here's a sample spreadsheet for a six-month loan [see **FIGURE 1**]. The first two rows include general information about the loan. Starting in row 6, column A lists each payment's due date, column B the number of payments remaining, and column C the interest rate. Columns D through G use assorted formulas to calculate each month's total payment, the interest and principal portions of that payment, and the remaining principal balance.

When you create this table yourself, be sure to fill in the correct formulas [see **TABLE 1**]. With a single exception, discussed at right, rows 8 through 11 of

dynamic (and possibly depressing) monthly payments. As long as the interest rates remain the same, so do the payments. But change the interest rate for any one month, as we did for July (the previously mentioned exception to rows 8 through 11 being identical to row 7), and everything changes from that month on.

Column A shows a useful formula for listing dates that always land on the same day of the month. Basically, each formula adds 28, 29, 30, or 31 days to the date in another cell, usually the one above it.

You may find it necessary to add @ROUND() functions to certain formulas. This is especially true where a

the worksheet contain the same formulas as row 7; once you have written the first seven rows, use /Copy to copy A7..G7 to A8..G11.

The key to this worksheet is the series of @PMT() formulas in column D. Each one reads a different balance and a different interest rate, producing

```

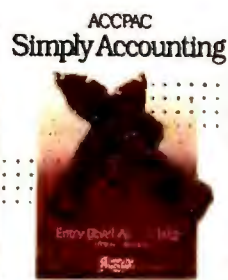
C2: @DATEVALUE("3/9/92")
A6: +C2+@CHOOSE(@MONTH(C2)-1,31,@IF(
    @MOD(@YEAR(C2),4)=0,29,28),31,
    30,31,30,31,31,30,31,30,31)
D6: @PMT(G1,C6/12,B6)
E6: +C6/12*G1
F6: +D6-E6
G6: +G1-F6
A7: +A6+@CHOOSE(@MONTH(A6)-1,31,@IF(
    @MOD(@YEAR(A6),4)=0,29,28),31,
    30,31,30,31,31,30,31,30,31)
B7: +B6-1
C7: +C6
D7: @PMT(G6,C7/12,B7)
E7: +C7/12*G6
F7: +D7-E7
G7: @ROUND(G6-F7,2)

```

TABLE 1: Use these formulas in creating the spreadsheet in **FIGURE 1**. Note that while the formulas in cells A6 and A7 wrap to multiple lines here, each formula should be entered on a single line. The results in rows 8 through 11 are created by copying row 7.

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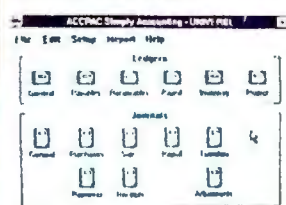


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formula might return 0.00. 1-2-3 may return a confusing -0.00 or 0.01; in a 30-year mortgage on a large loan, the odd penny difference can usually be ignored.

Before committing funds or signing a legal document, check with your bank or financial institution to see how they figure their variable-rate loans. Their figures and yours will probably differ slightly. One reason: Your bank will adjust your repayment schedule if you choose to make the first payment at a time other than exactly one month after the loan date.

*James Kennedy,
St. Augustine, Florida*

Dispatch Disks as You Diaper

The plastic containers used to hold Johnson & Johnson baby wipes are perfectly sized for storing 3½-inch floppies, with each container holding 30 to 35

POWER TIP NO. 243

Line Up dBASE III Plus Reports

dBASE III Plus report forms aren't very flexible, but there are a few tricks you can use to bend a report to your will. For instance, a semicolon inserts a hard return, which is handy if you want two or more fields to appear one above the other. For example, you might use `Lname + ";" + Rank` to produce:

Smith
Sergeant

You can combine this trick with the `REPL()` function, which repeats any character. For example, `Lname + ";" + Rank + ";" + REPL("-", 20)` will put a 20-dash line below each name-and-rank pair.

*Alan Schwartz
San Francisco*

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BASICS: THE NORTON UTILITIES 6.0

You can invoke most of the utilities either by using the front-end menu or by typing the program file name at the DOS prompt. To use the menu, type **norton** and press **<Enter>** at the DOS prompt.

UNERASE

Unerase file in current subdirectory	Highlight file name, UnErase , type first letter of file name
Unerase file in another subdirectory	File • change diReCtory , select subdirectory, unerase file
Unerase all files in subdirectory	File • G roup• OK • UnErase • P rompt for missing 1st letters• UnErase , type first letter of each file in turn
Unerase file in erased subdirectory	Highlight erased subdirectory name, UnErase , type first letter of subdirectory name, change to subdirectory, unerase file
Unerase file in erased subdirectory when you don't know which subdirectory it was in or can't unerase the subdirectory	Search • f or L ost names, highlight file, UnErase , type first letter of file name
Unerase file when you're not sure of file name	File • v iew A ll directories, highlight recognized file, UnErase , type first letter of file name

Tip: To increase your chances of successfully unerasing a file, don't save or copy other files to your hard disk before running **UnErase**.

DISK DOCTOR (PROGRAM FILE NAME: NDD)

Test for errors in a disk's directory and file structure	Diagnose Disk , select drive(s), Diagnose . At Surface Test screen, Cancel
Test logical and physical integrity of hard or floppy disk(s)	Diagnose Disk , select drive(s), Diagnose . At Surface Test screen, Begin Test
Create on-screen report of test results	At Summary screen, Report
Print report of test results	Finish viewing on-screen report of test results, Print

Note: Testing a hard disk for physical defects is more time-consuming than logical testing is. However, it's good preventive maintenance, and you should do it weekly or monthly. Regular occurrence of physical defects may indicate serious disk problems. Make sure you back up your data.

SPEED DISK (PROGRAM FILE NAME: SPEEDISK)

Defragment disk	Select drive, Optimize
Change options	Select drive, Configure
Change optimization method	Optimize • O ptimization Method, select method, <Enter>
Order subdirectories	Directory order , select subdirectory, Add • OK
Sort files within each subdirectory when optimizing	File Sort , pick Sort Criteria and Sort Order, OK
Verify all data is being transferred properly	Other options , Read-after-Write • OK
Save configuration	Configure • S ave options to disk
Show physical location of files on your disk	Information • W alk map, select block

Tip: Before running Speed Disk, disable any TSRs that may write to your hard disk. One way to do this is to boot from a bootable floppy disk with a streamlined AUTOEXEC.BAT file.

FILE FIND (PROGRAM FILE NAME: FILEFIND)

Find lost file using all or part of file name	Type file name, with or without wild cards, <Enter>
Find lost file by contents	Move to Containing field, type text string, <Enter>
Limit search to current directory and its subdirectories	Current directory and below• S tart
Limit search to files created or modified before or after specific date	<F4> , Date is after and/or Date is before, enter date(s), <Enter> • <Enter>
Limit search to files of particular size	<F4> , Size is greater than and/or Size is less than, enter size(s), <Enter> • <Enter>
View ASCII version of found file	V iew
Exit File Find and change to found file's subdirectory	Highlight file, G o T o

Tip: You may have more success finding data if you search using a keyword instead of a phrase. Some programs insert formatting symbols that might prevent File Find from finding a multiword phrase.

AUTOMATING

Note: You can add the following Norton Utilities commands to your AUTOEXEC.BAT file in order to run them automatically each time you boot your computer. To avoid typing the full path name before each command or having to change to your NORTON subdirectory, include your NORTON subdirectory in your AUTOEXEC.BAT file's PATH command, and make sure the PATH command precedes these commands.

Create copy of system area, making disk and file recovery more foolproof	image
Create protected area where deleted files are temporarily moved, making UnErase more foolproof	ep /on
Speed up system by creating disk cache	ncache /install
Prevent viruses or malfunctioning programs from writing to disk	diskmon /protect+
Create on-screen signal indicating drive access	diskmon /light+
Change keyboard to fastest rate	ncc /fast

Note: DOS 5.0's and PC Tools' MIRROR performs the same function as The Norton Utilities' IMAGE. If you currently use MIRROR, you can still use Norton's UnErase and Unformat. Just type the parameter **/mirror** after unerase or unformat in the menu or at the DOS prompt.

Tips: If you use Ncache or another disk cache, make sure DOS's FASTOPEN command isn't in your AUTOEXEC.BAT file. Along with its other features, Ncache performs the same functions as FASTOPEN, but more efficiently. You can save Norton Control Center (**ncc**) settings with **File**•**S**ave settings, then restore them by putting the command **ncc /set** in your AUTOEXEC.BAT file.

ADVANCED: THE NORTON UTILITIES 6.0

The Norton Utilities also allows you to access its utilities from the DOS prompt. This is faster than using the menu, but you have to remember the individual commands. To be able to access these commands from any subdirectory, include your NORTON subdirectory in your AUTOEXEC.BAT file's PATH command.

Note: If you selected the Alternate Names option when you installed Norton, the names of some of these commands may differ.

RECOVERY

Unerase deleted file	unerase [path\]filename
Unformat formatted disk	unformat drive:
Diagnose and repair directory and file structure errors	ndd drive: /q
Diagnose and repair directory, file structure, and physical surface errors	ndd drive: /c
Diagnose and repair 1-2-3, dBASE, or Symphony file	filefix [path\]filename
Repair damage caused by DOS's RECOVER command	disktool /dosrecover
Mark possibly bad cluster to prevent future use	disktool /markcluster
Revive defective floppy	disktool /revive

PRODUCTIVITY

Find lost file by name	fl filename
Find lost file by contents	ts "data string"
Quickly change directories	ncd dirname
Sort files in current directory by date and time	ds dt
Sort files in all the current drive's directories by name and extension	ds ne \ /s
Print ASCII text file	lp [path\]filename
Change file's date to today	fd [path\]filename
Change file's date to another date	fd [path\]filename /d:mm/dd/yy
Safely format 360K floppy on drive A:	sformat a: /a /360
Quickly format 720K floppy on drive B:	sformat b: /q /a /720
Display information about system components and performance	sysinfo /summary

Tips: To find an individual file on your hard disk when you know its name, it's faster to use File Locate (**fl**) than File Find (**filefind**). You can also use Norton Change Directory (**ncd**) to make or remove subdirectories. But if you use DOS or another program for this, press <F2> next time you're in Norton Change Directory to alert it to your changes.

Store hard-disk-saving information on floppy	disktool /saverescue
Save hard disk using above-mentioned floppy	disktool /restore

Tip: Because of its propensity for trashing data, you may want to remove DOS's RECOVER from your hard disk.

BATCH FILES

You can include the following Batch Enhancer commands in your batch files for added functionality.

Make speaker beep	be beep
Make text bright	be sa bright
Make text blink	be sa blinking
Make text red	be sa red
Change text to yellow and background to blue	be sa yellow on blue
Switch foreground and background colors	be sa reverse
Underline text (monochrome monitors only)	be sa underline
Return screen colors and attributes to normal	be sa normal
Pause for specified time (tick = 1/60 second)	be delay ticks
Pause execution of batch file until time specified (24-hour format)	be trigger hh:mm
Perform warm reboot	be reboot
Run Batch Enhancer script file	be filename

Note: You must have ANSI.SYS or its equivalent loaded through your CONFIG.SYS file to use Batch Enhancer to control attributes and colors. The colors you can use in BE SA commands are white, black, red, magenta, blue, green, cyan, and yellow.

A Batch Enhancer script file is an ASCII text file containing a list of 'BE' commands. No special extension is required, and 'BE' will find a script that's in the current directory or in a directory listed in your PATH command. Commands in a script file do not need the 'BE' prefix, and they will run much faster.

NDOS

NDOS, a replacement for COMMAND.COM, provides enhancements to many DOS commands, plus it gives new commands. To replace COMMAND.COM with NDOS, copy NDOS.* from your NORTON directory to your root, and place the line **shell=c:\ndos.com /p** in your CONFIG.SYS file.

Create long file description (up to 40 characters) to be displayed when using DIR	describe filename "description"
Display file with forward and backward paging and scrolling	list filename
Change both drive and directory	cdd drive:\directory
Move file(s) to another directory	move filename(s) directory
Execute command in current directory and all its subdirectories	global command
Execute command on specified file(s)	select command filename(s)
Execute command except on specified file(s)	except filename(s) command
Display list of executed commands	history
Save log of commands to file	log /on
Save copy of current drive, directory, and environment	setlocal
Restore values saved with Setlocal	endlocal
Display total disk space, bytes used, and bytes free	free drive:
Display memory status	memory
Toggle system stopwatch on/off	timer

Note: You can also use many Batch Enhancer commands directly with NDOS.

Tip: You can test out most NDOS commands by simply typing **ndos** at the DOS prompt and pressing <Enter>. To return control to COMMAND.COM, type **exit** and press <Enter>.

disks. This is much cheaper than buying disk organizers costing anywhere from \$4 to \$8, and reusing this packaging eliminates plastic waste.

The containers are stackable, come in blue or white, and include an integrated lid that is permanently hinged. I recommend the unscented wipes, as the boxes are more pleasant to be around and the wipes are better for baby's bottom. Anyone who has or knows someone with an infant can inexpensively organize floppies, protect the environment, and keep babies clean and happy.

John C. Stilin
Houston, Texas

Editor's note: Incurring one of my most unusual business expenses, I bought a box of Johnson's Baby Wash Cloths (as they're properly called) to test this tip. The cloths cost about \$3.50 for a tub of 84, and the tub does make an excellent disk storage container. Because the moist towels contain an emollient solution (which doesn't feel greasy, but might hurt floppies nonetheless), I recommend rinsing the tub thoroughly with soap and water before pressing it into service.

Also on the shelf were Kleenex Hugies, Scott Baby Fresh, and Longs (the local store) brands. Some looked promising, but others had tubs that were clearly narrower or shorter than Johnson's. If you'd like to use a different brand, try one tub for size before making a major investment.

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; PC World Online, Star-Dot-Star; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Sorry, we cannot acknowledge submitted materials. ☺

Brett Glass is a contributing editor for PC World.

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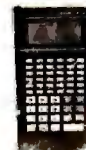
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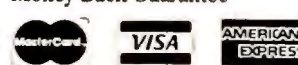
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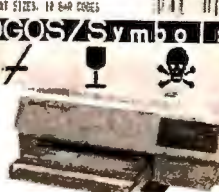
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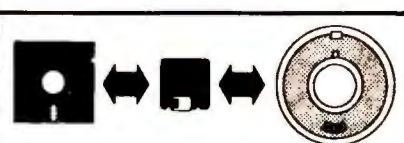
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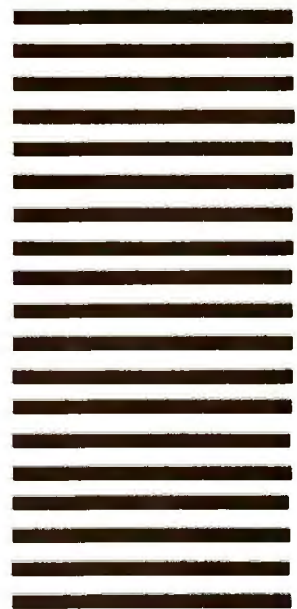
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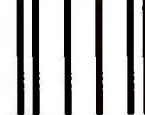
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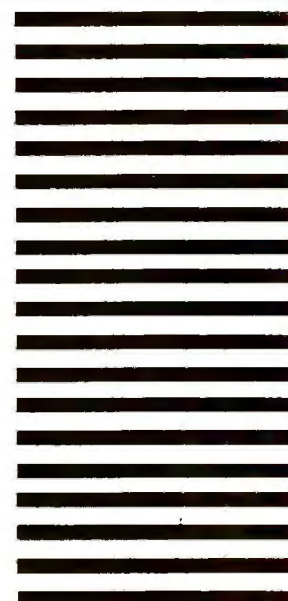
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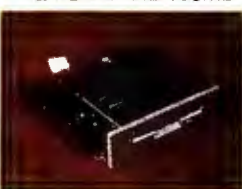
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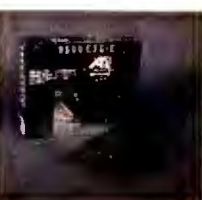
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Satisfaxion Classic - Intl 9600.....	369



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Novell	
Netware Lite	65
Netware Lite with DR DOS 6.0.....	75

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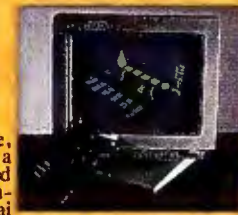
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Parallel/2 Serial/Game Card.....	29
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XT 1.44 Dual Floppy Controller.....	35



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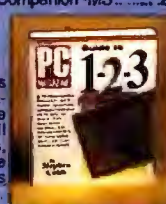


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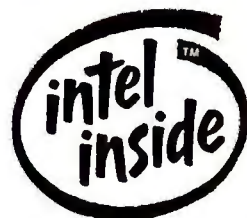
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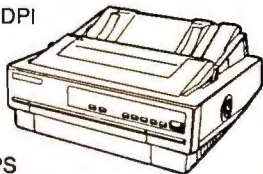
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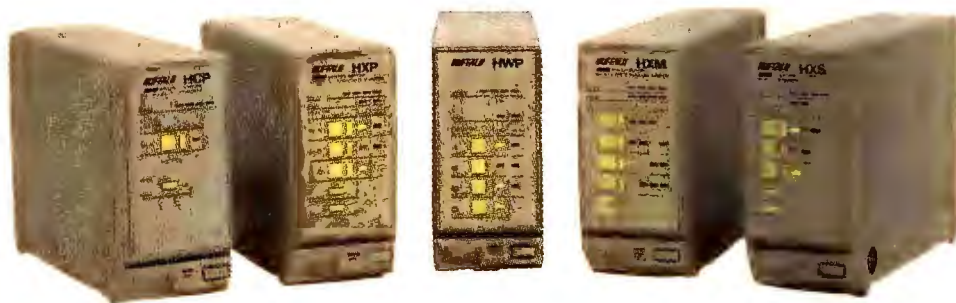
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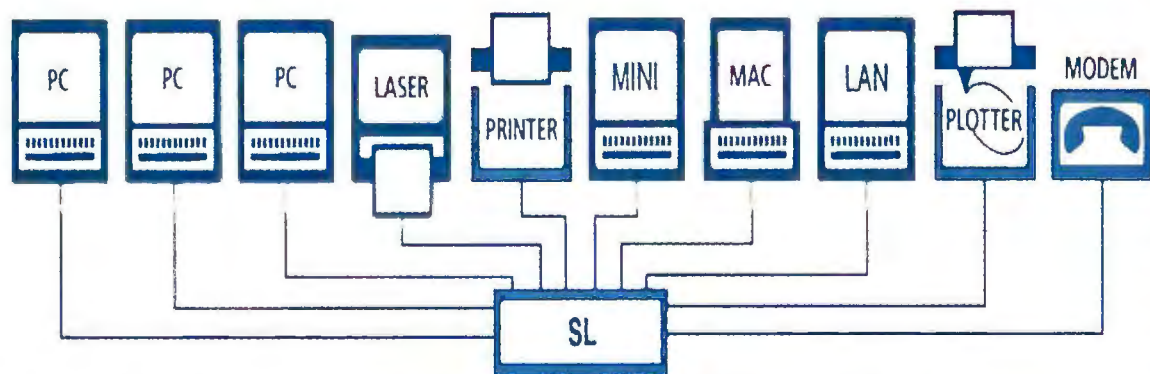
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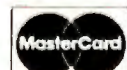
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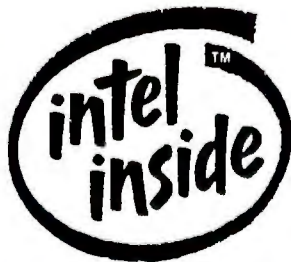
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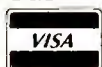
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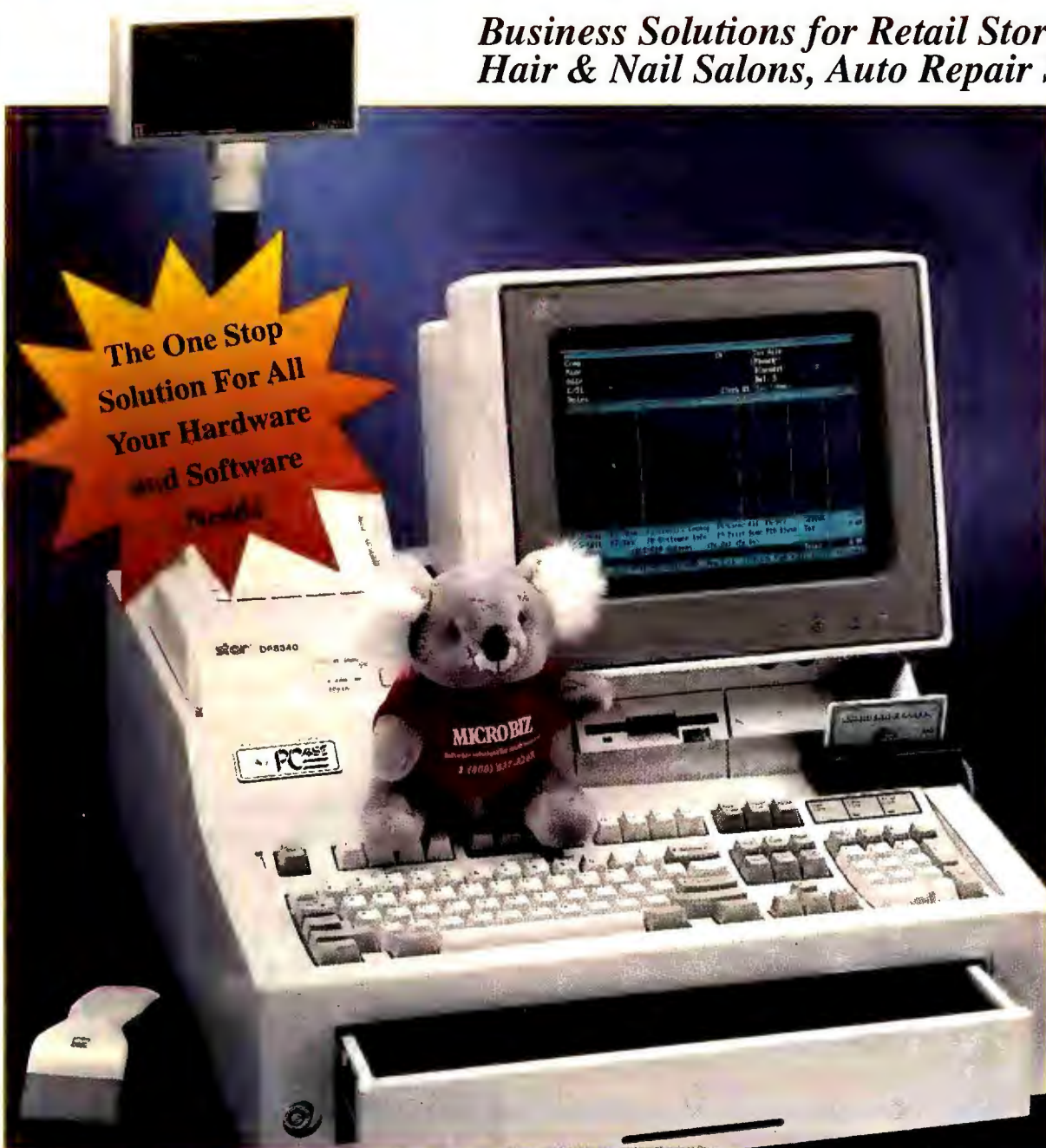
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THE HOME OFFICE

The practical guide to home/office computing

by Steve Bass

Are you sitting at your desk in your office, wondering whether you'll lose both tomorrow—to a leveraged buyout, perhaps, or just the continued malaise of the U.S. economy?

Not a pleasant thought, but let's be realistic. While your nameplate is still on the door, you need to find out how long you could survive a personal economic catastrophe.

To get the answer, you need to know what your financial status is today. And there are a number of personal finance programs that can help.

If you've been using *Quicken* or *Managing Your Money* to pay your bills and manage your bank and credit accounts, you're already halfway there. You have a logical, easily accessible record of your personal payables and receivables.

If not, get one of these programs and start entering the numbers, posthaste. With tax deadlines approaching, you'll have to assemble most of this information anyway.

I use *Quicken*—primarily a check-book program—because it's designed with plenty of data entry shortcuts and thorough but easily accessible reports

like an instant budget. *MYM*, a good alternative, lets me do still more. With *MYM*, I not only can enter checks but can also balance my assets—insurance, IRA, Keoghs, and other investments—against my enormous home mortgage, outstanding loans, and other liabilities.

MYM also has sophisticated analysis and reporting capabilities. But if, like me, you already have invested time in *Quicken*, stay with it and simply import your data into *MYM* or *WealthStarter*.

Once the numbers are in, you have to look at yourself as a business would and generate the two financial documents that, more than any others, show a business where it stands: a balance sheet and an income statement. A personal



BUD PEEN

balance sheet is a snapshot of your assets and liabilities at a specific point in time. An income statement details just your income and outgo for a certain period—a month, a quarter, a year.

You could accomplish this using a spreadsheet—entering your checks, developing the simple arithmetic formulas—but hey, why reinvent the wheel? Both *Quicken* and *MYM* offer dozens of ways to cut the pie, making it easy to take that snapshot of your assets. Then print your income statement, a report

that measures just your income—salaries, rents, dividends, whatever—against how much you spend on groceries, rent, and other essentials.

Armed with these documents, you can then start to “what if?” and create different budgetary scenarios to determine what your expenses should be for different levels of income. In a sense, this is your own personal business plan.

If you get laid off, you'll need at least six months worth of income and a strategy for holding onto as much as you can for as long as you can. Inevitably, that means cutting expenses.

I'm self-employed, which has its own financial ups and downs, especially in these recessionary times. Still, I've been able to fine-tune my budget, and *WealthStarter* even helped me set some *attainable* financial goals. Unfortunately, that means giving up my plan for a friendly takeover of Microsoft, but it does include putting something away for a comfortable retirement.

The recession is real, and although you can't stop it, with the help of your desktop computer, now you can have a say in your own financial destiny. ●

Contributing Editor Steve Bass is a family therapist and president of Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).

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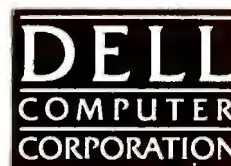
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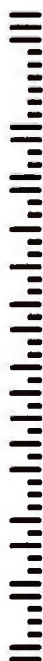


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Timeframe	i486	i486SX	i386	i386SX	Notebook	Other
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1-3 months	_____	_____	_____	_____	_____	_____
3-6 months	_____	_____	_____	_____	_____	_____
6-12 months	_____	_____	_____	_____	_____	_____
More than 12 months	_____	_____	_____	_____	_____	_____

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3-6 months	_____	_____	_____	_____	_____	_____
6-12 months	_____	_____	_____	_____	_____	_____
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But the best part about Critical Care is that you'll probably never have to use it.

Our award-winning technical hotlines solve 90% of problems reported over the phone, usually in 10 minutes or less.

So call us and ask for more details about Critical Care. Or call the other guys and ask about their emergency service. They'll get back to you.

Eventually.

800-232-5610

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SOME MORE BLOWS TO THE COMPET

Here's news that's going to make a lot of computer manufacturers wince. We've dramatically reduced the prices of our entire range of Dell systems. So now you can buy one of the best computers on the market without knocking out your budget.

And while other companies' standards often go down along with their prices, we'll still give you the service and support package described by *PC Week's* editors as "overkill." Our toll-free technical hotlines solve 90% of reported problems

**LOWERED BY
\$300**



NX20 from Dell 20 MHz i386™ SX System
System includes
2 MB RAM, 40 MB Hard Drive, VGA LCD

- 60 MB Hard Drive also available
- 8.3 x 11" footprint
- 6.8 lbs.
- 2-3 hour battery life
- CCFT edgelit triple supertwist display
- 32 Gray levels
- Full size keys with 3mm travel
- Modem, memory and coprocessor options
- One year return to factory service

**LOWERED BY
\$300**



Dell 486P/20 20 MHz i486™ SX System
System includes
4 MB RAM, 80 MB Hard Drive,
UltraScan™ 14C Color Monitor

- Upgradeable processor design
- Up to 40% faster performance than 386DX systems
- Keyboard Password Protection
- RAM expansion to 64 MB
- 1024 x 768 non-interlaced monitor with 70 Hz refresh rate for flicker free operation
- 1 floppy drive

**LOWERED BY
\$800**



Dell 486P/33 33 MHz i486 System
System includes
4 MB RAM, 100 MB Hard Drive,
UltraScan 14C Color Monitor

- Upgradeable processor design
- Programmable Flash EPROM for easy BIOS upgradeability
- Expands to 64 MB RAM using 32-bit SIMMs with gold-plated connectors
- 1024 x 768 non-interlaced monitor with 70 Hz refresh rate for flicker free operation
- 1 floppy drive

All prices and specifications are subject to change without notice. **Payment based on 36-month, open-end lease. *Leasing arranged by Leasing Group, Inc. In Canada and Mexico, configurations and prices may vary. FORTUNE 500 is a registered trademark of The Time Inc. Magazine Company. Dell disclaims proprietary interest in the marks and names of others. *Service provided by BancTec Service Corp. On-site service may be available for an additional charge.

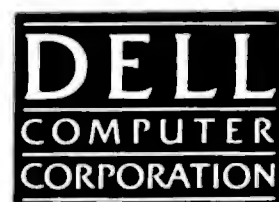
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over the phone, usually in 10 minutes or less. Our TechFaxSM line offers system information 24 hours a day. And if needed, a trained technician can be at your desk-side with a solution in hand, usually by the next business day.[△]

Perhaps this is why Dell comes so highly recommended. After all, we've won *PC Week's* Corporate Satisfaction Poll for PCs, portables and servers an unprecedented eight times.

So call us and find out why over two-thirds of the FORTUNE 500[®] now use Dell computers. But don't bother talking to our competitors; they're a little short of breath.

We just took the wind out of their sales.



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LOWERED BY \$1,000



Dell 486D/33 33 MHz i486 System
System includes
4 MB RAM, 230 MB Hard Drive,
UltraScan 14C Color Monitor

- 5 storage bays, 6 16-bit slots
- 8 KB internal cache
- RAM expands to 64 MB using 32-bit SIMMs with gold-plated connectors
- 1024 x 768 non-interlaced monitor with 70 Hz refresh rate for flicker free operation
- 1 floppy drive

INTRODUCING



Dell 325SX 25 MHz i386SX System
System includes
2 MB RAM, 50 MB Hard Drive,
VGA Color Monitor

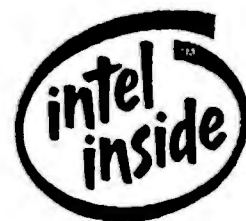
- 1024 x 768 integrated video support
- Novell certified
- Expandable to 8 MB RAM
- 3 16-bit expansion slots
- Keyboard Password Protection
- 1 floppy drive

INTRODUCING



Dell 486D/16 16 MHz i486SX System
System includes
2 MB RAM, 50 MB Hard Drive,
VGA Color Monitor,

- Upgradeable processor design
- Programmable Flash EPROM for easy BIOS upgradeability
- RAM expands to 64 MB using 32-bit SIMMs with gold-plated connectors
- SmartVu[™] Diagnostic Display
- Can support 5 storage devices
- 6 16-bit expansion slots
- 1 floppy drive



AFTER YOU PUT YOUR JAW BACK IN ITS PLACE, CALL US.

You'll find the Dell® 486P/16 as surprising as our competitors find it shocking.

It delivers full-fledged i486™ SX performance at the price of an i386™ DX machine; up to 40% more processing power at virtually no additional cost.

And that's just for starters. Because the 16 MHz i486SX processor easily upgrades all the way up to a high-end 33 MHz i486DX system, and even beyond.

In other words, this is a computer that comes with the future built in. Along with some Dell technical innovations you'll be amazed to get at a price like this.

Features like programmable Flash EPROMs, for example, that make BIOS upgrading a matter of slipping in a diskette. 32-bit SIMMs with gold-plated connectors for greater

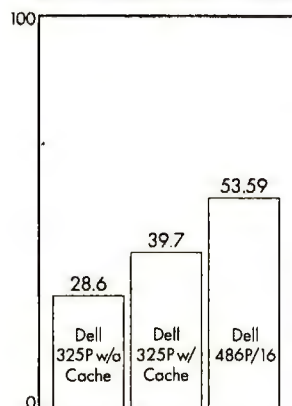
reliability. And built-in 1024 x 768 video support for high resolution graphics.

All this, starting at an unbelievable \$1,749 for a complete system.



So when you've finished staring at this page, call and ask about the support that comes along with the Dell 486P/16. And be prepared to be speechless again.

Landmark 2.00 Benchmark Test



\$1,749 (Lease*: \$66/Month**) Dell 486P/16 16 MHz i486SX System System includes 50 MB Hard Drive, VGA Color Monitor, 2 MB RAM and 1 Floppy Drive

800-232-2033

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