

PC WORLD

March 1994 \$3.95

New Ways To Boost Windows

The Right Apps

**Word for Windows,
WordPerfect, and
Ami Pro Face Off**

Expert Tips

**Excel, 1-2-3,
Quattro Pro,
Improv**

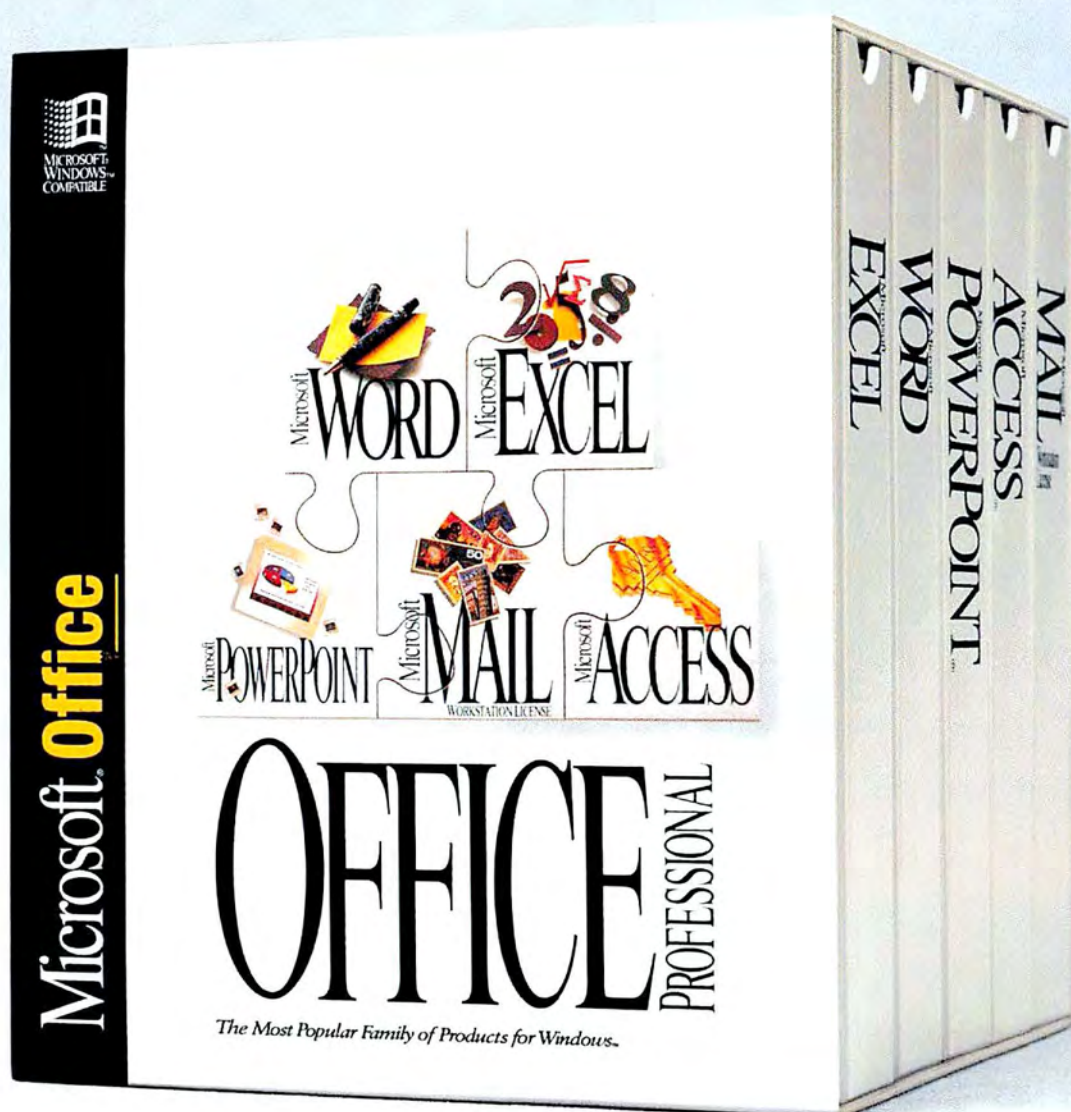
Speeding It Up

**Top 10
Graphics
Boards**

**Sneak Peek:
Windows
4.0**



INTRODUCING THE MICROSOFT OFFICE.



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Wizards and Cue Cards. So you can put your manual away.

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Moving information between programs is like this: Drag a chart from Microsoft Excel and drop it into Word with Drag-and-Drop.



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TipWizard tracks the way you work and offers bright ideas on how to save time.

Only our Microsoft Office Manager (MOM) puts all the leading programs right at your fingertips with a click.

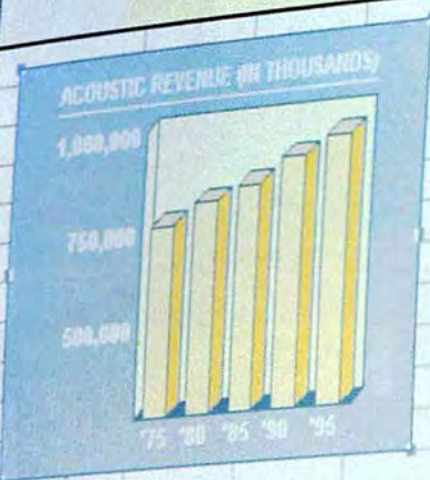
Sharing information between programs is as easy as dragging it from one and dropping it into the other.

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WORK TOGETHER
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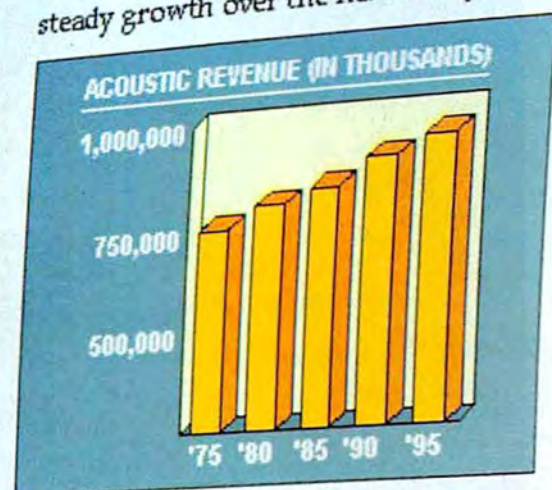
Microsoft Excel - ACOUSTIC.XLS
File Edit View Insert Format
Tools Data Window Help

	A	B	C	D
2		REVENUE (IN THOUSANDS)		
3		1975	1980	1985
4	Acoustics	750,000	820,000	850,000



Microsoft Word - ENCORE.DOC
File Edit View Insert Format
Tools Table Window Help

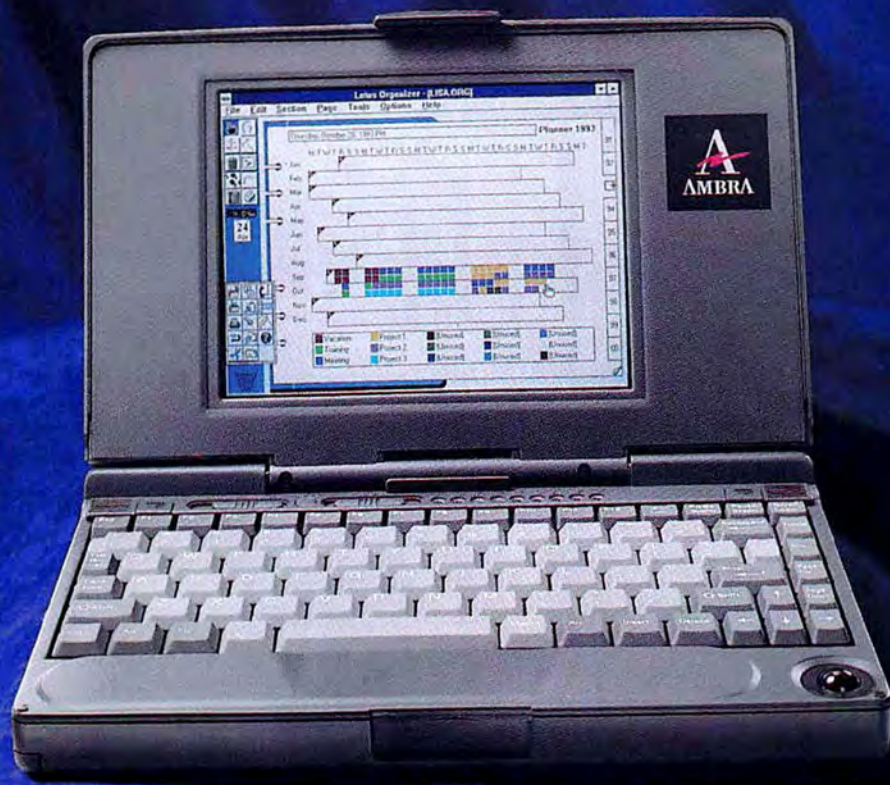
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- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
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- Integrated 16mm trackball
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- Carrying case
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PC WORLD



Systems

122 Top 20 PCs: More for Less

As the prices for Pentiums plummet and DX2-66 PCs pack on RAM, storage, and added value, our Top 20 charts sort it all out for you. Two brand-new machines, the Axik 486DX2-66PCI and Micron 466 VL Powerstation, shoot to number one on the Budget Desktop and Power Desktop charts.

New This Month

- | | |
|--------------------------------|------------------------------------|
| 125 ALR Evolution V-Q | 140 Int'l Instrumentation Blue Max |
| 125 Ambra DP60E/VL | 141 Micron 466 VL Powerstation |
| 125 AT&T/NCR System 3230 | 141 NEC Image P60 Pentium |
| 128 Austin Power System 60 | 141 Netis N466VG |
| 128 Axik 486DX2-66PCI | 142 NuTek Duet 486DX2/66 |
| 134 Blackship BLK 486DX2/50 LB | 142 Polywell Poly4586-66EV |
| 134 CSP 486 Medium Tower | 142 Tagram HiNote 14 |
| 134 DTK FEAT-33 | 143 Tri-Star 486DX2/66 Tower MPC |
| 140 Image 486-DX-33 | 143 VTech Platinum SMP |
| 140 Insight VL 486DX2-66 MM | |

Digital composition by TX Unlimited/San Francisco

Cover Story/Windows

154 Windows Word Processors: Wizards Versus Coaches

Microsoft Word, WordPerfect, or Lotus Ami Pro? You don't have to wish for a more powerful and intuitive word processor—you can demand it. Our own word processing expert investigates Wizards, Coaches, Tips of the Day, OLE capabilities, and other automated tools in this year's batch of contenders. Here's our choice for the best of the newest Windows word processors.

180 60 Spreadsheet Tips

We talked formulas and formatting, references and recals when we polled our network of spreadsheet mavens for their top shortcuts and secrets. What we came up with is 60 timesaving tips on how to do all that and more in 1-2-3, Excel, Improv, and Quattro Pro.

200 Top 10 Windows Accelerators: Hercules Comes On Strong

We tested the latest graphics boards using all-new graphics benchmarks designed to reflect real-world tasks in a wide range of Windows applications. The result: a concise buyers' guide ranking the Top 10 boards for speeding up Windows.

Top of the News

54 Building the Future of Windows

Our inside look at the next version of Windows reveals smoother multitasking, improved performance, plug-and-play setup—and an end to DOS.

59 Photos Without Film

Apple's QuickTake 100 digital camera takes color photos directly to the desktop.

62 Documents on the Cheap

A low-cost, high-quality trio: Canon's laser-quality ink jet, speedy 600-dpi laser printer, and neat little color scanner.

66 The Alternative to Business Travel

The next best thing to being there? Intel's \$99 ProShare lets colleagues collaborate via PC and phone.

D. 202

Gone are the days of free and friendly software support. What's left is a world of limited phone calls, 900 lines, and fee-based corporate support. We tell you how much it could cost you and how to decide who to pay.

- 83** Insight PCI P60, Ambra DP60/PCI Pentiums
- 84** WinWriter 600 printer
- 84** TI microLaser Pro 600
- 86** DPS-I, DPS-II LCD note/projection panels
- 86** Logitech PowerPage, Plustek Scanfx scanners
- 88** Power Translator for Windows, Power Japanese 2.0
- 90** BallPoint Mouse 2.0
- 90** SpinRite 3.1

- | | | | |
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| 91 | Prodigy for Windows | 100 | Great Literature Plus for Windows CD ROM |
| 91 | IBM's OS/2 for Windows | 103 | Hell Cab CD ROM |
| 94 | Scan/US 1.0 demographic software | 104 | In Motion, Media Clips CD ROMs |
| 94 | Microsoft's Money 3.0 | 105 | From Alice to Ocean CD ROM |
| 95 | CheckIt Pro: Analyst diagnostic software | 106 | TCP/IP 2.0 for OS/2, 2.1 for DOS and Windows |
| 95 | InfoCentral PIM | 108 | TalkShow 2.0 |
| 98 | Managing International Business CD ROM | 109 | Sprinter multiplexer |
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- Two VESA local bus, five 16-bit and one 8-bit expansion slots
- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- MS-DOS 6.2 w/Tools

PACKAGE 2

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Lease \$63/month	
486SX-33	\$1595
Lease \$58/month	
486DX-33	\$1695
Lease \$61/month	
486DX-50	\$1795
Lease \$65/month	
486DX2-66	\$1995
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- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- Microsoft Mouse
- MS-DOS 6.2 w/Tools, Windows for Workgroups 3.11

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486DX-50	\$2195
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- Two VESA local bus, five 16-bit and one 8-bit expansion slots
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- Microsoft Mouse
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- Choice of Lotus Application

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- Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM
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- On-board SCSI socket
- Two VESA local bus, five 16-bit and one 8-bit expansion slots
- Six-bay desktop w/2 cooling fans
- 101-key space-saving keyboard
- Microsoft Mouse
- MS-DOS 6.2 w/Tools, Windows for Workgroups 3.11
- Choice of Lotus Application

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- MS-DOS 6.2
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- Microsoft Windows for Workgroups 3.11

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a notebook.
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- Complete ZEOS Customer Satisfaction Package.

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- 80MB IDE hard drive

486SL Contenda: \$1395

Lease \$59/month

- 4MB RAM
- 80MB IDE hard drive

PACKAGE 2

386SL Contenda: \$1295

Lease \$55/month

486SL Contenda: \$1695

Lease \$61/month

- 4MB RAM
- 80MB IDE hard drive
- External 3.5" floppy drive
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386SL Contenda: \$1595

Lease \$58/month

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Lease \$72/month

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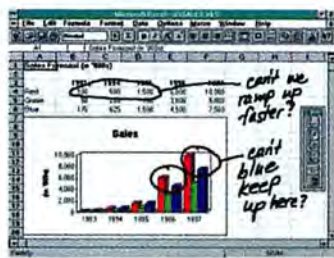
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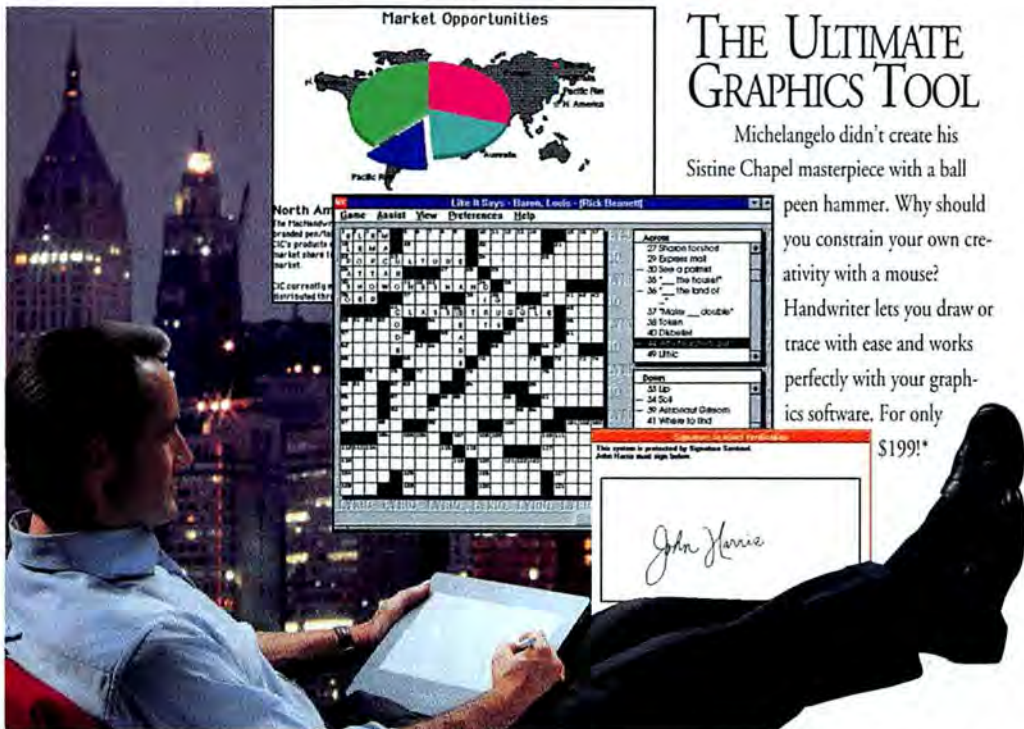
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Coming Soon to a Video Store Near You



PC World's main offices are located in an industrial section of San Francisco known by the high-tech cognoscenti as Multimedia Gulch. In renovated ware-

houses, home/work lofts, and low-rent offices, small start-up companies work furiously to churn out software on CD ROMs. At local espresso shops, it's not uncommon to overhear snatches of unintelligible conversations about bandwidth, frames per second, rendering, and the like.

Across the city, a blue-collar shopping district seems as far from Multimedia Gulch as it can get. There's the familiar mix of stores: Safeway, A-1 Bakery, El Rey Shoe Repair, the Ocean Avenue Garage, a Chevron station, and Blockbuster Video—all essential to everyday life, and decidedly not high tech.

But multimedia is seeping into the mainstream. San Franciscans walking into this Blockbuster Video will find a corner filled with CD ROM software and multimedia systems. One of several in a Bay Area pilot program, the store rents and sells disks and drives for a number of platforms: Sega CD, Panasonic Reel 3DO, and Philips Magnavox CDi (for more details, see *Top of the News*). A quick scan of titles reveals the usual action and adventure games—*Stellar 7 Dragoon's Revenge*, American Laser Games' *Mad Dog McGee*—along with a smattering of CD-I movies like *The Hunt for Red October*.

What caught my eye, though, was the IBM Multimedia 486SX PC, Apple Macintosh TV, and shelves of CD ROMs for these two systems. Little kids can take home *Berenstain Bears: Learning at Home* and *Richard Scarry's Busy Town* from Paramount Interactive. For us big kids, there's *Adventures*, a travelogue with information on vaca-

tions and tours around the world; *Small Blue Planet*, with political and topographical maps to zoom in on; *American Journey: 1896-1945*; and lots of others.

Pickings for the business crowd are slim. Excluding general reference titles like *Compton's Interactive Encyclopedia*, the sole business entry is *Multimedia PowerTalk*—a compelling disk, no doubt, containing an interview with economist and author Paul Zane Pilzer by Anthony Robbins, author of *Awaken the Giant Within*; 300 (count 'em!) related articles; more than 800 color images; and the full text of four books.

Siskel and Ebert for CD ROMs

Big deal, you say. So along with the schlocky third-run videos that you schlepp home on Saturday night, you can schlepp home schlocky third-run CD ROMs. That's not the point, though. More than 5800 titles are on the market right now, with many more titles to follow.

And that's where *PC World* comes in. Each month we're reviewing new CD ROM titles in our popular *New Products* section. We'll help you pick out the best titles and avoid those with 250MB of worthless and hard-to-navigate information, video, and sound. We'll focus on business, educational, and entertainment software we think most interesting to our audience of business managers. We'll continue to cover application software in the "Software" section of *New Products*, as well as games and other off-hours titles in *Break Time*.

Blockbuster Video's move into CD ROMs signals mass market acceptance of the technology, although new users may be in for a shock. CD ROM hardware and software is not as simple as VCRs and videos. According to a clerk at Blockbuster, most people interested in renting the store's PC and Mac CD ROMs are computer literate, but com-

plaints that the software is too hard to install are common. We've also heard complaints from readers and staff alike that CD ROMs don't always work right, gobble up hard disk space indiscriminately, and litter disks with files that are impossible to find and delete. Even worse, installing CD ROM drives and their accompanying sound cards can send even the most patient users back to hard drives and floppies. So in addition to reviewing new CD ROM titles, we'll tackle topics like these in regular multimedia special reports in the coming year.

Despite these problems, CD ROMs are here to stay. Of our readers, well over half of you either now own or plan to purchase CD ROM drives. And like

More than 5800 CD ROM titles are on the market right now, with many more to come. We'll help you pick out the best.

many other publications, we're exploring the best way to deliver *PC World* itself on CD ROM.

PC World on CD ROM?

Are you interested in a CD ROM version of the magazine? What would be most useful? Some possibilities: one or two years' worth of searchable back issues, video and sound clips to supplement the text, hyperlinks between articles in an issue, links from reviews to a demo version of the software itself, and catalogs for buying software.

We're interested in your feedback. Write—by E-mail, fax, or mail (see page 12)—and let us know what you'd find most valuable and most dispensable.

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2 WITH A SIMPLE COMMAND, LUCY LAUNCHES FROM NOTES INTO THE TRAVEL AUTHORIZATION FORM IN AMI PRO TO PREPARE FOR HER TRIP TO SPORTS WORLD. NOTES HAS ALREADY FILLED IN MOST OF THE TEMPLATE WITH LUCY'S FILE INFORMATION. SHE FILLS OUT THE REST OF THE INFORMATION AND THE TRAVEL DOCUMENT IN NOTES IS UPDATED.

1 THIS NOTES APPLICATION SHOWS HOW A COMPANY CAN AUTOMATE THE TRAVEL PROCESS. HERE, LOTUS NOTES CONTAINS THE AMI PRO TRAVEL REQUEST, THE FREELANCE TRIP PRESENTATION AND THE 1-2-3 EXPENSE REPORT. ANY AUTHORIZED MEMBER OF LUCY'S WORKGROUP MAY ACCESS, SORT AND REPORT ON THE DATA BECAUSE OF THE NEW NOTES/FX TECHNOLOGY.

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02/10/94	Domestic Marketing Review	\$1,500	\$1,592
02/18/94	SportsWorld '94	\$11,000	\$9,812
02/18/94	SportsWorld '94	\$2,000	\$1,875
02/18/94	Korean Factory Assessment	\$9,000	\$7,737
		\$21,100	\$20,122



Integrating five top-rated Windows™ applications to work together as one was the big idea behind Lotus® SmartSuite®.

Now, Lotus SmartSuite, featuring five highly useful and usable Windows applications, all seamlessly integrated, raises the bar again with the most powerful and most sought after capability in business systems today: The way to get people working together.

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in 1-2-3® remains the clearest, most meaningful way to make sense of shared data by letting each user know who made what changes when and why.

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The most important technology for empower-

SMARTSUITE AND LOTUS NOTES. THE SECRET TO INTEGRATING WORKGROUPS.

ing workgroups is now found in a whole new software application category called groupware. And the product that defines and leads this category is Lotus Notes.

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Freelance Graphics - Trip Presentation

MERCURY SPORTS
Trip Report

SportsWorld '94
Miami
February 1 - 5

Select New Page button below
and choose Key Business Reasons

All Reports By Employee

Request	Returning	Expense Total
1/22/94		\$4,220.70
1/15/94		\$7,736.70
2/5/94		\$1,875.44
1/11/94		\$1,489.92

Lotus 1-2-3 Release 4 - Expense Report

Employee Expense Form

Emp # 4091 Dept # 122 Dept Name Design Facility Saturday Wk Rate 0205/94 2536

Day	Date	Time	Rate	Total
Sun	1/22/94	11:00	11.00	11.00
Mon	1/23/94	12:24	10.00	12.24
Tue	1/24/94	9:00	25.00	25.00
Wed	1/25/94	46:00	32.00	32.00
Thu	1/26/94	12:27	127.82	127.82
Fri	1/27/94	12:27	127.82	127.82
Sat	1/28/94	11:00	11.00	11.00
Sun	1/29/94	11:00	11.00	11.00
Total				\$1,194.00

SUMMARY

Total Expenses	\$1,194.00
Advances**	\$600.00
Balance Due Mercury Sports	\$6.00
Balance Due Employee	\$1,375.44

3 WHEN SHE RETURNED FROM HER TRIP, LUCY CREATED A PRESENTATION REPORTING HER SUMMARY ON SPORTS WORLD IN FREELANCE GRAPHICS. THIS PRESENTATION WAS ROUTED AS A NOTES DOCUMENT SO OTHER INTERESTED PARTIES IN MARKETING, PRODUCT DEVELOPMENT AND EVEN OTHER SALESPeOPLE ON THE ROAD, LIKE DAVE, CAN QUICKLY ACCESS IT AT THEIR CONVENIENCE.

4 LUCY COMPLETES HER 1-2-3 EXPENSE REPORT FOR THE TRIP, WITH THE ESTIMATED EXPENSES AND THE CASH ADVANCE AMOUNT BEING AUTOMATICALLY ENTERED FROM AMI PRO TO 1-2-3 THROUGH THE NOTES/FX LINK. THE EXPENSE REPORT IS AUTOMATICALLY ROUTED TO HER MANAGER AND THEN TO FRED IN ACCOUNTING.

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tions. And notably, in the technology for working together.

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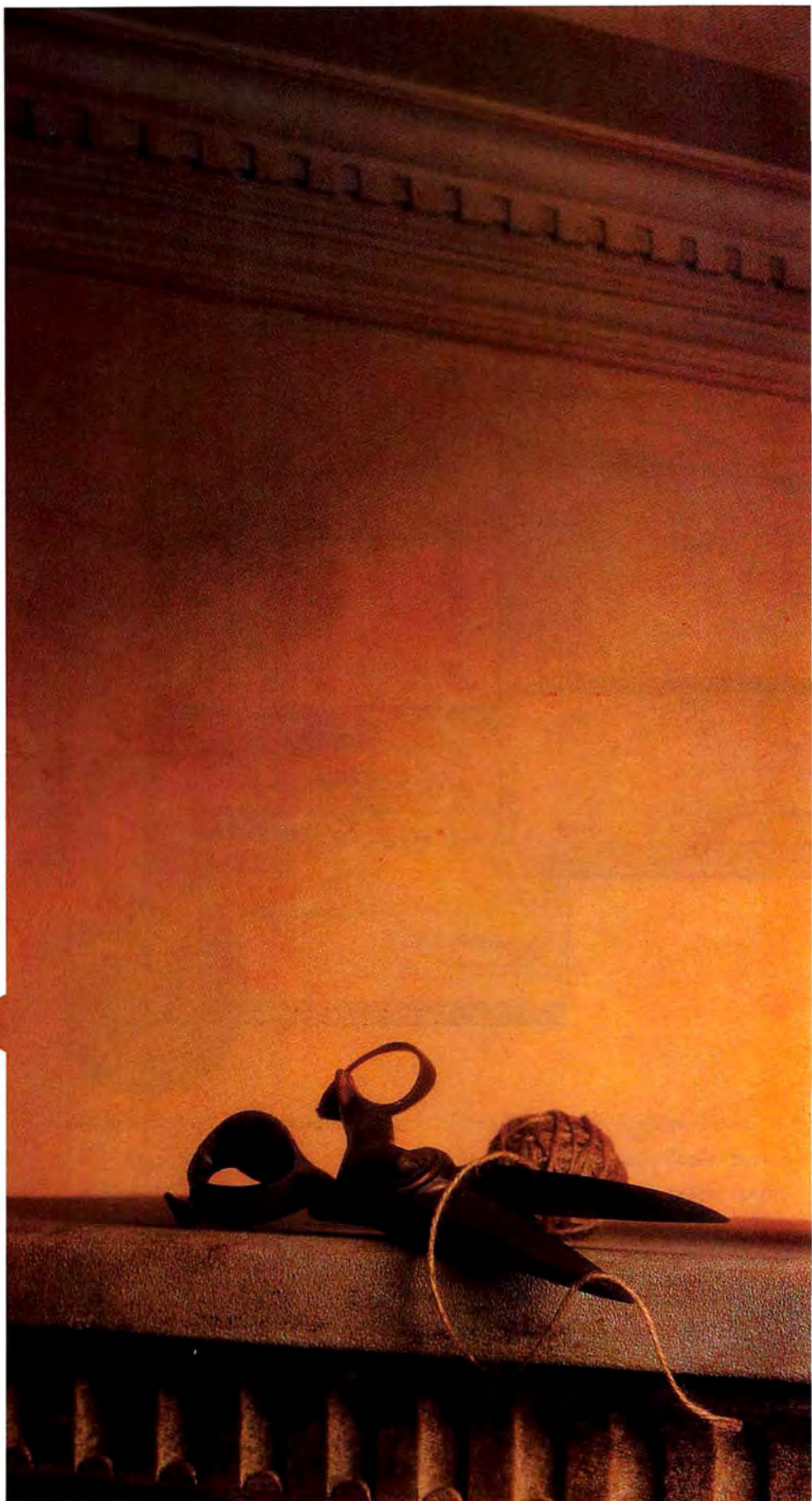
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oration. ¹Size and weight indicated are for the Contura Aero 4/25 Model 84 and Model 170. Model 4/33C pictured here weighs 4.2 lbs. ²Batteries and certain options covered by a one-year warranty. For further information on our
ired here starting at \$2,199. The Intel Inside Logo is a registered trademark of the Intel Corporation.

Circle 83 on reader service card

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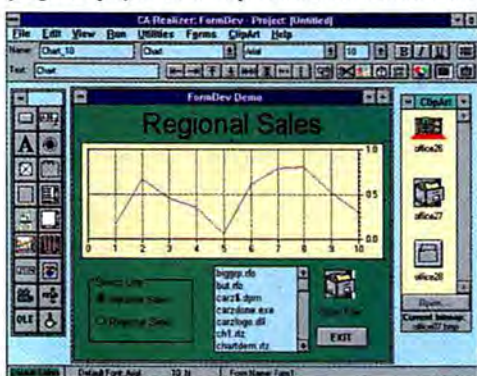
Compared to Visual Basic 3.0, CA-REALIZER® 2.0 is half the cost and twice the product.

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CA-REALIZER is already the easiest, most powerful BASIC for Windows and OS/2, and with version 2.0 it's even better. No one can match our combination of features, ease of use, and price. No one can make it easier to port your applications from QuickBASIC, and

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CA-REALIZER also comes with a huge array of powerful, plug-and-play tools like spreadsheets, charts, text editors, animation,



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Circle 29 on reader service card

Beta Bugbears, Support Falls Down, DOS Lives

Don't Get Too Hasty

Every month I look forward to your informative articles. I do have one complaint, though: Why do you test beta software? I would prefer to wait for a subsequent issue and read a critique of the shipping code. That way, *PC World* could publish information about any bugs that are found while the program is being tested for the review and compare the product's performance to that of its peers.

Phil Englert, Baie-d'Urfé, Quebec

Editor's response: *PC World* takes a three-pronged approach to this matter: Our news section covers many beta products to satisfy readers who want to know about the latest software and hardware, our reviews section thoroughly evaluates and tests shipping products, and subsequent news stories follow up on persistent bugs (see "Are You Being Used to Test Software?" in February's *Top of the News*).

Filmsy Support

I know of no other industry that takes as cavalier an attitude toward customer satisfaction as the software industry does.

Once they have made a sale, vendors seem to think that they no longer need to help customers. It is always possible to reach Microsoft's sales department immediately, but if a customer calls for "free" technical service, the wait on hold can be more than an hour. Why should consumers buy a program from a company whose "service" costs more in phone charges than the price of the application?

I cite Microsoft as an example because, in my experience, it is the worst in this respect. Also, 90 days after purchase, Microsoft starts charging \$2 per minute for technical support. In contrast, Dell is a fine model for the hardware industry; Dell seems to recognize that good customer support is essential to its future success.

I am stuck with DOS and Windows, but whenever possible my dollars go to the companies that recognize the importance of customer support. Fortunately, there are still a few in this category, such as Colorado Memory Systems, Media Vision, Stac Electronics, Intuit, and Quarterdeck. Let's hope that they don't follow Microsoft's lead.

Malcolm H. Battles,
Freedom, New
Hampshire

Editor's response: Check out "The End of Free Support" in this issue.

Disputing a Best Buy

You stunned me by rating a Gateway system as a Best Buy in "486 Face-Off: Local Heroes or Little-Town Blues?" [November]. You didn't even rate the Gateway 4DX2-66V in the top five for Best Performance, Best Price, or Best Service and Support; consequently, your Best Buy rating seems suspect.

John C. Nicholas, Conifer, Colorado

Author's response: The Gateway 4DX2-66V won its Best Buy by virtue of its overall combination of attributes: It features good performance, expandability, configuration, and support. As of the February issue, *PC World's* system reviews include Power and Budget Top 20 lists that more clearly convey overall ratings and compare newly reviewed systems with systems that we have recently reviewed. Please let us know how you like the new approach.

—Rex Farrance

Playing by the Rules

I'm always disappointed when someone in the computer press jumps on the IBM-Apple bandwagon. In January's *Inside Source*, David Coursey says,

"If you're concerned about the power that the Microsoft-Intel combine wields over personal computing, the PowerPC is your best hope of breaking it."

While I may not be totally comfortable with Intel's and Microsoft's power, those companies at least demonstrate a willingness to respond to market forces. IBM, Apple, and Motorola have always



kept their prices artificially high. They had a chance to join the PC competition years ago; they chose not to because they didn't want to compete by free-market rules.

Had Apple licensed the Mac OS for Intel platforms, Windows would not exist. IBM's PS/2s were nothing more than an attempt by IBM to start a new standard—favoring itself, of course—and slow the clone juggernaut.

I concede that IBM and Apple make good machines, but those systems were out of the price range of a lot of individuals and small offices until recently. Even today, you still pay more for IBM and Apple equipment than you would for comparable clones from companies like Dell and Gateway.

The fact that IBM and Apple have now forged an alliance shows just how desperate they have become. Who could have imagined that scenario five or ten years ago?

Alan Warren, Athens, Texas

Bargain Hunter

With due respect to Michael Galvin's advice to buy systems locally in November *Letters* ["Just Go Shopping"]: One of the biggest problems plaguing local computer suppliers is their inability to match prices and products with those of vendors from other cities and states.

When I was ready to invest in a 486DX2-66, I called practically all the dealers in my city. Not one could come close to the prices

advertised in *Computer Shopper*. For \$2099 I was able to buy what I wanted from the catalog—a system with a 15-inch monitor, a 425MB hard drive, and 8MB of RAM expandable to 32MB. *Computer Shopper* gave me five companies to choose from.

Two weeks after I received my system, an ad in *Computer Shopper* reduced the price by \$100. I called the company, the sales manager called back after an hour, and my credit card was credited for the difference.

My advice to buyers is, do your homework. As with any purchase involving a large cash outlay, you need to consider several alternatives. If you see an appealing ad in a magazine, check the back issues to see if the product is advertised consistently. Use a credit card for your purchases. And avoid systems that have proprietary parts; that way, if anything happens, a local repair company will be able to fix the problem.

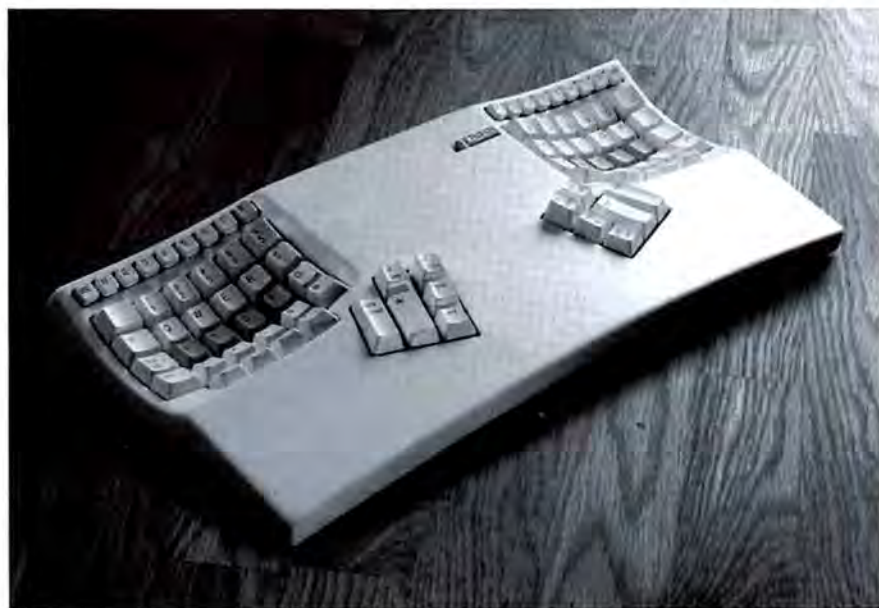
Luis M. Baez, Bellevue, Washington

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Let's Make a Deal

Shareware authors probably resign themselves to getting paid by one out of ten users. If *PC World* could arrange to distribute thousands of copies of shareware programs for a guaranteed fee per copy, even if that fee were well below the author's normal registration price, I'm sure shareware authors would consider it a good deal.

Dale E. Miller via PC World Online

Mad About WordPerfect

I'd been a happy WordPerfect user since release 4.2, and I'd never even had to call tech support in all those years. So naturally when WordPerfect 6.0 for Windows hit the street, I ordered it right away. Having read the glowing reviews, I planned to have the upgrade installed on every PC at work by the end of the month.

What a disaster! Undocumented features that even WordPerfect's tech support can't help you with—like the much-touted Address Book, which apparently stores your data in the twilight zone—a huge 33MB bite out of my hard drive, XT-speed performance, and more bugs than a street hustler.

The last four days have been filled with frustration, lost data, and hours of busy signals from tech support. If I'd wanted undocumented features, a clunky new interface, and no backward compatibility, I'd have switched to Word.

JB Fenn via PC World Online

DEL WPWIN

Forget Word and WordPerfect and buy Ami Pro. It has more formatting power than either of these has-beens and is easier to use (plus, it's much faster). I used to use WordPerfect, but after trying Ami Pro for less than a month, I deleted WPWIN from my hard drive.

John Ried via PC World Online

ALR bests three other 60MHz Pentium systems

Advanced Logic Research, Inc. Evolution V™

AST Research Inc. Frammia™ LX P.60	72.0
Compaq Computer Corp. Deskpro™ 60M	69.9

Winstone 94 Version 1.0

HC Week 10 issues 1, 1002 page 70. Measure 30 measures overall system performance using five scripts to test 12 popular Windows applications. It computes the product of the individual scores to find an overall score. Final results are weighted based on the relative number days of each 12 applications.

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“Speed that’s bound to inspire a case of Pentium envy in any user who tries out an Evolution V”

PC World - January 1994



What's next?

January 25, 1994



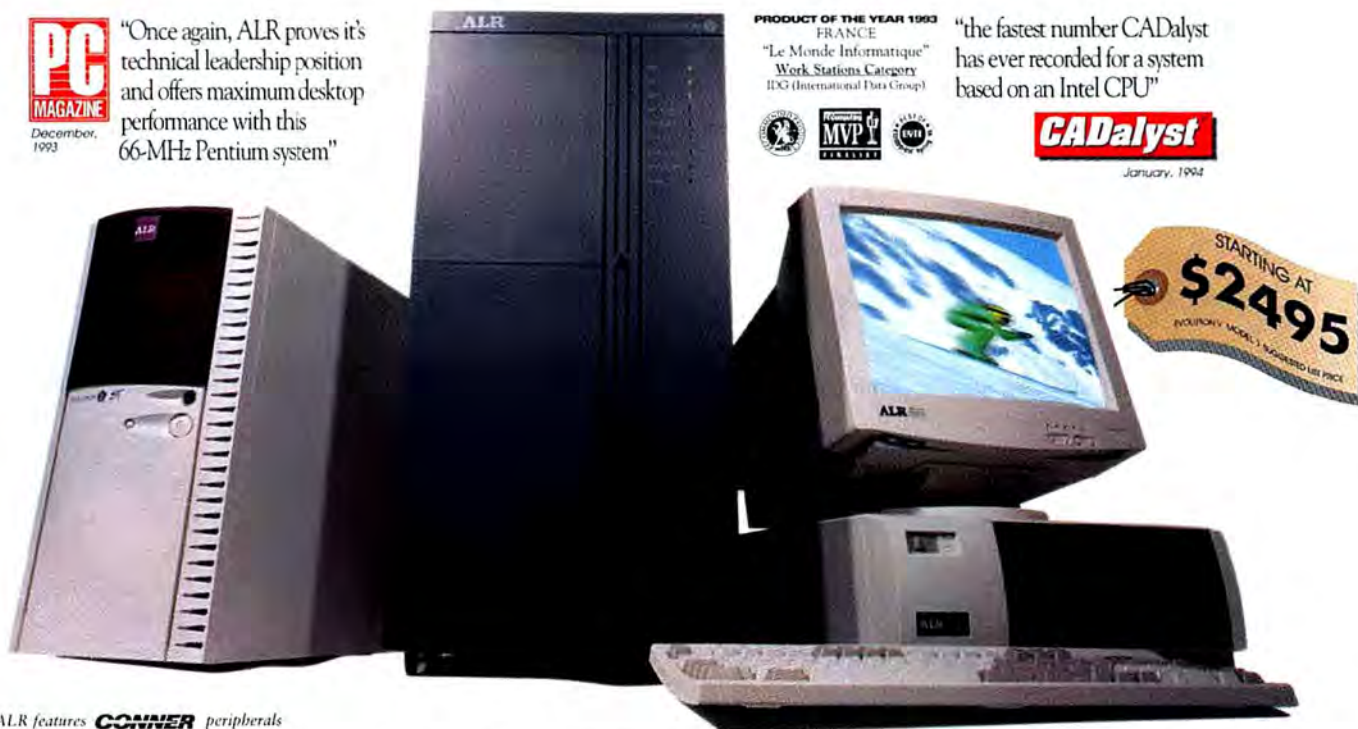
"Once again, ALR proves it's technical leadership position and offers maximum desktop performance with this 66-MHz Pentium system"

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IDG (International Data Group)

"the fastest number CADalyst
has ever recorded for a system
based on an Intel CPU"

**CADalyst**

January, 1994



ALR features **CONNER** peripherals

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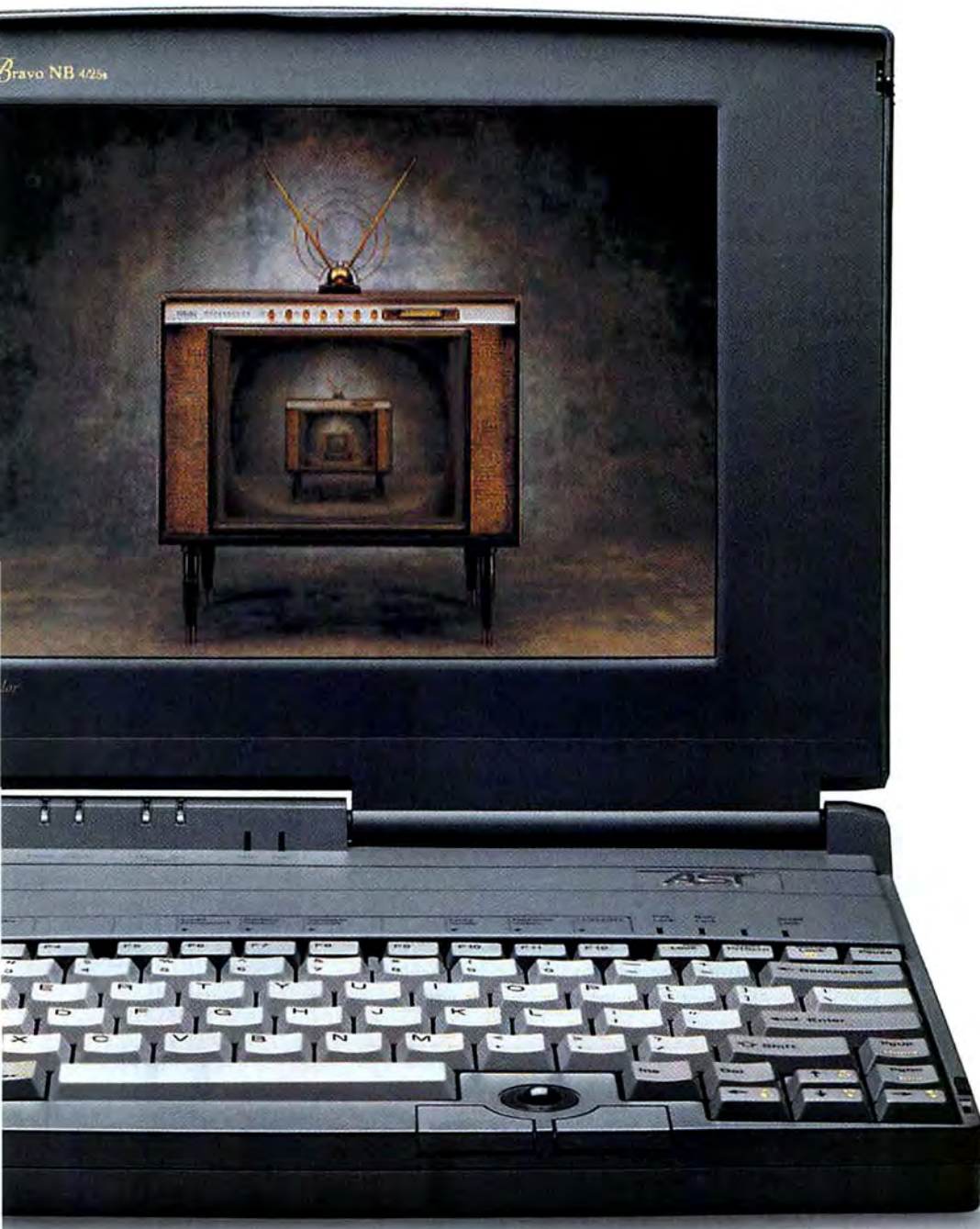
Circle 9 on reader service card

Remember when color TVs suddenly became affordable? Can you say déjà vu?

*U*nless you still watch a black and white TV and listen to 8-track tapes, price is probably the only thing stopping you from getting a color notebook. In which case, we'd like to introduce you to the Bravo NB. Not just because it's affordable, but also because it has features you normally don't find on notebooks costing hundreds more. Like the most advanced Dual Scan STN technology, which gives you 256 bright, clear colors on a full-size 9.5" screen. To make sure you won't have to wait to see those colors, it has a powerful Intel 25MHz 486SX microprocessor, local bus video and 512KB video memory. It also has 4MB RAM that can be expanded to 20MB and up to a 170MB hard drive. There's even a Type III PCMCIA expansion slot so you can send or access information from anywhere, as well as enough other features to fill that column to your right. And since our resellers perform as well as our computers, you can get one right away by calling 800-876-4AST. All of which should make choosing a color notebook as simple as, well, black and white.



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Go With the DOS Prompt

MS-DOS 6.2 isn't a 32-bit, multithreaded, multitasking, object-oriented, graphical operating system—but I like it anyway. It delivers adequate tools for a reasonable price, and it's easy to use.

Most of today's 32-bit operating systems claim ease of use, but none of them are very easy. They're spread over numerous directories. Their configuration files are about as simple as a 1040 tax form. They're finicky about hardware, and their RAM requirements are growing faster than the national debt. In short, they're hard on both my schedule and my wallet.

These days, when I think ease of use, I think of a DOS prompt.

JackoStein via PC World Online

Hidden Costs

Items such as November's "ALR's Bargain Pentium PCs" [*Top of the News*] are misleading. The table of contents entry reads, "With base prices starting at \$2500..." After reading the actual item, I see that the \$2500 price leaves out hard drive, monitor, and a

few other key features. The ALR Evolution V Model 170DWN with the "more realistic" price tag of \$3893 is certainly not the outstanding bargain you state it is.

Few would really want a Pentium with a 170MB hard drive—most offered in your magazine have at least 400MB. Gateway and Ambra ads in the same issue offer genuine values at most attractive prices.

In light of the true deals available, why did you choose to favorably highlight an unrealistic and misleading come-on price? I understand why vendors present their offerings in such distorted light, but for *PC World* to parrot them is unfair to readers.

Peter J. Wilson, Scarsdale, New York

Features Worth Paying For

I'm a longtime Excel user, and I use Quattro Pro for Windows at my new job. Excel retails these days for around \$495, Quattro for around \$100. After using both programs, it's apparent to me that in this case, you *do* get what you pay for.

I could go on for pages about why I like Excel so much better than Quattro Pro for

Windows. But if I had to narrow it down to three features, I'd say that the auto-save, word wrap, and outliner are what make me prefer Excel.

I'm against rampant "featuritis" in software as much as the next person, but functions such as auto-save and outliners save users monumental time and effort. They are well worth the disk space. I find it hard to believe that Quattro left them out.

Howard Wexler via CompuServe

Corrections and Clarifications

January's *New Products* incorrectly stated that Microsoft's Windows Sound System can read back letters with its ProofReader software. ProofReader has a limited financial and numerical vocabulary suitable for reading back spreadsheets but not letters. In addition, we stated that the original Windows Sound System included an 8-bit sound board; the board was actually a 16-bit product. *PC World* regrets the errors.

PC World welcomes your responses and ideas (see page 12 for contact information). ■

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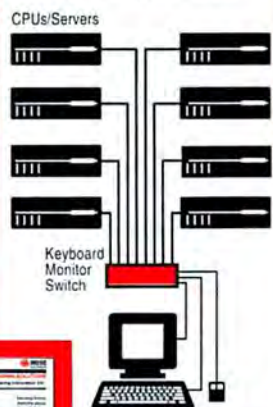
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Flat Square Screen		•	•
On-Screen Programming			•
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F760iW	21"	0.28mm	H: 50.75kHz V: 53.90Hz	1280x1024
F680iW	17"	0.28mm	H: 33.25kHz V: 55.90Hz	1280x1024
F550iW	17"	0.28mm	H: 27.6kHz V: 53.90Hz	1024x768
F340iW	15"	0.28mm	H: 27.6kHz V: 53.90Hz	1024x768

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Circle 194 on reader service card

Long Distance: The Next Best Thing to Being There?



If you purchased a computer in the last year, chances are it came with a minimum of one year of on-site service. Service contracts have become a standard offering

with new PCs and provide added security for buyers—particularly if you're not buying from a local store with its own service department. But judging from early results of our monthly Service and Support Monitor survey, not many PC owners benefit from the rapid-response, on-site service touted by so many PC companies.

Of the roughly 3600 survey respondents who reported having a problem of some type with their desktop computer (ranging from configuration snafus to faulty components), half said their problem was resolved over the phone; 17 percent received on-site service; 14 percent took their system back to the store they bought it from for repairs; 12 percent were shipped a new component to swap for the faulty one; 5 percent returned their computer; and 2 percent received a replacement unit.

At one level, the reliance on phone support is a good sign. It means that many of the problems reported by readers were likely caused by software conflicts, faulty device drivers, or other configuration problems rather than a hardware failure.

But don't let the statistics fool you into thinking that problems were resolved quickly. The type of service provided—and the speed with which it is performed—varies considerably from one PC maker to the next.

One of the most surprising results was the frequency with which some companies utilized component swaps rather than on-site replacement. Many compa-

nies that sell exclusively by mail—and for which on-site service is a particularly strong selling point—were not likely to dispatch a repair technician. Some examples: Only 1 percent of all Northgate customers responding to our survey said they used on-site service; 2 percent of the Gateway and Insight customers reported an on-site repair; 5 percent of Zcos owners said they used the service. Dell Computer, the oldest player in the mail-order market (now a retailer as well), dispatched on-site repair technicians much more frequently—27 percent of the time, according to survey respondents. (See "Help for Ailing PCs" for a breakdown by company on how respondents' PCs get repaired.)

Surprisingly, many of the more established players—which came late to the on-site, around-the-clock level of PC service pioneered by mail-order firms—are quicker to use the on-site option, according to the customers responding to our survey. IBM sent out its famous field service engineers to 41 percent of our respondents; 38 percent of the Compaq customers who filled out the survey reported using on-site service; and 23 percent of NEC customers and 18 percent of AST customers said a

repair technician had come to their home or office to repair their computer.

Ultimately, the test of any type of support is how satisfied customers are after the repair has been made. On the whole, respondents rated the quality of service provided by PC companies 3.4 out of 5.0. That's just slightly better than "satisfactory." Scores for individual companies vary considerably, ranging from Northgate's high of 4.3 (though it rarely used on-site service) to low 2.8 scores for Leading Edge, Packard Bell, and Tandy—all companies with a strong retail presence. Customers from the three companies also frequently reported that their hardware problems were never resolved, as did Insight and DTK customers (see "Still Waiting for Satisfaction").

Know Your Options

Clearly, preferences can vary considerably from one person to the next. Some users prefer to troubleshoot problems over the phone, then swap parts themselves (or with the help of a friend) rather than hassle with scheduling an on-site repair. Others would never dream of opening their computer and would just as soon skip lunch to meet the repairperson than spend hours on

In-warranty repairs may be costly for owners of PC Brand, Tandon, and Positive Computers. Inventory for the defunct companies was purchased by K&M Factory Outlet Store in Simi Valley, California (805/522-6844). Owners of these brands can call the company for notebook and desktop repairs. K&M is not obligated

to honor warranties, however, so even if your computer is still under warranty, you'll have to pay for the repairs...Purchasers of the "Headstart Edition" of Meca Software's

KEEPING UP



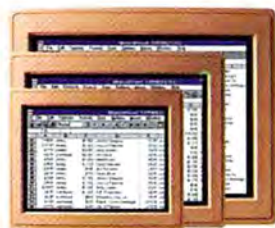
Andrew Tobias' TaxCut may be eligible for a refund. In a settlement with the Massachusetts Office of the Attorney General, Meca agreed to pay \$17,500 in penalties for "misleading representations" that led customers to believe the product could be used to file and print 1993 returns. (Only the "Final Edition" can.)

Registered owners should have received notice of the refund. Other customers have until May 15 to request a refund from the attorney general's office (617/727-8400).

By Roberta Furger

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CONSUMER WATCH

Help for Ailing PCs

Company	Number of responses	HOW PROBLEM WAS RESOLVED						
		Phone support	On-site repair	In-store repair	Component swap	System swap	Factory return	
AST	114	52%	18%	20%	3%	1%	5%	
Compaq	180	43%	38%	8%	7%	2%	1%	
CompuAdd	71	45%	19%	17%	6%	4%	6%	
Compudyne	78	34%	7%	44%	7%	3%	1%	
Dell	248	54%	27%	0%	16%	1%	1%	
DTK	80	34%	24%	24%	11%	1%	2%	
Gateway	761	70%	2%	0%	21%	1%	3%	
IBM	301	39%	41%	9%	5%	2%	1%	
Insight	55	71%	2%	2%	14%	2%	7%	
Leading Edge	81	41%	17%	32%	1%	1%	4%	
NEC	68	42%	23%	15%	10%	3%	5%	
Northgate	71	69%	1%	5%	18%	1%	3%	
Packard Bell	294	66%	14%	8%	3%	3%	3%	
Tandy	57	45%	8%	35%	2%	0%	8%	
Zeos	172	68%	5%	0%	16%	1%	7%	

Percentages for all categories for each company may not total 100 due to rounding. Results based on monthly PC World Service and Support Monitor responses.

The majority of PC owners responding to our survey were able to resolve their hardware problems by talking to a tech support person. Use of other service options, such as on-site service or component swaps, varies considerably among the companies whose services were represented in our survey.

the phone with a support technician.

Where do you fall between these two extremes? Answer that question before you buy your next PC. If you know a lot about computers—or are a quick study and willing to learn—on-site service may not be too high on your list. If you're among those who prefer to have someone else handle your repairs, ask about on-site service and under what conditions you can use it. If you're buying locally, find out what the average turnaround is on repairs and whether all systems need to be sent to a central location to get fixed.

In either case, you're going to have to rely on tech support for help, so find out the hours of operation and check into the responsiveness and expertise of the techs. Online forums are an excellent source of information from other PC users, and *PC World* reviews list the full array of support options offered by PC manufacturers. The ultimate test, though, is to pick up the phone and call the companies from whom you're considering buying. If you aren't happy with the service before you buy your

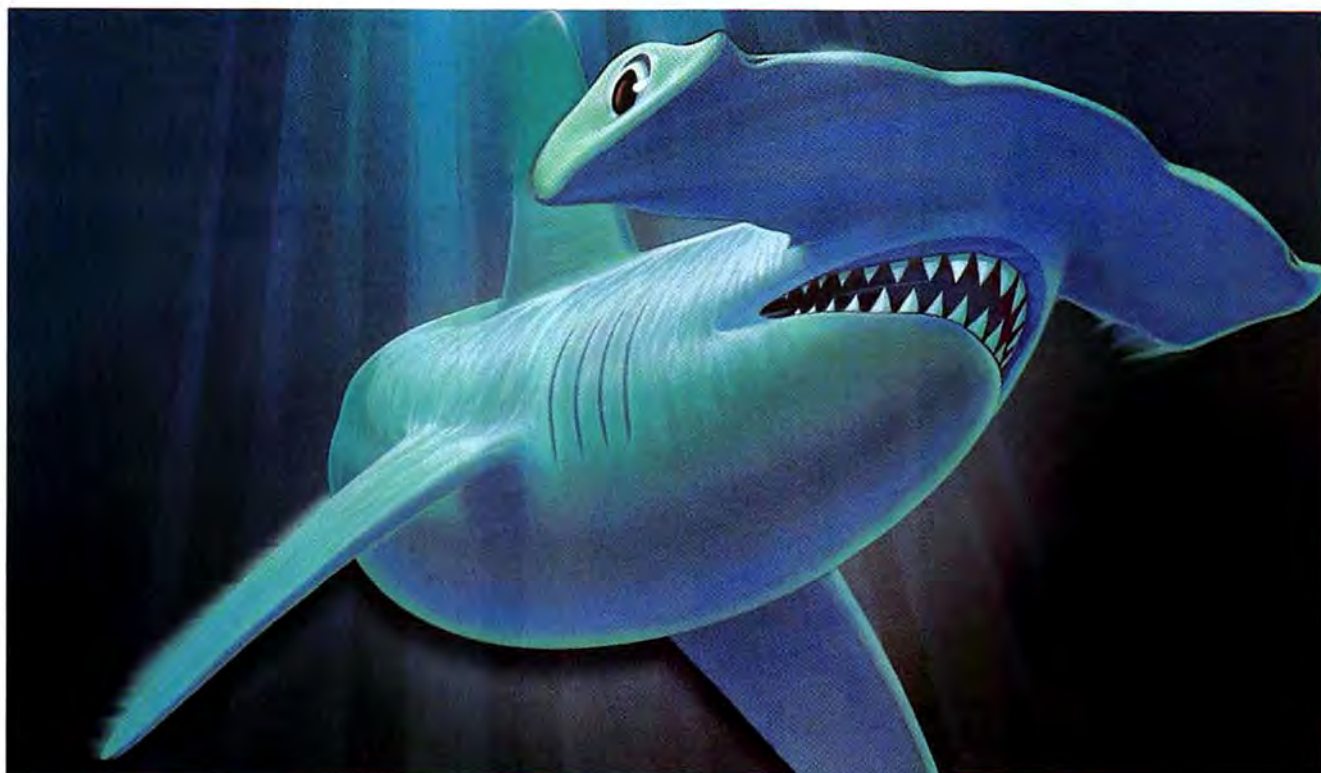
PC, don't expect anything better after—when your PC's out of commission and you're desperate for help.

Cast Your Ballot

PC World uses the monthly Service and Support Monitor to collect information on the reliability and service of dozens of PC companies. We will use the information in product reviews and report on it regularly in *Consumer Watch*. Make your experience count. Turn to page 150 and fill out this month's survey. Then watch for a special report in our June issue.

A Word About the Numbers

PC World's monthly Service and Support Monitor is not a random-sample survey so the results are not statistically projectable to a larger base of *PC World* readers or to PC owners in general. With more than 14,000 responses received to date, however, the survey comprises a very large sample of service and support experiences among personal computer owners and provides valuable insight into relative differences in the service



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Still Waiting for Satisfaction

Company	Satisfaction with service ¹	Problem never resolved
AST	3.4	13%
Compaq	3.5	16%
CompuAdd	3.6	7%
Compudyne	3.6	1%
Dell	3.9	7%
DTK	3.4	24%
Gateway	3.5	13%
IBM	3.6	14%
Insight	3.0	28%
Leading Edge	2.8	23%
NEC	3.7	17%
Northgate	4.3	7%
Packard Bell	2.8	25%
Tandy	2.8	29%
Zeos	3.7	12%

¹ On a scale of 1 to 5, where 5 is best.

Customer satisfaction with service from vendors varies considerably among the companies that were represented in our survey.

provided by various PC manufacturers.

To minimize the potential for reporting bias (such as having only owners who've had a problem fill out the questionnaire), we offer a monthly prize, which all respondents are eligible to win. We also encourage respondents to send in the survey even if their computer has been problem-free. Finally, we limit our reporting to companies about whom we have received at least 50 responses, to minimize the margin for error on any one company's scores.

Shop Talk

Time Slips Away From Upgrade

I purchased the DOS version of Timeslips Personal Plus time and billing software for \$106 in September. I was told that the Windows version wouldn't be available till late December or early January 1994. Shortly afterward, I read a favorable review of the Windows version in a publication, so I called about getting an upgrade from DOS to Windows. That's when my nightmare began. I was shocked to find that the up-



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- HDD 40 MB/80 MB/120 MB
- VGA 512K Super VGA on board
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- Dimension 315 x 225 x 70mm

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Standard configurations

- CPU i386DX-33/i486SX-25/
i486DX-33
- Math Processor Socket ready
- Memory 1 / 4 / 16 MB (expandable)
- Cache 32K/128K
- FDD 1 x 3.5", 1.44 MB
- HDD 40 MB/80 MB/100 MB
- VGA On board
- Display Unit CRT monitor
- Expansion Slot 2 x 16-bit ISA
- Dimension 315 x 225 x 70mm



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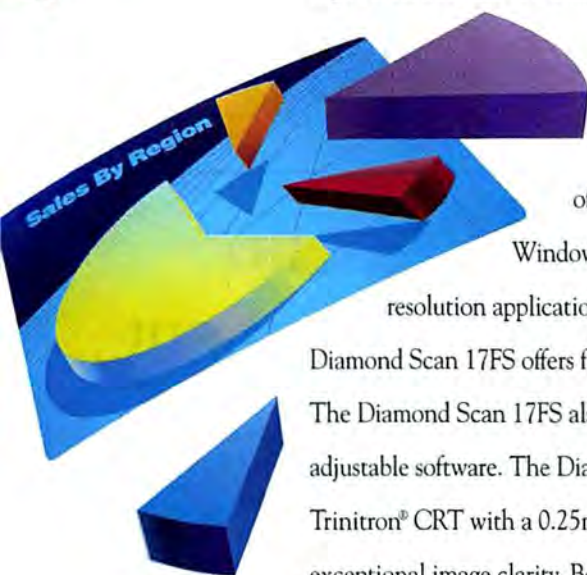
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Circle 188 on reader service card

grade from DOS to Windows wouldn't be available until January 1994, even though the Windows version for new users was being shipped in October. Why are upgraders being discriminated against?

Dwayne K. Dowell, Louisville, Kentucky

Editor's note: Mitchell Russo, Timeslips Corporation's president, told us the company released the Windows version for new users before the upgrade version because the upgrade wasn't ready for prime time. There were still bugs in the function that imports records from the DOS version. Russo felt confident that the program was ready for new users who didn't have large databases to import from the old DOS version, but he wanted to be sure there were no bugs in the upgrade before it was released. According to Russo, "We were able to learn from our peers in the industry that releasing buggy software to your installed base to get the money early is not worth it."

Given the recent epidemic of buggy software being released to consumers, Russo's course was probably the wise one.

BUG WATCH



Microsoft says that a February maintenance release will address disk and memory problems users have encountered when using OLE 2.0 objects in Word files. Users have reported that when working with OLE objects, documents occasionally become corrupted or the object disappears into a 1-inch box (Microsoft acknowledges the latter problem but says it has not seen any instance of the first). The maintenance release will also resolve difficulties some users have converting Word for Windows 2.0 macros to 6.0, general protection faults that may occur when accessing the

Word for Windows 6.0

Microsoft says that a February maintenance release will address disk and memory problems users have encountered

equation editor, and screen-to-printer kerning discrepancies.

Microsoft Customer Service
206/882-8080

Lotus Notes 3.0B

Lotus Development has issued a maintenance release to Notes 3.0 to improve the interoperability of Notes 2.0 and 3.0. Call the Lotus sales department.

Lotus Development Corp.
800/346-1305

—Sarah Klein

Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those with the broadest interest.

Sarah Klein is an editorial intern for PC World.

Bungled Back-Order

I responded to a series of phone calls from MathSoft of Cambridge, Massachusetts, by ordering some software for \$254.94. The

young man I spoke to when I placed my order assured me that he would ship the software immediately. I charged the cost to my personal credit card because I was

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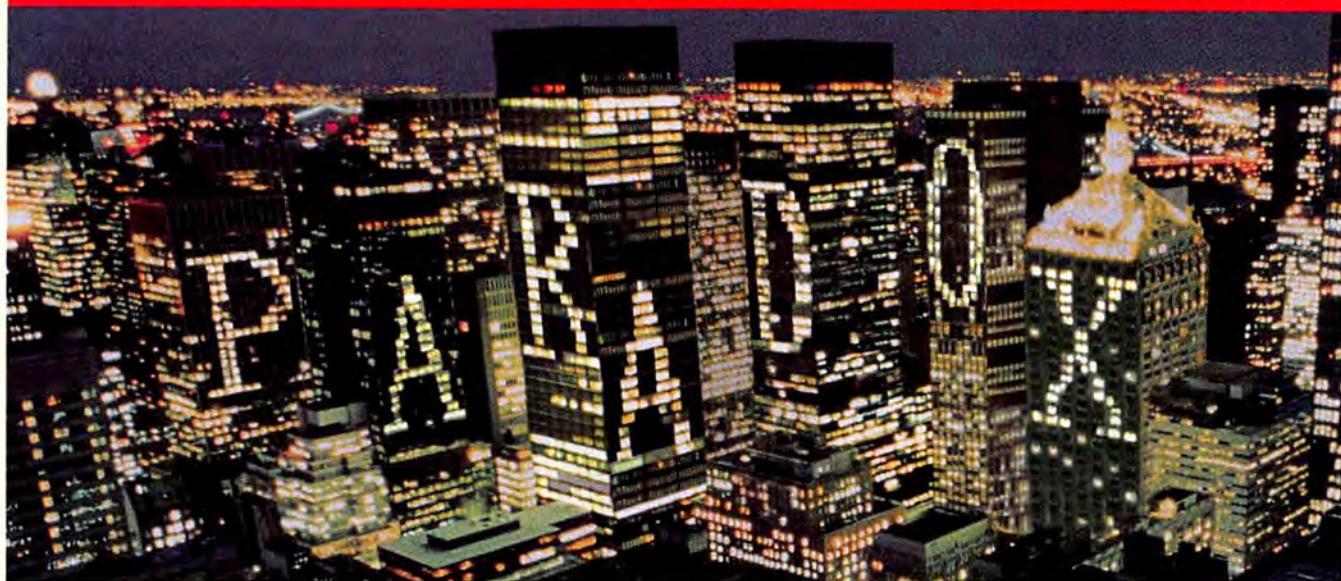
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Circle 63 on reader service card

confident that my employer would reimburse me.

The software, however, didn't arrive until early June—about six weeks later. By that time, I couldn't get reimbursement for the purchase because I work for an educational institution that closes during the summer months. No one informed me the software was back-ordered. It arrived out of the blue and—of course—so did the charge on my credit card statement.

I immediately returned the software, and my wife called MathSoft to request that the charge be removed from my credit card. She reported that the MathSoft people were rude, arrogant, and insulting. I then wrote a letter to MathSoft's main office, and the firm's response was to remove just \$49.99 from my credit card.

David Baughman, Yuma, Arizona

Editor's note: Julie Sall, vice president of marketing for MathSoft, apologized for the "inconvenience, frustration, and unprofessional behavior" the Baughmans experienced. She also issued them a refund and some free software. "MathSoft strives for

good customer service, and we sincerely believe that the Baughmans' experience doesn't reflect our normal service levels," Sall assured us. However, to ensure this doesn't happen to anyone else, MathSoft tightened inventory planning, implemented a postcard notification system for back-ordered products (this will soon be required by law; see "News Monitor" in December's *Top of the News*), and retrained customer service representatives to be more sensitive to customer concerns.

Backup Destroys Family

I purchased a genealogy program called Reunion from Leister Productions in Mechanicsburg, Pennsylvania. I spent several months entering the names of more than 700 of my relatives, as well as important statistics. I even printed a number of charts and sent them to my relatives. The charts were impressive, and I was pleased with the program.

One Monday morning—when I wasn't too alert—I attempted to back up my genealogy before leaving for work. I messed

up the backup and ruined my files in the process. After trying unsuccessfully to restore them, I called Leister Productions. To my surprise, the phone rang only twice before I was talking to someone very interested in my problem. He said he would talk to the programmer and see if anything could be done. Within two hours, I got a telephone call requesting that I send them the ruined files. Two weeks later, I had the files back and most of the data was recovered. The only information lost was the wedding dates and some notes. All 716 people were there.

I thought you might like to know there are still software developers interested in their customers.

David Lindeman, Fort Wright, Kentucky

Shop Talk is researched and written by PC World Assistant Editor Christina Wood. Think you've gotten a raw deal—or a great one? Consumer Watch wants to hear the details. We'll investigate complaints and publish letters with the broadest interest (see page 12 for contact information). ■

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Circle 152 on reader service card



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Circle 240 on reader service card

The High Cost of Keyboard Injuries

Is working at a computer a high-risk task? Absolutely. Computer users are at risk for repetitive-strain injury (RSI), a cumulative condition that causes everything from persistent aches in arms and hands to crippling, career-ending pain. Every year thousands of people must leave work because of repetitive-strain injuries. Many others suffer in silence (see "Danger at Your Fingertips," May 1993). And the cost to companies, in both lost productivity and workers' compensation claims, is enormous.

This month Ellen Ignatius, manager of health and safety at Blue Cross of California's human resources department, describes the aggressive steps her company took to combat RSI. Although the battle isn't over, Blue Cross's ongoing preventive measures have turned the tide—and earned the company an unprecedented million-dollar insurance dividend two years in a row. —Ed.

The Plague

Work environments tend to look and function alike: In nearly every company, regardless of size, you see the same gray cubicles, simulated-wood desks, desktop computers, and chairs. This uniformity is actually a health hazard because the people who occupy these identical workstations aren't all the same size and shape. A small person who works 40 hours a week at a desk that's too high is slowly damaging her arms or hands. A tall person who spends all day looking down at a computer screen can eventually hurt his neck or back.

In 1990 most of the 3500 employees at Blue Cross of California sat at the same-size workstations and used a desktop computer or a terminal or both. Throughout the company, graphic designers, secretaries, programmers, data entry people, insurance underwriters, claims processors, managers, and others complained of pain in the neck, arms, hands, and shoulders. That year 26 peo-

ple were unable to do their jobs due to debilitating pain and filed workers' compensation claims.

These injuries cost the company a staggering \$1.6 million in 1990 alone. To make matters worse, insurance rates were skyrocketing; Blue Cross needed to find a new insurance provider to cover its employees. Because of the unusually high number of workers' compensation cases filed that year, most insurance companies wouldn't even take the time to give us a quote.

A Plan of Attack

Meanwhile, the California Occupational Safety and Health Administration (Cal/OSHA) insisted that Blue Cross develop an injury prevention plan. As a specialist in job-related environmental injuries and a registered nurse, I was hired by Blue Cross to investigate the problem and develop and implement a plan to correct it.

When I started my job, I immediately noticed a general lack of understanding—both among workers and their doctors—about the causes of RSI. People would come into my office and say, "My shoulder is killing me," but they had no idea what was causing the pain. Some of their physicians hadn't identified that their patients were suffering from work-related injuries. Several employees were undergoing expensive treatment or even invasive surgery.

Based on information I found in scientific journals, reports issued by the National Institute for Occupational Safety and Health (NIOSH), and other sources, I determined what kind of health coverage we needed. After much investigation and persuasion, a large insurance company agreed to cover Blue Cross employees—on the condi-

tion that the number of RSI cases be decreased. As part of the agreement, I located medical facilities that could treat such injuries. Rather than turning to a standard occupational clinic, I wanted to locate specialists who could diagnose RSI quickly and help those who suffered from it.

The next challenge was to develop a plan for prevention. Working with an ergonomic specialist, I studied the existing work environments in which most of our employees spent eight hours a day. We conducted an extensive, companywide job analysis to reveal which employees were most at risk for RSI.

The first remedy, we decided, would be to buy adjustable chairs that comply with NIOSH's (800/356-4674) standards, complete with adjustable height, seat pans, arms, backs, and stable, five-point bases. Next, we went shopping for adjustable workstations. It's important to be able to raise or lower the height of the desktop, as well as adjust the drawers, lights, and keyboard tray.



Ellen Ignatius is manager of health and safety at Blue Cross of California.



Delmer was confident he would be released immediately.

(Delmer was surprised to learn there were so many "bad" monitors on the streets.)

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Changing Habits

Once we purchased the new equipment, we taught people how to use it. I put together a training program that allowed both management and employees to identify RSI symptoms early.

This area posed a significant challenge. A few managers were suspicious that employees would learn about RSI and "fake it" in order to take a company-paid leave of absence. Knowing their managers' attitudes, many employees who suffered from RSI had been reluctant to come forward.

But I've learned from working with companies where there's a high risk for injury that honesty is the best policy. When employees know the risks and what is being done to protect them, they follow the rules, and conditions ultimately improve.

In our training classes for managers, we explained that RSI was a very real injury that cost our company enormous sums. We described its symptoms and told them where to direct people who complained of pain. We also showed them how to set up a workstation properly. We showed all the workers proper ways to sit and work, how to do regular exercises, and how often to take stretch breaks.

A Big Payoff

Within a year the ergonomic consciousness of the entire company had changed. While setting up the program, we founded an official ergonomic committee assigned to keep up with the latest ergonomic designs, assess new equipment, and offer a set of standards to our facilities department. We carefully documented everything we did for our insurance carrier and Cal/OSHA.

Our ability to prove the thoroughness and efficacy of our program paid off in spades. The number of injuries dropped so much that in 1992 we received a \$1 million insurance dividend and in 1993 another million. If the rate of RSI continues to drop, we expect to receive another dividend of \$1 million for 1994. And Cal/OSHA now uses the standard we developed.

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. If you use PCs to manage people and other resources in a business environment, we want to hear from you (see page 12 for contact information).

The Apple Report On PowerPC

NUMBER 2 — RISC PERFORMANCE AND CROSS-PLATFORM COMPATIBILITY

Many of the most popular applications have been or are being optimized to take advantage of the high-performance PowerPC processor.

PowerPC chips are faster and less expensive than Pentium chips — so are the personal computers they will run.

A complete Macintosh system with PowerPC will cost well under \$2,500, but will offer better performance than higher-priced Pentium-based systems.

With SoftWindows, Macintosh with PowerPC will have the ability to run DOS and Windows applications, unmodified.

For more information about Macintosh with PowerPC, call 1-800-732-3131, ext. 150, in the U.S. We'll send you a copy of our informative, free booklet, *PowerPC Technology: The Power Behind the Next Generation of Macintosh Systems*. In Canada, call 1-800-665-2775, ext. 910.

In the first half of 1994, Apple will introduce a new family of computers that already has the entire computer industry standing on end.

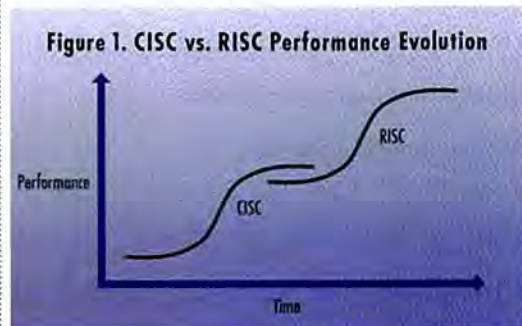
They will offer better performance than computers based on the X86 microprocessors. They will be extremely competitive on a price basis. And they will be compatible with Windows and DOS applications, by using SoftWindows software.

They will be based on the revolutionary new PowerPC™ microprocessor, created jointly by Apple, IBM and Motorola.

For the first time, desktop personal computers will take advantage of RISC chip architecture previously found only in high-performance workstations. This advance will make possible quantum improvements in the way we manage and work with information.

RISC vs. CISC.

Tremendous advances have been made in CISC architecture over the years. However, the physical limitations of the new, high-performance CISC design mean that CISC chips must be significantly bigger and more complex, and must run at hotter temperatures to perform the same tasks as comparable RISC chips. Consequently, the newer



generation of CISC chips, like the Pentium, are much more expensive to manufacture. Which means that personal computers powered by PowerPC chips can offer a significant advantage in price as well as in performance.

As you can see on the chart, RISC microprocessors offer dramatically greater potential for growth, leading us well into the next century and increasing the practicality of features like voice recognition, videoconferencing, object-oriented software and multimedia capabilities — functions that will be integral to doing business in the 21st century.



More compatible personal computers.

Apple's new generation of Macintosh® personal computers built around the PowerPC chip offer the ability to run MS-DOS and Windows applications, as well as Macintosh software. Moving from one environment to the next will be seamless and, even more importantly, it will be effortless.

PC users who move to Macintosh with PowerPC will gain access to the large number of new applications which take advantage of the incredible performance of the new PowerPC chip.

Higher-performance optimized applications.

When PowerPC microprocessor-equipped Macintosh computers begin shipping, software developers including Microsoft, WordPerfect, Adobe, Aldus and Claris will begin shipping new versions of their most popular software, specifically rewritten to take full advantage of the new processor's capabilities.

These optimized, sometimes called "native," applications will offer significantly faster performance than their MS-DOS, Windows or current Macintosh counterparts.

Unprecedented value.

Because RISC-based personal computers cost less to manufacture than equivalent systems based on CISC chips, we will be able to make this technology available for well under \$2,500 for a complete mainstream desktop system*. Competitive with a lower-performance, Pentium-based PC.* Watch for Apple Report #3, coming soon.



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Your PC Is Ringing and Your Phone Has E-Mail



Do you remember the TeleCompaq? The Tele-what, you say? I just wish my current PC were integrated with a telephone as nicely as Compaq managed

the combination nearly a decade ago.

The 1985 TeleCompaq never came close to catching on. As an XT-class machine with a built-in modem, a two-line telephone with speed-dial buttons (on the computer!), a dialing directory, and TeleCompaq-to-TeleCompaq dial-up E-mail, the machine was fine. But technology was moving too fast in other directions, and connecting the machines to office telephone systems proved nearly impossible. In the end, the TeleCompaq was a wrong number.

Still, just about everyone would like to have their telephones and computers working more closely together. It's simply a matter of how and how much.

We want our desktop machines to dial our telephones—even through the corporate PBX. We'd like to have our PCs dial using the office phone directory, the entries in our personal information managers, and even corporate databases. Our voice mail should be accessible from the PC and our E-mail from the telephone. Faxes should appear magically on our desktop. All this should, of course, be tightly integrated with our mobile and portable systems.

For most PC users, this communications cornucopia won't happen today, tomorrow, or even in the next few years. While we may be accustomed to trading in our PCs every couple of years, the average lifetime of an office phone system is seven to nine years—or about as long as most of your co-workers have been aware that MS-DOS exists.

So even if real standards existed today

and we had the hardware and software to implement them, it would take quite a while for office telephones and computers to merge neatly into one, especially when LANs are involved.

TAPI on Your Windows

But it is going to happen. And if you have huge lungs, you could even hold your breath waiting. I am that sure. And so is Microsoft, which thinks enough of the idea that a Telephone Applications Programming Interface (TAPI) is a big part of its Microsoft At Work efforts. AT&T and Novell are working on this too, as are many of the telephone PBX and hardware vendors—along with some major PC hardware companies, I'm told. Among software developers, all the PIM vendors are buying in, especially Jensen-Jones, which has developed a Windows package called Commence. WordPerfect, meanwhile, has taken the first step by phone-enabling its Office 4.0 mail and scheduling package. It's really quite slick.

Other details are up in the air, however, because the alliances and standards are still being ironed out. If all goes well, several companies that aren't

ready to announce anything as I write this column will do something publicly over the next month or so. In short, some of our prayers for improved PC-to-phone connections are being answered, but this is probably a very bad time to buy a new PBX.

So sit on your checkbook and watch how everything unfolds—unless, of course, you prefer being on the bleeding edge of new standards. Here's my best take right now: If you have a small business, you can probably buy in right away, especially if AT&T's small-business PBXs meet your needs. Other vendors should follow quickly, and a short lease might be just the insurance you'd need for future upgradability. Big businesses, because their telecommunications needs are more complex, should give all the issues greater thought—especially LAN connectivity. Home-office users, meanwhile, will start benefiting as soon as TAPI applications and devices hit the market.

Contributing Editor David Coursey edits P.C. Letter. He can be reached on PC World Online (see page 12 for contact information).

As long as we're talking about connecting telephones and computers, here's another trend that bears watching: **Desktop conferencing across LANs and phone lines.** About a dozen vendors are entering the market, all trying to ring up profits by en-

abling users to see one another (despite jerky video), share electronic white-boards (despite small screens and the hurdle of making annotations easy to understand), and control one another's computers (despite no shortage of products that do this already). Prices range from hundreds to

LOOKING AHEAD



thousands of dollars. **This technology is not ready for prime time** in the under-\$1000 range, no matter how big the vendor's name may be. But give the category 18 to 24 months, and maybe desktop conference software will be on the way to be-

coming a mainstream application. **The new pornography:** Interactive PC games, using video images of real people, that let the user decide whether the characters—typically screaming for help—live or die. In fact, the user can kill them just for grins. Is this really something we want our kids to play with?

By David Coursey

FOUR MILLION PEOPLE MAKE THAT FOUR



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running around.

Lotus cc:Mail, recently rated
the #1 e-mail system by *Infoworld*[†]
and *Software Digest*^{††} offers
benefits no other e-mail can
match. Like a unique, rules-
based architecture which

lets you automatically
manage, filter, even
reroute your mail. And Lotus
Organizer™ 1.1, the top-rated
personal information
manager, is integrated

into cc:Mail Group Pack so you
can schedule meetings quickly
and easily. Just enter a suggested
time for a meeting
and Organizer
will consult
your co-
workers'
schedules



BILL IN PRODUCTION USES
cc:MAIL TO COMMUNICATE
WITH HIS OUTSIDE
SUPPLIERS.

and tell you whether they're
available. And it does this
without revealing personal
schedules. Plus, cc:Mail has a
built-in spell checker, flexible

search options, an intuitive
user interface and dozens
of features that make it
easy to use.



SALLY, THE DESIGNER, HAS
CUSTOMIZED HER MAILBOX
TO PRIORITIZE HER INCOMING
MAIL AUTOMATICALLY.

CURRENTLY USE cc:MAIL. MILLION AND TEN.

In fact, cc:Mail Group Pack is so
easy to install, use and maintain

that you don't need

a dedicated LAN

manager. And

cc:Mail works

across virtually

all major hardware platforms,

networks and operating systems.

So it's easy to see why publi-

cations like *BYTE*, *LAN Magazine*

and *Windows Magazine* have

showered cc:Mail with awards.

And why 4.2 million people

in all kinds of compa-

nies depend on cc:Mail

every day.

This standard is now



TED IS THE PRESIDENT OF A SMALL FURNITURE COMPANY. HE PURCHASED THE cc:MAIL GROUP PACK TO MAKE HIS COMPANY MORE COMPETITIVE.

available for businesses, or work-
groups, like yours. For about

half of what these

products would

cost separately,

you get a cc:Mail

Group Pack

which includes: cc:Mail for

Windows 2.0, cc:Mail for DOS,

Organizer 1:1 and licenses

for 10 users. All for just

\$845 (SRP). (To add more

users or to purchase additional

copies of cc:Mail and/or Organizer

see your Local Authorized

Reseller.) At this price,

it is not a question of

whether or not your

company

needs

e-mail.

The question

is: how quickly

can you get Lotus cc:Mail

Group Pack.

Fortunately, it is available

right now. Just visit your Lotus

Authorized Reseller or call

1-800-448-2500.



JIM, THE SUPPORT/ DELIVERY GUY, USES ORGANIZER TO PLAN HIS DAY.



RHONDA IN SALES RECEIVES ORDERS FROM HER REGULAR CUSTOMERS VIA cc:MAIL.



SYLVIA IN ACCOUNTING LIKES EVERYTHING ABOUT cc:MAIL.



JEFF, THE ART DIRECTOR, IS NO COMPUTER GENIUS. BUT HE GOT UP AND RUNNING ON cc:MAIL WITH NO TRAINING.

Lotus
Working Together™

BUILDING THE FUTURE

DOS as we knew it is finally replaced by a 32-bit operating system that puts an end to installation nightmares and offers preemptive multitasking.

The Windows of tomorrow exists today as a series of components—technology building blocks—waiting to be assembled. Which blocks are used and how they fit together will determine the final product that today is known only as the Chicago Project.

“Chicago is not a product,” declares Windows product manager Jeff Thiel. “It’s a set of technologies, and we haven’t even decided how we’re going to put them together into products for customers.”

But a look at Microsoft’s initial efforts at assembling these technologies reveals a Macintosh- and OS/2-like interface. Will the next version of Windows, due in the second half of the year, look or act anything like these pre-beta releases? Microsoft officials say it’s too soon to tell.

“We’re not interested in squelching info—we just don’t want to confuse our customers,” says Brad Chase, general manager of Microsoft’s Personal Systems Group, who oversees the hundreds of people working on the project. The team occupies all of Building 5, a two-story structure in the older section of Microsoft’s campuslike headquarters in Redmond, Washington. According to Chase, the preliminary Chicago Project versions are test releases—trial balloons that contain some fairly solid under-

JEFF BERLIN

Edited by Russell Glitman

OF WINDOWS

lying technology and a user interface that's as changeable as the weather.

Nevertheless, Chase and Thiel have plenty to say about the project's foundation technologies: a 32-bit preemptive multitasking operating system kernel; almost complete support for the Win32 application programming interface; a simpler, more consistent interface for programs, files, and other system resources; improved networking and communications; and support for Plug and Play hardware. Whatever the specific interface turns out to be, these core features add up to a compelling Windows upgrade for power users and novices alike that offers better performance, more reliable multitasking, and streamlined hardware setup, system configuration, and networking.

More Than Just Window Dressing

Plug and Play tops Thiel's list of Chicago's revolutionary technologies, and it's destined to make computing dramatically easier. In fact, Brad Silverberg, vice president of Microsoft's personal systems group, has instructed his staff to think of the product as being developed for his mother, who is intimidated by PCs. Devised by a consortium of PC industry vendors, including Microsoft, Intel, Compaq, Phoenix Technologies, and Adaptec, Plug and Play architecture will end hardware installation and configuration nightmares. Currently, installing network, SCSI, audio, and other adapters means reconciling DMA-channel and IRQ conflicts through a frustrating process of trial and error. The combination

of a Plug and Play-compliant PC, peripherals, BIOS, and operating system could make such installations as easy as changing a light bulb—or adding a peripheral to a Mac. Thiel says Plug and Play is being extended to a wide range of buses and device interfaces, including Micro Channel, PCI, VL-bus, SCSI, and even infrared links.

Plug and Play's broad scope implies even more dramatic benefits, particularly for mobile-computer users, according to Thiel. One of the key features of Plug and Play is

dynamic configuration, which will allow you to connect or remove peripherals such as PCMCIA cards and docking stations without powering down or rebooting the system. The operating system will also sense the change in the hardware configuration, load or unload the appropriate drivers, adjust video display resolution, and moderate among the PC, operating system, applications, and user. Ultimately, mobile Plug and Play computers will be able to sense the presence of wireless peripherals and networks and reconfigure themselves on the fly. For example, a user who walks into a conference equipped with an infrared-interface printer might see the printer appear automatically as a Windows icon on screen.

In addition to making PC hardware easier to live with, Chicago portends a simpler Windows interface. Although Thiel won't say what specific tools will appear in a shipping product, he says the current File, Program, and Print Managers, along with the Control Panel, will be combined into a

Preliminary Chicago Project versions are test releases that contain some solid technology and an interface as changeable as the weather.



News Monitor

FREE SUPPORT ENDANGERED: Toll-free, unlimited tech support has long been a sacred cow at WordPerfect, but it has become too expensive to keep. WordPerfect users have until July 1 to register for support and will receive 180 days of free support (starting from the first support call) for business apps such as WordPerfect 6.0 for Windows. You'll get 90 days for work-group apps. After that, WordPerfect will provide support for \$25 per incident or \$2 per minute. The company will maintain free fax-back, bulletin board, and online services. During your period of free support, you can bypass the tech queue and get immediate service by paying the same rate, or \$150 per incident for work groups. A Premium Service program (with different plans for small, medium, and large businesses) will offer priority access, assigned technicians, and other bonuses. Annual premium service contracts range from \$2500 to \$15,000.

WordPerfect's new CEO, Ad Rietveld, is focusing on improving productivity, because rivals Lotus and Microsoft have more revenue per employee than WordPerfect, says software analyst Jeffrey Tarter. "Support is costing them too much," he says. While some users will be upset at the support changes, WordPerfect certainly won't be alone in the doghouse: Many software vendors offer only 90 days of free support.

Meanwhile, an interim release of WordPerfect for Windows, 6.0a, is due in March. It should be faster than the original, includes numerous bug fixes,

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unified resource manager. The inclusion of OLE 2.0 and its systemwide support for drag-and-drop actions suggests that many tasks that currently require users to select menu commands or type text into dialog boxes will become click-and-drag affairs. And like Windows NT, OS/2, and the Macintosh operating system, Chicago will support long, descriptive file names.

Thiel also promises innovations that will make multitasking easier to deal with: "We've witnessed typical Windows users as well as new computer users grappling with that in usability testing and have worked out some designs that will simplify things," he claims. More than that, Thiel won't say.

Solid, But Not Far Out

While all these innovations make it easier for you and your PC to interact with new hardware, Chicago's 32-bit operating system core makes running apps easier, faster, and more reliable. Like Windows NT, the operating system kernel obviates a separate DOS operating system. It marks the end of hand-editing and tweaking configuration files like CONFIG.SYS and AUTOEXEC-

.BAT, then rebooting, to modify system setup. The new operating system replaces DOS's segmented-memory design with protected-mode processing that explodes the 640K limit, boosts the performance of applications, and simplifies software development. Unlike NT, Chicago's underlying operating system should run any existing DOS or Windows device driver or application, with the exception of enhancements or replacements to Windows 3.1's moribund Program and File Managers—bad news for utility vendors.

Taking another page from the NT book, Chicago preemptively multitasks applications; this means the operating system, not the application, decides how best to divide processing power. Like NT, Chicago isolates the memory used by one application from that used by others or by the operating



MOTHERS OF INVENTION: Project members and VP Brad Silverberg, front left. He wants a product that won't intimidate his mom.

system. Those two capabilities provide more reliable background processing for sensitive real-time applications like fax, and near-complete protection from poorly written applications and drivers that can crash Windows 3.1. Chicago won't support symmetric multiprocessing or C-2-level security, and it won't be portable to other processor platforms like MIPS or the PowerPC.

There should be no shortage of applica-

A Tale of Three Cities: Chicago isn't the only revolutionary version of Windows that Microsoft has in store for PCs. Upgrades to Windows NT, due both this year and next, will make the workstation and

server operating system sleeker, incorporate interface innovations from Chicago, and add 3-D graphics and other advanced features.

Microsoft has also been busy improving its core desktop versions of Windows, delivering

late last year a significant upgrade to Windows for Workgroups in version 3.11. With 32-bit networking that frees up scarce conventional memory by moving network drivers and protocols into extended memory, the upgrade is a must for Windows for Workgroups 3.1 users. It's also not a bad move for stand-alone Windows users, who can benefit from the environment's 32-bit file access, which bypasses ROM-based system BIOS for dramatically faster file reads and writes. By comparison, the company's similarly titled Windows 3.11, released in January, offers only updated drivers already available through online sources.

A slimmed-down version of Windows, which is dubbed WinPad, is also expected to launch by the middle of 1994. Designed for a new class of handheld systems, the product should make mobile computing easier by means of a rich set of communications and file synchronization facilities.

The Windows Campaign

Microsoft's plans for worldwide desktop domination will shift into high gear over the next 12 months as the company rolls out new versions of Windows.

Product	Delivery	Key Features
Windows 3.11	January 1994	Updated drivers and packaging (not an end-user upgrade)
Chicago Project (Windows 4.0?)	Beta: March 1994 Ships in second half of 1994	32-bit preemptive multitasking; more Mac-like user interface; integrated 32-bit networking; improved communications; support for Plug and Play hardware
Daytona (Windows NT3.x)	Beta: Q1 1994 Ships in mid-1994	Smaller, faster kernel and subsystems; multiple preemptive Win16 sessions; OLE 2.0; 3-D graphics; improvements to Advanced Server
Cairo (Windows NT 4.0?)	Beta: early 1995 Ships in 1995	Superset of Windows NT and Chicago; distributed, object-oriented file system; NextStep-like application building

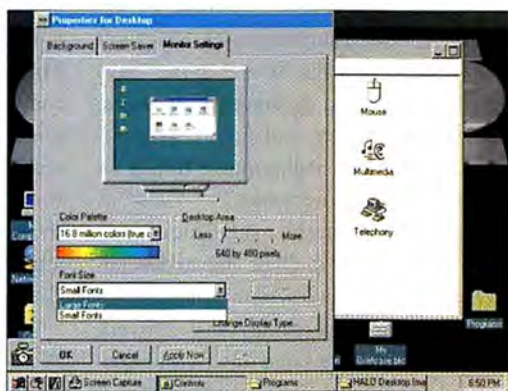
tions for Chicago. Included among the technology building blocks is support for all but a few Win32 APIs, so programmers can write a single 32-bit application that will run under both Chicago and Windows NT. To keep Chicago from developing NT's memory appetite—NT requires at least 12MB—Thiel says developers can stick with 16-bit code for those portions that have little effect on performance, such as the User module, which handles window management, and portions of the Graphics Device Interface. System resource limitations, the bane of current Windows power users, disappear in Chicago, thanks mostly to the use of 32-bit code.

Says Thiel, "Like everything else, 32-bit has some benefits and some costs. What we've done is look through the system and identify areas where applications can benefit most from 32-bit code, and where the biggest problems are with respect to compatibility and size." The result: Chicago requires 4MB and a 386 processor and should run existing Windows applications at

least as fast as a 4MB Windows 3.1 system. Chicago won't run on systems with less memory: "We don't see that as much of a barrier for most people," he adds.

Opening a Window on the Enterprise

The biggest surprise about Chicago's integrated 32-bit networking is not that it per-



NOT THE NEW WINDOWS LOOK. Or maybe it will be. With this feature you can set resolution on the fly.

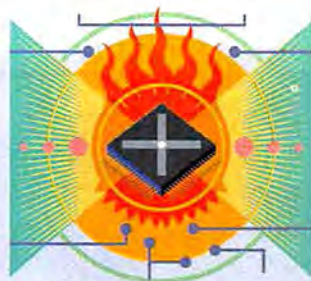
forms faster and more reliably than most DOS-based peer networks, but that it's essentially already available in Windows for Workgroups 3.11, which provides much of

Windows NT users will get an interim upgrade this summer (no version number has been announced, although 3.11 is likely). This upgrade will slim and accelerate NT's core elements and add new workstation and server capabilities. Code-named Daytona, the revision will optimize operating system, networking, and interface elements for better performance in less memory. A Microsoft source says that Daytona might run in 8MB (compared to 12MB for the current version), but the company's principal intention is to improve performance on existing installations rather than attracting new 8MB users.

Like Chicago, Daytona will offer systemwide drag-and-drop functionality and in-place document editing, thanks to OLE 2.0, and multiple separate preemptive 16-bit Windows sessions similar to those currently offered by OS/2 2.1. Today, Windows NT 3.1 offers only one 16-bit Windows-on-Windows

(WOW) session; Windows applications running within the WOW environment multitask cooperatively, making them just as prone to memory errors and slowdowns as they are under Windows. In addition, Daytona will include improved NetWare client software, plus support for 3-D graphics through the included Open GL library, licensed from Silicon Graphics. Windows NT Advanced Server will enjoy new networking tools and a faster print server.

Cairo, a major revision of Windows NT scheduled for release in 1995, will combine Daytona's core technology with Chicago's object-oriented interface and ability to run any 16-bit or 32-bit Windows application. In addition, Cairo will include an object file system and distributed operating system that compete with similar technologies under development by Hewlett-Packard and Sun, as well as application building blocks similar to tools offered by the NextStep OS.



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and adds a QuickCorrect feature that fixes typos and misspellings. The release is free to registered users.

RETURN ON INVESTMENT: Senior executives at Fortune 500 companies now say that investments in information technology (IT) are paying off, according to a recent survey. Consulting firm Nolan, Norton & Company, a wholly owned subsidiary of KPMG Peat Marwick, polled 100 CEOs, CFOs and COOs at Fortune 500 companies for the study, which examined executive attitudes toward IT's business benefits. An overwhelming 65 percent of the executives said they receive most or all the benefits they expect from technology. The top benefits: productivity increases and lower costs. Executives are more satisfied now than in the past for two reasons, says John P. Halloran, managing partner of Nolan, Norton's U.S. operations. They're more educated about the technology, and they have realized it takes time to see improvements, he says. "They're finally seeing improvements at the macro level of the business." The survey also showed that three-quarters of the executives either direct or review IT spending, and one-third say they will need to increase their spending to stay competitive.

INFORMATION HIGHWAY IN THE SKY: Airplanes will soon use on-board LANs to provide services to passengers. Select models of Boeing's new 777 plane will run a type of fiber optic cabling, called fiber data distributed

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Top of the News



JEFF THIEL ENVISIONS the ways in which the PC will make your life more flexible.

Continued from page 57

the protected-mode networking technology used in the Chicago Project. Both systems offer a benefit system administrators are dying for: the ability to run multiple net-

work transports and LAN adapter drivers.

"If you wanted to be able to connect to NetWare servers and NT servers and use TCP/IP, you could have all of these basic popular transports running at the same time," Thiel remarks. What Chicago adds to existing Windows for Workgroups connectivity, he says, is a simplified, object-oriented interface. "If I have multiple servers I'm interested in connecting to, Chicago's user interface lets me browse those," says Thiel. "If I click on the server, it shows me what shares are there, and if there are printers attached. That will improve things for people working on networks."

Even if you're on the road, Chicago will keep you in touch. You'll be able to dial into your desktop Chicago system or a Windows NT server to access files and network resources, or do the same thing via a serial or infrared connection. Once you're linked, a file synchronization utility akin to Lap-Link will ensure that both computers contain the latest versions of data files. File synchronization APIs for applications will support data merging when the original version of the file has also changed in the interim.

Finally, the built-in MAPI (messaging API) 1.0 provides systemwide support for workgroup programs and the ability to send messages from within applications.

Work in Progress

The building blocks that will be used to make Chicago into a product sound—and look—impressive. The company's challenge: With 50 million Windows users Microsoft must balance the need to provide compelling new features with support for a huge and varied installed base. But that's technology. Now comes the artistry of software development. How Microsoft uses these elements to design an easy-to-use, attractive environment will also determine Chicago's success.

Whether Chicago becomes Windows 4.0, Windows for Workgroups 4.0, or something completely different is anyone's guess. "There's no box, or boxes, that we've decided on at this point," says Thiel. "We just think of it as this technology project." What users think about is getting their hands on the beta when it rolls out this spring.

—Scott Spanbauer

Building Chicago

As the successor to Windows 3.1 nears beta testing, Microsoft unrolls the schematics for a future operating system.

Ease of use:

- Plug and Play architecture support
- Simplified hardware installation
- On-the-fly device reconfiguration and driver loading and unloading means you can hot-swap devices such as PCMCIA cards and laptop docking stations
- Simplified interface
- Program, File, and Print Managers and other system tools combined into a single drag-and-drop desktop interface
- Interface improved to make task-switching and multitasking easier to understand



Performance:

- 32-bit operating system core
- Protected-mode 32-bit flat memory model; no 640K RAM limitation
- Separate memory areas to prevent crashes during multitasking
- Preemptive multitasking
- Operating system is integrated with the Windows user interface
- System configuration doesn't require command-line tools or rebooting
- Win32 API support
- Compliant applications can run under both Chicago and Windows NT
- 32-bit and existing 16-bit Windows applications should run as fast as or faster than under Windows 3.1
- System resource limitations that plague Windows 3.1 power users are effectively removed

Connectivity and Networking:

- Faster 32-bit networking integrated into the operating system
- Dynamic loading and unloading of multiple network transport software on demand
- Simplified access to multiple networks through user interface
- Mobile computer support
- Point-to-point remote access between Chicago systems, and between Chicago systems and other Microsoft networks
- File synchronization utilities and support for document version control
- MAPI (messaging API) 1.0
- Support for work-group applications

Minimum system requirements:

- 386, 4MB RAM; 8MB recommended

Photos Without Film

TEST DRIVE

While it's only a matter of time before digital cameras replace the film-based variety, don't throw out that Nikon just yet. Unless you're on the level of a professional photographer, it's hard to beat the resolution, color, and image quality of an inexpensive, easy-to-use 35-millimeter Instamatic.

However, digital cameras are improving rapidly. Take Apple Computer's new QuickTake 100, for instance. While the QuickTake won't drive Kodak or Polaroid out of business anytime soon, it's among the first sub-\$1000 digital cameras to take color photos. Plus it performs a few tricks that its celluloid brethren can't; since it can shoot digital pictures, you can quickly transfer color photos to your hard drive without a laborious scanning session. For insurance adjusters who need digitized photos of auto accidents, corporate personnel managers who want database-ready images for employee records, and business users who want digitized images in their presentations, the QuickTake is a fast and powerful tool.

Easy as Any Camera

Apple wisely designed the QuickTake to be as easy to use as a consumer electronics product. Shaped like a pair of binoculars, the device operates much the way a conventional camera does—only without the film. I found the QuickTake simple to operate. The front of the unit features an 8mm camera lens and a built-in flash that works automatically in dim lighting. To take a picture, you simply look through the viewfinder on the back of the camera and press the shutter on top. As with any camera, you'll hear a click that indicates that the photo has been taken. Within 4 seconds, a green light in the viewfinder tells you the camera is ready for the next picture.

Next to the viewfinder are four control buttons and an LCD control panel display. You use the buttons to set photo resolution, erase images stored in the camera, and control the flash and the timer. The LCD display shows battery status, current resolution, the number of pictures taken, and other settings.



COOL

QUICKTAKE:

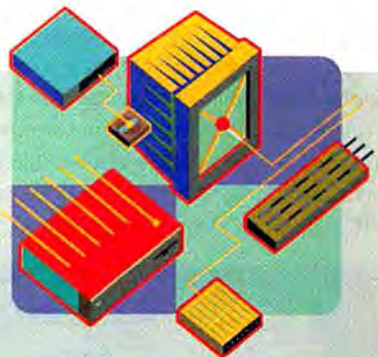
Apple's color digital camera

At standard 320 by 240 resolution, the QuickTake 100's internal RAM can store up to 32 photos at a time. At the higher 640 by 480 resolution, it stores up to 8 photos. To conserve battery power, the camera goes to sleep after a minute of inactivity, or after 5 minutes if connected to a computer.

Windows and Mac Image Editing

QuickTake comes with image editing software for both Macintosh and Windows PCs. To transfer photos to a Windows PC, you simply connect the camera to the serial port (the cable is included), and then load the QuickTake software and select *Move All Camera Images to Disk* from the Camera menu. The transfer process can take a minute or several minutes, depending on the number of images you're transferring and the speed of your system. Naturally, a faster processor and disk subsystem speeds up the transfer.

Using a prerelease copy of the Windows program, I found the software easy to install and use but rather limited in functionality. It lets you view the photos, as well as rotate, zoom in, change color depth, or convert an



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interface (FDDI), in the ceiling of the planes. Airlines including British Airways and Continental will use this cable, along with a file server and router, to support a token-ring LAN inside the plane. GEC Marconi, an electronics company based in England, is one of the vendors that airlines have already contracted with to outfit Boeing 777 planes with such networks.

The airlines will deliver movies, interactive shopping, and destination information to video screens on seat backs via the LAN, says Dave Trowern, a GEC Marconi technical engineer. Many airlines will let passengers send and receive E-mail using a modem jack located on each seat's armrest. Communication to and from the airplane will be accomplished through a satellite radio link, being developed by telephone companies such as AT&T. The Boeing 777 planes are scheduled to start commercial flights in June 1995, although the communications services may not be ready at that time.

INTEL DROPS PENTIUM PRICES: Intel is dropping Pentium prices by 14 percent, which should translate into lower prices for high-end systems. The new 66-MHz Pentium price is \$750; the 60-MHz chip is \$675. Also, Intel's 66-MHz 486DX2 has dropped 18 percent to \$360. Intel says it plans to ship millions of Pentiums this year.

Edited by Randy Ross

Contributors: Joe Abernathy, Jeff Bertolucci, Laurianne McLaughlin

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image to gray scale. In addition, you can cut and paste portions of an image into other Windows applications. You can convert an image to any of the major graphics file formats, including TIFF, GIF, PCX, and PICT (for the Macintosh). However, for

will take only black-and-white photos)—the QuickTake's color capabilities produce vastly superior images. While no match for 35mm film or expensive digital cameras designed for professionals, the QuickTake 100's photos are suitable for many mainstream business uses. However, even at

the high-resolution setting (640 by 480), the detail and color quality of the QuickTake photos reminded me of output from a Polaroid instant camera: they were often blurry, with colors that bled together.

While the QuickTake's low price is impressive, beware the hidden costs that are associated with manipulating large color images. You'll need a powerful desktop system and possibly even a color printer to print your photos. For proper viewing, you'll

want a 486 with 8MB of RAM, plenty of hard disk space for storing the images (which can take up over 100K apiece), a color monitor, and a video card capable of displaying 16.8 million colors at VGA resolution. Running on a 386SX monochrome

QuickTake 100

Apple's new low-cost digital camera takes color photos and is easy to use.

Key Features: Stores up to 32 digital images at a time • Two resolution settings • LCD panel displays battery status, number of pictures taken, and other settings • Includes Windows or Macintosh image editing software

Estimated Street Price: \$699 to \$749

Availability: Second quarter 1994

Microsoft Corp., 800-426-9400

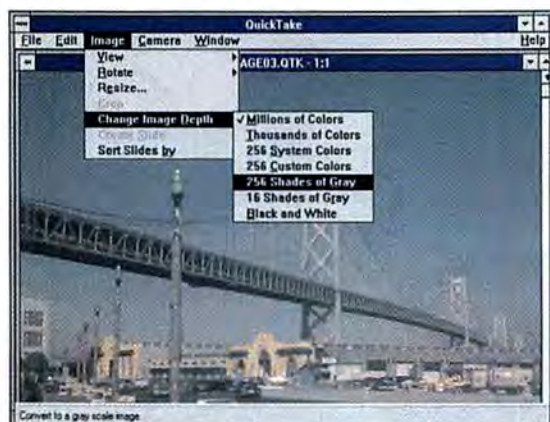
Apple Computer, Inc. 800/776-2333, 408/996-1010

Reader service no. 760

notebook, the QuickTake software was much too slow and the photos too grainy. The program ran infinitely better on a 486 with a color monitor.

The QuickTake 100 really isn't a consumer electronics product—not yet, anyway. It is too expensive, it requires a considerable hardware investment, and it produces color photos that leave plenty of room for improvement. Nevertheless, the QuickTake is a significant step forward in the evolution of digital photography.

—Jeff Bertolucci



BASIC IMAGE EDITING tools come with the Windows software, and QuickTake supports all the leading formats.

serious image editing, you'll want to use a more powerful program such as Photoshop or Photostylr.

What about image quality? Compared to other digital cameras in its price range—most notably Logitech's Fotoman (which

CDs for Sale or Rent:

Nervous about paying \$40 or \$60 for a CD ROM title that you may not want to look at, let alone own? Blockbuster Entertainment Corporation may have the solution.

Under a new try-before-you-buy program, customers in the San Francisco Bay Area can try out over 200 CD ROM titles—on SEGA, Phillips Magnavox CDI, Panasonic Real 3D0, Apple, and IBM systems—in the store or rent the software or equipment to try at home.

Blockbuster has a range of action and strategy games, educational programs, and reference works available. For \$4, you can take any program home for three evenings. Blockbuster charges \$14.95 to rent a SEGA, Magnavox, or Panasonic CD player, and \$19.95 to rent a player and three programs for three evenings. If you decide that you like the program or the equipment after a test drive, Blockbuster has both for sale and will credit \$5 toward a purchase of any title. An equipment purchase gets you ten free program rentals.

So far about 37 companies, including Compton's NewMedia, Software Toolworks, and the Voyager Company, have signed on their titles. The fast-action games, however, have proved to be

the most popular, according to a Blockbuster spokesperson.

If the program takes off in the Bay Area, Blockbuster plans to extend it nationwide over the next year. Spokespersons for two of Blockbuster's competitors, Tower Records and Wherehouse, say that they have been researching the marketplace and may come out with similar programs.

Blockbuster's try-before-you-buy approach may be just the jumpstart the nascent CD ROM titles market needs. While sales of CD

ROM players have been growing at a rapid rate, CD ROM titles haven't been moving as quickly, says Bruce Ryon, principal multimedia analyst with San Jose market research firm Dataquest.

Nearly 80 percent of the titles shipped are bundled with equipment when it is purchased, says Ryon. He thinks people hesitate to buy more titles because they are unsure of the quality.

"People see these saltine-sized, herky-jerky pictures, and they are wondering if they want to spend money for them," says Ryon. "I think what Blockbuster is doing can only have a positive effect on the market."

—Sarah Klein



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486DX microprocessor. What's more, our incredible new lower prices make ZEOS Ambra systems more affordable than ever!

To give you the best value, we offer money-saving packages that include quality ZEOS components and choice extras. Standard are an upgradable Intel CPU, 128K SRAM cache for faster data access, and enough bays to add a CD-ROM, 5.25" floppy and tape backup. Plus, five expansion slots including two VESA local bus. All this in a space-saving slim case. Of course, we'll also custom-build a system to your exact needs—choose from many affordable options including modems, networking cards and more.



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Documents on the Cheap

TEST DRIVE

So, Martha Stewart will not be flying in to personally decorate your office this year. Don't worry. You may not be able to afford a make-over for your office, but you can get one for your documents, thanks to three new products from Canon Computer Systems that are aimed at the small and home office market.

CCSI has introduced a neat little color scanner for about \$1000; an improved version of its tiny ink jet printer that provides laser quality for only \$299; and a 600-dpi, 8-ppm laser printer for about \$1300. (These are estimated street prices.)

CCSI, established in 1992, functions as an independent subsidiary of Canon Inc. While Canon still sells printer engines to Hewlett-Packard, CCSI is trying to win over the small and home office market by tout-

couldn't test the laser printer because it wasn't available at press time).

Go for Color Scanning

Canon's Color Scanner IX-4015 makes a crafty little helper at about \$1000 on the street (it lists for \$1175). This single-pass, 24-bit color, 400-by-1200-dpi-resolution scanner matches the specs of Hewlett-Packard's \$1179 ScanJet Ilex. But the Canon takes up a lot less room on your desk: 11.25 by 16 inches, compared with 14.5 by 23 inches for the HP. At this price and size, it may be time to buy a color scanner to bring pictures into reports or to pump up your desktop publishing capabilities.

The IX-4015 proved easy to set up with my bare-bones system. It took me less than half

an hour using the

**BEST
BUBBLEJET
YET: Canon's BJ-200e.**

Connect the SCSI cable and install the software, and you're ready to go.

You'll immediately see the value of the included software, the first Windows version of Light Source's Ofoto. Its Auto-

scan feature does the scanning

work for you. Just place the art-

work on the scanner, choose

the printer you're

using, and click

Autoscan. Ofoto identi-

fies your image (whether

it's line art, gray-scale

photo, or color

photo), scans

and sharpens

it, straightens it

if you placed it

down at an

angle, and ad-

justs shadows

and highlights.

The software

even crops out

excess white space. While most

image editing apps have these

features, they are often buried

beneath layers of menus.

If you don't want to use

Autoscan, Ofoto will let you do

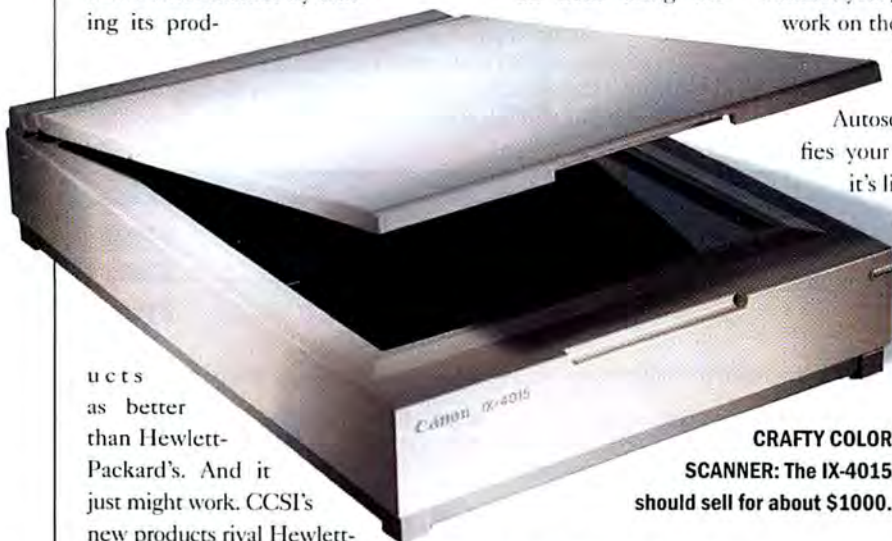
the work yourself. You may

want to manually crop out a portion of the image (a simple click-and-drag operation), resize the image (just plug dimensions into a dialog box), rotate or flip the image, or adjust its tones. The software comes with a first-class manual that explains everything in plain English. This scanner also supports the TWAIN interface standard, which ensures that the scanner works directly with most OCR and image editing software.

Best Ink Jet Gets Even Better

For \$399 list, the tiny BJ-200e packs a powerful publishing punch. This ink jet printer offers 360-dpi laser quality text and 4-ppm speed in a package that measures only 13.7 by 6.8 inches. With the BJ-200e, CCSI has made a good product even better. The BJ-200 won a Best Buy in *PC World's* January 1994 ink jet roundup, but the BJ-200e trounces its predecessor when it comes to printing graphics, especially photographs. Now you can handle newsletter-type work.

Since ink jet printers spray a



ucts as better than Hewlett-Packard's. And it just might work. CCSI's new products rival Hewlett-Packard's in features yet often take less desktop space, cost less, and have a two-year parts and labor warranty, compared with HP's one-year warranty.

I tested the new scanner and ink jet printer (although I

couldn't test the laser printer because it wasn't available at press time).

**CRAFTY COLOR
SCANNER: The IX-4015
should sell for about \$1000.**

quick-start guide. It isn't quite

plug and play: You'll have to

open up your PC, possibly set

some DIP switches on the

included SCSI interface card,

snap in the card, and set the

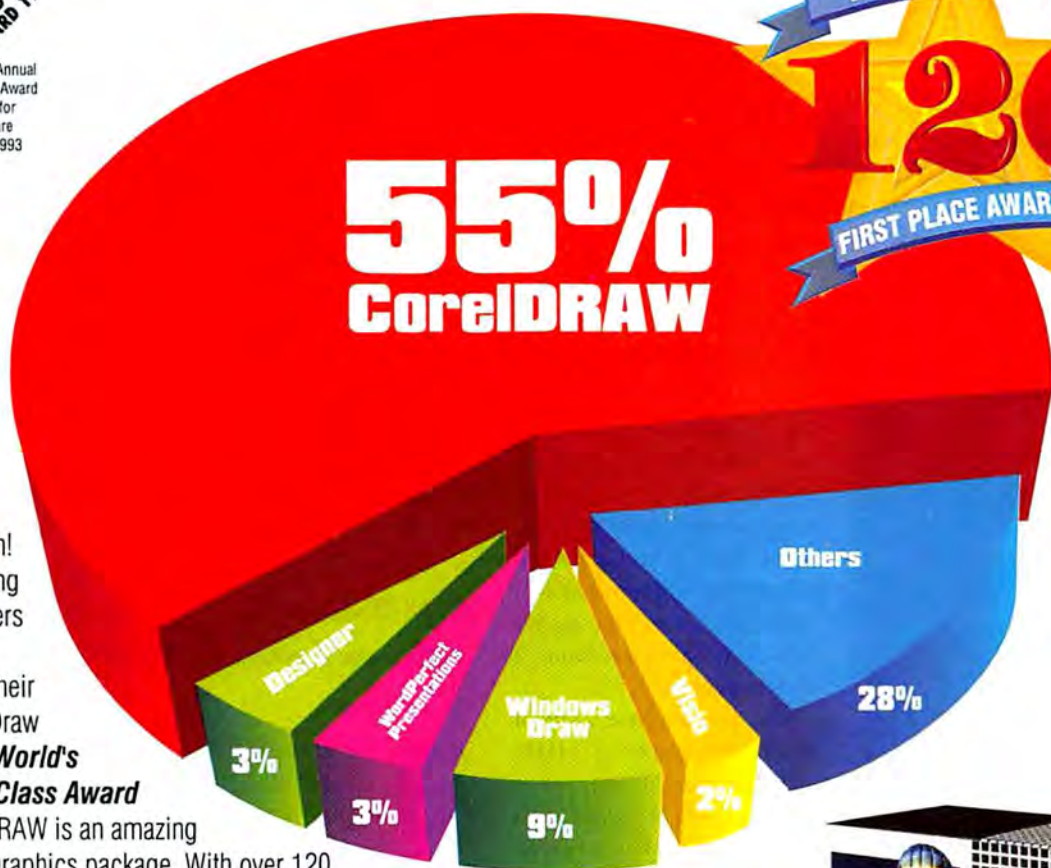
SCSI ID switch on the scanner.

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December, 1993



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Circle 93 on reader service card

Continued from page 62

stream of liquid on a page (unlike lasers, which use heat and pressure to apply dry ink), sometimes the pages smear after you touch them. But I had no smudge problems with this printer. On a text job its print quality is so good that the average person can't tell the difference between this output and that of a 300- or even 600-dpi laser printer.

As for newsletter work, test pages I printed from Ventura Publisher came out very well. The original BJ-200 didn't do as well with photographs: It left



LOOK, NO BANDING. Output from the BJ-200e, bottom, trounces the award-winning BJ-200.

some banding effects on them. Thanks to software and driver improvements, the BJ-200e eliminates that problem. I compared printouts of the same picture printed from the BJ-200 and the BJ-200e. Comparing and judging output can be a picky affair, but the BJ-200e's improvement was crystal clear—no bands.

CCSI also implemented better paper handling for envelopes: There's less wrinkling, and the tray now holds 15 en-

velopes instead of 10. Canon has added 20 TrueType fonts, which makes for faster printing in Windows, especially in your word processor. The printer has a 100-sheet paper tray and 49K of memory.

LaserJet 4 Competitor

The 600-dpi, 8-ppm LBP-860 Business Laser Printer targets the small office that needs a high-volume or small-work-group printer. With the LBP-860, Canon Computer Systems takes on an HP giant: the 600-dpi, 8-ppm LaserJet 4.

The LBP-860 uses the same Canon engine as the LaserJet 4. The LaserJet 4 lists at \$1839 but should sell on the street for less than \$1400. The LBP-860 also lists at \$1839, but analysts expect a street price of about \$1300 for it. The Canon and HP printers have two significant differences. The first applies only to people considering a PostScript upgrade.

Both printers have 2MB of RAM, expandable to 34MB, and both offer PostScript as an upgrade option. But the Canon printer uses a technique developed by Peerless Systems called Memory Reduction Technology, which enables you to print PostScript documents with only 2MB of RAM. (Many printers, including the LaserJet 4, require 6MB.) CCSI's memory arrangement should work fine for the majority of PostScript print jobs, with one exception. For a particularly complex graphic, such as a full-page photo, you will still need to add 2MB to 4MB of RAM.

The second difference between the CCSI and HP printers: The CCSI does not offer an internal network card, which is



THE 600-DPI, 8-PPM LBP-860 targets the small office and should sell for about \$1300.

an option with the LaserJet 4. The CCSI printer does offer an AppleTalk port as an option. It also has serial and parallel ports and a PCMCIA Type II slot.

Both printers have 45 internal scalable fonts—35 IntelliFont, 10 TrueType—and a 250-sheet tray. (The LBP-860 also has a multipurpose 100-sheet tray that can hold 10 envelopes.)

Both have Enhanced PCL 5. CCSI claims its printer is slightly faster than the LaserJet 4. This CCSI printer deserves consideration, especially by small offices on a tight budget.

So now you have better documents, more desk space, and money in your pocket. Sounds like a good image to me.

—Laurianne McLaughlin

Canon Unveils Color Scanner, Bubble Jet, and 600-dpi Laser

Canon Computer Systems Inc., 800/848-4123

IX-4015 Scanner

A small color scanner with Ofoto Windows for automatic scanning.

Key Features: 24-bit color • 400-by-1200-dpi resolution

Pricing: \$1175; \$1000 estimated street

Availability: Immediate

Reader service no. 753

BJ-200e Ink Jet

The newest version of this printer delivers better graphics quality.

Key Features: Tiny footprint • 360-dpi laser quality text • Faster Windows printing • Improved graphics quality

Pricing: \$399, \$299 estimated street

Availability: Immediate

Reader service no. 754

LBP-860 Business Laser Printer

Taking on HP's LaserJet 4, this printer does high-volume work.

Key Features: 600 dpi • 8 ppm • 250-sheet tray • Memory banding allows some PostScript jobs with only 2MB RAM

Pricing: \$1839, \$1300 estimated street

Availability: Immediate

Reader service no. 755



ANOTHER DEMONSTRATION OF HOW EASY IT IS TO INSTALL OUR NEW SCANNER.



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New ScanMan® EasyTouch plugs directly into your parallel port, with no boards or drivers. It's easy to install, and moves from PC to portable and back again faster than insults at the U.N. EasyTouch includes OmniPage® Direct™ AnyFont™ OCR for Logitech, FotoTouch™ image editing software, Logitech's AutoStitch™ (for scanning large or odd-sized documents), and can add



professional quality grayscale scans to all your favorite Windows™ applications. And at about a third of the price of a flatbed scanner, you'll have no trouble keeping your budget balanced. Pick up ScanMan EasyTouch at your local dealer, or call **1-800-889-0059**.



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Circle 241 on reader service card

The Alternative to Business Travel

TEST DRIVE

Intel's \$99 ProShare Personal Conferencing, Standard Edition, is the latest entrant in a nascent document conferencing software market. These packages let you share electronic documents and presentations with an associate or customer at another location via a network or a standard phone line. But after you envision savings on travel, overnight mail, and other costs traditionally associated with conducting business from a distance, the caveats start gathering like storm clouds on opening day.

To use the products over phone lines, you'll want high-speed modems; vendors recommend at least 9600 bps, and we found even a 19.2-kbps modem a little tedious.

Then there's the question of when communicating over a PC is as good as being there. For selling an idea or product, you really want to meet, greet, and close the prospect in person. And for collaboration and group editing of documents, I prefer a

printout because my computer screen doesn't hold a full page of copy. For me, faxing or sending the document via electronic mail to those on my LAN are the better solutions.

If these qualifications don't dampen your enthusiasm, Intel's ProShare is worth a look. The product is one of the least expensive and simplest to operate. ProShare is particularly suited for reviewing complex PC-based CAD documents that don't fax easily—such as engineering plans or architectural blueprints—or marketing collateral pieces with someone at a remote location.

The Intel Connection

ProShare lets you share documents with one other PC connected by either a LAN or a phone line and modem. You will want talk to the other person simultaneously, so a second phone line is in order.

Document sharing is performed one of two ways in ProShare. A white-board feature, which appears as a note-



ANNOTATE BIT-MAPPED DOCUMENTS by selecting from a range of fonts and colors with ProShare's Configure Tool options.

pad, provides a common viewing screen. Any document imported or pasted into this area can be viewed by both participants. The hitch is that the image is not the actual document but a bit-mapped snapshot, which you annotate with various tools. This means you can't edit the actual shared document to incorporate changes. To change the original document you have to enter changes

manually into the original in its native application.

Alternatively, you can use the product's remote OLE 1.0 feature to embed the document in the white-board. The other user, provided he or she has a copy of the application that created that document, can edit it directly.

ProShare lacks a more sophisticated feature, known as application sharing, that lets you take control of one another's applications and edit the displayed document with minimal frustration. This feature is available in more expensive products such as Fujitsu's \$299 DeskTop Conferencing. The Premier Edition of ProShare—due in April—will include application sharing and is expected to list for \$299. Intel also has a \$2499 video teleconferencing product.

The Conference

I found the beta version of ProShare that I worked with a breeze to install. To ease communications setup, the program lets you pick your modem from

Document Conferencing: The Competition

Product	Price	Vendor	Features
FarSite	\$179	DataBeam, 606/245-3500	Rich viewing features including pan and zoom; synchronized viewing
DeskTop Conferencing	Limited three-user version \$99, full product \$299	Fujitsu Networks Industry, 800/446-4736	Application sharing, supports multiple simultaneous users, LAN and WAN support only
TalkShow 2.0*	\$199	FutureLabs, 800/933-8887	Supports multiple simultaneous users, online chat for single-phone-line users, synchronized viewing
Person to Person for Windows*	\$280	IBM, 800/426-9402	Supports multiple simultaneous users, private screen, upgradable to video conferencing, import feature for long documents
Communicator I*	\$99	Eyetele Communications, 604/984-2522	Supports multiple users, online chat mode, synchronized viewing, upgradable to video conferencing, private screen

* Product or some features not available at press time.

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And trying it requires absolutely no money.

You're looking at some great drawings and diagrams made by a bunch of people who can't draw.

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And since Visio supports OLE 2.0, you can easily integrate drawings with other Windows applications. Creating great business drawings has never been simpler.

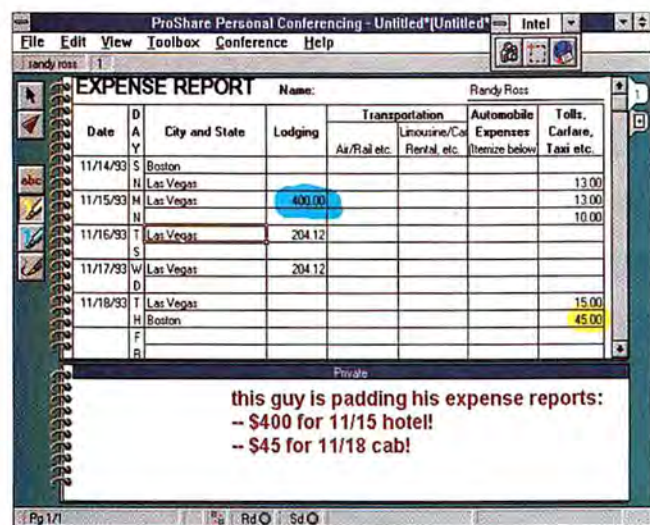
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and the name of an authorized reseller near you, or order Visio for just \$129:

1-800-446-3335, ext. F3C

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MAKE PERSONAL NOTES using the private screen feature. We've listed items on this expense report that warrant further explanation.

Continued from page 66
a list of preconfigured setups and sets all the communications parameters.

The interface is the picture of simplicity. The work area uses a notebook metaphor and divides into two parts. One notebook is the shared white-board, and the other is a private viewing area in which you can make notes, import documents, and look up data without the other person seeing what you're up to.

To prepare for a conference,

you'll want to import and arrange all your pages or "slides." The product allows you to import data in several ways. For multipage documents, you can use an Import command. This uncommon feature worked for most types of documents, but it wouldn't accept files in Ami Pro's native format or in Freelance presentations. A more foolproof option for viewing documents is to print the document from its native application by choosing the ProShare cap-

ture driver from the list of printer options in the print setup menu of your application.

For capturing part of a document—say, a piece of a graphic from a spreadsheet—the program includes a screen capture and cropping tool.

Connecting by Modem

Making a connection using a modem and phone line with the beta version of the product was simple enough. ProShare also includes a slick feature that lets you send a run-time, view-only version of the product via modem to someone who doesn't have it.

On the downside, conducting the actual conference and viewing documents was sometimes a pain. Memos that fit fine in the Ami Pro or Word for Windows workspace were too wide for the ProShare notepad when brought in via the Import command. Likewise, a Freelance presentation that fit fine on screen in its native application was also too wide for ProShare. Trying to read these documents required so much scrolling around, I wanted a Dramamine afterwards. Any presentation

ProShare Personal Conferencing, Standard Edition

WINDOWS Inexpensive, simple desktop conferencing lets you share documents with another PC.

Key Features: Shared white-board • Easy to use • Remote OLE 1.0 • Import feature for long files • Lets you send run-time version to other people

Pricing: \$99

Availability: Immediate

Intel, 800/538-3373

Reader service no. 756

conducted this way would be ineffective. Intel said that the finished product will address this issue.

In addition, there was no way to be sure the presentee and presenter were looking at the same part of the document. (The program has a page counter so you both know which page you're on.) A synchronization feature would have been nice and is available in several competing products.

—Randy Ross

Zeos Makes Room for IDE CD ROM Drives:

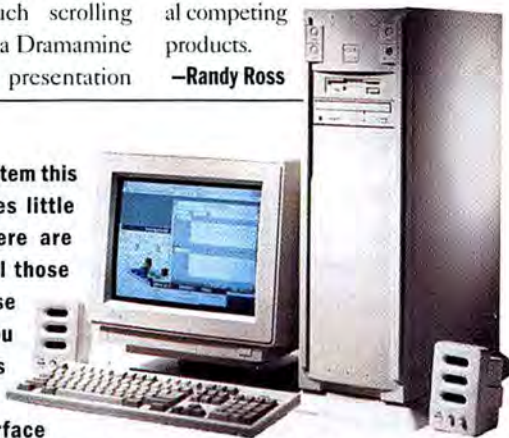
Some people can never get enough money, power, or peripherals. For these individuals, the PC industry offers hope. New low-priced Pentium/PCI systems, such as the Zeos Pantera line, let you pack in IDE peripherals, including a crop of easy-to-install IDE CD ROM drives expected later this year.

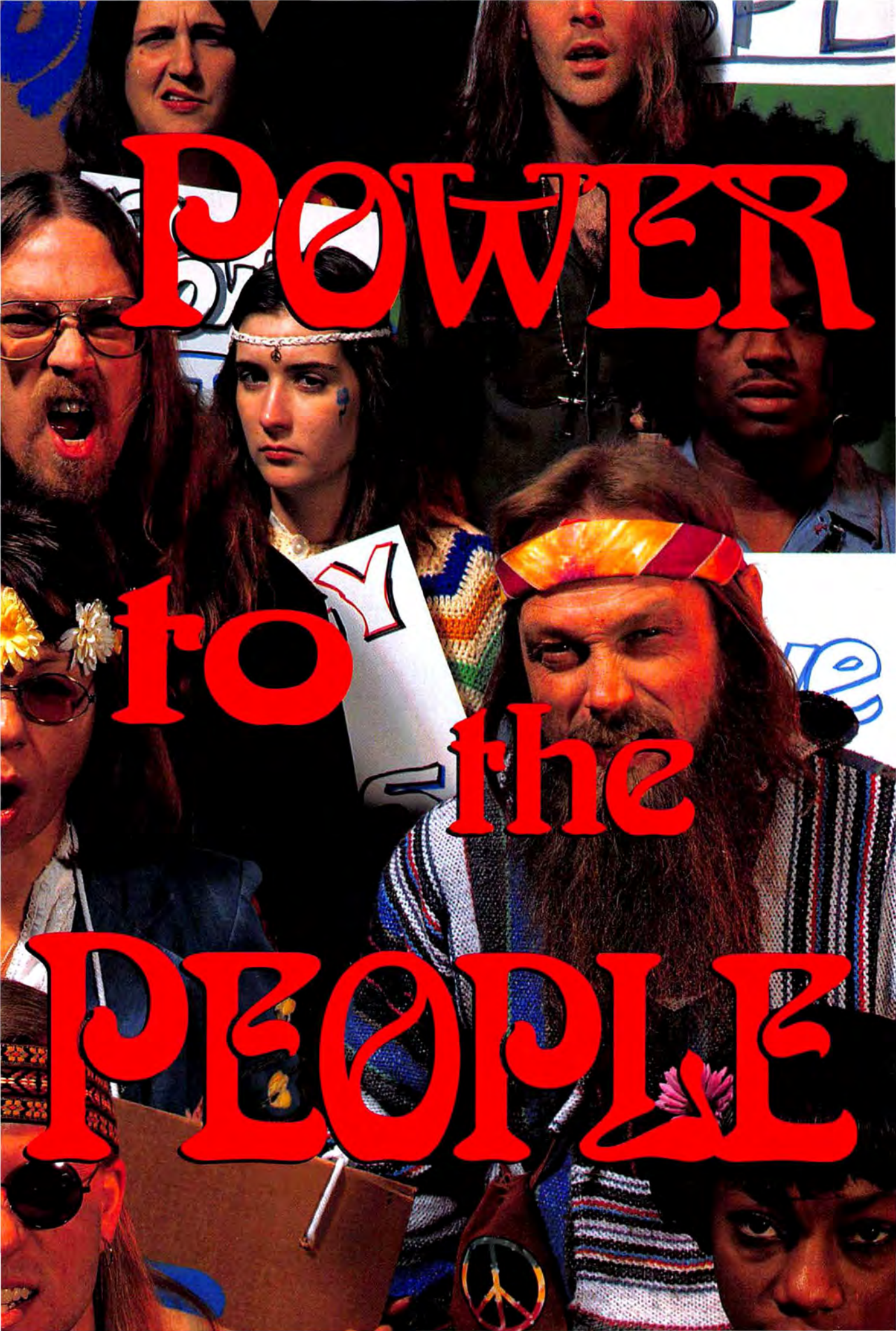
The Pantera line includes two desktop systems and a half-dozen towers. The towers start at \$2995 for a 60-MHz Pentium 10-bay system. They include a Mitsumi CD ROM drive, two free PCI slots for add-in cards, and two PCI/IDE drive connectors integrated into the motherboard that can support a total of four devices. If IDE isn't your thing, you can upgrade the system with a user-installable on-board Fast SCSI-2 chip that supports up to seven devices.

These systems include 12-bit mono audio on the motherboard with jacks for a microphone and speakers. The base tower system includes a 340MB IDE hard drive, 8MB of RAM, a Diamond Stealth PCI Windows accelerator, and a 15-inch monitor.

But buying a system this expandable makes little sense unless there are peripherals to fill those slots. And for ease of installation, you can't beat devices with an industry-standard interface

and no adapter cards. Enter IDE. Expect IDE CD ROM drives as early as the first half of the year, says Robert Katzive, vice-president at Disk/Trend, a Mountain View, California, market research firm. Currently, CD ROM drives are expensive if they have a standard interface like SCSI, and less expensive if they have proprietary interfaces. Both options require an adapter card, which is a pain to install, says Robert Abraham, vice-president at Freeman Associates, a Santa Barbara, California, market research company.





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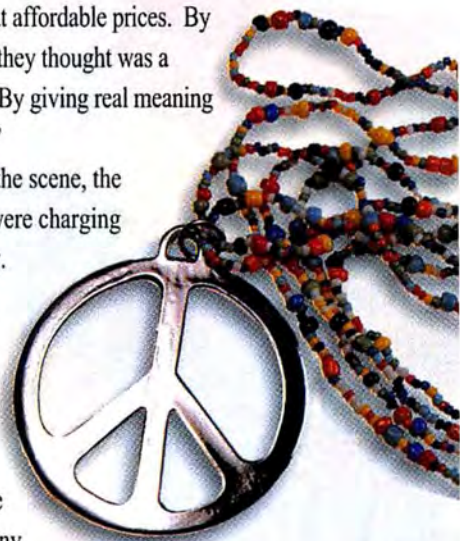


By the Time We Get to Woodstock

When historians write the history of the personal computer industry years from now, they'll remember Gateway 2000™ as the radical PC manufacturer that gave power to the people by selling the highest-quality, latest-technology computers at affordable prices. By showing PC buyers a level of service they thought was a throwback to the peace and love era. By giving real meaning to the tattered, worn-out term "value."

When Gateway 2000 came onto the scene, the establishment computer companies were charging whatever they wanted for technology. Gateway was a real downer to them because we began selling the same technology for a whole lot less. And the buyers were very smart. They shouted, "Hell no, we won't go," to the big companies, and took a chance on the revolutionary Midwest company called Gateway 2000. Soon a great legion of people — even more than Woodstock attracted — was buying Gateway PCs.

Today, Gateway 2000 is bigger than many of the companies for which it was an alternative. So why should you buy a Gateway computer today? Same reasons as in the beginning. You still get the best price, quality and service from us.



Demonstrations

That's why *PC Magazine* readers said Gateway 2000 was #1 in overall reliability, and we also received the most votes when readers were asked if they would buy again from the same company — in both desktop and portable PC categories. (Thanks, *PC Mag* readers!) That's why, for the third consecutive year, we swept *Computer Shopper's* Best Buy Awards. (Thanks, *Shopper* readers!) And that's why we took five top honors in *PC World's* World Class Awards, including Best Mail Order Company and Best Service and Support. (Thanks, *PC World* readers!) Even though we're now a Fortune 500 company, we still champion anti-establishment thinking. Check it out. You'll find GW2K is far-out, groovy and totally unreal!



8 0 0 - 8 4 6 - 2 0 6 5

Gateway Gives You Performance

The Eagle has Landed

When Gateway 2000™ introduced a Pentium™-based system — loaded — for under \$4,000, everybody in the industry knew the Eagle had landed. The best PC value on the planet had arrived! The editors of *PC/Computing* heralded the accomplishment by naming it Best Desktop of 1993.

Then we topped our achievement by offering *four* Pentium processor-based systems, including a *new 66MHz model*, priced from \$2,495 to \$3,995. Now that's a giant leap in value for one of the highest-performance PCs on earth. These systems are tomorrow's technology available today at affordable prices — only from Gateway.

Our P5 systems include Intel's 64-bit Pentium processor, which moves instructions and data twice as fast as a 486 system. The P5 PCs get another performance boost from a PCI local bus. The PCI bus can operate 10% to 15% faster than a VESA® local bus. New this month, all PCI local bus systems also include a PCI IDE interface, which dramatically improves hard drive performance (up to twice as fast). The PCI bus' "plug and play" feature makes your PC easier to use, too, by automatically configuring peripherals.

Space-Age Video

The PCI bus is coupled with a space-age video system, with 2MB standard video memory giving you 64,000 colors at 1024 x 768 resolutions. The high-performance PCI-based video system achieves 16 million colors, true 24-bit, in VGA and SVGA resolutions. Our standard video system gives you the best overall performance on the market.

The net effect of the PCI local bus and this video system is computer performance that will send you into orbit. It's definitely far-out!

486 PCI Local Bus System is A-OK

The PCI local bus with PCI video and disk subsystems is also available in a 66MHz 486DX2 system, which is upgradable to the Pentium OverDrive™ processor. Another A-OK value in a high-performance system from Gateway!

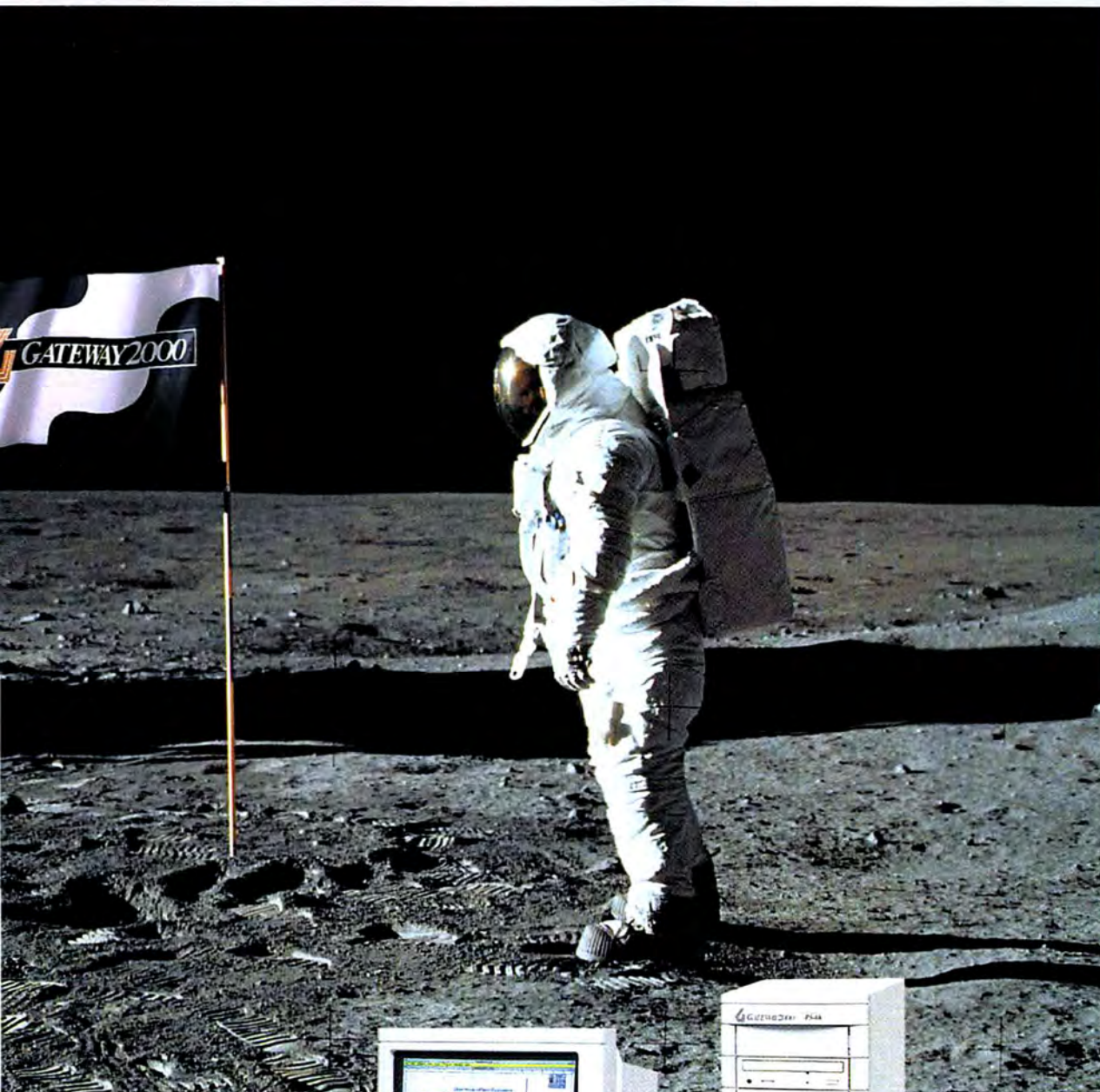


Photo courtesy of NASA. Thanks!



8 0 0 - 8 4 6 - 2 0 6 5

That's Out Of This World!



Our P5-60 was named Best Desktop of 1993 by the editors of PC/Computing. "(It) is nearly twice as fast as its nearest competitor at Windows operations. When it comes to top-of-the-line desktop systems, you can't beat high performance for a low price," states the editorial.



Our new 66MHz Pentium-based system is priced at only \$3,995.



Be A Trend-Setter With A



Our 4DX2-66V model has to be one of the most highly decorated PCs in the history of the industry. For good reason! Like other Gateway VESA and integrated systems, it's a very attractive value.



4DX2-66V
Best Desktop



4DX2-66V
Best Windows PC



4DX2-66V



4DX2-66V



4DX2-66V



4DX2-66V

Gateway VESA Or Integrated PC



Our Family PC™ comes with CD-ROM, sound card, speakers, joystick, fax/modem and multimedia software. You choose one software option from five great Family PC multi-title packages. Some of the outstanding titles you can get are: Microsoft Works,™ Dinosaurs and Encarta,™ Cinemania,™ Time Almanac, Links Golf Collection, The Animals!, MicroProse™ Game Pack, MECC Elementary Education Pack — and more!

You'll be a trend-setter in your office or neighborhood if you choose a Gateway VESA® or integrated system because there's nothing more fashionable than a great buy. Everybody wants one!

VESA a Go-Go

Our VESA local bus machines give you go-go performance at a fab price. VESA, which stands for Video Electronics Standards Association, assures you of compatibility with any VESA peripheral. These systems are also upgradable to a Pentium™ OverDrive™ processor if you need more processor power in the future.



Integrated PCs Sock it to 'Em

Our integrated systems definitely sock it to the competition. Offered in space-saving mini desktop cases, our local-bus integrated PCs give you twice the video performance available in many standard desktop machines. In fact, video performance in our integrated systems is similar to, or better than, that found in many of our competitors' high-end systems.

Of course these machines are also upgradable to a Pentium OverDrive processor.

Our special Family PC,™ with full multimedia capabilities and exciting software choices, is priced at only \$1,995. Ask us for details.

If you want a mod PC for the fewest dollars possible, you want an integrated system from Gateway. You can bet your bippy on that!

Energy Stardom

All Gateway 2000™ VESA local bus and integrated systems wear the Energy Star seal to show they comply with energy-saving guidelines established by the EPA. Our commitment to the Energy Star program is just one of the ways we're working to help the environment — and to help you save money!



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For The Rolling Stone In You.

Whether you travel constantly from continent to continent or occasionally from office to home, Gateway has the perfect portable PC to keep you rollin' on down the highway.

Easy Rider

The revolutionary HandBook® 486 gives you more MIPS per pound than any other PC! Plus, the HandBook is the answer to the most common question seasoned portable users ask themselves: Should I take my portable or not? Is it worth the hassle? With a HandBook, you'll never ask yourself that question again. It's so small and light, it's effortless to carry. The decision is automatic: Of course you'll take your HandBook. You'll never want to be without it! The HandBook is a truly extraordinary product that will forever change the way you use a PC.

The HandBook has all the features that matter to you, too, including: ideal weight and size (less than 3 pounds, about the size of a day-planner); plenty of power (genuine Intel® SL Enhanced 486 processor); great screen (bright, 7.9-inch backlit VGA display); comfortable 78-key keyboard; EZ Point™ integrated

pointer (no need to carry a clumsy mouse); excellent battery life; suspend/resume (a handy feature that allows you to stop work any time and resume later without losing data or restarting the system).

Psychedelic Day-Tripper

"(The ColorBook's) 9.4-inch dual-scan color display is so good you might think you accidentally got an active matrix display." That's what *PC Magazine* said about the Gateway 2000™ ColorBook. It's psychedelic! The ColorBook, with its latest-technology color display, also includes: 486 performance (genuine Intel SL Enhanced 486 processor); excellent portability (weighs less than 5.7 pounds and is ultra-thin — just 1.77 inches); simultaneous video support; a built-in trackball; two PCMCIA Type II slots (can also be used for one Type III PCMCIA card); great battery life (up to four hours); suspend/resume.

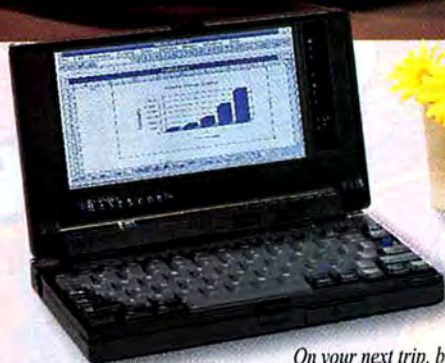
For dazzling color at a mono price, look no further than the ColorBook.



"You've got a friend in the business."®

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Gateway Has Groovy Portables.



On your next trip, be sure to take along a good book.
That's a HandBook or a ColorBook from Gateway 2000!



HandBook
Best Subnotebook



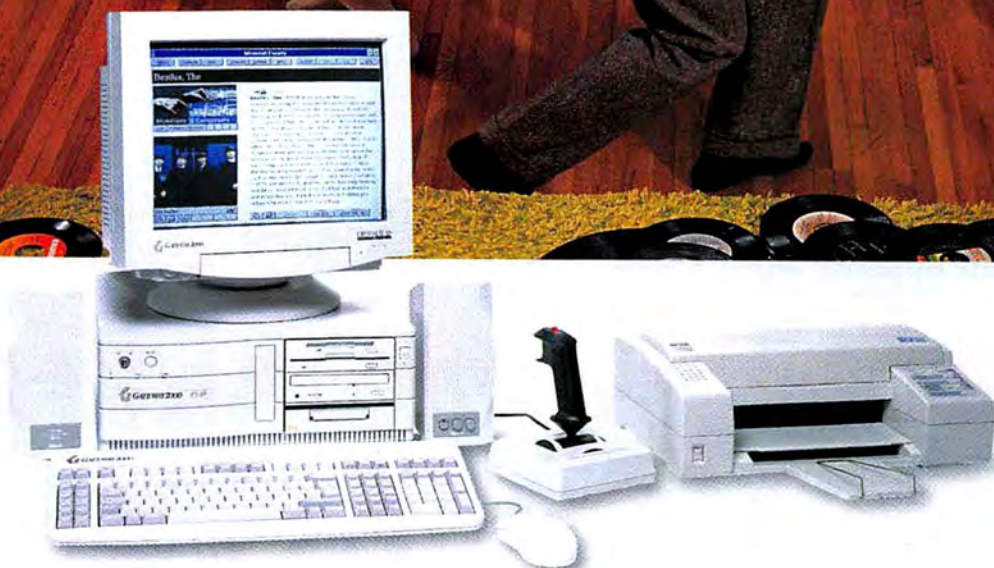
HandBook
Best Subnotebook



HandBook
Best Hand-Held/Palmtop



Add A Twist



Shown here is our P5-60 model loaded with options including a 17-inch CrystalScan monitor, combo floppy drive, multimedia kit with optional Yamaha speakers, Colorado Memory Systems tape backup unit, FlightStick and Epson Stylus 800 printer. With multimedia, the sights and sounds of any era are available to you with a click of your mouse. Right on!

PORTABLES

HANDBOOK® 486

- Weight: 2.94 Lbs.
- Dimensions: 9.75" x 5.9" x 1.6"
- SL Enhanced Intel® 486 Processor
- 4MB RAM (expands to 8MB or 20MB)
- 80 to 130MB IDE Hard Drive
- 7.9" Backlit VGA Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 1 PCMCIA Type II Slot
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial & PS/2 Ports
- MS Works for Windows™
- MS-DOS 6.2, WFW 3.11 & Serial Transfer Cable

HANDBOOK 486SX-25

With 25MHz 486SX CPU and 80MB Hard Drive

\$1495

HANDBOOK 486DX2-40

With 40MHz 486DX2 CPU and 130MB Hard Drive

\$1995

HANDBOOK PACKS

Traveler's Packs:

- Case, extra battery & PCMCIA 9600/2400 fax/modem. **\$369**
- Case, extra battery & PCMCIA TelePath™ fax/modem. **\$489**

Presenter's Pack:

- PCMCIA VGA adapter, Asymetrix® Compel & case. **\$319**

PORTABLE OPTIONS

PCMCIA Cards:

- TelePath 14400/14400 fax/modem. **\$319**
- 9600/2400 fax/modem. **\$199**
- Ethernet adapter. **\$189**
- Token Ring adapter. **\$449**
- HandBook VGA adapter. **\$229**

Batteries:

- 2.2Ah NiMH batteries. **\$89**
- Alkaline battery pack. **\$29**

Diskette Drive:

- HandBook external 1.44MB. **\$99**

Cases:

- ColorBook **\$49** HandBook **\$55**

Extended VIP Warranty:

- We'll ship a replacement within 24 hours during warranty. Point of sale only. **\$100**

COLORBOOK™

- Weight: Under 5.7 Lbs.
- Dimensions: 11.7" x 8.5" x 1.77"
- SL Enhanced Intel 486 Processor
- 4MB or 8MB RAM (expands to 8, 12 or 20MB)
- 3.5" 1.44MB Diskette Drive
- Removable 120 to 250MB IDE Drive
- 9.4" VGA Dual-Scan STN Color Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial & PS/2® Ports
- External VGA Port
- MS Works for Windows
- MS-DOS 6.2 & WFW 3.11

COLORBOOK 486SX-33

With 33MHz 486SX CPU, 4MB RAM and 120MB Hard Drive

\$1995

COLORBOOK 486DX-33

With 33MHz 486DX CPU, 4MB RAM and 250MB Hard Drive

\$2695

COLORBOOK 486DX2-50

With 50MHz 486DX2 CPU, 8MB RAM and 250MB Hard Drive

\$2995

COLORBOOK PACKS

Traveler's Packs:

- Case, extra battery & PCMCIA 9600/2400 fax/modem. **\$329**
- Case, extra battery & PCMCIA TelePath fax/modem. **\$449**

MULTIMEDIA KIT

Here's everything you need to add multimedia to any Gateway desktop PC. You won't find a better holiday price anywhere!

- Gateway 2000 16-Bit Sound Card, Sound Blaster™ Compatible
- Double-Speed CD-ROM
- 2 Labtec® Speakers
- Microsoft Encarta & Corel Photo CD Software
- Gateway System CD

\$299

For system configurations that include a CD-ROM drive: **\$132**
Only with system purchase.

SOFTWARE & EXTRAS

If a system comes with "choice of application software," choose one of the following packages:

- Microsoft Excel for Windows™
- Microsoft Word for Windows™
- Microsoft Word and Bookshelf®, CD-ROM Edition
- Microsoft PowerPoint for Windows™
- Microsoft Project for Windows™
- The Entrepreneur Pack (Works™, Publisher™, Money™ & games)
- Borland Paradox® database and Quattro® Pro for Windows spreadsheet
- Microsoft Access™ for Windows
- Publisher's Pack (CD-ROM only; includes CorelDRAW3™, ArtShow, MS Publisher 2.0 & MS Design Pack)

With desktop and selected portables you also get the following software and extras at no additional charge:

- MS-DOS 6.2 & Windows for Workgroups 3.11
 - CoSession™ Host Remote Diagnostics (with all modems)
 - QAPLUS Diagnostics
 - Gateway Computer Glossary
 - Gateway Mouse Pad
- Systems with CDs also include:
- Gateway System CD with Microsoft Multimedia Pack™
 - Multimedia On-Line User's Guide
 - Gateway Mall On-Line Catalog

SERVICE

Every Gateway system is backed by:

- 30-Day Money-Back Guarantee
- One-Year Limited Warranty
- Lifetime Toll-Free Technical Support
- On-Site Service Available To Most Locations
- Lifetime BBS Membership
- FaxBack Automated Fax Service

Our money-back guarantee does not include shipping. On-site service is provided at no charge during warranty if our technicians determine it is necessary. If you'd like to read our warranty and guarantee policies, please call for a free copy.



Printed on recycled paper with soy inks.

Gateway 2000 is a corporate sponsor of
GLOBAL RECYCLE



To Your Gateway PC!



When you've picked the PC you want, take a look at the options listed here to make your system as productive and fun as possible. Sorry, the peripherals listed here are sold only with the purchase of a system. For details on our complete line of extras for Gateway customers, ask for our special add-on components division when you call.

Multimedia

Multimedia Kit

Here's everything you need to add multimedia to your Gateway PC:

- Gateway 2000™ 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
 - Double-speed CD-ROM drive, tray-loading, compatible with music CDs, multisession photo CDs and CD-ROM titles
 - 2 Labtec® speakers that attach to your PC monitor
 - Microsoft® Encarta & Corel Photo CD software
 - Gateway 2000 System CD with Microsoft Multimedia Pack™
- \$299**

For system configurations that include a CD-ROM drive, get the multimedia kit without CD-ROM drive for: **\$132**

Yamaha®YST-M10 Multimedia Speakers

New! The small speakers that sound big. And come with a tiny price. This free-standing, self-powered speaker set is a great value! **\$75**

Altec Lansing Multimedia Speakers

Get superior stereo sound with these top-rated Altec Lansing ACS-300 speakers with separate powered subwoofer. **\$219**

CH FlightStick

The joystick that's recommended by our kids! With a sensational "feel" and rugged construction, this is the last joystick you'll ever have to buy! **\$35**

Communications & Storage

TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Package includes CommWorks™ data and fax communication software, plus a CompuServe® trial membership. **\$149**

Cardinal® 2400 Fax/Modem

Internal fax/modem, 2,400bps modem, V.22bis, with 9,600bps fax capability. Package includes CommWorks data and fax communication software. **\$49**

Colorado Memory Systems® TBU

250MB internal automatic tape backup unit copies up to 9.5MB per minute. Comes with Windows and DOS software, one tape and cable. **\$159**



Networking

Intel EtherExpress™

A 16-bit Ethernet adapter from a world leader in networking. **\$105** Twisted Pair or BNC Kit (BNC kit includes cable, connector, terminator and card).

Ethernet Adapter from 3Com®

Manufactured by 3Com for Gateway. Features parallel tasking architecture with a high level of integration. **\$105** Twisted Pair. **\$125** BNC Kit (includes cable, connector, terminator and card).

Monitors

CrystalScan® 17-Inch Monitor

Non-interlaced color monitor, .26mm dot pitch. If your system comes with a 14-inch monitor, you can upgrade to this monitor for **\$430**. If your system comes with a 15-inch monitor, you can upgrade for **\$350**. (Prices good only for upgrades at the time of system purchase.)

Printers

Epson® 1070+ Printer

Here's a value-priced, wide-carriage dot matrix printer that gives you 225cpi in draft mode, 10 letter-quality fonts and 4 scalable fonts. Quiet, too (46.5db)! **\$359**

Epson 3260 Color-Capable Printer

Add color to your documents with this 24-pin, quiet dot matrix printer. Comes with 10 letter-quality fonts. **\$199**; Color Option **\$45**; Tractor Option **\$15**

Epson Stylus 800 Ink Jet Printer

Great laser quality at an even greater value. Measuring only 17 inches by 10.5 inches, the Stylus 800 has seven different typefaces and prints an extra-quiet 150 characters per second at 360dpi. Parallel cable included. **\$289**

Epson ActionLaser 1500 Laser Printer

The ActionLaser delivers professional-quality printouts with crisp, sharp images, black blacks and smooth, "jag-free" lines. It also features a fast six-page per minute print speed, 14 resident fonts, 300 x 300dpi, and 1MB memory expandable to 5MB. Parallel cable included. **\$669**

TI microLaser™ Pro 600

This Texas Instruments laser printer redefines value in high-performance printing with 6MB RAM standard, a fast eight pages-per-minute print rate, 500-sheet capacity and true 600dpi quality.

With 23 PostScript® Fonts: **\$1,449**

With 65 PostScript Fonts: **\$1,629**



Lexmark 4039 10R

The printer for tomorrow's technology! Featuring a fast, RISC processor it switches between PostScript and PCL5 printer languages automatically and prints at a remarkable 10 pages per minute at true 600dpi. **\$1,399**

Easy Payment Options

We make it easy for you to buy a Gateway PC, too! We accept most major credits cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers.



You can also apply for our new Gateway 2000™ DuoLine™ MasterCard® Card, issued by Dial National Bank, which lets you make purchases from Gateway and anywhere else MasterCard is accepted by giving you two lines of credit — one for Gateway purchases and one for all other purchases. For Gateway purchases, the card has no annual fee and a low variable interest rate of just 12.9% APR. For other transactions, you get a variable interest rate of 13.9% APR and a low \$18 annual fee.*

*Cash advance fee is \$1 plus 2% of the amount of the cash advance, but not less than \$5 nor more than \$10. Financing is available on approved credit with the Gateway DuoLine MasterCard, issued by Dial National Bank, Des Moines, Iowa.



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Our '60s models are all Gateway 2000 employees and their children who relived the flower-power era for this ad.

INTEGRATED & VESA SYSTEMS

4SX-33/4DX-33

- Intel® 33MHz 486SX or DX CPU
- 4MB RAM
- 212MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" Diskette Drive
- 14" Color CrystalScan® 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard & MS Mouse
- MS-DOS® 6.2 & WFW™ 3.11
- MS Works for Windows™
- EPA Energy Star Compliant

4SX-33 - \$1295

4DX-33 - \$1495

4DX2-50/4DX2-66

- Intel 50 or 66MHz 486DX2 CPU
- 8MB RAM, 128KB Cache
- 212MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- 3.5" Diskette Drive
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- AnyKey® Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

4DX2-50 - \$1795

4DX2-66 - \$1995

4SX-33V

- Intel 33MHz 486SX CPU
- 4MB RAM
- 212MB 13ms IDE Hard Drive
- VLB™ Graphics with 1MB
- Local Bus IDE Interface
- 5.25" & 3.5" Combo Drive
- 14" Color CrystalScan® 1024NI
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- AnyKey® Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

\$1495

4DX2-50 FAMILY PC™

- Intel 50MHz 486DX2 CPU
- 8MB RAM, 128KB Cache
- 212MB 13ms IDE Hard Drive
- Local Bus Graphics with 1MB
- Double-Speed CD-ROM, 16-Bit Sound Card & Speakers
- 2400/9600 Data/Fax Modem
- 3.5" Diskette Drive
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard, MS Mouse & Joystick
- Choice of Family PC Software
- EPA Energy Star Compliant

\$1995

VESA & PCI SYSTEMS

4DX-33V/4DX2-50V

- Intel 33MHz 486DX or 50MHz DX2 CPU
- 8MB RAM, 128KB Cache
- 424MB 13ms IDE Hard Drive
- VLB Graphics with 1MB
- Local Bus IDE Interface
- 5.25" & 3.5" Combo Drive
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

4DX-33V - \$1975

4DX2-50V - \$1995

4DX2-66V BEST BUY

- Intel 66MHz 486DX2 CPU
- 8MB RAM, 128KB Cache
- 424MB 13ms IDE Hard Drive
- VLB Graphics with 1MB
- Double-Speed CD-ROM
- Local Bus IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

\$2295

P4D-66

- Intel 66MHz 486DX2 CPU
- 8MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

\$2495

4DX2-66V

- Intel 66MHz 486DX2 CPU
- 16MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- VLB Graphics with 2MB
- Double-Speed CD-ROM
- Local Bus IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software
- EPA Energy Star Compliant

\$2795

PENTIUM SYSTEMS

P5-60

- Intel 60MHz Pentium™ CPU
- 8MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- MS Works for Windows

\$2495

P5-60 BEST BUY

- Intel 60MHz Pentium CPU
- 8MB RAM, 256KB Cache
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

\$2795

P5-60

- Intel 60MHz Pentium CPU
- 16MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 3.5" Diskette Drive
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

\$3295

P5-66

- Intel 66MHz Pentium CPU
- 16MB RAM, 256KB Cache
- 540MB 13ms IDE Hard Drive
- PCI Local Bus Graphics with 2MB
- Double-Speed CD-ROM
- PCI Fast IDE Interface
- 16-Bit Sound Card & Speakers
- 3.5" Diskette Drive
- 17" Color CrystalScan 1776LE
- Tower Case, 300W Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- AnyKey Keyboard & MS Mouse
- MS-DOS 6.2 & WFW 3.11
- Choice of Application Software

\$3995



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Networking

A PC WORLD MONTHLY SECTION ON GETTING THE MOST FROM YOUR NETWORK

What Your Net Manager Would Like You to Know

You don't know me, but you probably know and work with someone just like me. I'm a network manager, and if we work together smoothly, it can pay off big-time in trouble-free services and added resources for you and your group.

My work is demanding, and long hours

nology that seems doomed to obsolescence? The only way I can make these decisions intelligently is with your feedback.

I also must avoid another, more personal type of obsolescence. I need to continually study and research in my sparse spare time to keep my knowledge level up to date.

Many of the users on our network know more about particular software packages than I do, but I have a good excuse. While they are busy learning about Microsoft Excel 5.0, I'm boning up on more network-specific products—such as NetWare 4.01.

It's easy to become so immersed in the technology that I forget the one crucial point that influences everything I do: When I network computers, I am really networking people. If my network does not meet the business needs of the people it connects, it has failed—

even if it is technically perfect. There is only one way to make sure my network and the benefits it provides hit the target. I need to talk with folks like you.

Can We Talk? Six Tips

If you're not talking regularly with your network manager, you should be. Keep the following points in mind:

1 I need your advice and observations, whether I ask for them or not.

The best way to start a dialogue with your



WELCOME NETWORK USERS!

If you manage employees who work on networked PCs, you know that some of your most puzzling technical questions and thorniest budget decisions are about the network.

Networks offer enormous benefits, but everyone struggles with applications that don't always run right, or resources that aren't what or where you expect. You may even find yourself signing off on products you don't really understand.

PC World Networking Edition will help you deal with the promises and perils of networked life, providing tutorials, tips, product reviews, case studies, and other practical information. Welcome, and let us know what you'd like to see!

—Eric Bender, Executive Editor

INSIDE NETWORKING

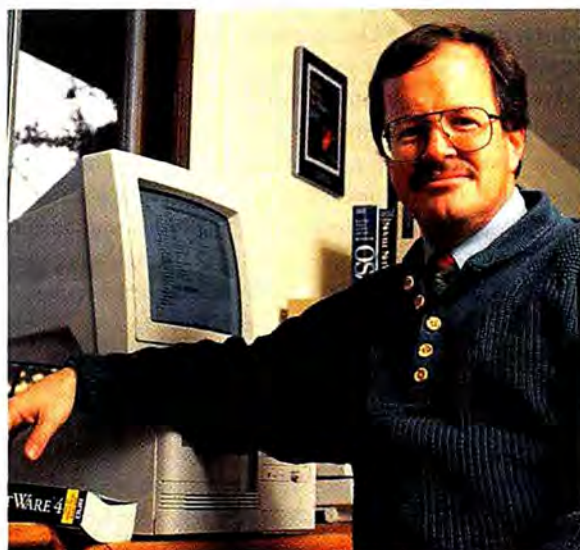
81 / Product of the Month

FaxWorks Pro LAN Offers Convenient Net Faxing

82 / New in Networking

GoldMine 2.5 for Windows, OnTime Enterprise for Novell NetWare

Contact *PC World Networking Edition* at 77 Franklin St., Boston, MA 02110; 617/482-8470, 617/426-0235 (fax); 71154,443 on CompuServe.



SAVE YOURSELF HEADACHES BY TALKING EARLY AND OFTEN with your local network manager, advises Bill Lawrence.

are the norm. So are the job's contrasts: One moment I'm crawling under a desk to locate the cause of a failed network connection, and the next I'm standing in front of a committee of senior managers explaining why I want to recable headquarters.

Rapid technology changes present me with a steady parade of tough decisions. When is it best to update a particular aspect of the network, and when best to forgo a change for the sake of stability or to save money? And when is it time to change direction completely and abandon a tech-

network manager is to provide feedback about the network's features and performance. Does the network provide the right mix of software to meet your work group's business needs? Is network performance adequate? Are shared resources, such as printers, ample and strategically located?

A network manager I know relies on a group of particularly astute users on his network to provide an early warning system. These users report any degradation in network performance or stability and also serve as the network manager's eyes and ears in the user community, advising him of user reactions to the various services provided by the network.

2 Do I hear from you only when the network is down, when neither of us is in the best of moods?

The worst time to talk with your network manager is in the heat of a serious network problem. Calling to report that the network is down and to inquire when it might return to service is one thing; calling to vent a lengthy complaint about how you can't get your job done and threatening to escalate the matter to the highest levels of company management is quite another. Tying up the network manager on the phone to listen to your complaint means he or she is not free to resolve the problem.

Do your best to keep a cool head, and trust that your network manager will do his or her best to fix the problem as quickly as possible. Every network manager I know is concerned to the point of obsession with providing good service. One network manager sums up his policy this way: "When my network breaks, I don't go home until it's fixed."

3 When making decisions, make me your partner sooner rather than later.

Consider this cautionary tale: A technically savvy manager needed to provide a custom database application for his department. So he hired a consultant whose credentials looked impressive, and in no time the application was built. The new program worked just fine until a department member located in another building tried to run it. The system crashed mysteriously, and the crash repeated itself whenever users in different buildings tried to use the application at the same time.

The network manager was finally called in. He discovered that the database application was built with a software tool that employed an unusual communications protocol to manage record-locking among workstations. The routers that linked the networks in each building were not

equipped to transfer this protocol. A little consultation up front could have headed off this sort of costly incompatibility.

If your network manager is like me, he or she will be honored to participate in your technology selection process. I remind my clients to weigh in these factors:

- * Does the new technology you are considering fit well with the existing workstation and network environment? Some incompatibilities are obvious—a program that requires UNIX/Motif is a misfit if your organization's PCs run DOS and Windows—but more subtle incompatibilities are easy to miss. A program that prints only to PostScript printers is a poor choice if none of the networked printers in your

It's easy to become so immersed in the technology that I forget one point that influences everything I do: When I network computers, I am really networking people.

company are PostScript-aware.

- * Does the new technology match the in-house expertise of your company's computing professionals? If you are comparing two document-management systems, and one uses a proprietary database to index the documents while another uses a common database manager for which you already have trained database administrators, then the latter product is clearly a better choice, all other factors being equal.

A Day in the Life of a Network Manager

7:30 a.m. to 9 a.m. As usual, start by checking servers, network segments, and other devices that have been unattended overnight and confirming that last evening's backups were successful. Today one of the disk volumes on the accounting server is full. I notify the computing manager in accounting. She discovers that an overnight report had run amok.

9 a.m. to 10 a.m. Meet with document imaging project team to hammer out server disk space requirements. Bulk scanning of documents starts in 2½ months. Commit to providing 5 gigabytes of storage within the next 60 days.

10 a.m. to 11:30 a.m. Vendor demonstrates a disk array featuring special error-recovery features and "hot-swappable" disks. Array looks like a good candidate for

disk storage required by document imaging project. Vendor reps offer evaluation unit. Promise to get back to them.

11:30 a.m. to 12 noon. Grab a quick lunch with my boss in the company cafeteria. We discuss the disk array, the document imaging project, and the budget. He promises to okay the requisition for the evaluation system.

12 noon to 3 p.m. Retreat to the server room to complete the installation of a new optical jukebox. Interrupted by a report of sluggish performance on the engineering department's CAD system. I run some tests that show that the network and CAD server are normal. User says the problem occurs when he sends a drawing to the plotter. Check his workstation and find that his Windows printer configuration is

incorrect. Fix that—everything is fine.

4 p.m. to 4:30 p.m. Prepare requisition for the disk array and also print a copy of my budget worksheet.

4:30 p.m. to 4:45 p.m. Meet with boss and get his signature on the disk array requisition.

4:45 p.m. to 5:30 p.m. Give the network a final stability and performance check and launch the night's backup tapes.

5:30 p.m. to 6:30 p.m. It's the night for the NetWare Users' Group meeting, so grab a fast-food dinner and head over to the meeting.

6:30 p.m. to 8 p.m. The NetWare Users' Group focuses on upgrading to NetWare 4.x, a subject that prompts both enthusiasm and dread.

8:30 p.m. Arrive home (at last).

Product of the Month

FaxWorks Pro LAN Offers Convenient Net Faxing



* Does the new technology duplicate something you already have? If you manage the facilities group and want a full-featured CAD system to draw office layouts, check to see if another group (such as the engineering or design department) already has installed a full-featured CAD system. You may save money by adding your purchase to their existing software license, and you will also receive the benefit of their expertise and experience as you learn to use the CAD program.

4 Forgive me if I'm hardheaded about my technical standards. There are usually good reasons.

A client recently asked how much it would cost to connect a new type of workstation to our network. I calculated the cost in detail and came up with a figure that was several times the cost of the workstation itself. He didn't like my answer and probed me for the details. The line items on my cost calculation included costs for:

- * Placing a different kind of port in our network hub.

- * Licensing a new communications protocol for our network routers and servers.

- * Licensing support for a new file system on a mix of servers.

- * Retrofitting our backup software to support the file system for his workstation.

He wisely decided not to go ahead.

Sometimes the cost of going in a nonstandard direction is not so obvious up front. One company standardized on a particular word processor and put considerable effort into building standard libraries of fonts, macros, and printer definitions that enabled employees to produce documents that could be shared companywide. When the word processor vendor was slow in releasing a Windows version, the legal department decided to switch to a competing product. The move proved costly: A group of typists trained in both word processors now must convert documents being routed into and out of the legal department.

5 Support my efforts to be proactive.

"Let it break." I once received this strange order from my boss. We had campaigned unsuccessfully to get the authority to automatically delete old messages from our E-mail system. The message file was steadily increasing in size, and in a few months it would grow to exceed our server's disk space. Requests for voluntary cooperation

There's a reason why just about every modem that now ships comes with faxing capabilities: Faxing directly from your PC makes sense. You save time sending faxes. And when you're on the receiving end, you get optimal-quality faxes that can be printed on normal paper or stored electronically.

Sharing fax resources over a network makes even more sense—and that's the purpose of SofNet's FaxWorks Pro LAN. Designed for small- to medium-size networks, FaxWorks Pro LAN offers quick and easy faxing to Windows or DOS users. And you don't have to monopolize a PC with the server software; just pick a Windows machine, and the Pro LAN server software runs in the background.

machines, which are still handier for paper documents. But if you have a scanner on your system, you can scan in paper documents as TIFF files through Pro LAN, then fax them to recipients. Pro LAN supports all TWAIN-compatible scanners, as well as the Complete Page Scanner, the Fujitsu with Laser Master Card, the Hewlett-Packard ScanJet Plus, and the Microtek MS-2.

Received faxes arrive at the server, and the fax administrator (or anyone else using the server machine) can route them to the addressee.

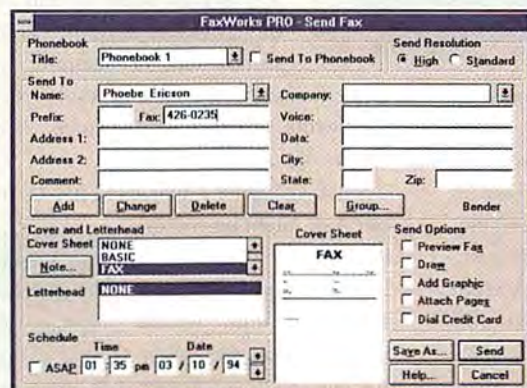
Pro LAN includes a FaxTracker that lets you monitor and manipulate the faxes you send from your PC, as well as save and retrieve the faxes you receive.

The package also lets you easily annotate faxes and automatically forward them to another location, or run them through a text-recognition module and export text to Ami Pro, Excel, 1-2-3, ASCII, or Windows' Clipboard. The administrator's super-Tracker monitors the activities of all faxing users.

The package comes with ten customizable cover-sheet formats and a designer that lets you create your own.

A 2-user starter kit lists for \$199, a 10-user version costs \$599, and a 25-user version is \$999. Registered users of SofNet fax products and competitive products can upgrade to FaxWorks Pro LAN for as little as \$79. SofNet offers FaxWorks Pro Server for Novell networks. The server portion of FaxWorks Pro LAN requires a Class 1, Class 2, or CAS-compatible modem and 71K of conventional or EMS memory. The package works with NetWare, NetWare Lite, LANtastic, Windows for Workgroups, and other popular networks.

—Andrea Powers



SENDING FAXES IS SIMPLE WITH FAXWORKS: You "print" the fax with this straightforward dialog box.

Before you begin your installation, designate an administrator to add users and monitor faxes. Installation itself is simple. You don't need the manual to get Pro LAN up and running on the server PC, but be sure to consult it before installing the user software. After you complete the installation, you'll find 'FX-WORKS on LAN' added to your list of Installed Printers. You can send faxes from any PC and receive faxes on the server PC.

To send a fax from another application, select *FX-WORKS* as the target printer, then print the document. FaxWorks presents straightforward menus to help you get the job done.

Most fax-modem installations supplement rather than replace existing fax

FaxWorks Pro LAN

SofNet; 800/329-9677, 404/984-8088, 404/984-9956 (fax)

Reader service no. 750

New in Networking

GoldMine 2.5 for Windows

GoldMine 2.5 for Windows offers an integrated system for handling client management and internal communications tasks throughout an organization.



GOLDMINE 2.5 PROVIDES CONTACT MANAGEMENT plus group scheduling for network and distributed users.

The package integrates contact management, group scheduling, E-mail, sales automation, task delegation, and customer database functions. GoldMine holds detailed contact information in tabbed file folders and can show multiple contacts, activities, and calendar displays on screen simultaneously. The package also features remote data merging, user-definable screens and fields, and easy hooks to external word processors. GoldMine 2.5 for Windows lists for \$895 for a five-user network pack from Elan Software (310/454-6800).

Reader service no. 751

OnTime Enterprise for NetWare

OnTime Enterprise for Novell NetWare claims to be the first real-time, enterprisewide group-scheduling package integrated with NetWare. Users scheduling a meeting receive up-to-date calendars for potential attendees anywhere in the enterprise; all attendees are immediately notified of meetings, and meeting originators are immediately notified of RSVPs. The package supports both DOS and Windows clients and works with leading mail packages. Costs start at \$5600 for 100 users for OnTime Enterprise, offered by Campbell Services (313/559-5955).

Reader service no. 752

had gone largely unheeded. "Let the disk fill, and let the system break," he said sadly. "Then people will be ready to listen."

No network manager should have to resort to this kind of brinkmanship. Instead, he or she should be empowered to manage the network in the same way a captain navigates a cruise ship. No sea captain runs a ship aground to justify the need to repair the ship's navigational system.

When your net manager predicts trouble ahead, believe it.

6 Help me manage change wisely and efficiently.

Two kinds of people are connected to networks: those who want to use the latest and greatest of everything and those who hate change. As one net manager put it, "My users are happy as long as nothing ever changes or stays the same."

Ironically, network managers themselves seem to fall into these two camps. Some find the stimulation of learning and implementing new things almost intoxicating, while others regard change as the enemy of net stability.

Since changing a major feature of your network might be controversial, it is important to lay the groundwork for a successful shift. Astute network managers follow the same steps as software vendors in paving the way for a new software release.

First, test beta versions of the software among sophisticated users. Those with an insatiable appetite for the latest and greatest are excellent beta test candidates.

Second, unleash a publicity barrage. The press releases, briefings, and demos employed by software vendors each have in-house equivalents. Your net manager can send a companywide E-mail message describing the upcoming change and then hold a series of departmental meetings to

discuss and demonstrate the major new features the change will provide.

Third, software publishers cushion the changes entailed in a new release by providing tutorials, training videos, conversion utilities, and other tools to help the upgrader. A wise network manager makes similar accommodations for those who are shifting somewhat unwillingly to something new.

If you're not getting this service from your network manager, talk with him or her about receiving more help. In general, your network manager should be willing to talk with you. If you know of shortcomings with your network and have suggestions for making it better, your ideas will more than likely receive an enthusiastic hearing. In some cases, your horizons may broaden as you hear good reasons why a particular idea of yours cannot be implemented. If you are one of the fortunate few whose network is already everything you want it to be, meet with your network manager anyway to deliver a well-deserved pat on the back.

—Bill Lawrence

Bill Lawrence is part of a team that manages a 3000-workstation network for a major utility. He also is author of Using Novell NetWare 4 and Using Novell NetWare, both from Que Corporation.

When Bad Things Happen to Good Networks

When network troubles occur, you can help the net manager fix them quickly by collecting the following data:

- Write down error messages verbatim.
- Be prepared to recount exactly what you were doing when the problem occurred. If possible, see if repeating the same steps causes the same problem.
- How widespread is the problem? Is it limited to your PC or to the PCs in your work group, or has it spread to your entire floor or building?
- Has the problem occurred before, or were there any warnings (such as decreasing performance)?

What do you do if your network is down, your net manager is out of reach, and you didn't plan ahead? If you're sufficiently desperate, you *might* be able to safely shut down and restart a device that doesn't store data—such as a router or gateway. But you're on thin ice if you're dealing with a device that stores files or performs transactions, such as a file server. If you turn off the device while files or transactions are stored in memory and not yet committed to disk, you could corrupt the data. If you take the chance, be prepared to take the consequences.

When the crisis has passed, review with your network manager how to handle things more elegantly next time.

Ambra, Insight Offer Pentiums for Less

Mail-order vendors, because of their low overhead, frequently offer the newest technology at the lowest prices. Take the new Pentium systems from Insight Direct and IBM's Ambra Computer, for example. The products feature 60-MHz Pentium processors, PCI local buses, and other high-end goodies at prices that are on the level of 66-MHz 486DX2 systems.

But the similarity ends there. Pentium systems can perform up to 50 percent faster than the average 66-MHz 486DX2-based system, according to the PC World Test Center. Notably, the \$3599 Insight system performed well above average for a Pentium-powered PC. For more budget-constrained buyers, Ambra offers a similar but slower system for \$3219 and a more basic configuration for \$2559—one of the lowest prices we've seen for a Pentium. So if you're in the market for a blazingly fast Windows system, an NT or OS/2 workstation, or

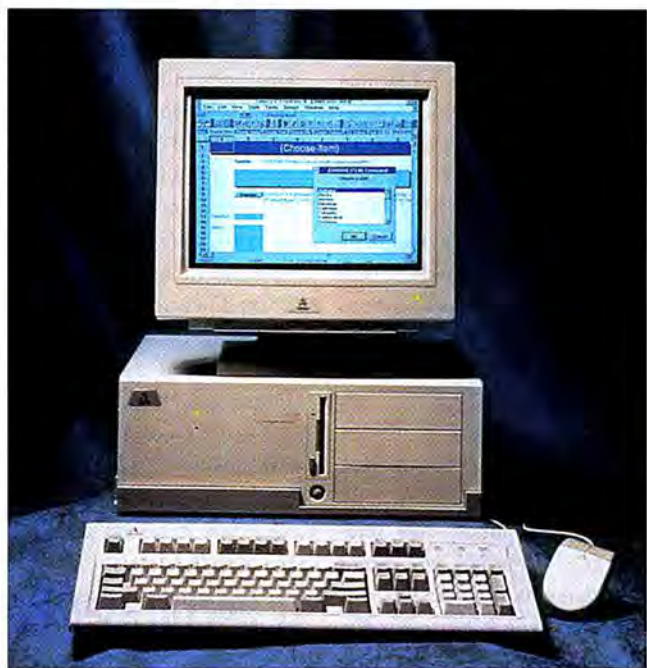
even a network server, these Pentium systems are worth your consideration.

Insight PCI P60 CD

The Insight PCI P60 CD is a little like a 5-year-old who doesn't know what he wants to be when he grows up. On one hand, the product is very expandable, so it could be a network server. But it also offers enough graphics power to function as a high-end desktop. Either way, there's little uncertainty when it comes to performance: This system is fast. The Insight PCI P60 CD ranked in the top 25 percent of all Pentiums tested in our Microsoft Excel and Word for Windows benchmarks, and in the top 50 percent in our Paradox and Freelance tests.

The \$3599 standard configuration features 16MB of RAM, a double-speed CD ROM drive, a 540MB hard drive, and 256K of secondary cache. Insight includes an ATI PCI local bus Windows accelerator with 1MB of VRAM expandable to 2MB. One feature that may have contributed to the system's superior performance is the 32-bit PCI local bus adapter for the hard drive. Systems using a sluggish 16-bit ISA adapter, as the Ambra does, can have slower disk performance.

The Insight PCI P60 CD is expandable on several fronts. The vertical case has ten open bays, allowing plenty of room for peripherals. The four available slots accept either four ISA cards or three ISA cards and one PCI card. (As with many PCI systems, the P60 CD's motherboard design forces one ISA



THE AMBRA DP60/PCI offers a Pentium processor and local bus performance at mail-order prices.

connector and one PCI connector to share a slot.)

The product's 16MB of RAM, composed of four 72-pin 4MB SIMMs, can be expanded to 128MB. The 72-pin SIMMs make upgrading easier because, unlike with their 30-pin brethren, you can mix SIMMs of various sizes in the same system (for instance, 1MB and 4MB SIMMs). One caveat for users who want on-site support: Insight does not offer this option in its standard one-year parts and labor warranty.

Ambra DP60/PCI

This system offers high-end graphics and a low price, but only middling performance. The \$3219 configuration includes 8MB of RAM, 256K of secondary cache, a double-speed CD ROM drive, a 440MB hard drive, and a Dia-

mond Viper PCI video accelerator with 2MB of VRAM.

We tested a DP60/PCI with 16MB of RAM. Priced at \$3579, this unit ran in the middle to top of the Pentium pack in the Excel and Freelance tests but scored in the lower half running Word for Windows and Paradox.

The DP60/PCI offers adequate expandability for a desktop system. With its IDE adapter integrated into the motherboard to free up a slot, this machine accepts either five ISA cards and one PCI card or four ISA cards and two PCI cards. It also includes four free drive bays. The system, which uses 72-pin SIMMs, accepts up to 128MB of RAM.

Ambra's \$2559 entry-level Windows configuration comes with a 340MB hard drive but no CD ROM drive.

—Randy Ross

Insight PCI P60 CD

One of the fastest Pentium systems around.

Insight Direct Inc.

800/998-8011

List price: \$3599

Reader service no. 631

Ambra DP60/PCI

Low price and moderate performance for a Pentium PC with a PCI local bus.

Ambra Computer Corp.

800/252-6272

List price: \$2559 to \$3579

Reader service no. 632

WinWriter 600 Speeds Windows Printing

Aimed at Windows power users, Lexmark's WinWriter 600 offers speed, a low price, and an innovative design. This printer features 600-dot-per-inch (dpi) resolution and an 8-page-per-minute (ppm) engine and is street priced at around \$1250 or less, a lower street price than that of its main competitor, the Hewlett-Packard LaserJet 4, according to Lexmark.

The WinWriter is among the first devices to incorporate Microsoft's At Work architecture. At Work provides a common interface for PCs, printers, copiers, fax machines, and telephones. Currently you won't find many At Work devices, but analysts expect more by the end of the year.

The printer features Motorola's 16-MHz 68000 processor and 2MB of RAM, as well as Microsoft's Windows Printing System software (the printer component of At Work). The WinWriter can send you audio or visual messages on the status of print jobs or problems; for instance, you may get an "Out of paper" audio message.

According to Lexmark, the WinWriter offers quicker Windows printing than the LaserJet 4. Since the printer shares processing chores with the PC, it prints complex documents slightly faster—even though its

Motorola 68000 processor is less powerful than the LaserJet's RISC chip.

To test this claim, I used a WinWriter and a LaserJet 4, in conjunction with a 25-MHz 386 PC with 8MB of RAM, to print a Ventura Publisher newsletter page that included a small photo and drawing. Print quality was nearly identical, but the Lexmark was about 19 percent faster than the HP. The WinWriter printed the page in 1 minute and 25 seconds, while the LaserJet took 1 minute and 45 seconds.

—Laurianne McLaughlin



LEXMARK'S NEW WINWRITER 600 features 600-dpi resolution, an 8-ppm engine, and a street price of around \$1250 or less.

TI microLaser Pro 600 Takes On HP LaserJet 4

How can you tell the difference between competing 600-dpi laser printers? The difference between the powerful new Texas Instruments microLaser Pro 600 and the lesser-equipped Hewlett-Packard LaserJet 4 is \$40 to \$240—in TI's favor.

Powered by a 20-MHz RISC processor and an 8-ppm engine, the microLaser Pro supports PostScript Level 2 and PCL 5 and can automatically switch between the two page description languages to accommodate most print jobs. In addition, the printer can switch on the fly between its parallel and AppleTalk serial interfaces—useful for mixed networks of PCs and Macintoshes.

A lot of what is standard on the microLaser Pro is an add-on on the LaserJet 4. For instance, the microLaser comes with 6MB of RAM expandable to 22MB; the LaserJet 4 has only 2MB. You can load 500 pages

into the microLaser's dual paper trays; the LaserJet 4's two trays hold 350 sheets.

However, the microLaser does have its share of options, including a SCSI or serial interface, ethernet or token ring network adapter, and a PowerStep processor upgrade—which I would highly recommend if you plan to print a lot of sophisticated graphics. Even though the microLaser is a powerful printer in its standard configuration, it took me several hours to print, revise, and twice reprint a Harvard Graphics presentation of medium complexity.

The microLaser Pro is warranted for 12 months or 60,000 pages—Chrysler should be so generous with its mileage. While the printer consumes some 700 watts at maximum power, it features an energy-saving mode that greatly reduces power consumption after a configurable period of inactivity. A liquid crystal display allows you

to interact with the printer in a variety of languages. The 32-pound microLaser Pro is relatively small: 13 inches wide, 14.4 inches deep, and 12.8 inches high.

The \$1599 microLaser Pro PS23 includes 23 Adobe Type 1 PostScript fonts, while the \$1799 PS65 model boasts 65 PostScript fonts. Both models also include 8 scalable Intellifont-type fonts and 14 HP III bit-mapped fonts.

—Joe Abernathy

WinWriter 600

This Microsoft At Work printer offers 600-dpi resolution and 8-ppm speed.

Lexmark Int'l

606/232-2000

List price: \$1399

Reader service no. 633

Texas Instruments microLaser Pro 600

A 600-dpi printer for Macintosh and PC networks that's priced competitively with the HP LaserJet 4.

Texas Instruments

800/848-3927

List price: PS23 \$1599, PS65 \$1799

Reader service no. 634

Lowest Prices on the SX, DX & New DX2-50!

Rave Reviews! Read what the experts say:



"Scoring high in overall value and design, the Micro Electronics WinBook gives you a lot for your money, including an outstanding integral trackball."

PC MAGAZINE, Guide to Portable Computing, 8/93



"If you're a Windows user on a budget, or just have a bad case of Mac envy...you should take a look at the WinBook. It's a machine that can hold its own with more expensive, less thoughtfully designed systems from other direct vendors."

COMPUTER SHOPPER, This Powerbook Twin Acts Like a PC, 9/93



"The WinBook is a great example of what a Windows notebook should be...fast, easy-to-use and a miser on battery life...It's also inexpensive: nearly 50% less than some comparable notebooks."

WINDOWS MAGAZINE, Transcontinental Portable, 9/93

The WinBook Intel486 SX-25, DX-33 & DX2-50 SL Enhanced Features



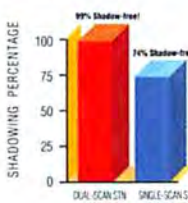
Ergonomically engineered & designed by award-winning Palo Alto Design

The WinBook's unique ergonomic features include a sloping wrist rest and keyboard with full-size keys, plus a centered, dual-button trackball—allowing you to work in total comfort away from your desk.

Clear, sharp color display gives you near-active matrix quality at a passive matrix price!

Images are sharper and clearer with less cursor loss. And the WinBook's advanced dual-scan color display gives you 99% shadow-free performance compared to other single-scan passive matrix displays. You get a brighter, crisper, wider angle of view with an 18:1 contrast ratio—compared to

13:1 with previous passive matrix technology.



Longer battery life

The WinBook features NiMH 2200 MA batteries with gold-plated contacts, allowing it

to run much longer than units with traditional NiCAD batteries—and there's no memory effect!



The WinBook offers you more features for less!

- 9600 baud send/4800 baud receive fax/2400 baud modem
- Industry-standard type II PCMCIA slot
- 512K video RAM
- Fast-acting LCD screen
- Built-in centered dual-button trackball

Docking station gives you desktop power!

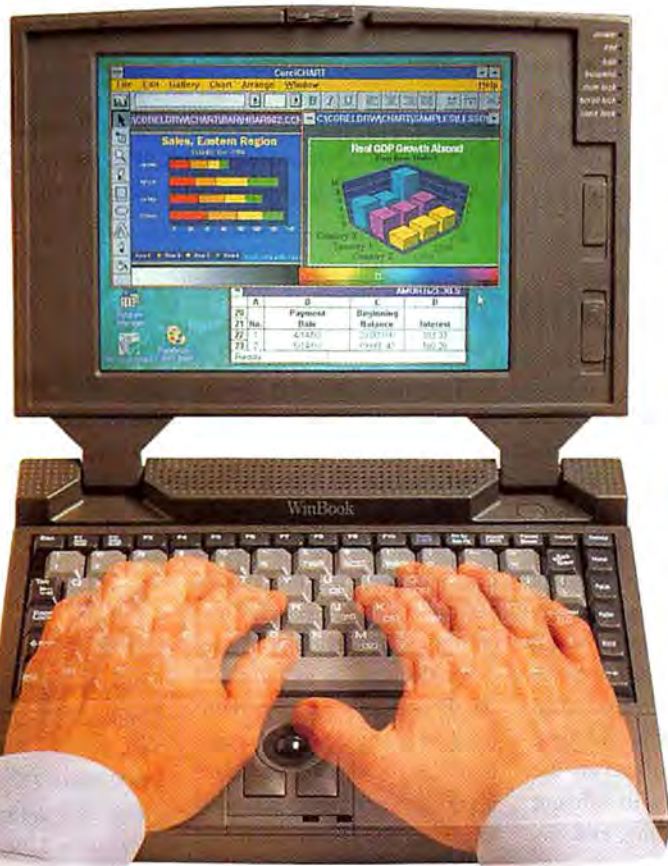
Two expansion slots and drive bays let you add peripherals such as monitors, hard drives, CD ROMs, I/O cards or an extended keyboard. Includes parallel, serial, I/S/2 mouse, external keyboard and VGA ports. And it's just \$399!



Mouse/keyboard, parallel, serial and VGA ports plus PCMCIA expansion



Upgradable processor!



WinBook™

Micro Electronics
a division of MEI/Micro Center, Inc.



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4MB RAM/200MB HDD

- SL Enhanced Intel 486SX 25MHz

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SX & DX Specifications

- Size/Weight: 11" x 8 1/4" x 1 3/4"
- SX monochrome, 5.4 lbs. with battery
- SX and DX dual-scan color, 5.5 lbs. with battery
- Pointing Device:
 - Nine-Axis dual-action, Microsoft-compatible trackball

Battery

- SX-25: up to 3 hours with power management; over 5 hours with auxiliary power system (less 30 minutes for color)
- DX-33: over 2 hours with power management; up to 5 hours with auxiliary power system
- NiMH (no memory effect)
- World-wide auto-sensing AC adapter

Processor and Memory

- SX: enhanced Intel486 SX 25MHz; DX: 33MHz or DX2 50MHz CPU
- 4MB-16MB (upgradable to 32MB)
- Post-Processed Random Access Memory
- 1K internal cache
- Drives:
 - 1 built-in 1.44MB 5 1/4" floppy drive
 - Internal 200MB (16MB) hard drive
- Software:
 - Comes loaded with MS-DOS and

Microsoft Windows

- Display:
 - SX monochrome: super-heralded 64 gray-scale 12" LCD and 1024 x 768 for external monitor
 - SX and DX color: dual-scan 12" color display 9.5" LCD and 1024 x 768 for external monitor
 - 512K video RAM
 - Adaptive contrast and brightness
 - Visible LED indicator on cover/lid

Keyboard

- Full-function keyboard with 85 keys and 4 inverted T-cursor controls; 30mm keycap spacing
- Modem:
 - Fax 9600 baud send/4800 baud receive/2400 baud modem
- I/O Ports:
 - PS/2 mouse interface/AT keyboard interface
 - PCMCIA type II slot

- Serial: 9-pin connector
- Parallel: 25-pin connector for CRT
- Video: 15-pin connector for CRT
- 150-pin docking station
- Auxiliary battery port
- Options:
 - Docking station
 - Car charger
 - 340-MHz hard drive
 - EME 16MB and 32MB RAM (upgradable)

Hit the Road With IntelliMedia's Notebook/Projection Panel

Recent start-up IntelliMedia has an innovative solution to the problem of taking presentations on the road. The company's Digital Presentation System (DPS) combines a full-fledged notebook computer and LCD projection panel in one lightweight unit.

Both DPS models are based on a 25-MHz 486SLC CPU with 4MB of RAM expandable

to 16MB and a 120MB hard drive expandable to 500MB. They also feature a 1.44MB floppy drive, PS/2-compatible mouse and keyboard ports, standard parallel and serial ports, Windows 3.1, and DOS 5.0—in other words, everything you'd expect from a standard midrange notebook except for a built-in keyboard or pointer.

What's really different about these notebooks is their screens. Instead of standard notebook displays, the DPS's have built-in active-matrix LCD projection panels (8.4 inches diagonally on the DPS-I, 10.4 inches on the DPS-II). You can take a DPS to a meeting, lay it on an overhead projector, and project your presentation onto the nearest screen or wall. The only problem: You can't adjust the panel's position in the same way

you can a normal notebook screen. To use the DPS as a conventional notebook, you'll need to prop it up at an angle to see the display clearly.

Each DPS unit comes preloaded with a Windows applet that, at start-up, searches the

floppy drive for presentation files from Microsoft PowerPoint, Freelance Graphics, and Harvard Graphics. If it finds one, it first launches the appropriate application and then starts the presentation.

—Dan Miller

DPS-I, DPS-II

An all-in-one notebook computer and LCD projection panel.

IntelliMedia Corp.

800/706-0077

List price: DPS-I \$5995, DPS-II \$6995; digital options card \$995

Reader service no. 635



INTELLIMEDIA'S INNOVATIVE DIGITAL PRESENTATION SYSTEM combines a full-fledged notebook PC and an LCD projection panel.

Logitech and Plustek Put New Twists on Scanning

If you can't spare the desk space for a flatbed scanner but want more versatility than a hand-held can offer, check out a sheetfed scanner from Logitech or Plustek.

Logitech's ScanMan PowerPage is a 400-dpi gray-scale scanner that works as either a sheetfed or a hand-held unit. To convert the narrow rectangular scanner into a hand-held unit for scanning pages from books or other materials that won't fit through the feeder, simply remove the bottom panel. ScanMan PowerPage plugs directly into the parallel port and requires no board installation. The \$79 battery pack frees you from the AC adapter, allowing you to bring the unit along

on business trips.

Logitech bundles ScanMan PowerPage with its own Foto-Touch Color imaging software, Caere's OmniPage Direct Any-Font OCR software for Logitech, and Delrina's WinFax Lite fax software. The company buys the scanner from Nisca, which sells a similar unit with different software drivers (called the Niscan Page) for the same \$799 list price. However, the Nisca unit comes with different OCR, image editing, and fax software.

Plustek's Scanfx combines color scanning, faxing, and copying functions in a compact device measuring 5.5 by 9.6 inches. You simply set the appropriate mode on the unit's

LCD panel, hit the start button, and let the Scanfx do the rest. You can scan and fax color documents at 300 to 600 dpi, but you'll need a fax-modem to send faxes. And while the Scanfx's capability to send faxes at 300 dpi is unique, most fax machines and fax-modems can receive documents at only 200 dpi. Plustek offers free software to allow fax-modems to receive the higher-resolution faxes, but it's questionable whether many recipients will obtain and install the software needed to take advantage of this feature.

If you select the copy mode, the Scanfx scans an image and sends it directly to your printer. This eliminates the middle step of having to tell the software to

print the image you've just scanned. A ten-page automatic document feeder also ships with the unit.

—Anita Hamilton

Logitech ScanMan PowerPage, Plustek Scanfx

Two versatile scanners for under \$1000.

Logitech Inc.

800/231-7717, 510/795-8500

List price: \$799; battery pack \$79

Reader service no. 712

Plustek

800/685-8088

List price: \$899

Reader service no. 636

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Value**

AWESOME

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**486 DX-40 Vesa Local Bus,
Multimedia System**

For Office, Professional & Family Fun

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- 1.2MB or 1.44MB Floppy Disk Drive
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- Wave Table Digital Sound Card
- Stereo Mini Speakers
- Microphone, Cables & Adapters
- Desktop Case/200W Power Sup.
- 101 Enhanced Keyboard
- 14" Super VGA 1024x768 Res Monitor



\$ 1699



MPCTM
Multimedia PC

Multimedia Upgrade Kits

StudioPro

\$ 349

Media Vision 16 Bit Sound Card
NEC Double speed CD-ROM

StudioProXL

\$ 529

MR 16 Bit Digital WaveTable Card
Toshiba Double speed CD-ROM

StudioPro3

\$ 549

Media Vision 16 Bit Sound Card
NEC Triple speed CD-ROM

CD-ROM Kits

StudioPro

Internal
\$ 179

NEC Double speed SCSI CD-ROM (320ms)
SCSI Host Adapter

StudioProXL

\$ 399

Toshiba Double speed CD-ROM (200ms)
SCSI Host Adapter

StudioPro3

\$ 419

NEC Triple speed CD-ROM (195ms)
SCSI Host Adapter

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Windows Software for the Global Economy

American businesses are competing more and more in a global marketplace created by events ranging from the ratification of NAFTA to the acceptance of GATT. But even as nations work to break down

human intervention. In either case, a trained translator must supervise the translation process, because the accuracy—and the nuances—of the translated document can vary widely depending on the subject matter. To help users ensure that the translations are accurate, Power Translator can be set either to process entire documents without interruption or to prompt for input when it runs across ambiguities or conflicts.

Power Translator for Windows works with ASCII and TXT files and accepts data from most OCR software and scanners. The software comes in language-specific modules, each one containing the vocabulary, grammar, and idiomatic rules unique to that language. All the modules are bidirectional, so users can translate both to and from the target language. The built-in dictionary can expand

to hold commonly used words and phrases, making it particularly useful for handling technical text or boilerplate documents that share similar phrases. In addition, users can search the word and phrase dictionaries using Power Translator as a handy online dictionary. Each version of the product is \$299.

Power Japanese

Mastering a foreign language is no small task, but Power Japanese goes a long way toward easing the burden. This program leverages all the strengths of the PC, making liberal use of engaging sound and animation to teach users to write, speak, and read Japanese. More important, the program boasts excellent organization, realistic goals, and an impressive mastery of the nuances of Japanese language and culture. Having formally studied Japanese for two years, I'm wary of inflated promises from language training products. But this software quickly dispelled my doubts. Whether you want to run through the whole course, which is equivalent to about a

Power Translator for Windows

WINDOWS PC-based language translation promises to ease the burden of tapping markets abroad.

Globalink Inc.
703/273-5600,
703/273-3866 (fax)
List price: \$299

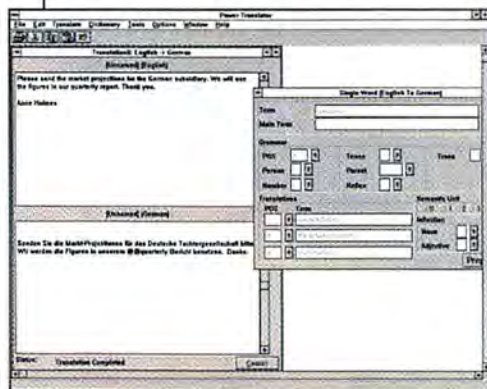
Reader service no. 629

Power Japanese 2.0

WINDOWS This language training software takes advantage of the PC's talents to help users master the basics of Japanese.

BayWare Inc.
415/312-0980,
415/578-1884 (fax)
List price: \$389

Reader service no. 630



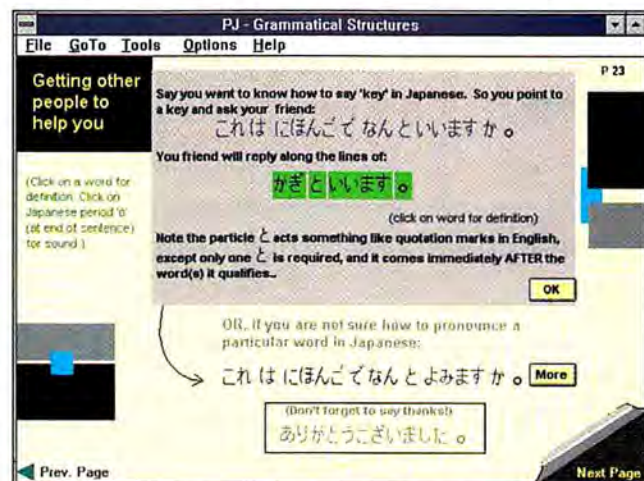
POWER TRANSLATOR FOR WINDOWS contains the vocabulary, grammar, and idiomatic rules unique to a language.

economic trade barriers, businesses have to struggle against a more intractable barrier—language.

Now PC-based software packages are providing valuable tools for overcoming this barrier. Globalink's Power Translator for Windows helps users translate documents between English and a choice of French, Spanish, and German. And for those seeking to master the business language of Asia, BayWare's Power Japanese 2.0 is an excellent alternative to traditional language courses.

Power Translator

Like any computer-based translation program, this product has its limitations. Power Translator excels at processing technical manuals, boilerplate documents, and revisions of previously translated files. However, business correspondence and other prose require extensive



POWER JAPANESE leverages all the strengths of the PC, including sound and animation, to teach you to write, speak, and read Japanese.

year-and-a-half of college-level training, or just pick up the basics, Power Japanese is an excellent product.

Power Japanese runs under Windows, is available on either CD ROM or 35 1/4-inch floppy disks (or 17 3/4-inch disks), and is broken into four sections that can be installed separately to save hard disk space. The program teaches through a host of exercises that make users work with the sounds, words, and phrases of Japanese. It incorporates sound and animation to help users learn to recognize, pronounce, and write the characters of Japanese's two syllabic alphabets, Hiragana and Katakana. In addition to the software, users receive a limited Japanese dictionary, an exercise book for learning both alphabets, and a set of flash cards.

—Michael Desmond

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Circle 105 on reader service card

Microsoft's Mobile Mouse Includes Custom Software

BallPoint Mouse 2.0

A new ergonomic design, lots of customization options, and other extras make notebook navigation a little easier.

Microsoft Corp.

800/426-9400

List price: \$125, software-only upgrade for current BallPoint Mouse users \$19.95, hardware upgrade \$50

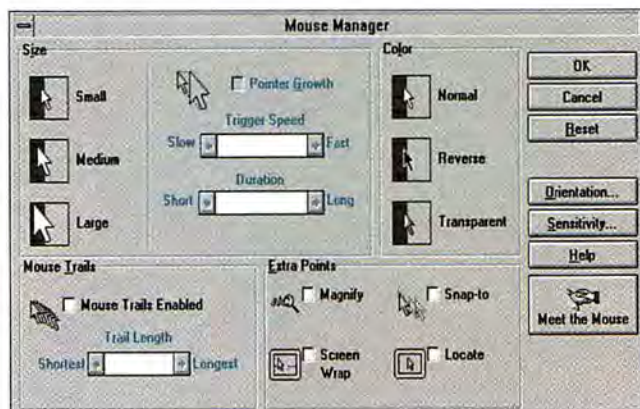
Reader service no. 757

If you spend time on the road, you'll want to take a look at the new Microsoft BallPoint Mouse 2.0. Its new design and enhanced software are ideal for computing on the go.

Microsoft has made several hardware changes to the BallPoint Mouse. Its large sculpted buttons fit the hand nicely and can be configured using the accompanying software. The mouse connects to a notebook's

mouse port, leaving the serial port free for peripherals. The clip included with the mouse attaches permanently to the side of your notebook keyboard, and the BallPoint Mouse clips on and off easily. Once the mouse is installed, the tilt can be adjusted to one of six different angles. All you have to do is press the buttons on either side and rotate the mouse until you find the spot that's most comfortable. The notebook can be closed after the BallPoint Mouse is installed.

To its credit, Microsoft devotes a fair amount of space in the documentation to discussing ergonomics and the importance of finding an angle that's right for you, as well as to making sure that even when you're on the road your setup is comfortable. The documentation even recommends taking regular breaks from typing and offers simple exercises that



REDUCE MOUSE MOVEMENTS with Mouse Manager's Snap-to feature and modify your cursor with the Transparent and Size functions. Mouse Trails makes it easier to spot your cursor on notebook screens.

users can try. The helpful advice is a welcome addition.

The new Microsoft Mouse software includes Mouse Manager, a customization interface that provides a variety of new features for tailoring mouse and cursor functions: The Magnify feature automatically enlarges hard-to-read areas up to 24 points or in a 6-inch box; the

Snap-to option automatically puts the pointer on the default option; the Locate option puts the cursor in the middle of the screen so you can find it easily; and using the new ClickLock feature in conjunction with a third button, you can drag without holding down a button the entire time.

—Roberta Furger

SpinRite 3.1 Supports Compressed Drives

The latest version of Gibson Research's hard disk diagnostic utility offers a variety of new features and enhancements. These include improved

detection of disk defects, floppy disk support, and the capability to work with hard disk compression software such as Stack-er, SuperStor, and MS-DOS's

DoubleSpace.

SpinRite version 3.1 works directly with the hard disk rather than the system's BIOS. This capability allows the program to detect a drive's surface defects more quickly and accurately, according to the company. In addition, the program's

new "drive fingerprinting" system allows it to start faster by maintaining a hidden verification file in the drive's root directory. This small, 571-byte file includes a summary of SpinRite's five prior diagnostic sessions, as well as user option settings from the most recent SpinRite session and other useful information.

Version 3.1's drive benchmarks include a new data throughput test that detects a hard drive's internal cache and measures the drive's buffered and unbuffered data transfer rates to gauge its performance.

By hitting the <Esc> key, you

SpinRite 3.1

Faster performance and compressed-drive support lead the list of new features for this disk diagnostic utility.

Gibson Research Corp.

714/362-8800,

714/362-8808 (fax)

List price: \$129, upgrade \$29

Reader service no. 758

can interrupt SpinRite's diagnostic or repair operations on any hard drive and resume them at a later time.

—Jeff Bertolucci



SPINRITE'S DynaStat Data Recovery system recovers data from damaged disk sectors.

Finally, Prodigy Does Windows—Sort Of

Prodigy for Windows

WINDOWS Photos and sound enhance this online service's interface.

Prodigy

800/776-3449

List price: software free for current members, otherwise \$4.95 (doesn't include cost of service)

Reader service no. 625

The first thing you'll notice about Prodigy for Windows is its striking resemblance to the DOS version. But don't despair. While Prodigy fails to implement Windows conventions as fully as the interfaces of other online services, such as CompuServe and America Online, the Windows version of this consumer-oriented service offers some unique and valuable features.

Color photos now accompany many news and sports stories—a feature that AOL and CompuServe lack. Prodigy's missing-children section includes photos of each child as well. However, your video card must be set for

256 colors to get realistic-looking images. While you can't copy the photos into another program, you can copy any Prodigy screen and it will be saved as a BMP file. Once the graphics are in the other program, you can scale them, much like clip art. One annoying drawback: Since Prodigy only gives you the option of copying the entire page, you'll need an image editing program to remove extraneous material such as advertisements at the bottom of the page.

A new text-handling feature is a mixed blessing. While Prodigy for Windows lets you copy text into other Windows programs, you can't manipulate the text directly from the screens you use to view stories and information, as you can with competing Windows online services.

To copy a news story into your Windows word processor, for example, you need to select Copy from the Edit menu or press <Ctrl>-C. A dialog box asks if you want to copy the entire story or just the page you're viewing. Once you've made your selection, editable

text appears in a scrolling window. Only then can you select the text you want and copy it into your word processor.

Other features make the service easy to use. You can now customize the tool bar at the bottom of the screen by assigning up to 14 buttons to a selection of standard commands or to your own macros. The cursor changes from an arrow to a hand when it's placed over active buttons, making it easier to find your selections. In addition, a hypertext search feature helps you navigate through the service.

Another feature helps reduce connect charges. After 5 min-

utes of inactivity, a window appears on screen. If you don't respond in 2 minutes, Prodigy automatically logs you off.

Like America Online for Windows, Prodigy offers some basic voice messages, including a "Hello" when you sign on the service and "Good-bye" when you log off. A small envelope appears in the bottom right-hand corner of the screen to notify you that you've received mail; a voice message tells you that you have mail as well.

To get the most from this product, you'll need a reasonably fast modem, say 9600 bps, especially for viewing photos.

—Anita Hamilton

OS/2 Without Windows

OS/2 for Windows sounds like another Windows application. Simply install, run, and enjoy, right? Wrong.

This \$149 operating system is OS/2 2.1 tweaked for Windows 3.1 users. Unlike OS/2 2.1 (\$249), this new product doesn't include a version of Windows, relying instead on your existing Windows code and setup. When properly configured, it provides Windows with true multitasking, faster performance on some tasks, and better crash resistance.

But no matter how it's packaged, OS/2 is still OS/2, which means that Windows users may find it tricky to install and learn. Moreover, you may need to upgrade your current Windows PC. To reap the benefits cited above, you'll want 20MB to 40MB of RAM.

Installing the 16 disks took about 45 minutes, and I had to

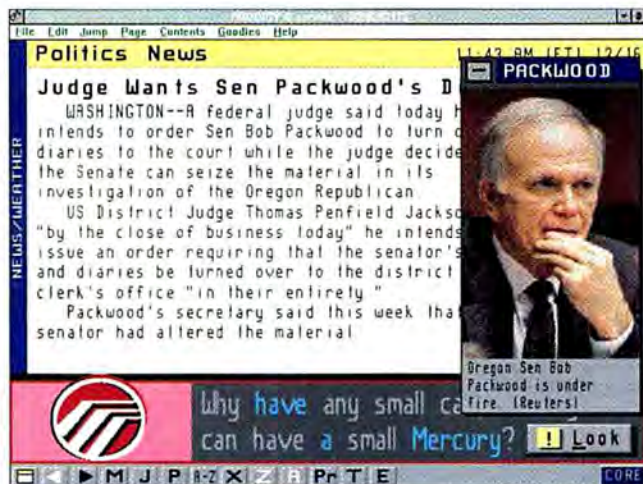
OS/2 for Windows

This lower-priced version of IBM's 32-bit operating system is powerful—but it's not for the faint of heart.

**IBM Personal Software Products Division
800/343-6672
List price: \$149**

do it twice to get it right. Learning to use the program was reminiscent of my first encounters with DOS after using a Mac: Basic navigation was a pain. For example, the mouse conventions differ from those of Windows. For optimal performance, you must adjust OS/2 settings for each Windows application. Worse still, the manual is too technical for the average Windows user, and the program lacks an uninstall feature.

—Randy Ross



PHOTOS IN PRODIGY FOR WINDOWS spice up news, sports, and people stories—but you're still stuck with ads on virtually every screen.

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separations.



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(other systems featured are not pictured)

PC Computing
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 - SpaceSaver Keyboard • Multi-Session, Double-Spin CD ROM Drive • Sound Blaster 16 Sound Card • Peavey Speakers • Microphone • MS-DOS 6.2/Mouse • Microsoft Windows for Workgroups 3.11** (or Windows 3.1)
- Order Code #5000446

Scan/US: Map Software for Marketing

A new Windows market analysis tool makes targeting customers, plotting retail growth, and planning direct-mail campaigns easier and more efficient. Scan/US combines a graphical interface with built-in demographic information to provide color-coded maps of your target customers' locations.

Traditional geographic information systems are designed for highly trained engineers who must analyze scientific data to plan projects—for instance, the location of a pipeline. These applications typically cost upwards of \$1000 and don't include demographic profiles—crucial for market analysis. Scan/US, however, costs \$395, can be used by PC novices, and is designed for business.

Say you want to open a video

store in Santa Monica. The program lets you run a competitive analysis based on data from your files and the bundled databases, including databases from the U.S. Census Bureau and other government agencies, to determine where your probability for success is highest. The analysis would help you determine the surrounding area's population density, where that population shops, and how far people are willing to drive to rent videos. This information helps you turn location-related data, often buried in your spreadsheets and databases, into intuitive pictures.

Scan/US ships with 300 variables but can work with more. You can create, for example, a ZIP code map, import a database containing your customers'

ZIP codes, and then see their median income broken down in colors: red for over \$100,000; yellow for \$25,000 to \$49,000; and brown for under \$25,000.

Another useful tool for evaluating retail potential is the MicroGrids feature. Similar to the lines on a topographical map, MicroGrids are superimposed grid lines that indicate population density. Grid lines appear close together in densely populated areas and farther apart in sparsely populated areas. You can navigate the entire United States or areas as small as five square blocks.

Add-ons for Scan/US include databases of U.S. business information, Bureau of Labor Statistics lifestyle and psychographic profiles, shopping centers, and retail potential. You can also buy

Scan/US 1.0

WINDOWS Scan/US lets you visualize your market share on color-coded maps.

Scan/US Inc.

310/820-1581

List price: \$395 until March 31, \$695 thereafter; add-ons \$75 to \$995

Reader service no. 628

more detailed census records, including information on the ages of homeowners by income, population trends, family structure, and the labor force. You can purchase files for block group, ZIP code, county, state, region, and country. Annual updates for most files are available through Scan/US.

—Caroline Jones

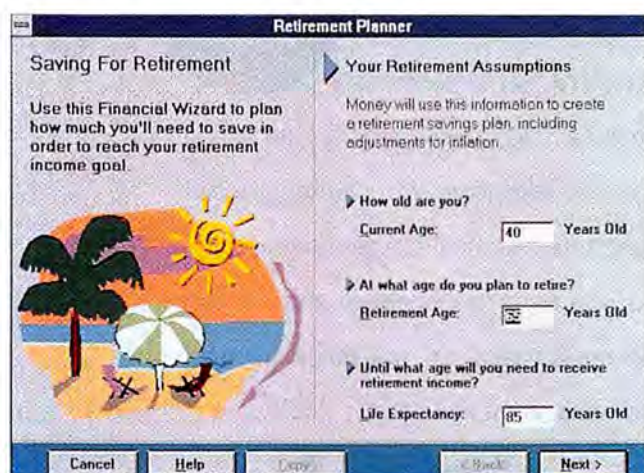
Financial Management and Electronic Banking From Your PC

Are you interested in using a personal finance package but turned off by the data entry typically associated with the software? Then Microsoft's \$34.95 Money 3.0 may be what you're looking for. The newly released upgrade supports a variety of online services, all of which are designed to make

tracking finances and recording monthly transactions easier.

Microsoft has teamed up with National Payment Clearinghouse to offer three types of online services: bill payment, investment information, and banking. Integrated electronic bill paying and investment information were musts for Money to catch up with feature-rich competitors like Quicken and Managing Your Money, longtime leaders in the personal finance category. But the electronic banking feature is a first in personal finance.

In this release, Microsoft has signed on three regional banks: U.S. Bank in the Pacific Northwest, Michigan National Bank, and First National Bank of Chicago. You'll be able to transfer



MONEY 3.0 can help you plan your retirement. It also supports online financial services to simplify your banking chores.

funds, obtain account balances, and get detailed information on all your transactions. As with ATM transactions, the banks will issue PINs (personal identi-

fication numbers) for each bank account holder. All they need now is to figure out a way to get the PC to spit out \$20 bills.

—Roberta Furger

Money 3.0

Microsoft catches up with the competition and brings electronic banking to the desktop.

Microsoft Corp.

800/426-9400

List price: \$34.95 until April 15, \$69.95 thereafter

Reader service no. 627

TouchStone's Nearsighted Technician Finds What's Ailing Your PC

TouchStone Software's latest Windows-based diagnostic program, CheckIt Pro: Analyst, is like a crafty computer-repair technician who's slightly nearsighted. It can analyze the makeup of any given DOS, Windows, or OS/2 system, but it doesn't see everything, and it sometimes makes mistakes.

Compared to its DOS-based cousin, CheckIt Pro: Deluxe, this program adds several useful tools while omitting virus checking and system burn-in features. You can now collect information about the hardware components and software configuration of remote systems by having users run an included applet called CHWDATA.

Another new feature lets you quickly compare the hardware and operating system differences of any two PCs, which can help you determine why one system is misbehaving while the other isn't.

Upgrade Adviser, perhaps the most interesting new tool, compares a system's current components and configuration to the minimum requirements of more than 1800 programs and more than 120 peripherals. If you need to add memory or upgrade the operating system, CheckIt Pro tells you.

CheckIt Pro: Analyst

WINDOWS This program provides a number of useful tools for diagnosing PC problems.

TouchStone Software
800/531-0450

List price: \$149, for users of CheckIt Pro versions \$39.95, for CheckIt 3.0 users \$59.95

Reader service no. 626

The program falls short where most other diagnostic programs do: Its reporting about interrupt request channel (IRQ) and direct memory access (DMA) usage isn't always accurate. Due to the nature of the AT bus, diagnostic programs often have to make guesses here. In a test system, CheckIt Pro wrongly reported that IRQs used by a sound board and a hand scanner were free.

At \$149, it's a good deal if you're called upon to fix co-workers' PCs and if you understand the limitations of diagnostic software.

—Reid Goldsborough

	Loaded:	Compared:
General		
Platform:	MAIN CKD	MAIN CKD
Platform:	Windows/386	DOS
Date:	12-13-1993 21:18	12-14-1993 12:03
Main System		
Computer Type:	High Performance PC	High Performance PC
Processor:	Cyrix 486DLX, 33 MHz	Cyrix 486DLX, 33 MHz
Cache:	None	None
Bus:	ISA (16 bit)	ISA (16 bit)
BIOS Mbr:	Phoenix	Phoenix
System Memory		
Total:	8 MB	8 MB
Base:	640K	640K
Upper Memory:	159K	159K
Extended:	7160K	7160K
386:	8192K	7160K
Virtual:	2 GB	1 GB
Current Mem:	2.95	1.10
Primary Video		
Adapter:	VESA	VESA
Chip Set:	Matrox	Paradise
RAM Size:	1024K	1024K
Monitor:	VGA Color	VGA Color
Hard Drive		
Total Size:	212M	212M

CHECKIT PRO: ANALYST enables you to quickly compare the hardware and operating system differences between any two PCs so you can diagnose a problem PC. The differences are highlighted in red.

WordPerfect Redefines the PIM

InfoCentral deserves the label "personal information manager" more than any other PIM. I was so impressed with my preproduction copy of InfoCentral, I dumped Lotus Organizer, the PIM I'd been using. This powerful Windows program lets you manage not only contacts but also your work relating to them. Never again will you lose an important letter or spreadsheet in the depths of your hard drive. The product also provides an easy-to-use calendar and a task list.

InfoCentral uses an outline metaphor to organize data. These expandable outlines, called "iBases," show the relationships between all your information: people, companies, meetings, and documents.

InfoCentral's quick tour describes the three words you need to know to use the program: *add*, *connect*, and *find*. Here's how easy it is. Say I want

to add an industry analyst to my iBase. I choose the Add icon and enter the person's name, address, phone numbers, and so on. (Fields are totally customizable, and there's room for extras.) A dialog box asks, "Is this person connected to any other person, organization, or thing?" I choose Yes and see a double ring, the connect tool, attach to my cursor. The analyst's company is already in my iBase, so I click on the company, fill in his title, and he's connected. Now he shows up in the company entry, under People.

The real beauty of InfoCentral is that it can find the proverbial needle in a haystack. If I don't talk to this analyst for a year, I may forget his name. I may remember only his company. Using the Find icon, I search for the company, and in the People category, I see him.

If the analyst is quoted in a story I write, I'll connect the

InfoCentral

WINDOWS This simple yet powerful PIM offers outlines for tracking contact information and related documents on your hard drive.

WordPerfect Corp.

801/225-5000

List price: \$149

Reader service no. 624

word processor document. Now I can easily keep track of all the work I've done involving him.

InfoCentral's simple calendar offers drag-and-drop scheduling. The task functions were incomplete in the preproduction copy I evaluated.

WordPerfect also throws in four iBases with useful data like contact info for top hardware and software companies. At \$99 on the street, InfoCentral will quickly prove its worth to you.

—Laurianne McLaughlin

PowerViewer

It's 9:00, Monday morning and you've just learned the horrifying news. That big meeting with the president of the company next week? It's been moved up. Way, way up. And that report for the big meeting? It's due in half an hour. **F**ortunately, you've got PowerViewer™ for Windows™, the one tool that lets you access virtually any database and create presentation-ready reports with a few simple clicks of the mouse. **You** take a long sip of coffee, sit down in front of your computer and click open PowerViewer.

Access More Information.

Click. Quickly, you access the Connect Profile menu and select the database you want. Because PowerViewer supports over 25 of the most popular PC and relational databases, all the information you need is right at your fingertips. And with Powersoft's Database Connection Hotline, you know any questions you have will receive immediate answers. **C**lick. You go into the Report Painter and select the specific data for your report using one of PowerViewer's powerful point-and-click query techniques. You choose the one that suits you best, whether it's our easy-to-use QuickSelect, our powerful graphical query builder, or a query you've saved from a previous task. **C**lick. Now you're ready to create your report. You select one of the many built-in QuickStyle

Create Stunning Reports.

templates that enable you to create stunning reports with full-color 2D and 3D graphs and charts. PowerGuides and Data Smart design tools lead you through every step and let you preview and customize any aspect of your report in seconds. Include a pie chart. Change fonts. Add colors. Pull in your corporate logo. And click, click, click — suddenly, you've created a masterpiece.

PowerViewer makes information access as simple as point and click. It empowers you to make full use of your company's information and lets you do it faster and with greater ease than you ever thought possible.

PowerViewer, Just \$99.*

It's 11:00 and you've just come out of the big meeting. Your report was a hit. A big hit. So big, in fact, the president has asked you to run it by the entire company, gather everyone's opinions and give him a report on your findings. **U**nder ordinary circumstances, this would be the kind of news that could ruin your entire month. **F**ortunately, one of your colleagues has PowerMaker™ for Windows, the tool that gives you all the functionality of PowerViewer plus the power to design fully-interactive forms, manipulate databases and create complete Windows-based applications in no time.

**Click
Click**



**Click
Click
Click
Click**



**Click
Click
Click
Done**



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**Click
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PowerMaker

Build Applications Too.

Click. You open PowerMaker, access the Connect Profile menu and select a database to capture responses to your employee survey. You can use the powerful WATCOM™ SQL relational database that's included in PowerMaker or select any other database on your network. Then, with the touch of a mouse, you access the Database Painter and PowerMaker guides you painlessly through creating your database layout.

Click. Next, you access the Form Painter. Another touch of the mouse links your database to the survey form you're about to create. Then, just like when you created your report earlier, you simply choose a QuickStyle form template, layout your survey and customize it in seconds. Edit text. Rearrange questions. Add toolbars. Bring in all the bells and whistles. In minutes, you've created your very own Windows application.

PowerMaker, Just \$199.*

Click. Now, it's time to distribute your application to the world. PowerMaker not only enables you to share your applications with everyone on your network; it lets you do it without any user runtime fees. So you just put your "President's Survey" on the network and tell your colleagues it's coming. They simply click open the icon and fill in the blanks. Your

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Circle 158 on reader service card

Managing International Business: Seminar on a CD

Managing International Business gives your management team an intensive electronic "seminar" developed by a Harvard Business School professor. This \$2000 CD ROM is designed to be a new, cost-effective way to educate midlevel managers. Sound ex-

it uses case studies to teach global business strategy: Managers learn from other managers' experiences and then apply this knowledge to their own situations.

When you start the program, you get an overview lecture from Professor Bartlett. Then you page through each of the three case studies—viewing lecture material, playing video clips of discussions with executives involved in the cases, and working through related material.

The first case profiles financial difficulties encountered by electronics giants Sony and Matsushi-

ta and explores possible cost-cutting methods and product strategy. In the second case, students learn about a big challenge at Procter & Gamble: the launching of its first Pan-European product (a detergent). The third case involves Asea Brown Boveri, a multinational conglomerate based in Zurich. The company's CEO discusses his business strategy—including changes in staffing, communications, corporate structure, and information systems—to make the firm more competitive in the global market. The program includes video clips that play in 2-inch-square screens and add an interesting dimension to the case studies.

Once each manager has gone through the CD ROM, a human resource staff member or senior manager can lead a group discussion and explore the issues as they relate to your business.

There are drawbacks to this kind of business seminar, however. You can't ask the professor questions, and you don't get as much interaction with other participants throughout the process. And unlike with a traditional seminar, you can't network. Another drawback is the unusual pricing policy. The

\$2000 price covers use of the product for ten users for a year; you must pay a \$1000 renewal fee for each additional year of use, much as you'd pay a speaker for continued visits. Still, this product poses an intriguing way to educate managers about business issues.

—Laurianne McLaughlin



MANAGING INTERNATIONAL BUSINESS teaches global business strategy.

pensive? Bringing a Harvard-quality speaker on-site for a day can cost \$5000 to \$25,000, according to human resource professionals we spoke with. Of course, there are drawbacks to an electronic lecturer, but this product may suit your needs.

I saw a preproduction copy of the multimedia disk, which was developed by Course Technology and Harvard Business School professor Christopher Bartlett. Focusing on managerial issues,

Managing International Business

This CD ROM uses case studies to educate midlevel managers.

Course Technology

800/648-7450,

617/225-2595

List price: \$2000 plus \$1000 yearly renewal fee

Reader service no. 702

Unleash the Dracula Within

Call it Dracula, the Interactive Sequel. This CD ROM-based game—billed as an interactive horror movie—features a compelling mystery, and liberal use of audio and video clips. You play the part of Alexander Morris, the American protagonist who's trying to discover the circumstances of his brother's untimely death. As Morris, you roam about nineteenth-century London collecting clues, meeting with characters, and keeping a diary of events. The goal: to get to the bottom of a series of strange killings that—obviously—have something to do with the fa-

Dracula Unleashed

The Prince of Darkness comes to CD ROM.

Viacom New Media

800/877-4266,

708/520-4440

List price: \$69.95

Reader service no. 703

mous vampire. Your decisions and actions affect the plot and lead to various outcomes. While many CD-based games suffer from the slow access times of the medium, *Dracula Unleashed* provides smooth, seamless play.

—Michael Desmond



STALK THE UNDEAD in *Dracula Unleashed*, an interactive CD ROM set in nineteenth-century London.

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A Library of Classics With Sound and Animation

Great Literature Plus for Windows

WINDOWS Some 1900 classics, plus sound and animation, on a disk. **Bureau of Electronic Publishing**
201/808-2700
List price: \$64.95
Reader service no. 704

When I had to do research for high-school English class, I never had it this good. *Great Literature Plus for Windows* packs over 1900 literary titles, including fiction, poetry, drama, historical documents, and religious books. A CD ROM with all this material,

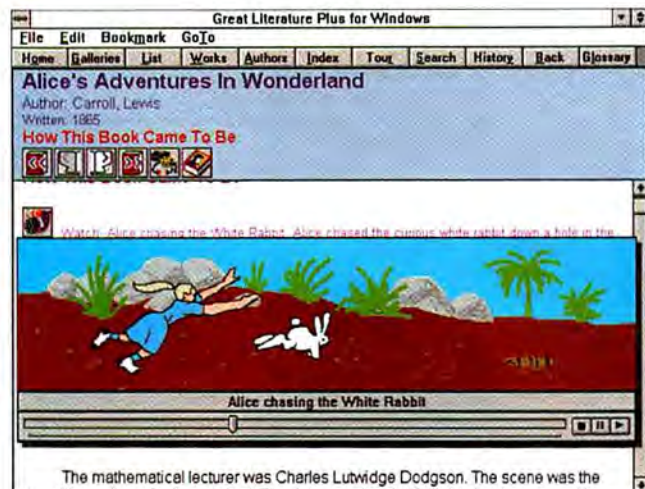
plus search capabilities, gives you a mini-library and a librarian right inside your PC. Have a particular Shakespearean phrase in your head and need to find out where it comes from? Type in the phrase, and *Great Literature Plus* brings you to the right spot in the right play. Want to see how different authors use symbolism in their fiction? This CD can give you a tour of examples. It also provides short biographies of authors. If you're a literature buff, you may just enjoy browsing. Along with text, you'll find short animation sequences and music clips. With some entries, you can click an icon to hear narration.

The software's interface provides easy access. Its main

screen shows a drawing of a room with labeled components that you click on to access specific works. For example, you click on the bookcase to see

works by subject and click on a book on the floor to see works by title. *Great Literature Plus for Windows* lists for \$64.95.

—Laurianne McLaughlin



JOIN ALICE in Wonderland in *Great Literature Plus for Windows*.

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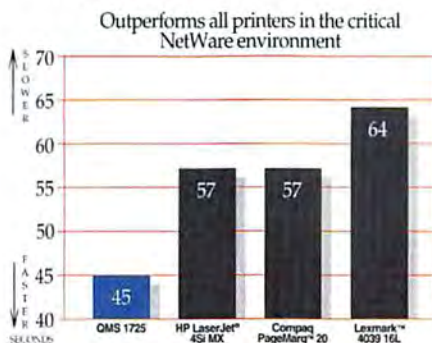
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by leaps and bounds.



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*Source: MWA Consulting, June 1993.

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Appointment in Hell

You think you've got it tough? I'll tell you about tough, man. You should try driving a cab in New York. These other guys, they cut you off, they steal your fares, and make you *mad*, man. That guy who shot the commuters, I know what drove him to it. It wasn't his fault. It's the city."

That's a real, if surreal, con-

versation I had with my cab driver on the morning of December 8. By that afternoon, I was suffering major déjà vu in the process of reviewing *Hell Cab*, a new Windows-based interactive CD ROM adventure set in New York.

To avoid surrendering your soul to Checker Cab, you'll take an adventure through the Big Apple and time, with stops at the Empire State Building, Nero's Rome, World War I, and the Jurassic period. *Hell Cab* makes you feel like you actually are in New York, with every detail of the Empire State correct, down to the whistle of the wind on the observation deck and the view of New Jersey.

Designer Pepe Moreno pays



YOU WANNA GO WHERE, MAC? *Hell Cab* is an all-too-realistic slice of New York life, as a maniacal cabbie guides you through the Big Apple.

amazing attention to detail, but Time Warner Interactive did a sloppy port from the Macintosh to Windows, so there are occasional problems with the sound and video—just enough to an-

noy you. Still, this product is worth checking out. *Hell Cab* is among the first CD ROM titles to really deliver on the creative promise of multimedia.

—Joe Abernathy

Hell Cab

WINDOWS Is it hell or New York? You decide in *Hell Cab*.

Time Warner Interactive
800/593-6334

List price: \$99.95

Reader service no. 705



It's about time a computer company listened to my needs. Not just tell me what they think I need.

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Reader service no. 706

Aris Entertainment

310/821-0234

List price: \$29.95 to \$59.95

Reader service no. 707

The recent addition of motion video support to the leading business presentation graphics packages represents a nice touch, but you still need video

clips to use this feature. Two new families of clip media CD ROMs address this void, providing audio clips, musical scores, still photos, special effects, and video clips for use—all of them royalty free—in your presentations.

Jasmine Multimedia Publishing has an impressive collection of source materials, having worked on the licensing for most of a decade. The company's *In Motion* series includes *Seasons*, *Science*, *Nature*, *Space*, *Sports*, *Business*, *America*, and *Amazing Moves* (a collection of bizarre videos). Jasmine sells two disks of video special effects and one of stock video clips. Image titles include *Working Stills*, *Scenic Stills*, and *Wil-*

derness Stills. Out of all the video clips on the 20 CD ROMs, only a handful of video clips have ambient sound, which may not matter much for business presentations but lowers the entertainment value of some of this classic material. Instead, most Jasmine disks include separate professional sound tracks for adding background music to presentations.

The *MediaClips* series from Aris Entertainment takes a better approach, with seven of its CDs featuring 25 video clips (with audio), along with 100 to 200 high-quality photos and 100 to 200 sound files apiece, depending on title. Series titles include *Money, Money, Money*; *Tropical Rainforest*; *Jets & Props*

(a two-disk set); *Full Bloom*; *Deep Voyage*; and *WorldView* (space images). Four disks of still photos and sound files include *Island Designs* (a two-disk set), *Business Backgrounds*, *Wild Places*, and *Majestic Places*.

As long as you're aware of the lack of sound on many Jasmine video clips, you won't be disappointed with the quality of these clip media sets—and your audiences won't be disappointed with your presentations.

Jasmine Multimedia titles list for \$59.95 (stills), \$99.95 (animated series), and \$129.95 (special effects disks), with discounting available on the street. Pricing on the Aris titles ranges from \$29.95 to \$59.95.

—Joe Abernathy

Boarding Pass

Boarding Pass

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From the City of Angels to the Windy City or



1700 Miles Across the Outback With the Camel Lady

In case you haven't already heard about "the camel lady's" trek (with four camels and a dog) across the Australian outback, here goes: Alice is a small town in a desolate part of Australia, and the camel lady (Robyn Davidson) is a hard-headed Australian woman with guts and very little sense of self-preservation. Her story is fasci-

nating, and the photos of her 1700-mile jaunt (taken by Rick Smolan, creator of the *Day in the Life* photo-book series) are stunning.

This is a great book/disk bundle. The beautiful photo book contains Davidson's first-person tale. Even if your initial reaction is that she was nuts even to attempt such a dangerous, pointless mission, you'll end up spellbound. Her writing is poetic and honest. And the story of how she got the money and camels is intriguing. She spent two years preparing for the trip, accumulating a little cash and learning to train camels. She even shares the resentment and affection she feels for the photographer who

made it all possible while spoiling her vision for the adventure.

If there aren't enough pictures for you in the book, turn

to the CD ROM, which has many more in addition to text, sound, and full-motion video.

—Christina Wood

From Alice to Ocean

Take a trip across the outback with Robyn and her friends.

Claris Corp.

800/325-2747

List price: \$139

Reader service no. 711



FROM ALICE TO OCEAN: Join the camel lady and her entourage (four camels and a dog) as they journey across the Australian outback.

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*Battery life measured by PC Magazine's Battery Run-down Test. Actual results may vary.

IBM Offers a Better Way to Surf the Net

A software package with the less-than-catchy name of TCP/IP could give you one of the coolest communications machines in town. Short for Transmission Control Protocol/Internet Protocol, TCP/IP allows different types of computers to communicate. IBM's TCP/IP is a set of extensions for DOS, Windows, or OS/2 that lets your personal computer become a peer with the thousands of high-powered machines on the global Internet computer network.

You may know Internet as the "information superhighway" currently in vogue with the Clinton administration and every phone, cable, and media company in the nation. Based

on the military- and research-oriented ARPAnet, Internet is a network of UNIX networks that spans the globe, embracing more than 15 million users, most of whom gain access through corporate or educational LANs. Individuals and small firms are making increased use of the net, but only through relatively primitive dial-up connections. Once dialed in, you have to navigate using the arcane UNIX command prompt.

By adding the TCP/IP utilities to your system, your DOS-, Windows-, or OS/2-based PC gains the capability to speak the native language of UNIX networks, and, by extension, Internet, opening up whole new realms of power and sophistica-

tion. With a simple point and click, you can easily download any of the millions of files on the net, browse the hundreds of special interest news groups, and send E-mail around the world in minutes. Over the last several months, I've shown a number of highly sophisticated Internet mavens what the net looks like with a Windows interface, and they've all converted immediately to the new way of doing things. You will too if you give it a try.

IBM's TCP/IP is not a product for communications novices. While a competing package, NetManage's Chameleon TCP/IP for Windows, installed in a couple of hours, IBM's DOS and OS/2 extensions required a

TCP/IP 2.0 for OS/2, 2.1 for DOS and Windows

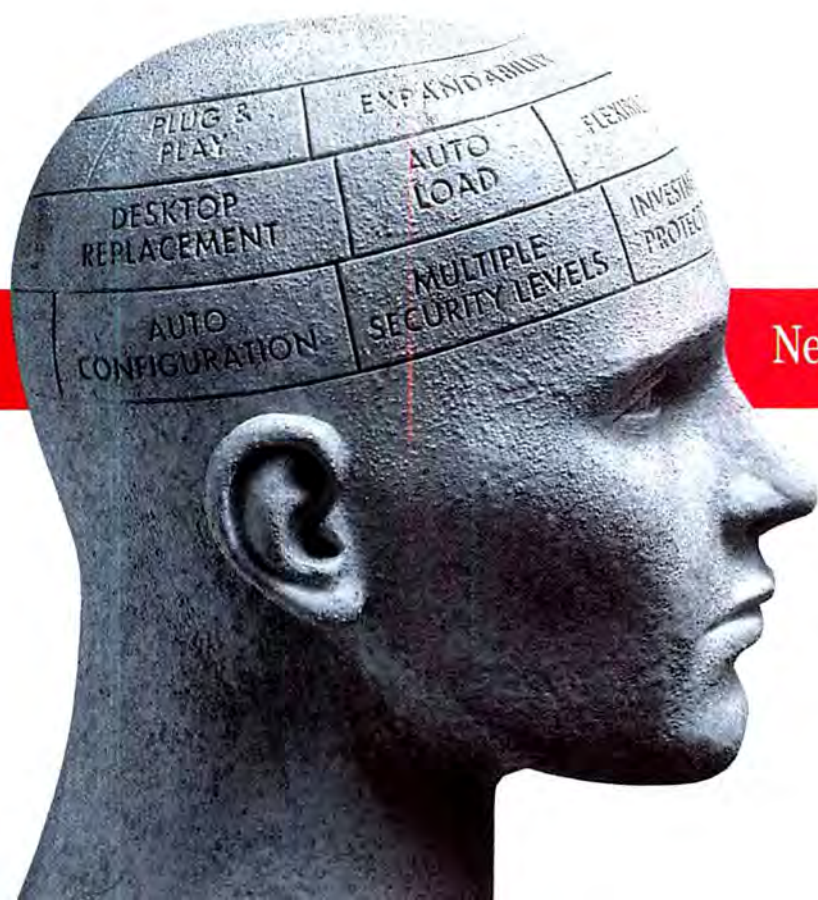
Join the global Internet and other UNIX-based computer networks directly.

IBM

800/426-2968

List price: \$230 for base kit (ask about special promotional pricing); Network File System kit \$135; NETBIOS kit \$110 for OS/2, \$125 for DOS and Windows

call to technical support to successfully install. If you're reasonably comfortable with the basics of telecommunications, you'll be fine, but if you've never used a modem, don't start



New Intelligent Docking: So smart it

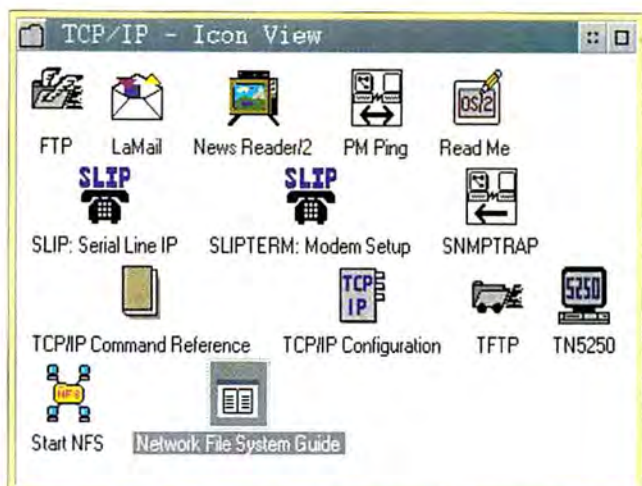


here. One thing recommending IBM over Chameleon, in addition to its support for DOS and OS/2 as well as Windows, is a price (\$230) nearly half that of Chameleon (\$400).

And what do you get for the money? The basic TCP/IP protocols, along with a number of applications to help you use Internet or other TCP/IP networks to which you may connect. Among these are an E-mail tool, a file transfer protocol (FTP) front end, a Telnet client for logging on to distant computers, printer sharing, and network management tools based on the Simple Network Management Protocol (SNMP). Once you're on Internet, you can retrieve a number of free

graphical tools for browsing the net, including the multimedia Mosaic interface, which work only via TCP/IP.

The physical TCP/IP connection itself may take the form of an adapter card hooked to a network with TCP/IP connections, or you may dial into a network, including Internet, using Serial Line Internet Protocol (SLIP). Individuals can expect to pay around a dollar an hour for an Internet SLIP account, while small businesses can get a shared, dedicated SLIP connection for a flat fee of less than \$200 a month for 14,400-bps access to around \$1000 for T1. Price varies according to your location and modem capacity. Refer to the book *The Internet*



A WINDOWS FILE TRANSFER APPLICATION and DOS utilities come with TCP/IP for DOS and Windows, which makes Internet connections easy.

Guide for New Users by Daniel Dern or *Connecting to the Internet* by Susan Estrada for help.

If you want to buy the best pure Windows TCP/IP package, I recommend Chameleon from NetManage in Cupertino,

California. If price is an issue, or you want support in DOS or OS/2, IBM is your choice. In the next version, I hope they exercise more care with the user manual and installation process.

—Joe Abernathy

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*Color monitor shown above not included with Intelligent Docking System.

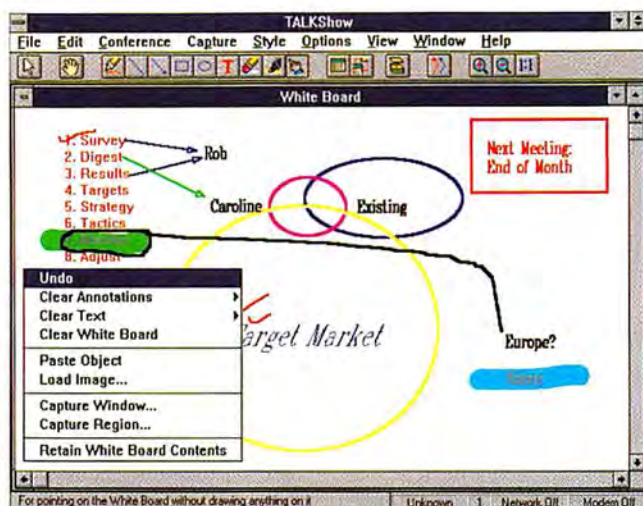
Hold the Next Meeting at Your Desk

How can you have a meeting or give a presentation and collaborate with all the participants in your project when some are in other offices, states, or countries?

An alternative to the traditional paper chase is TalkShow 2.0 Windows document confer-

encing software. The idea behind this software genre is that people in remote locations can participate in real-time presentations and view and comment on documents via network or modem connections.

This version adds several enhancements over 1.0: You need only purchase one copy of TalkShow. From it, you can make an unlimited number of "guest" copies; the only restriction is that these guest users cannot initiate a session. Other new features include a Slide Tray that simplifies presentation organization, support for WAN protocols, colored pointers and highlighters for each participant, an interactive chat box for real-time discussions, JPEG com-



PRESENTATIONS AND WHITE-BOARD DISCUSSIONS are accessible by all participants via network or modem connections.

pression for fast image transfer, and support for popular image file formats. You cannot connect more than two modems together. But you could use a modem to call a computer on a network

to link users on a LAN.

With trends moving toward cost cutting and globalization, desktop conferencing and TalkShow 2.0 make sense.

—Gene Smarte



We're listening. We're learning.



Sprinter Cuts Interoffice Phone Costs

All companies look for ways to cut costs. Micom Communications' new low-cost Sprinter offers businesses a way to reduce phone expenses between headquarters and branch offices significantly.

Sprinter is what's known as a *multiplexer*—an external device that consolidates voice, data, and fax traffic over a leased digital or analog phone line. While high-end multiplexers have been used for years by Fortune 500 corporations with expensive T1 digital leased lines, Sprinter brings this technology to small- and medium-size businesses. List priced at less than \$1500 per unit, Sprinter is a relatively affordable multiplexer for smaller companies that have branch

offices in other cities.

Say your business is headquartered in Los Angeles and you've got a branch office in San Jose. Micom estimates that one hour of toll calls per day costs \$240 a month. If you're already leasing a digital line from the phone company, you can install Sprinter (between a LAN bridge/router and PBX) and route that hour's worth of calls over the leased line—saving your business \$240 a month.

In addition to headquarters-branch office use, Sprinter can be used by telecommuters who work from home. However, when you add up the expense of installing two devices (about \$3000) plus a leased digital or analog line, Sprinter for the

home office isn't as cost-effective as it is for remote offices (where voice and fax traffic is bound to be greater).

To ensure sufficient bandwidth for data, fax, and voice calls, Sprinter uses a proprietary compression technology called Silence Suppression. This compression scheme sends only "active" voice and fax signals across the wire. According to Micom, a typical speech conversation is about 60 percent silence (including pauses, breaths, and periods of silence). Since Sprinter doesn't transmit these moments of silence, it can reduce speech bandwidth requirements by up to 60 percent, the company claims. The result is more bandwidth for data and

Sprinter

This low-cost multiplexer can help small- and medium-size businesses cut phone costs.

Micom Communications Corp.

805/583-8600,

805/583-1997 (fax)

List price: \$1290 to \$1450

Reader service no. 621

other network traffic.

Sprinter works on analog and digital leased lines at speeds from 9600 to 64,000 bits per second. The product lists for \$1290 with a single voice/fax channel or \$1450 with a voice/fax and data channel.

—Jeff Bertolucci

The most comprehensive line of 486 notebooks designed specifically to meet your needs.

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You'll find the entire high-performance lineup, from our economical monochrome WinSX/25™ to our active matrix color WinDX2/50™ powerhouse, is ideal for portable and desktop replacement needs. The critics agree. To start with, Texas Instruments notebooks are the only products in any category ever to win five *PC Magazine* Editor's Choice Awards all in a single issue.* And that's just the beginning.

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† RAM expandable to 20MB with optional memory. †† Estimated street price. Dealer prices may vary.

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 **TEXAS
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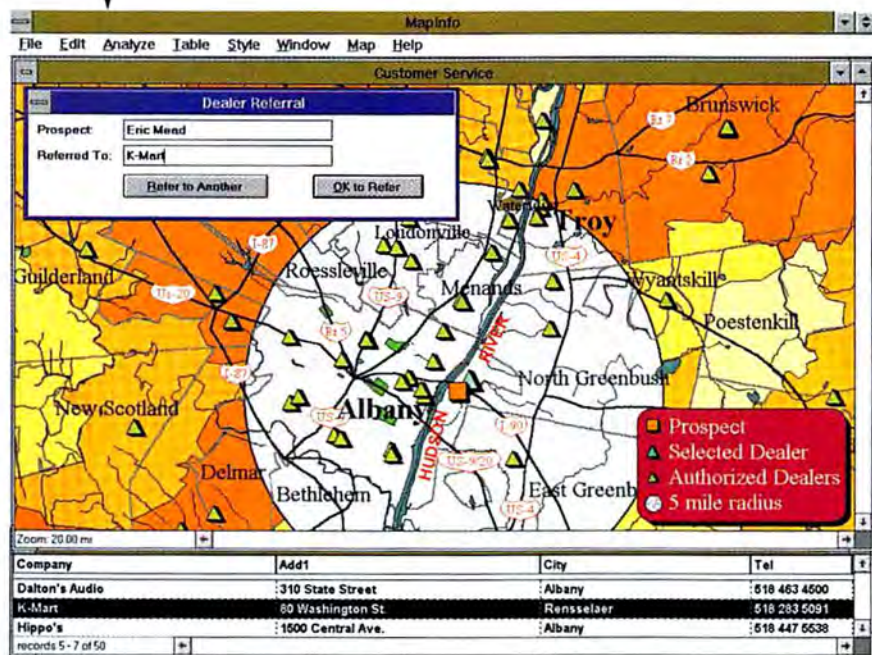
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Reader service no. 610

Kai's Power Tools for Windows

WINDOWS Whether you're serious or casual about graphics, if you need a creative high, check out Kai's Power Tools for Windows. Long considered the cool tool for Mac users, Kai's Power Tools is now available in a Windows version that plugs into leading image editing programs such as Photoshop, Photostyler, Painter, and Picture Publisher. Kai's exotic interface provides both playful simplicity and powerful image manipulation. The program offers 33 filters and extensions that would normally take hours to create. For example, you can generate natural-looking textures that



KAI'S POWER TOOLS plugs into the leading Windows image editing programs and offers powerful image manipulation tools.

seamlessly tile together for backgrounds or overlays, or add impact to your fonts with subtle multicolor gradients. In addition, you can highlight portions of your images with realistic 3-D lighting effects or create the illusion of a pulled-back page corner with the page-curl filter. For downright psychedelic effects, you can even generate Mandelbrot and Julia set fractal patterns. At \$199, Kai's Power Tools for Windows is serious graphics made fun. HSC Software, 310/392-8441, 310/392-6015 (fax).

Reader service no. 612

Newscast for Windows

WINDOWS No news may be good news where misfortune is concerned, but the right news at the right time can mean profit for your business. With Newscast for Windows from Mainstream Data, you can access the same news information as leading media organizations. The \$995 Newscast enables you to configure custom reports from the various news wires. Just choose which news services you want—priced from \$10 per month for USA Today Deci-

sionline to \$1100 for some financial services—and how many workstations are to receive the data. You'll need either an FM data receiver (\$845) or a small dish satellite system (\$1445) to receive the signal. (Currently 14 cities receive Mainstream's FM coverage.) Mainstream Data Inc., 801/584-2800.

Reader service no. 614

ADI MicroScan monitors

ADI Systems' five new monitors are priced to be competitive with displays from Mag Innovision and ViewSonic. ADI's MicroScan 2E and MicroScan 3E are 14-inch displays that meet the Environmental Protection Agency's Energy Star Computers program guidelines for low power consumption. (They can automatically power themselves down to consume less than 30 watts of electricity after a user-defined period of inactivity.) The MicroScan 3GP, 4GP, and 5AP are 14-, 15-, and 17-inch displays, respectively, that meet both the Energy Star guidelines and the more stringent Swedish TCO standard for power consumption.

Edited by Jeff Bertolucci

All five displays use micro-processor controls, are compatible with VESA-defined video modes, and are covered by a two-year warranty. Low-emissions versions are available for a small extra charge. Estimated street prices: MicroScan 2E \$325, 3E \$345, 3GP \$410, 4GP \$490, and 5AP \$899. Prices of the MPR-II-compliant versions: \$30 extra for the 14-inch models, \$40 extra for the 4GP, and \$50 extra for the 5AP. ADI Systems Inc., 800/228-0530.

Reader service no. 613

ATI Video Wonder

ATI's Video Wonder takes the Swiss Army knife approach to graphics and video. This video board packs all the hardware you'll need to accelerate Windows graphics, compress full-motion video, and enhance video playback—making it a one-stop solution for users working with graphics and video. The Video Wonder board uses the Shared Frame Buffer Architecture developed by Intel and ATI, which lets the Mach32 graphics accelerator chip and the Intel i750 video compression chip share on-board components.

The Video Wonder can capture 160 by 120 video at 30 frames per second (fps) or 320 by 240 video at 15 fps. The board's video playback hardware and software let it run video clips up to full screen without a dramatic loss in quality and frame rate. Also, the board's ATI accelerator chip and 2MB of VRAM support 65,000 colors at 1024 by 768 resolution, with a fast 76-Hz refresh rate. The Video Wonder lists for \$999 and is available for systems with ISA, VL, and PCI buses. ATI Technologies, 905/882-2600.

Reader service no. 617

SmartSync 1.0

WINDOWS If you frequently take home work from the office, check out SmartSync from Nomadic Systems. This Windows-based file transfer and synchronization utility supports serial, parallel, modem, and floppy-based transfers. What makes SmartSync unique is that it transfers only *sections* of a file that have been changed, rather than the entire file. This can save you transmission time—and phone costs if you're using a modem link. And if you're connected via modem and lose contact, SmartSync remembers which file it was transferring, automatically reconnects, and continues the transfer without any intervention on your part. You can use passwords to restrict file access. And when there's a synchronization conflict—for example, two files with identical names but different data—SmartSync saves both files rather than overwriting one of them. SmartSync lists for \$169.95. Nomadic Systems Inc., 415/335-4310.

Reader service no. 615

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times and improved one-way-street directions but still lacks a public transportation guide. The floppies contain downtown maps only; you'll need the CD ROM version for metropolitan areas. The program's restaurant and hotel reviews, which are based on Zagat surveys, can help you avoid bad service and noisy accommodations. Taxi costs \$69.95 for the floppy version, \$79.95 for the CD ROM version. Additional downtown area maps cost \$9.95 each. News Electronic Data Inc., 800/505-8294.

Reader service no. 620

Designworks 2.0 for Windows

WINDOWS A full-featured graphics package that performs drawing, text, color, and image chores usually takes a while to learn. But Designworks 2.0 for Windows from GST Software combines these features into a simple, easy-to-learn package. The intuitive, straightforward interface reduces learning time, and OLE 2.0 support lets you edit and embed your Designworks projects in other OLE 2.0-compliant applications. In addition to its drawing and

imaging features, Designworks has custom shape tools that let you create all kinds of polygons. You can also adjust kerning and line spacing. The program supports RGB, CMYK, HLS, and Pantone colors, as well as four-color separations and 24-bit image manipulation. Designworks 2.0 lists for \$199. GST Software, 703/560-2354.

Reader service no. 616

Canon BJ-10sx

Canon's new BJ-10sx portable ink jet printer replaces the company's 2-year-old BJ-10ex. Weighing less than 4 pounds, the BJ-10sx is only slightly larger than the average notebook computer and a bit lighter than the 10ex. The 10sx prints up to 110 characters per second in draft, letter, and high-quality modes—30 percent faster than the BJ-10ex. The difference between each mode is ink coverage: It's lightest in draft, heaviest in high-quality. In any mode, the 64-nozzle printhead produces 360-dpi output. The 10sx prints on letter- and legal-size paper as well as on envelopes and transparencies. A 50-sheet paper feeder is optional. The 10sx uses AC power or

an optional battery pack that the vendor claims is good for 40 pages per charge. The BJ-10sx lists for \$349, with street prices likely under \$300, Canon says. The snap-in ink cartridge, good for 466 pages in high-quality mode, according to the vendor, has a list price of \$25. Canon Computer Systems Inc., 800/848-4123.

Reader service no. 618

Diamond VideoStar and VideoStar Pro

Diamond Computer Systems is breaking into multimedia with two new video capture and playback boards, the VideoStar and the VideoStar Pro. Both compress video using any of the compression/decompression formats available under Video for Windows. The VideoStar can capture video in a 160-by-120-pixel window at 30 frames per second (fps) or in a 320 by 240 window at 15 fps. For those looking to use video in professional applications, the VideoStar Pro uses high-quality JPEG video compression to capture a 320 by 240 window at 30 fps. Both boards use image scaling, filtering, and interpolation to expand video playback to full-screen resolutions as high as 1024 by 768 without dropping frames. The boards include video editing software and utilities and support special effects such as the so-called weatherman, which plays video directly against the background, without a window. The VideoStar lists for \$359, and the VideoStar Pro lists for \$529. Diamond Computer Systems, 408/736-2000.

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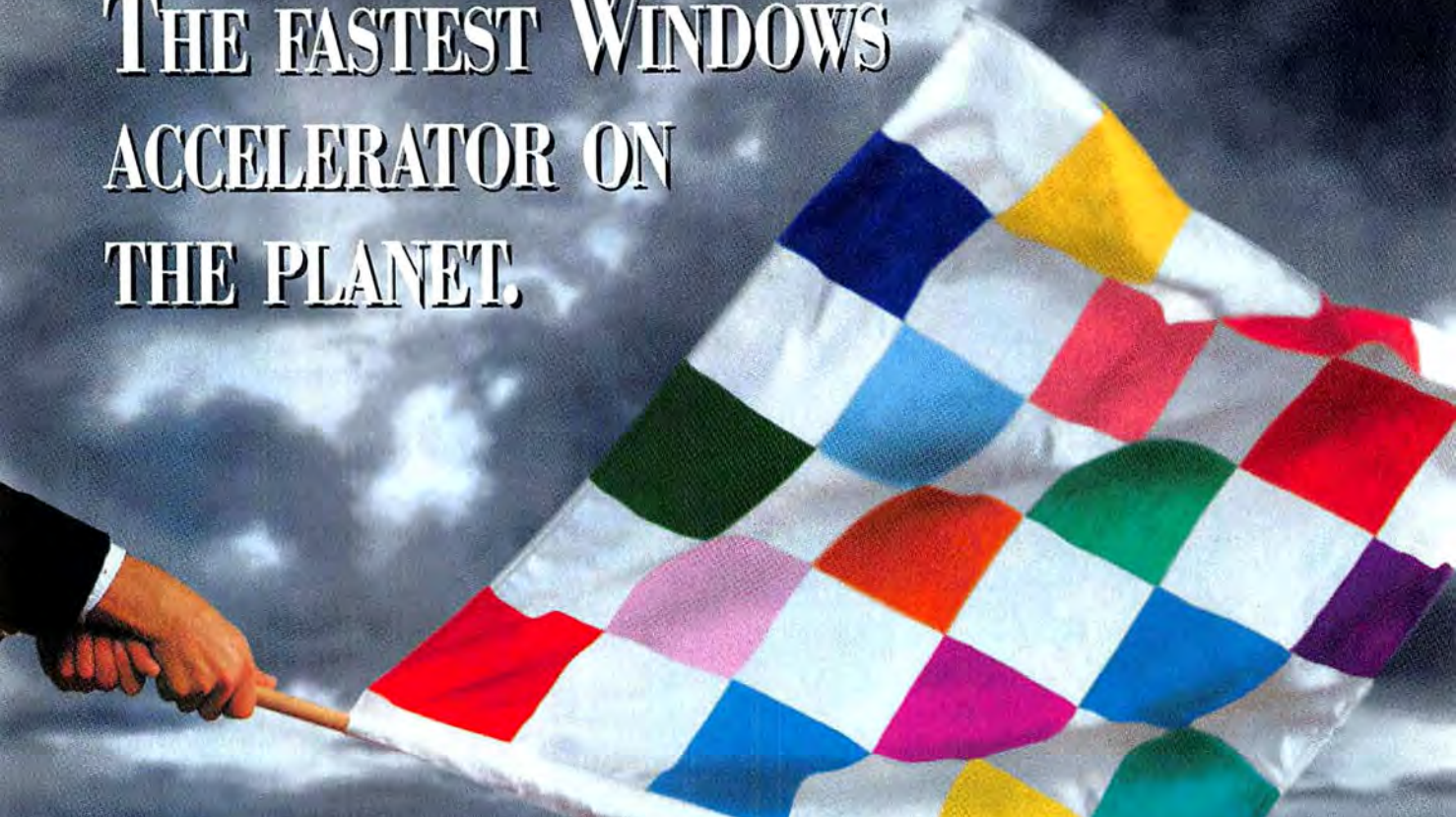
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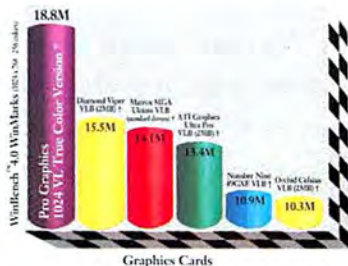


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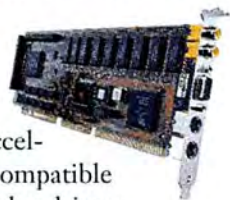


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Plus, Pro Graphics 1024 is multimedia upgradeable. So by adding a Media Vision video daughter card you can display video from any source, capture it, and play it on your screen, T.V. or record it on your VCR. Moreover, the Pro Graphics 1024 includes FastFilm™, a unique hardware feature that accelerates Video for Windows playback. Pro Graphics 1024 is also VGA and Super VGA compatible and it comes complete with Windows 3.1, Windows NT, OS/2 and AutoDesk ADI display drivers.



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X

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NEC

Top 20 PCs: More for Less

As Pentium prices plunge to
\$3000 and 486-66 PCs fight
back, new systems from Micron,
Austin, and Axik zoom to the top
of this month's charts.

By Rex Farrance

At *PC World* we've been in the business of providing buying advice from day one. And as the PC market changed, we changed with it to keep giving you the bottom line on how to get the most for your dollar. Last month we inaugurated our new system reviews, with Power and Budget Top 20 charts that list not just this month's top systems but the Best Buys among all the PCs we've tested recently. So this month's top systems compete against the best from December, January, and February. As a result, you get an in-depth look at the very newest systems—month after month. Furthermore, we recheck systems reviewed in prior issues to keep their pricing up to date.

Any system in our Budget Top 20 must cost \$2500 or less. We place no price limits on our Power Top 20 contenders, however. So a system with a particularly advantageous balance of low price and high power can find a spot on both lists. But any system must be at least Windows-capable to appear in our reviews.

The PC World Test Center just updated its test suite with applications that reflect your working style better than ever. And we compare each system we evaluate against a composite median system that represents a basic business PC. With the advances over the last year or so, the median business system we're reviewing today is a \$2880 486DX2-66 with 8MB of RAM.

With Pentium PC prices dipping below the \$3000 mark, 486DX2-66 prices are dropping in response. When we balance the high performance of the top-of-the-line 486 against prices that sink as low as \$1900 among our budget Best Buys, there's no doubt the DX2-66 is now the processor of choice for budget PCs. The DX2-66 is the processor used in 12 of the systems on our Budget Top 20 list—and among the top 10 machines, only 2 486DX-33s break up an otherwise solid 66-MHz landscape.

Testing by Ulrike Diehlmann and Susan Silvius; research and support by Gary Van Der Horn.

PC WORLD TOP 20

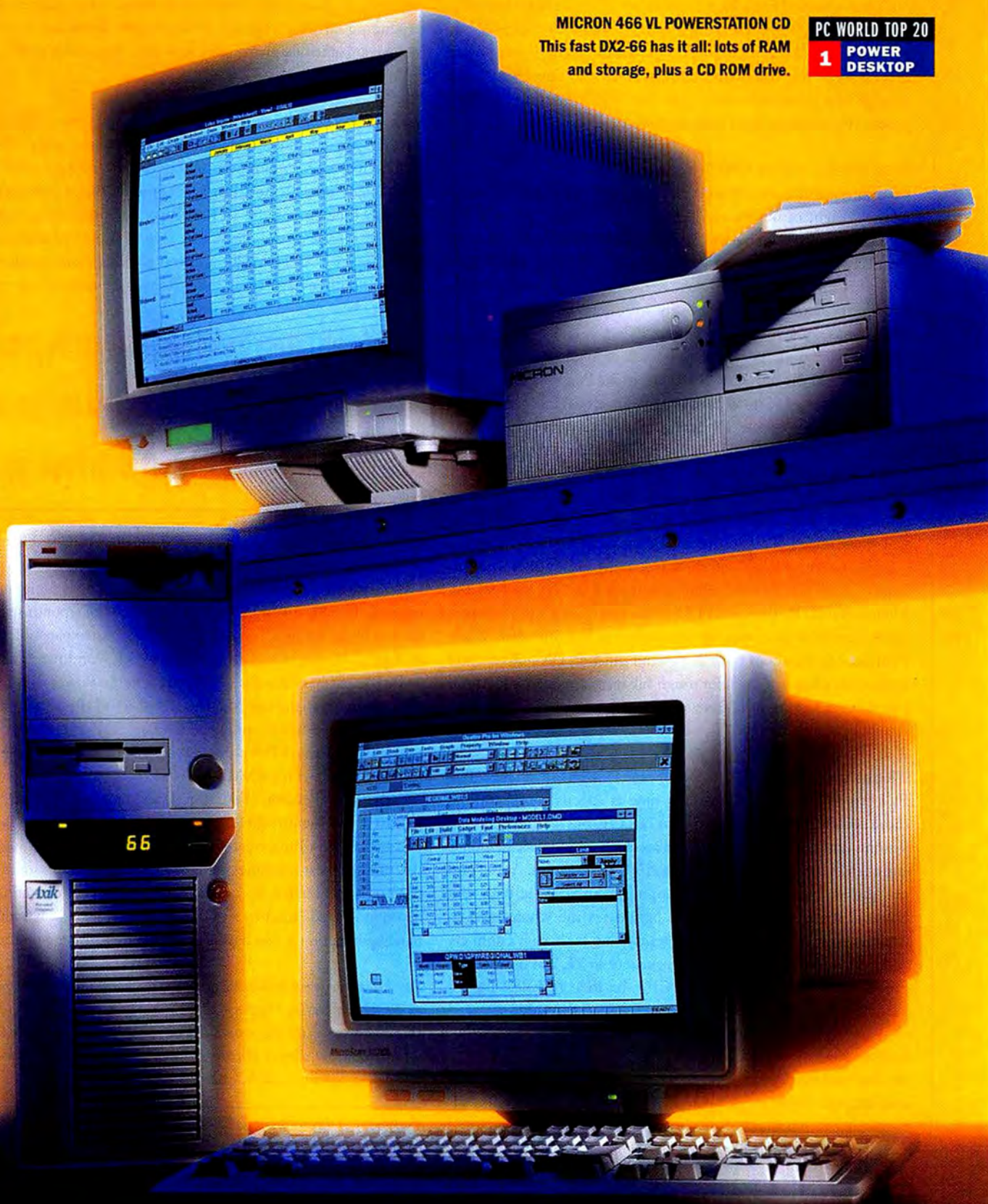
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Power Desktops pg. 126

Budget Desktops pg. 136

MICRON 466 VL POWERSTATION CD
This fast DX2-66 has it all: lots of RAM
and storage, plus a CD ROM drive.

PC WORLD TOP 20
**1 POWER
DESKTOP**



AXIK 486DX2-66PCI
Looking for a power system at a budget
price? Axik even bundles Windows NT.

PC WORLD TOP 20
**1 BUDGET
DESKTOP**

It's conceivable IBM's Blue Lightning-66 or AMD's forthcoming Am486DX2-66 may present an ongoing challenge in this area, but we doubt you'll see more than a sprinkling of the lower-power processors at the top of the budget rankings. There's just not enough of a price difference. And once you're used to 66-MHz power, you're not likely to settle for less.

Power Systems: Pentium Takes Over

Pentiums are already cutting a swath through the power systems market. Eight of our Power Top 20 are Pentiums; the rest are 486DX2-66s—and we've had opportunity to review relatively few Pentiums. Intel and system vendors have both made an effort to keep Pentiums affordable. The reasonable prices, combined with superior performance, have buyers with demanding applications lining up to buy Pentium PCs.

As more Pentiums come out, prices will drop further. And price isn't the only factor changing in the Pentium equation: Joining the initial 60-MHz offerings, 66-MHz Pentiums will soon be appearing. This month we review the muscular 60-MHz ALR Evolution V-Q Pentium system, the fastest PC we've ever reviewed, 17 percent faster overall than our median 60-MHz Pentium. ALR makes the two fastest Pentium systems that we've tested, showing that designing for speed really works.

Of course, the 486DX2-66 still has a strong presence as a performance processor. And a really well-tuned DX2-66, such as the Micron 466VL PowerStation CD (reviewed this month), still presents a credible performance alternative to Pentium-60s. While Pentium-60s are about 10 to 20 percent quicker, DX2-66s are still more than adequate even for tough business applications. And if your budget is tight, DX2-66s generally give you a big price break.

PCI or VL Bus Stops in Every Neighborhood

There's also an increasing trend toward PCI bus machines. The PCI bus shuttles data 32 bits at a time at speeds comparable to those achieved with the VESA local bus (VL bus). More high-end systems are coming with PCI video accelerators and disk adapters, and many vendors offer both PCI and VL bus systems. At the outset, the PCI bus seems to be stopping mainly in the high-rent power district, while the VL bus permeates the whole market. Manufacturers are still making systems using both, so it's unlikely you'll have to worry about your investment in VL bus boards. In a pinch, you can use either shared PCI/16-bit ISA or VL/ISA-bus (or VL/EISA-bus) slots to accommodate a standard ISA card.

Service Ratings With a Difference

Service and support are crucial. We've always based our service-and-support ratings on company policies and on anonymous calls simulating technical problems. For example, last year we reported Gateway 2000's phone responsiveness problems, caused by inability to expand tech staff to keep pace with increased sales. When staffing reached an adequate level, we let you know.

Now we've expanded our ratings to include another critical factor—your experience with vendors. Last October we began publishing a fax-back evaluation for service and support. Starting this issue, we include information from these surveys. As a result, we're drawing from a larger base of information and providing even more accu-

rate ratings. A note on pricing—we found price quotes varied, depending on which rep we spoke to. See if you can negotiate: Many companies are giving sales reps some bargaining room.

More Room at the Top

Since our new format separates budget PCs and power systems, we can give you tailored information on more systems in each category. The five highest-ranked machines on the Budget and Power Top 20 lists are your Best Buys each month. But if you can't find your machine among the 10 Best Buys, the other 15 systems on each list represent the elite picks from the pool of current and recent reviews. And to make sure you get the detail you need, we have in-depth reviews on all the systems we evaluate each month.

Pentiums are already cutting a wide swath through the power systems market: Just three months after our first Pentium review, these next-generation PCs own eight spots on our Power Top 20.

(see the end of this column for information on getting faxed reprints of previous months' system reviews).

Here are the current Best Buys that join selections from previous reviews: The Axik 486DX2-66PCI we review this month shoots to the top of the Budget Top 20. And why not? An expandable \$2398 PCI DX2-66 that comes with Windows 3.1, Windows NT, and a 345MB SCSI hard drive is a real prize. On the Power Top 20, two newcomers zip to the top: Micron's \$3599 466VL Powerstation CD, a 486DX2-66 with outstanding performance and a generous configuration, and Austin's Power System 60, a Pentium-60 PC that costs less than \$3100 with a 420MB hard disk.

In the second edition of our Top 20, the rationale is already clear: Just 10 of this month's 20 PCs make it onto our charts, and the majority of our Best Buys were reviewed previously. At the same time, this month's best machines come in at the top, forcing some older contenders off the list. It's easy to see a system's current rating. But if you look at the months a PC's been on the list and whether it's moving up or down, you have a good clue to its staying power.

Rex Farrance is an associate editor for PC World. He can be reached on PC World Online (see page 12 for contact information). PC World staff members Mike Desmond, Ulrike Diehlmann, John Goddard, Anita Hamilton, Bryan Hastings, Caroline Jones, Owen Linderholm, and Susan Silvius contributed to this article.

To receive a fax reprint of a month's complete system review, call 800/234-0455 ext. 365 and enter the corresponding fax reprint number: December 1993, 3012; January 1994, 3001; February 1994, 3002; March 1994, 3003. To get a fax of the list of all systems tested by the PC World Test Center for the Top 20, enter 7. Then enter your own fax number. Touch-tone phone required.

For more information about all products in this article, circle reader service no. 902.

This Month's Contenders

Our look at this month's contenders for the Top 20 Power Desktops and Budget Desktops. Icons show where systems placed on the Top 20 charts.

ALR Evolution V-Q

PC WORLD TOP 20
12 POWER
DESKTOP

PROS: Fastest PC tested to date, very expandable

CONS: High price

It seems we wind up testing the world's fastest PC every six months or so. That's because the performance watermark keeps rising. The ALR Evolution V-Q has just pushed our performance bar up another notch. This imposing 60-MHz Pentium tower is really designed to be a server, or an engineering or design workstation. And although we didn't put it through server tests, it cut through our business-application suite, placing first this month in every test and decisively whipping strong Pentium competition.

At \$6473, this system isn't cheap. But you get the 60-MHz Intel Pentium CPU, 16MB of RAM (expandable to an astounding 1GB), a 512K secondary cache, a 4MB caching hard disk controller, and a 544MB Conner IDE hard disk. And the ALR's expandability stacks up well against any server's, with a staggering 11 free externally accessible drive bays and seven free EISA slots.

The 1MB Western Digital Paradise graphics accelerator is based on WD's new 90C33 RocketChip, and it's impressive, if not quite up to top-end offerings from ATI and Matrox. This PC's shortcoming—for business application users—is its 14-inch CTX monitor, which lacks the size and resolution to excel with graphics-intensive applications. On the other hand, the display is adequate for server use. Those who run engineering, CAD, publishing apps, and so forth should order the system with a larger, more capable monitor.

ALR helps protect your investment with a strong but mixed 60-month/15-month parts and labor warranty, a year of on-site service for less than \$10, and 11-hour-a-day toll-free tech support. You can even call on Saturday. Expect to reach technical representatives quickly and get accurate, courteous answers. The ALR Evolution V-Q is truly remarkable, with its rarefied performance and high expandability. As a result, even its high price couldn't keep it from earning 12th place on our Power Top 20. *Advanced Logic Research, 800/444-4257, 714/581-6770 Reader service no. 713*



ALR

Ambra DP60E/VL

PC WORLD TOP 20
15 POWER
DESKTOP

PROS: Fast, relatively affordable Pentium PC

CONS: Needs more RAM

Ambra's a new company that's quickly making its presence felt—not surprising, considering it's backed by IBM. Last month we gave Ambra's Blue Lightning-based desktop a Best Buy and this month it's still number 9 on our Budget Desktops Top 20. This month's EISA/VL-bus Pentium machine fares well, com-

ing in at number 15 on the Power Top 20. These showings suggest that solid values may be available throughout Ambra's product line. Performance was about what we'd expect from an Intel Pentium-60 CPU, but we suspect this one would have run faster with 16MB rather than its relatively skimpy (for a Pentium) 8MB of RAM.

The system motherboard, manufactured by Acer, features a processor daughtercard plugged into a proprietary slot. A slick black heat sink covers one entire side of the CPU card. You must remove it to upgrade the 256K secondary cache to the maximum 1MB. Ambra also sells a dual-Pentium CPU card that fits the same slot.

The system design is clean; none of the six drive bays (four of them free) block access to any part of the motherboard. The motherboard itself is well designed. The only flaw in the system layout is the unaesthetic nest of cables alongside the drive cages. You get a copious six free EISA slots and one free EISA/VL slot.

Like all high-end Ambras, this unit comes with some nice extras, such as an integrated SCSI adapter and a capacious 540MB Seagate SCSI hard drive. You can add an internal SCSI removable-media drive—such as a CD ROM player—but there's no external SCSI port. Graphics chores are capably managed by a VLB Acer 685 Graphics Accelerator with 2MB of installed VRAM. This component teams up with a nice 15-inch Ambra monitor, which handles noninterlaced output at 1024 by 768 resolution.

Service and support, although supplied by IBM, falls short of the support you get with most IBM systems. For example, Ambra systems have only a one-year warranty. Also, some readers have complained about encountering confusion in Ambra's sales operation when calling for price quotes. That factor has much to do with the lowered rating of last month's Best Buy. The current \$3999 price of this unit is respectable for a Pentium, although Ambra also offers a less-expensive ISA PCI Pentium, the DP60/PCI, which starts at \$2799 with a smaller monitor and hard disk. *Ambra, 800/239-5409, 800/363-0066 (Canada) Reader service no. 714*



Ambra

AT&T/NCR System 3230

PROS: Excellent support, solid construction

CONS: High price, no local bus slots

If you're hanging around the showroom kicking tires, the AT&T/NCR System 3230 comes off as a solid system—well designed and well integrated. Inside, there's the clean look of the top-tier machine, with easy accessibility to the motherboard. When you take it for a test drive, you'll find the System 3230's performance zippy for a DX-33. A separate 64K secondary cache card fills a proprietary slot on the main board; to upgrade to the maximum 256K, you replace the card. The PC comes with 8MB of RAM—provided in two 4MB 72-pin SIMMs—and a 340MB hard drive. When you look at the sticker, however, you realize the \$2610 price will buy you a 486DX2-66 from many vendors.

In addition, expandability could be better. While the system's 1MB Cirrus Logic graphics accelerator, IDE and floppy adapters,

THE TOP 20

PC WORLD

POWER DESKTOPS



1 Micron 466 VL Powerstation CD
A classic power 486DX2-66.

- New this month
 ▲ Up from last month
 ➤ No change from last month
 ▼ Down from last month

BEST BUYS

		Last month	Months on list	Overall rating	Performance rating	Service rating	Price	CPU	RAM (MB)	Hard drive (MB)	Bus
1	➤		1	82	66	92	\$3599	486DX2-66	16	540	ISA
2	➤		1	81	64	92	\$3079	Pentium-60	8	420	ISA
3	▼	1	2	81	80	85	\$4995	Pentium-60	16	424	ISA
4	➤	4	2	79	81	85	\$4907	Pentium-60	16	540	ISA
5	▼	3	2	79	60	92	\$2767	486DX2-66	8	528	ISA
6	▼	5	2	78	60	85	\$3318	486DX2-66	16	340	ISA
7	▼	2	2	78	71	87	\$5395	Pentium-60	16	520	EISA
8	➤	—	1	77	57	81	\$2398	486DX2-66	8	345	ISA
9	▼	8	2	76	63	84	\$3510	486DX2-66	8	420	ISA
10	▼	6	2	76	63	94	\$5397	486DX2-66	8	1024	ISA
11	▼	7	2	76	63	87	\$4749	486DX2-66	16	520	EISA
12	➤	—	1	75	88	85	\$6473	Pentium-60	16	544	EISA
13	➤	—	1	75	65	68	\$3600	486DX2-66 ²	16	544	ISA
14	▼	9	2	75	75	81	\$5390	Pentium-60	16	540	ISA
15	➤	—	1	75	73	68	\$3999	Pentium-60	8	540	EISA
16	▼	15	2	74	59	71	\$2995	486DX2-66	16	420	ISA
17	▼	11	2	74	60	81	\$4082	486DX2-66	8	340	EISA
18	▼	10	2	74	61	78	\$2350	486DX2-66	8	340	ISA
19	➤	—	1	73	56	76	\$2669	486DX2-66	16	340	ISA
20	➤	—	1	73	70	84	\$5749	Pentium-60	8	540	EISA

¹ Call 800/234-0455 ext. 365 and use the fax reprint numbers to receive an instant fax of any individual system's review, features chart, and test report. To order fax reprints of each

month's complete systems review, enter the corresponding fax reprint number: December 1993, 3012; January 1994, 3001; February 1994, 3002; March 1994, 3003. To get a fax of



2 Austin Power System 60
Top-ranked Pentium starter.



3 IBM ValuePoint P60/D
Three-time Pentium Best Buy.



4 ALR Evolution V
Two-time Pentium Best Buy.



5 Zeos 486DX2-66
Best Buy two months in row.

Monitor size/ dot pitch	Vendor contact number	Issue reviewed	Fax reprint number ¹	Comments
17"/.26	800/438-3343	current	3061	Red-hot DX2-66 with tons of RAM, big hard disk, 4MB caching controller.
15"/.28	800/752-1577	current	3062	Low-price Pentium-60 starter PC is a great value. RAM upgrade would improve performance.
15"/.28	800/772-2227	Jan 94	3041	Three-time Best Buy was first-ever Pentium winner in January. PCI slots.
14"/.28	800/444-4257	Jan 94	3044	This Pentium was a Best Buy last month.
14"/.28	800/554-5220	Feb 94	3043	Fast DX2-66. First-class service, design. Super all-around value. Best Buy two months running.
15"/.28	800/289-3355	Jan 94	3045	Quick DX2-66. Well designed. Fine support. Best Buy in January and February, just misses here.
17"/.28	800/733-2237	Jan 94	3042	A Best Buy last month. Top components except for single-speed CD ROM drive.
14"/.28	800/234-2945 ³	current	3063	Need more RAM to use NT bundle. Fantastic, expandable business PCI machine. No. 1 Budget Best Buy.
15"/.28	800/632-4636	Jan 94	3048	Great 15-inch flat monitor, integrated SCSI, three-year warranty. Nice design but pricey.
16"/.26	800/210-1402	Feb 94	3046	Very expandable, high-priced PCI box. Fine graphics performance.
17"/.28	800/733-2237	Feb 94	3047	Terrifically fast DX2-66 with 17-inch monitor, but CD ROM drive is just single-speed.
14"/.28	800/444-4257	current	3066	Pentium-60 server is the fastest PC we've tested. Big price for a very big system.
15"/.28	708/540-8086	current	3064	Very fast dual-processor 486DX2-66 for symmetrical multiprocessing OSs; \$1000 less for single processor.
17"/.28	800/876-4278	Feb 94	3049	PCI Pentium box with outstanding performance, big monitor. Pricey.
15"/.28	800/239-5409	current	3065	Nice Pentium could use more RAM. Readers say Ambra presales service needs improvement.
15"/.28	800/846-2000	Jan 94	3055	Fast Windows 3.1 box with good expandability, double-speed CD ROM drive. Best Buy in January.
17"/.28	800/876-4278	Jan 94	3051	Upgradable to full Pentium. Fast DX2-66 with big monitor. Three-year warranty.
14"/.28	800/999-1278	Dec 93	3050	Hot performer. Quality construction and good support. Dropped \$150 since last month. No. 5 in Budget PC.
15"/.28	800/577-7526	current	3067	DX2-66 has attractive price. A year of on-site service costs \$120 extra, however.
17"/.28	800/632-4636	current	3068	Pentium EISA box. Great big monitor, internal SCSI, three-year warranty. Not cheap.

¹ the list of all systems tested by the PC World Test Center for the Top 20, enter 7. Touch-tone phone required.

² Symmetrical multiprocessing system (SMP) has two 486DX2-66 CPUs.

³ In California call 408/735-1234.

and I/O ports are all integrated, only three slots remain free—all of them 16 bit. Although most vendors offer VL or PCI slots on their PCs these days, AT&T/NCR has elected to go the straight ISA route on this system. Furthermore, there's just one free drive bay (externally accessible).

Granted, AT&T/NCR's service and support policies are terrific. In addition to a three-year warranty, you get a 30-day money-back guarantee, free on-site service for the first year, and a fast 1-day turnaround for factory repairs. Toll-free tech support is available 24 hours a day, 7 days a week. And the tech staff is courteous, accurate, and knowledgeable. Buyers of AT&T/NCR products tend to be of the corporate stripe, more concerned with system design and vendor longevity and reputation than with a rock-bottom price. Nonetheless, this system's relatively high cost keeps it from getting anywhere near our Budget Top 20. *AT&T/NCR, 800/637-2600, 513/445-5000* **Reader service no. 715**


AT&T/NCR

Austin Power System 60

PC WORLD TOP 20
2 POWER DESKTOP

PROS: Inexpensive Pentium, good support

CONS: Performance held back by mere 8MB of RAM

As configured, the Power System 60 has performance more representative of a hot 486DX2-66 than of an Intel Pentium-60 PC. Why? The 8MB RAM configuration is minimal for a Pentium, and even many top DX2-66s have 16MB these days. Thanks to its Pentium pedigree, however, this PC is still more than powerful enough to plow through any of today's complex business applications without raising a sweat. Its \$3079 price is so good, the Austin wins a Best Buy and rises to number 2 on our Power Top 20. And the 256K secondary cache and 420MB hard disk are solid basics on a Pentium PC.

Austin bundled an internal Sony CD ROM drive with the Power System 60—a handy feature, although you have to add a sound card and speakers to run multimedia apps. And because of the device's proprietary interface, you still have to spring for a host adapter if you plan to add SCSI devices. The Power System 60's motherboard is easy to access, with the exception of the two filled 72-pin SIMM sockets, which are partially obstructed by an internal drive cage. Fortunately, two other empty sockets are easily reached. Two drive bays are available (one externally accessible). And two PCI slots and three 16-bit ISA slots are free. If you're willing to settle for just one free PCI slot, you can add an additional free ISA slot to the count. The video system is also solid, with a 2MB Diamond Viper PCI graphics accelerator and a 15-inch Austin monitor.

Austin offers a generous two-year warranty with free on-site service for one year and a quick one-day turnaround on factory repairs.


Austin

In addition, expert toll-free phone support is available 18 hours, seven days a week, and you also get fax and BBS support. Though the Power System's benchmarks aren't dazzling, if you upgrade RAM to 16MB, you should be able to enhance its performance and wind up with a good basic Windows NT machine or a great OS/2 PC. As it is, this Best Buy Pentium starter box delivers the super value it takes to place number 2 on our Power Top 20. *Austin Computer Systems, 800/752-1577, 512/339-3500* **Reader service no. 716**

Axik 486DX2-66PCI

PC WORLD TOP 20
8 POWER DESKTOP

PROS: Good price, Windows NT bundle

CONS: Insufficient RAM for NT

1 BUDGET DESKTOP

Take a PCI-bus 486DX2-66 system, add a free copy of Windows NT, serve at an astounding \$2398 price, and you get a powerful economy

PC that's such a great deal it rocketed to the top of our Budget Top 20. With Microsoft's Windows NT and Windows 3.1 preloaded on the partitioned hard disk, you can boot in either DOS or NT. However, the applications needed to develop a good Windows NT applications test aren't yet available, so we evaluated this tower PC as a Windows 3.1 machine. We found it delivered solid 486DX2-66 performance, and while the system lagged a bit in our disk-intensive Paradox tests, it fared well in spreadsheet and word processing operations. One reason may be the 1MB PCI graphics accelerator, which sits in one of the three PCI slots. The accelerator is based on S3's 805 chip and takes advantage of PCI's high-speed 32-bit data path to quicken common Windows operations. And the system comes with a 256K secondary cache, expandable to 512K, and has a heady 128MB upper limit on RAM. In fact, this Axik package is so strong it's also a solid number 8 on our Power Top 20.


Axik

The well-designed motherboard features an integrated SCSI adapter, two free 32-bit PCI slots, and four free 16-bit ISA slots. You get three free externally accessible drive bays, two open internal bays, and easy access to RAM, secondary cache, and slots. The drive bays are positioned so you can reach all the SIMM sockets easily. Two of the four 72-pin SIMM sockets are free, so you can upgrade RAM without having to discard any SIMMs.

If you really want to run NT with this machine, you'll probably need a larger hard disk, as a 345MB SCSI drive is pretty minimal for an operating system that requires 75MB for its own installation. You'll also want more RAM than the standard 8MB: Microsoft lists 12MB as the minimum, but practically, you'd want at least 16MB for NT. Fortunately, this PC's price-to-power balance is so outstanding, it's a super budget buy as a Windows 3.1 system. If NT transcends its current niche as a LAN operating system, you can always add a larger hard disk and more RAM. Meanwhile you have all bets covered.

Axik isn't a household name, but the company produces consistently good designs and holds its own in our service-and-support ratings, offering one year of free on-site service and 12 hours of daily toll-free technical support (6 hours on **continued on page 134**)

WE'RE REDEFINING
WHAT YOU
SHOULD EXPECT
FROM
OFFICE PRINTERS.

Speed ('spēd) *n.* 1. A feature rarely found in low-cost inkjet printers. *example:* In letter quality mode, the **TI microMarc™** printer gives you laser quality printing at twice the *speed* of the HP DeskJet™ printer.



THE UNDER \$300 PRINTER, REDEFINED.

If you're looking for a printer with a street price under \$300*, you no longer have to settle for poor print quality or painfully slow print speed.

Now, for about the same price as a dot matrix printer, the TI microMarc, with its advanced inkjet technology, will give you the same 300 dpi print quality as most laser printers.

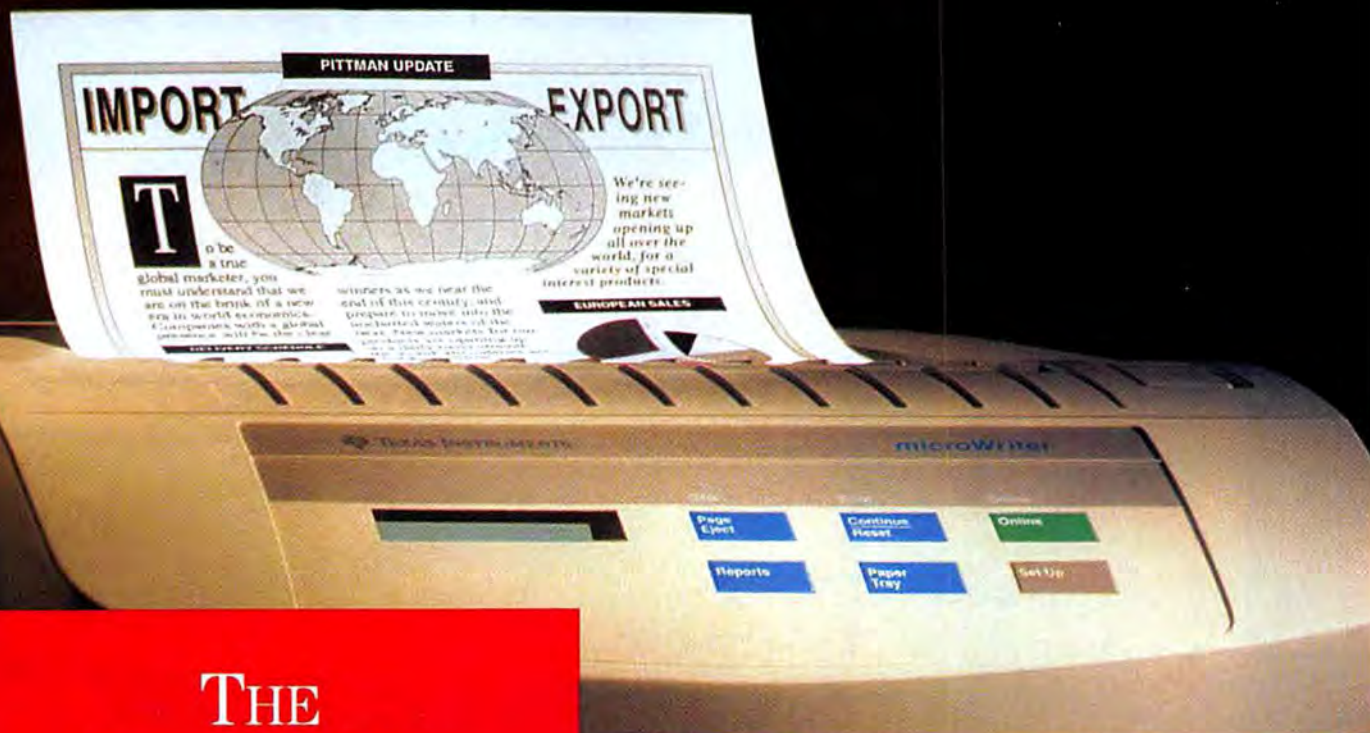
And unlike our biggest competitor, the HP DeskJet, instead of 50 nozzles applying ink to the page, we give you 128 nozzles. Which means that, in letter quality mode, we print text twice as fast. We also give you more memory than they do, for improved graphics. And the benefits don't stop there.

The TI microMarc is also easy to use, thanks to its new high-capacity, easy to replace ink cartridge.

The TI microMarc. It's so quiet, so reliable, so inexpensive to run and easy to use, it can help you get more from your printer than you ever thought possible. At a price you probably never thought possible. For more information or a dealer near you, call **1-800-527-3500**.

	TI microMarc	HP DeskJet 500
<i>Speed (in letter quality mode)</i>	300cps	120cps
<i># Of Nozzles</i>	128	50
<i>Print Quality</i>	300 dpi	300 dpi
<i>Memory</i>	24K	16K
<i>Pages/Cartridge</i>	1400	1000
<i>Weight</i>	12.1 lbs.	14.3 lbs.

Flexibility (flek·sə·bil·ət·ē) *n.* 1, A feature previously not found in this category. *example:* For under \$800, **TI microWriter™** printers give you the *flexibility* to start with **Adobe® PostScript®** or add it later; the comparable HP 4L does not.



THE UNDER \$800 PRINTER, REDEFINED.

If you're looking for a printer with a street price well under \$800, you'll have a hard time finding one with as many features as a TI microWriter.

Let's compare it to our leading competitor, HP, starting with basic models. First, take flexibility. Ours lets you add PostScript now or later. With the HP 4L you can't add it at all. Take paper handling. Ours comes with a 250-sheet tray standard, theirs with just a 100-sheet. Speed? We give you 5 ppm, they give you 4. Yet in spite of all this, we still list for hundreds of dollars less.

Now, let's compare high end models. As you'll see from the

chart, the features here are basically comparable—till you get to price. And once again, the TI microWriter is clearly the better value. For more information or a dealer near you, call 1-800-527-3500.

	TI microWriter Basic	HP 4L	TI microWriter PS23	HP 4ML
Print Speed	5 ppm	4 ppm	5 ppm	4 ppm
PostScript	Upgradeable	No	Standard	Standard
Paper Trays	(std.) 250 sheet	100 sheet	250 sheet	100 sheet
	(opt.) 250 sheet	Not Avail.	250 sheet	Not Avail.
List Price	\$599	\$849	\$799	\$1279

EXTENDING YOUR REACH
WITH INNOVATION™

**TEXAS
INSTRUMENTS**



Compatibility (kəmˌpat·əˈbil·ət·ē) *n.* 1, A feature typically lacking in this category. *example:* The new **600 dpi TI microLaser™ Pro 600** printer gives you DOS, Windows, Mac®, PCL5 and PostScript® compatibility standard; HP charges hundreds more.



Adobe PostScript

Specifications in chart are based on information as of 12/93. *Estimated dealer price including manufacturer's rebate is under \$1400. Dealer prices may vary. † At 4% coverage. ‡ Rebate applies to PS23 model. microLaser and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. LaserJet is a registered trademark of Hewlett-Packard, Inc. Mac is a registered trademark of Apple Computer, Inc. © 1993 TI.

THE UNDER \$1400 PRINTER, REDEFINED.

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You see, when we set out to design the ideal office printer, we began by asking thousands of users what they wanted most. And then, instead of making those "key care-about" optional, as others do, we made them standard.

Take print quality. We began with true 600 dpi resolution. And then enhanced it with 6MB of memory for improved graphics. Compatibility? We're DOS, Windows and Mac® compatible right out of the box. With all the right languages and interfaces. And with the intelligence to switch these automatically, depending on the environment. Connectivity? All popular protocols are supported with a single network option board. Low maintenance? Our new toner cartridge typically gives you

15,000 pages between changes. Paper handling? Two 250-sheet trays come standard. And finally, value. As the chart below shows, not only do we give you a lot more than our leading competitor, we also charge you a lot less.

So if you're considering a new printer, we invite you to try the new TI microLaser Pro 600. For more information or a dealer near you, call 1-800-527-3500.

Ask
About Our \$60
End User
Rebate.*

	TI microLaser Pro 600	HP LaserJet® 4	HP LaserJet 4M
<i>True 600 dpi</i>	Yes	Yes	Yes
<i>Speed/Processor</i>	8 ppm/RISC	8 ppm/RISC	8 ppm/RISC
<i>Memory</i>	6MB	2MB	6MB
<i>Emulations</i>	PCL5/ Adobe® PostScript 2	PCL5E	PCL5E/ Adobe PostScript 2
<i>Compatibility</i>	DOS/Mac	DOS	DOS/Mac
<i>Toner Cart. Life</i>	15K pages	6K pages	6K pages
<i>Paper Trays</i>	250 sheet/ 250 sheet	250 sheet/ 100 sheet	250 sheet/ 100 sheet
<i>Auto Language Switching</i>	Yes	No	Yes
<i>Auto Interface Switching</i>	Yes	Yes	Yes
<i>40MHz Processor Upgrade</i>	Optional	Not Avail.	Not Avail.
<i>List Price</i>	\$1599*	\$1839	\$2479

EXTENDING YOUR REACH
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 **TEXAS
INSTRUMENTS**

Circle 242 on reader service card

Saturdays). The company also provides fax and BBS service. The tech-support personnel are knowledgeable and friendly, and we never waited more than 2 minutes before reaching a representative. If you buy this PC with 16MB of RAM and a larger hard disk, we see no reason not to recommend this Best Buy system as an NT machine. As it is, it's a fantastic budget value. *Axix Computer, 800/234-2945, 408/735-1234 Reader service no. 717*

Blackship BLK 486DX2/50 LB

PC WORLD TOP 20
11 BUDGET
DESKTOP

PROS: Good price, lots of free bays and slots

CONS: All SIMM sockets filled, no weekend tech support

Like most Blackship products, this BLK 486DX2/50 LB is a price leader. At \$1995, it's about \$800 cheaper than our median system. And performance stands up surprisingly well on this 50-MHz box, even when compared to DX2-66s: The system finished our benchmarks nearly as fast as our median machine. This feat contributes to the Blackship's number 11 position on our Budget Top 20.

This tower model provides good expandability overall. A clock-switchable motherboard and a 238-pin ZIF socket should let you upgrade to Intel's forthcoming Pentium OverDrive. But keep in mind that an upgrade from the DX2-50 to a non-Pentium 66-MHz OverDrive is not advantageous, considering the relatively high cost and modest performance boost. It remains to be seen if Pentium OverDrive upgrades will be cost-effective for 486s faster than 33 MHz. The smartest move is to plan ahead and buy a PC with a CPU that will meet both your current and future needs.

This system provides one free VLB slot, three free 16-bit ISA slots, and three open drive bays. Unfortunately, the motherboard uses 30-pin SIMM sockets instead of the more versatile 72-pin variety. Eight 1MB modules fill all the SIMM sockets in this 8MB configuration. Buy the PC with either 4MB or 16MB of RAM, depending on your needs, and you'll get a bank of four SIMM sockets open for expansion (32MB is the RAM ceiling). The installed 256K secondary cache will more than suffice for Windows.

Blackship uses quality components: The 1MB Orchid Fahrenheit VA/VLB graphics accelerator/8-bit sound card comes with a microphone. The 512K Promise VL bus caching hard disk controller boosts performance on disk-intensive operations, and even with most business apps, you may not need a larger cache. Blackship also throws in a 9600/2400-bps Zoom Telephonics fax-modem. But the budget price buys you just a 14-inch monitor.

Your purchase is backed with one year of free on-site service, 2-day turnaround on factory repairs, and a 30-day money-back guarantee. Tech support is toll free, generally responsive, and accurate—although it's available only on weekdays during business hours. Overall, the Blackship BLK 486DX2/50 LB is a very good value. You get solid performance, expandability, and support—for a very competitive price. *Blackship Computer Systems, 800/531-7447, 408/432-7500 Reader service no. 718*



Blackship

CSP 486 Medium Tower

PROS: Excellent price, double-speed CD ROM drive

CONS: No empty SIMM sockets, poor customer service

Computer Sales Professional loads value into its 486 Medium Tower, delivering a solid 486DX2-66 for just \$2199 with 8MB of RAM, a 256K secondary cache, both floppy drives, a 425MB hard drive, a double-speed CD ROM drive, and a 15-inch monitor. Performance almost matched our median, the only significant digression being a 10 percent lag on the Excel test.

The five free expansion slots—three 16-bit and two 32-bit VL bus slot—and three empty full-size drive bays (two externally accessible) are more than in many desktops. Unfortunately, the 8MB RAM configuration fills all eight 30-pin SIMM sockets, so you must discard memory to expand RAM.

Since CSP prices this unit some \$600 cheaper than our median system, why doesn't it rate higher? Customer service is the problem. Although a fast 1-day repair turnaround policy and 45-day money-back guarantee grabbed our attention, we had to endure repeated long periods on hold, waiting to talk to a sales rep. When we tried to set up an official *PC World* on-site visit, it took three calls a day for 4 working days to reach the person responsible for approving press visits. We were told we'd have to wait 30 to 45 days until the company could spare the time for a site tour. Considering that, we wondered how a customer with a complaint would fare. We had to downgrade the company's formerly decent service rating to poor. We'll continue to monitor customer service, for otherwise this CSP package offers value that would rank it among our Budget Top 20. *Computer Sales Professional, 800/950-6660 Reader service no. 719*



CSP

DTK FEAT-33

PROS: Low price, two-year warranty

CONS: No weekend tech support

The \$1695 FEAT-33 minitower is a bargain hunter's special: dirt cheap, with oodles of space for expansion, and solid service and support. A 1MB VLB graphics accelerator and VLB hard disk adapter fill the two local bus slots, leaving a generous four 16-bit ISA slots free for adding peripherals. While the unit's 344MB hard drive is installed in an externally accessible drive bay, you can easily move it over to the internal bay, freeing up two externally accessible bays.

The AMD 486DX2-50 seems a functional match for its Intel counterpart. So although the FEAT-33's performance was a bit slower than our median system's, you can chalk up the difference to the minimal 4MB of installed RAM and slower (50-MHz) CPU. But a bank of four 30-pin SIMM sockets is waiting for an upgrade.



DTK

Satisfaction (*sat·əs·fak·shən*) *n.* 1, A feature previously left to chance in the purchase of a printer. *example:* When you buy a new TI printer*, your **satisfaction** is **guaranteed** or call TI within 30 days and we'll take it back.



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THE WAY YOU BUY A PRINTER, REDEFINED.

In the past year, we've introduced a whole new line of office printers. And as you've seen in the previous pages, they're some of the most advanced models on the market today. But now, we're also going to change the way you buy a printer.

When you buy one of these new TI printers, if you need any help at all, simply call us toll-free at 1-800-TI-TEXAS, and we'll work with you. Then, within 30 days from date of purchase, if you're still not completely happy, call TI and we'll take it back. It's as easy as that. That's how confident we are in each

and every printer we make. And even after the 30 days, you can continue to call the 800 number for any help you may need.

For more information about the TI microMarc™, the TI microWriter™ or the new TI microLaser™ Pro 600 printers, and for the name of a dealer near you, call 1-800-527-3500. And see for yourself how TI is redefining what you should expect from an office printer.

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* Offer applies to all new TI microMarc, microWriter and microLaser Pro 600 printers, if returned in good condition. microMarc, microWriter, microLaser and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. ©1993 TI.

Circle 242 on reader service card

THE TOP 20

PC WORLD

BUDGET DESKTOPS



1 Axik 486DX2-66PCI
Power system—budget price.

- ▶ New this month
 ▲ Up from last month
 ◀ No change from last month
 ▼ Down from last month

BEST BUYS

BEST BUYS			Last month	Months on list	Overall rating	Performance rating	Service rating	Price	CPU	RAM (MB)	Hard drive (MB)	Bus
1		Axik 486DX2-66PCI	—	1	81	57	81	\$2398	486DX2-66	8	345	ISA
2		Netis N433VL	1	2	79	38	76	\$1660	486DX-33	8	250	ISA
3		Netis N4D266VL Power Station	2	2	79	51	76	\$1899	486DX2-66	4	250	ISA
4		Blackship BLK 486/66 LB	3	2	78	52	75	\$1995	486DX2-66	8	244	ISA
5		Polywell Poly 4586VR	10	2	77	61	78	\$2350	486DX2-66	8	340	ISA

6	▼	IBM PS/1 Consultant DX2-66	5	2	77	42	85	\$2399	486DX2-66	8	420	ISA
7	▲	Inmac Insignia 466P	8	2	77	53	92	\$2488	486DX2-66	8	170	ISA
8	▲	Axik Ace Cache 486DX2-66V	9	2	76	56	81	\$2198	486DX2-66	8	245	ISA
9	▼	Ambra D466BL	4	2	76	49	68	\$2178	IBM 486BL-66	8	240	ISA
10	▼	NMC 486 VL-Bus Winstation	7	2	76	38	79	\$1891	486DX-33	8	212	ISA
11	▶	Blackship BLK 486DX2/50 LB	—	1	76	45	75	\$1995	486DX2-50	8	250	ISA
12	▼	CompuAdd C433S Low Profile	11	2	75	39	77	\$1779	486SX-33	8	210	ISA
13	▲	Axik Ace Cache 486DX2-66VG	15	2	75	56	81	\$2298	486DX2-66	8	250	ISA
14	▼	Micro Express MicroFlex-VL/S	13	2	74	37	79	\$1999	Cx486S-40	16	240	ISA
15	▼	Diamond DT 486C-40 VL	12	2	74	29	77	\$1439	Cx486S-40	4	250	ISA
16	▲	Insight 486DX2-66 VL	17	2	73	45	65	\$2199	486DX2-66	8	340	ISA
17	▼	AST Bravo LC 4/66d Model 213W	14	2	73	52	81	\$2479	486DX2-66	8	210	ISA
18	◀	MIS Promis SL-66	18	2	73	59	81	\$2499	486DX2-66	8	240	ISA
19	◀	Tangent VL 466	19	2	73	41	87	\$2150	486DX2-66	4	260	ISA
20	▼	Elitech Splendor III	16	2	73	41	76	\$1999	486SLC2-66	8	250	ISA

¹ Call 800/234-0455 ext. 365 and use the fax reprint numbers to receive an instant fax of any individual system's review, features chart, and test report. To order fax reprints of each

month's complete systems review, enter the corresponding fax reprint number: December 1993, 3012; January 1994, 3001; February 1994, 3002; March 1994, 3003. To get a fax of



2 Netis N433VL
Best Buy \$1660 DX-33.



3 Netis N4D266VL
DX2-66 priced under \$1900.



4 Blackship BLK 486/66 LB
DX2-66, 8MB RAM for \$1995.



5 Polywell Poly 4586VR
Fast, well-designed DX2-66.

Monitor size/ dot pitch	Vendor contact number	Issue reviewed	Fax reprint number ¹	Comments
14"/.28	800/234-2945 ²	current	3069	Great expandable business PCI DX2-66. Needs more RAM to use bundled Windows NT. No. 8 Power system.
14"/.28	800/577-7526	Dec 93	3021	Great price, good performance for an expandable DX-33. Second month as Best Buy.
14"/.28	800/577-7526	Feb 94	3022	Super price on good, basic DX2-66 but only 4MB of RAM. Second month as Best Buy.
14"/.28	800/531-7447	Jan 94	3023	Slots aplenty on two-time Best Buy DX2-66. Still under \$2000 but up \$100 from last month.
14"/.28	800/999-1278	Dec 93	3050	Hot performer moves up five spots from last month thanks to \$150 price drop. No. 18 on Power list.
14"/.28	800/426-3377	Feb 94	3025	Best Buy last month just misses here. Features Energy Star rating, new PS/1 user-friendly features.
14"/.28	800/547-5444	Feb 94	3056	Expandable IBM-made PC needs larger hard drive. Service and support rates high.
14"/.28	800/234-2945	Dec 93	3029	A particularly speedy DX2-66 for the money. Good service and support.
14"/.28	800/239-5409	Dec 93	3024	Reader feedback on confused presales service causes big drop from Best Buy last month.
14"/.28	800/424-2983	Dec 93	3027	Nimble performance for DX-33 keeps this PC on the chart.
14"/.28	800/531-7447	current	3070	Intel 486DX2-50 tower system is expandable, quick for its class. Good service and support.
14"/.28	800/627-1961	Dec 93	3031	On our tests, this 486SX-33 outran many DX-33s; responsive around-the-clock tech support.
14"/.28	800/234-2945	Feb 94	3035	DX2-66's price drops another \$100 from last month. Solid performer with good service.
14"/.28	800/989-9900	Dec 93	3033	Fast Cx486S-40 with competitive price, caching drive controller, responsive tech support.
14"/.28	800/989-7253	Dec 93	3032	Hard to find a lower price. Cx486S-40 with VL bus caching drive controller and good support.
15"/.28	800/998-8011	Dec 93	3037	Good price, clean design, great expandability. Previous inconsistent service improving.
15"/.28	800/876-4278	Dec 93	3034	Nicely designed compact business PC. Nearly flat 15-inch monitor, 24-hour-a-day support.
14"/.28	800/733-9188	Dec 93	3038	Solid DX2-66 performance, integrated fax-modem, good tech support.
14"/.28	800/800-6060	Feb 94	3039	Great expandability, solid service and support. Upgrade RAM to improve so-so performance.
14"/.28	800/358-8330	Dec 93	3036	Excellent price for December Best Buy with almost DX2-66 performance, CD ROM drive, 16-bit sound.

the list of all systems tested by the PC World Test Center for the Top 20, enter 7. Touch-tone phone required.

² In California call 408/735-1234.

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DTK offers a two-year warranty, a year of on-site service for \$75, and toll-free support 9 hours each weekday. Calls were answered impeccably. Although the FEAT-33 missed our Budget Top 20, it came close. If you want an inexpensive system with reliable support and room to grow, the FEAT-33 has lots to offer. *DTK Computer*, 800/289-2385, 818/810-8880 **Reader service no. 720**

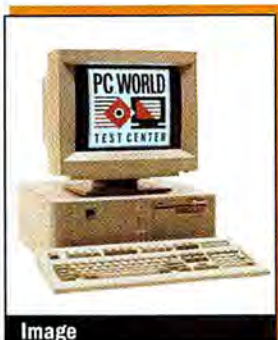
Image Microsystems 486-DX-33 Vesa Local Bus

PROS: Inexpensive

CONS: Sluggish performance

This Image system's \$1599 price is attractive—but this DX-33 is not a strong performer, even when measured against other 33s. Upgradability is good, with a motherboard that features a 238-pin ZIF CPU socket and is clock-switchable from 20 to 50 MHz. And although the 4MB RAM configuration is the bare minimum for Windows, an unoccupied bank of four 30-pin SIMM sockets is available for adding more RAM. The system's installed 256K secondary cache is the largest available, but you get just a basic 210MB hard disk. Even with two VLB slots claimed by the graphics and drive/IO adapters, one remains free, along with three 16-bit slots and one 8-bit slot. Three externally accessible bays are free.

On-site service is limited to the Greater Los Angeles area—a drawback for buyers outside L.A. On the other hand, Image provides 24-hour, seven-day tech support and a quick two-day turnaround on service-center repairs. You get a lifetime labor warranty and a one-year parts warranty. Tech support is knowledgeable, courteous, and responsive. Systems using the DX-33 still have a place when budgets are tight and applications undemanding, but this one's not quite fast enough to make the grade. *Image Microsystems*, 800/729-3400, 310/815-1000 **Reader service no. 721**



Image

Insight VL 486DX2-66 MM

PROS: Attractive hardware/software bundle

CONS: Rather slow performance

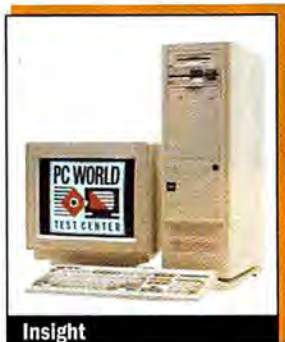
Insight's VL 486DX2-66 MM offers an impressive complement of multimedia components and software. It comes with 16MB of RAM, a healthy 420MB Western Digital IDE hard drive, and a 256K secondary cache. But despite the 486DX2-66 CPU and nifty extras, this box lagged a bit in performance when compared with our median PC. That, along with its relatively high \$3499 price, stopped it short of the Power Top 20.

The full-size tower case leaves ample room for expansion, and there's also easy access to the entire motherboard. Both VL bus slots are filled—one with an STB Power Graph VL-24 video board, the other with a local bus drive/IO adapter. The monitor is a respectable 15-inch CMS-1561 Multiscan. Even with the Spectrum 16 Multimedia sound card installed, three 16-bit slots and two 8-bit

slots remain free. And every slot can hold a full-length card.

With both floppy drives, the hard drive, and a CD ROM drive installed, you still get three free drive bays, (three externally accessible). The unit's 16MB memory configuration is the optimum for such a power system, and a bank of four 30-pin SIMM sockets remains free. Insight bundles Altec Lansing speakers, Labtec Stereo headphones, a microphone, and a surge suppressor. In addition, you get your choice of one of five CD ROM software bundles.

As we have often noted, Insight offers no on-site service option. However, it does provide 24-hour support, fax access, a new support BBS, and a quick two-day turnaround on repairs. Reader reports of past problems with Insight tech support pull this PC's rating down, although the current response trend is more positive. Insight often has machines on our Top 20 lists, but this particular model doesn't provide the required balance of price and performance. *Insight*, 800/998-8011, 602/902-1176 **Reader service no. 722**



Insight

International Instrumentation Blue Max Business Partner

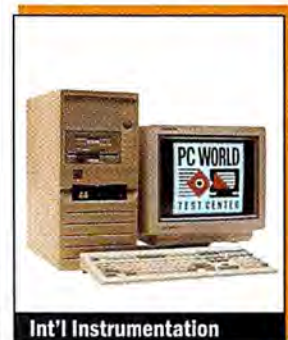
PROS: Energy Star compliant

CONS: Poor documentation

In most respects, this Energy Star PC is middle-of-the-road. The 486DX2-66 processor, 8MB of RAM, 256K secondary cache, and 344MB hard drive are all standard fare on business-class systems these days. And performance results (you guessed it) closely match those of our median PC, except in the DOS Paradox test, where it trailed by a little under 10 percent. That's a surprise, as the 2MB Promise VL-bus caching drive controller it uses has produced outstanding Paradox results in the past. A 1MB Genoa graphics accelerator claims one VL slot, and you get a 15-inch Samsung monitor.

Expandability is fair on this midsize tower. You'll find three free drive bays (two externally accessible), one free VL slot, and four free 16-bit ISA slots. Unfortunately, adding RAM to this 8MB PC is expensive. All eight of the 30-pin SIMM sockets are filled with 1MB modules, which means any RAM upgrade entails discarding installed SIMMs. Otherwise, system design is good. Despite some untidy cables, the motherboard is sensibly laid out, with all the essential components easily accessible. Documentation also needs some work, however, and the manual could be clearer.

International Instrumentation includes a year of free on-site service and a quick next-business-day turnaround on factory repairs. Toll-free tech support performed well in our tests; it's available 12 hours a day, seven days a week. All in all, the Blue Max is a solid



Int'l Instrumentation

PC. For \$2744—about \$100 less than our median system—you get a capable machine, not rating quite high enough to make our Budget Top 20, but fairly close. *International Instrumentation*, 800/543-3475, 805/495-7673 Reader service no. 723

Micron 466 VL Powerstation CD

PC WORLD TOP 20
1 POWER DESKTOP

PROS: Fast for a DX2-66, great monitor, CD ROM drive

CONS: Expensive for a DX2-66, no open SIMM sockets

This stylish desktop is loaded with quality features, and it earns a Best Buy and premiere billing on our Power Top 20. This is one of the fastest DX2-66s we've ever seen: Assisted by a 4MB Promise VL caching hard disk controller and a Diamond Viper graphics accelerator with 2MB of fast VRAM, the Micron Powerstation blasted through our tests 20 percent ahead of our median PC. It even beat all but one of the Pentium systems reviewed this month on both Paradox tests.

The case is neat and compact, and the system comes with 16MB of RAM, expandable to 64MB. All four 72-pin SIMM sockets are filled, however, so if you think you may need a future upgrade, ask Micron to install two 8MB SIMMs or even a single 16MB module rather than the four 4MB SIMMs. A maximum 256K secondary cache fills out the memory picture. The CPU is topped off by a fan mounted on a heat sink, which keeps the processor cool but also limits two of four free 16-bit ISA slots to half-length cards. You also get one free 5¼-inch externally accessible drive bay and one free internal 3½-inch bay.

The 4MB Promise IDE caching card uses one local bus slot and controls the 540MB IDE Conner hard drive. The zippy Diamond Viper graphics accelerator, based on the Weitek P9000 chip, holds 2MB of VRAM and delivers up to 1280 by 1024 resolution. The accompanying 17-inch programmable Mag monitor is a great complement, making for a superb video subsystem. Micron rounds out this package of top-notch components with a double-speed Mitsumi CD ROM drive with 280ms access time and a fast 300-kilobytes-per-second sequential transfer rate.

Micron's support looks good: A one-year warranty is backed by free on-site service and knowledgeable, responsive toll-free tech support. \$3599 may seem high, but look at what you get: a screamingly fast Best Buy DX2-66 loaded with quality components. *Micron Computers*, 800/438-3343, 208/465-3434 Reader service no. 724



NEC Image P60 Pentium

PC WORLD TOP 20
20 POWER DESKTOP

PROS: Great monitor, integrated audio and SCSI

CONS: High price, poor access to memory sockets, only 8MB of RAM

NEC joins the Pentium ranks with the introduction of the Image P60. This stylish EISA desktop machine comes decked out with just 8MB of RAM, but it also features a healthy 256K secondary cache, a big 540MB IDE hard drive, and a 2MB Diamond Viper PCI bus graphics accelerator. Top all this off with the stunning 17-

inch NEC 5FG monitor, and you've got a system to crow about.

The unit we tested was one of the first off the line, but it held its own in its 60-MHz Pentium class on our benchmarks, despite a lower RAM configuration than we expect in this class. In a feature-by-feature comparison with other Pentiums we've seen, the Image P60 measures up well by including a few flashy extras, such as integrated SCSI and audio. Memory is about the only upgradable component on the motherboard. If you need to add RAM beyond the 8MB that's already installed, you're in for a surprise: Four of six 72-pin SIMM sockets are empty and clearly visible, but unless you

have small hands, you'll have trouble accessing the sockets. We suggest that you just order this PC with 16MB of RAM to serve the horsepower of the muscular Pentium-60 processor.

NEC earns top marks for service and support by offering a liberal three-year warranty, with on-site service free for the first year, and a 30-day money-back guarantee for systems bought directly from NEC. Excellent technical support is available by phone and fax 12 hours a day, but just on weekdays. NEC makes well-designed and reliable equipment, and the overall value of this PC for the power buyer is enhanced by its great monitor and big hard disk. Even with its \$5749 price, it earns a place at number 20 on our Power Top 20. *NEC Technologies*, 800/632-4636, 508/264-8000 Reader service no. 725

Netis N466VG

PC WORLD TOP 20
19 POWER DESKTOP

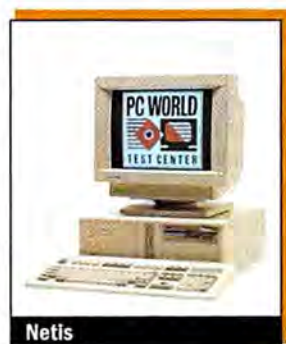
PROS: Swift performance, good price

CONS: None

The Netis N466VG is a power system at a near-budget price. This DX2-66 comes with 16MB of RAM, a 256K secondary cache, a 2MB Diamond Viper VLB graphics accelerator, and a 2MB caching hard drive controller. These components give the unit a noticeable performance edge over our median system. And the reasonable \$2669 price is good news.

Expandability has its ups and downs in this compact unit. All the SIMM sockets are accessible, and with 16MB of RAM installed, you have a bank of four 30-pin sockets free for future expansion. The hard disk controller accepts up to 16MB of RAM—enough for even outlandishly disk-intensive applications. Unfortunately, the fan atop the DX2-66 CPU prevents installation of full-length cards in two of the four free 16-bit slots. The unit appears to have two free 5¼-inch bays and one free 3½-inch bay, but in fact the Western Digital Caviar 2340 340MB hard drive fills the 3½-inch bay (there are no internal bays on this PC).

Netis charges \$120 for a year of on-site service—high, considering many companies provide it free. Toll-free phone support is available



Netis

10 hours daily and 6 hours on Saturdays. Netis technicians impressed us with their immediate and knowledgeable responses.

The Netis N466VG meets our expectations with good performance, a competitive price, and solid service and support. No wonder it earns a number 19 position on our Power Top 20. *Netis Technology*, 800/577-7526, 408/263-0368 Reader service no. 726

NuTek Duet 486DX2/66

PROS: Dual PC and Mac-alike systems, 17-inch monitor

CONS: Poor performance, Mac incompatibilities, no on-site service

Does a Mac-compatible and a PC in one box sound handy? Well, NuTek USA is taking a stab at making one. The Mac-compatible side of the equation is a work-alike—not a Mac clone—and it uses NuTek's proprietary operating system, which emulates the Mac OS without benefit of Apple's code. Whichever computer you need to use—Mac-alike or PC—you can switch to it in a flash. The PC runs on a 486DX2-66 and the Mac-alike on a Motorola 68030. Each side has its own 8MB of RAM, 170MB hard drive, expansion slots, and video processor. The PC has its own dedicated parallel and serial ports, and the Mac-alike provides a dedicated SCSI port. The 3½-inch floppy drive, keyboard, mouse, and video-to-monitor ports are all shared, but the two computers operate independently, with only one active at a time.

Unfortunately, this nifty concept fails in implementation. The PC's performance is so anemic, every DX-33 we tested this month beat its Excel times (even though the NuTek has a 4MB caching disk controller). You *can* configure the PC and Mac-alike to share a SCSI CD ROM drive, but only by filling your sole free slot with an ISA host adapter. And the eight 30-pin SIMM sockets on each system board are filled, making for extra-expense upgrades as you discard RAM you already paid for.

The Duet passed our series of compatibility tests using a variety of PC peripherals. But when our counterparts at the Macworld Test Center checked out the Mac-compatible, they found a slew of incompatibilities with important Mac software and hardware, such as Adobe Illustrator, Aldus PageMaker, Apple Macintosh PC Exchange, AppleTalk, AppleShare, any NuBus network card, and all tested models of the Apple LaserWriter. Poor PC performance is one thing, but as tested, the highly incompatible Mac-alike component is impossible to recommend. At least for now, if you need a PC and a Mac, you'll have to buy two computers. *NuTek USA*, 800/900-3838, 408/973-8799 Reader service no. 727

Polywell Poly4586-66EV

PROS: Fast, CD ROM drive

CONS: High price

If you're laying out a blueprint of server features, you might find Polywell's \$4585 Poly4586-66EV already fits your plan. While this tower is a 486DX2-66 rather than a Pentium powerhouse, it has the balance of performance and features you'd expect in a server for a

small-office LAN. Keep in mind that Polywell isn't known for cut-rate prices; rather, this vendor has a reputation for *not* cutting corners. And this solid system just missed a spot on our Power Top 20.

The Poly4586-66EV provides a solid 256K secondary cache, an ample 16MB of RAM, two free EISA/VL slots, and four free EISA slots. In addition you get a 540MB SCSI hard drive controlled by a 4MB caching EISA card. There's sufficient space to add drives in five free bays. The motherboard layout is good, and only one of four 72-pin SIMM sockets is filled, letting you upgrade memory without discarding SIMMs.

This DX2-66 is no slouch when it comes to performance. It outperformed most of its peer group on every test. The video system is outstanding as well. The VL bus Actix Graphics Engine Ultra board features 2MB of fast VRAM and the high-end S3 928 chip. In addition, the 15-inch ADI monitor provides high resolutions and refresh rates. While that level of quality isn't essential in a server, users of CAD, publishing, and other high-end apps will welcome it. And the double-speed Texel (now Plextor) internal CD ROM drive is convenient for installing large operating systems and can give workstations access to reference applications.

Polywell holds its own in support, with a two-year warranty on parts and five years on labor. You get 9 hours of daily toll-free tech support, weekend hours, and a year of on-site service for \$75. Polywell's support personnel are accurate and personable, and we never waited more than 2 minutes to get through. If you need a server or power workstation, and performance and quality count more than low price, this system merits a very close look. *Polywell Computers*, 800/999-1278, 415/583-7222 Reader service no. 728

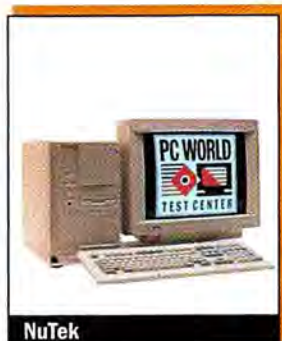
Tagram HiNote 14

PROS: Multimedia bundle, attractive price

CONS: Limited drive expandability

If you're looking for an inexpensive multimedia PC, the Tagram HiNote 14 is a real eye-catcher. For a temptingly low \$2327, Tagram delivers a double-speed CD ROM drive, a SoundBlaster-compatible sound board with MIDI support, speakers, and a slew of CD ROM software titles.

But you won't get top performance out of this minitower, as it's just a 33-MHz 486DX. The HiNote 14 comes with 8MB of RAM, a 256K secondary cache, a 250MB Western Digital Caviar IDE hard drive (connected to a VL bus adapter), and a Tseng Labs ET4000/W32-based VL bus graphics accelerator. The nifty 15-inch, programmable, noninterlaced Proton monitor offers fast ergonomic refresh rates all the way to its top 1280 by 1024 resolution and provides a glare-guard panel



Polywell



Tagram

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and a movable shade. The speakers are integrated with the display to cut down on clutter.

Inside you'll find only one drive bay free. The combination graphics accelerator, IDE adapter, and I/O VL bus card saves a slot, however, and four 16-bit ISA slots remain free. RAM expandability is not optimized on this system; the 30-pin SIMM sockets are all filled with 1MB SIMMs, which means you have to discard at least four SIMMs to upgrade (32MB is the maximum).

Tagram offers a one-year warranty accompanied by free on-site service and toll-free tech support with fax and bulletin board service. Our calls were rewarded by snappy 1-minute responsiveness and accurate answers. This PC is a decent value for multimedia buyers. But its middling performance and limited expandability keep it off our Budget Top 20. *Tagram Systems, 800/824-7267, 714/258-3222* Reader service no. 729

Tri-Star 486DX2/66 Tower MPC

PROS: Good performance, removable hard drive, 16MB caching drive controller
CONS: High price

The Tri-Star 486DX2/66 Tower MPC is a multimedia PC deluxe. The basic system leaves little to be desired, with its 16MB of RAM, 256K secondary cache, combo floppy drive, 420MB removable IDE hard disk, and amazing 16MB VL bus caching drive controller. While performance on this PC was good across the board, none of our tests—which are based on typical business applications—take advantage of such a large disk cache. But multimedia applications that need to access large chunks of data off the hard disk may run more smoothly using the big caching card, which supports two IDE buses and four hard drives.

You also get an internal double-speed Texel CD ROM drive, a 16-bit Sound Galaxy sound card, multimedia software, a pair of headphones, and Aztech speakers. The CD ROM drive is connected to a SCSI port that's attached to a circuit board tacked on to the end of the sound card. As a result, the assembly is on the flimsy side, and you'll have to be careful to avoid damage if you need to unplug and reconnect the cable. The 3MB Matrox VL bus graphics accelerator is a classy addition, as is the 17-inch MicroScan 5A programmable monitor. This big beauty supports up to 1280 by 1024 resolution—noninterlaced at an ergonomic 72 Hz—and provides an impressive .26mm dot pitch.

The free slot count is just adequate: one 32-bit VL bus, one 16-bit, and one 8-bit slot (the 16-bit accepts half-length cards only). You get plenty of room for hard drives, however, with five available drive bays (one externally accessible). And a bank of four 30-pin SIMM sockets is open, so you can go straight to the maximum 32MB of RAM without discarding any SIMMs.

Service and support is outstanding: Tri-Star's two-year warranty includes a year of free on-site service and a 30-day money-back guarantee. The toll-free tech support line—available 12 hours on weekdays—yielded perfect responses in 3 minutes or less. In addition,

you get BBS and fax support. Tri-Star spared nothing in putting together this super multimedia setup. Your only question will be whether you can afford the \$4965 price, which was steep enough to push this system well off our Power Top 20. *Tri-Star Computer, 800/800-2690, 602/961-3401* Reader service no. 730

VTech Platinum SMP

PC WORLD TOP 20
13 POWER
DESKTOP

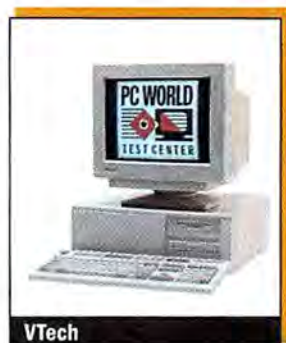
PROS: Fast, twin processors, very good price

CONS: Mixed feedback from readers about support

This desktop PC offers twice as much as most business users need—two 486DX2-66 processors: one on the motherboard, the other on a special riser card. This is a symmetric multiprocessing (SMP) system, meaning its twin CPUs can work together without each processor's being limited to separate tasks. Performance gains over single-processor designs can be huge, although you must use an operating system that can deliver SMP, such as Windows NT or the forthcoming multiprocessor version of OS/2. Fortunately, VTech bundles Windows NT on CD ROM. Intriguingly, in our business application test suite—composed of DOS and Windows 3.1 apps that use just one processor—the Platinum held its own against Pentium challengers, actually outpacing the Austin Pentium. Only the torrid ALR Pentium-60 outran the VTech decisively. But for DOS and Windows 3.1 (as tested), you should get as good performance from VTech's single-processor version (upgradable to twin CPUs), which costs a cool grand less than the \$3600 SMP product. If you're using Windows 3.1 and have plans to upgrade to an SMP-supporting OS, you can have the best of both worlds. Watch for a *PC World* review of the single-processor version in two months or so.

Consistent with its power focus, this system comes with 16MB of RAM, a 256K secondary cache, a 544MB hard disk, a 1MB VL bus graphics accelerator, and a 15-inch monitor. The system also features a double-speed CD ROM drive. Expandability is decent, although only one of four free 16-bit ISA slots accepts a full-length card. And just one drive bay is externally accessible.

VTech provides an excellent three-year warranty, a year of free on-site service, and toll-free tech support 8 hours a day seven days a week. Response from readers who had used VTech wasn't strongly positive, however. Only about three-quarters of them said their problem was resolved to their satisfaction. And *PC World* staff encountered problems verifying information with the company via published toll-free support numbers (possibly because of a turnover in public relations personnel). But all in all, the VTech Platinum SMP looks like a real value for users of NT and the forthcoming SMP version of OS/2. And considering the upgrade potential of the single-processor version—and its economy—if you purchase that instead, you wind up with a deal that's hard to resist, whichever way you go. This PC places number 13 on our Power Top 20 list, and the single-processor version should rank even higher. *VTech Computers, 708/540-8086* Reader service no. 731



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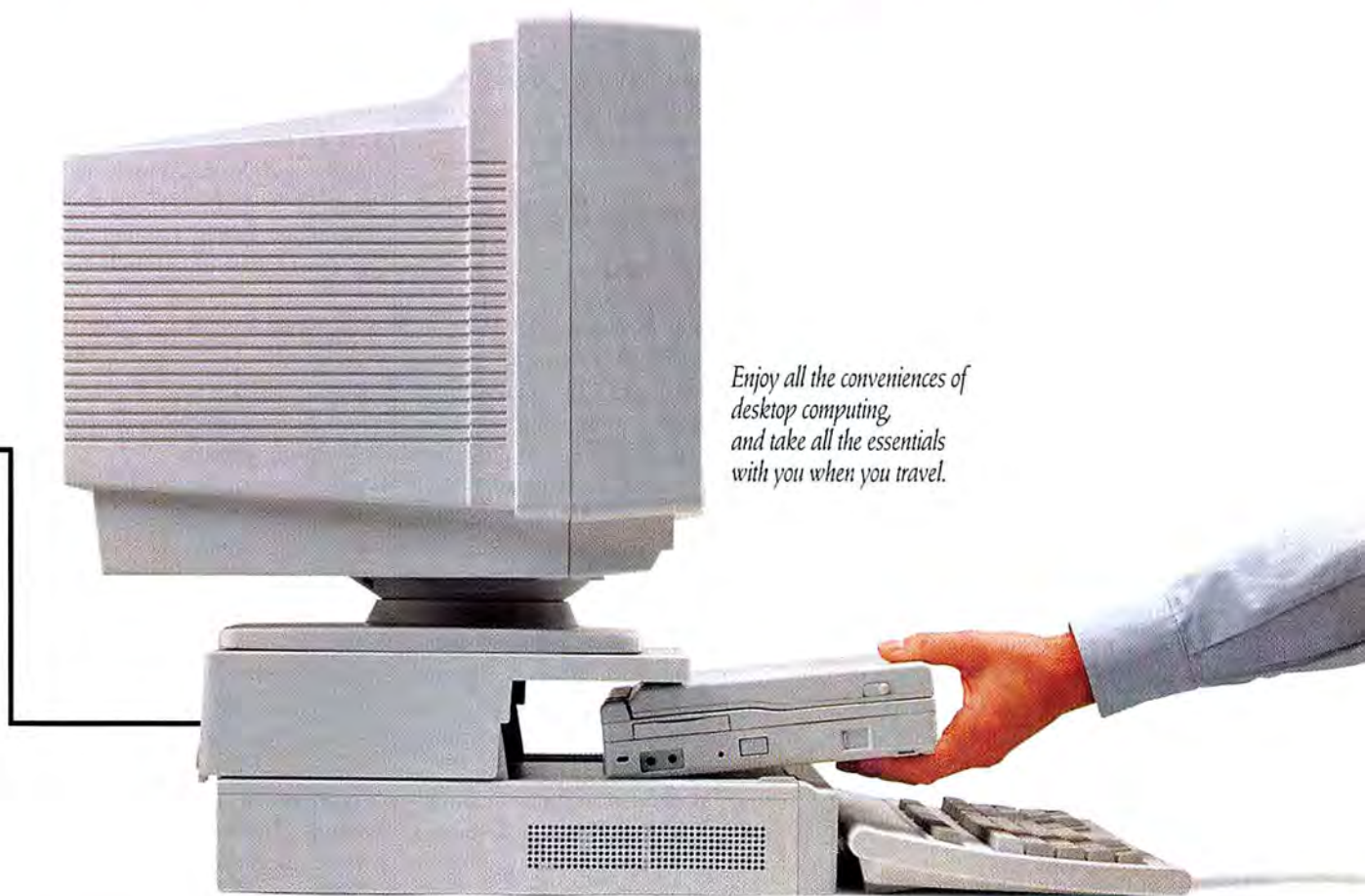


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System Snapshots

These systems, while very capable, don't match the preceding group for overall value in a business environment. However, many of them present unique and valuable solutions to end-user needs.

Canon Innova 486v

PROS: Energy Star compliant, good documentation
CONS: Slow performance, only one free drive bay
 Aimed at the small or home office user, Canon's DX2-66 Innova 486v offers a streamlined \$2299 system. Preinstalled software—including Microsoft Works and Micro Fax—and thorough documentation help get novices painlessly up to speed. But performance is poor. The unit took nearly twice as long as our median system to complete our benchmarks. The relatively small 4MB of RAM and lack of a secondary cache contribute to the disappointing scores.

The Innova has a tidy, well-integrated interior, with the base 4MB of RAM soldered to the motherboard. You get an internal fax-modem, two free VLB slots, and one free 16-bit slot. Two 72-pin SIMM sockets are free for RAM expansion, and empty secondary cache sockets accept up to 256K. Unfortunately, the 240MB hard drive fills the Innova's only internal drive bay, leaving just one externally accessible bay free. Despite the Innova 486v's modest cost (and Canon's fine support), lackluster performance knocks it well out of the running. *Canon Computer Systems, 800/848-4123, 714/438-3000 Reader service no. 732*

Hewlett-Packard Vectra 486/33VL Model 240

PROS: Three-year warranty, Energy Star compliant
CONS: Limited expandability
 Hewlett-Packard buyers expect top design and great support, and the Vectra 486/33VL Model 240 delivers—in part. This entry-level DX-33 system comes with a super service-and-support package (including a 36-month warranty) at a pretty fair price, considering HP's reputation for quality. Our \$2347 Energy Star system unit came with 8MB of RAM, a 128K secondary cache, and a 240MB hard drive.

The compact Vectra's design is a mixed bag. The power supply and fan are conveniently enclosed in an arm that swings out,

leaving the motherboard—and especially the CPU—completely accessible. But while the integrated 1MB local bus graphics accelerator leaves all four 16-bit ISA slots available, you

won't find any local bus slots. And the lack of free internal drive bays means you must rely on the sole free externally accessible bay for adding nonexternal drives. Performance is slower than our median unit's, although on the mark for a DX-33. You'll buy this Vectra only if you don't plan to add many peripherals. *Hewlett-Packard, 800/322-4772 Reader service no. 733*

IBM PC Company Consultant PS/1 MultiMedia

PROS: Low price, multimedia and CD ROM bundle
CONS: Poor performance, no local bus slots
 IBM PC Company's Consultant PS/1 bundles the basics in one low-cost package. For \$1699, this 486SX-25 desktop provides a combo floppy drive, a 250MB hard drive, a double-speed CD ROM drive, a SoundBlaster 16 sound card, and speakers. You even get a 9600/4800-bps fax-modem. And PS/1s have one very friendly feature: IBM's smart-power option saves the system state before shutting down. Then the system boots up to exactly where you left off, even if you were right in the middle of loading an application.

But performance—hamstrung by a minimal 4MB of RAM and lack of secondary cache—is below even what we typically see from 486SX-25 systems. And there are no local bus slots.

The warranty runs for just one year, and there's no on-site service. This PC may be a choice for the inexperienced buyer looking for multimedia extras. But its lack of zip in Windows apps pushes it off our list. *IBM Personal Computer Company, 800/426-3377*

Tandy 3100 Model 10

PROS: Low cost, good RAM upgrade path
CONS: Very slow, poor monitor
 For a while, 486SX-33s were offering an economical alternative to higher-priced 486DXs and DX2s. But the PC world is now teeming with relatively inexpensive—and much faster—DX2-66s. And the Tandy

3100 Model 10 486SX-33 suffers from additional shortcomings. Its low \$1699 price is offset by the minimal 4MB of RAM, lack of secondary cache, and smallish 212MB hard drive. Expandability is limited to one free drive bay and two free 16-bit ISA slots. Performance is completely outclassed by our median system's. And the Tandy VGM-390 14-inch monitor has .39mm dot pitch (.28mm is the current standard for business PCs). On the plus side, you get a Creative Labs 8-bit SoundBlaster sound card.

Tandy's central support isn't especially attractive. While a two-day turnaround on repairs is good, you pay the toll for tech support. It's hard to see the advantage in buying a system like this, considering that a few hundred dollars more will get you any one of a number of better-equipped DX2-66s. *Tandy, 817/390-3011 Reader service no. 734*

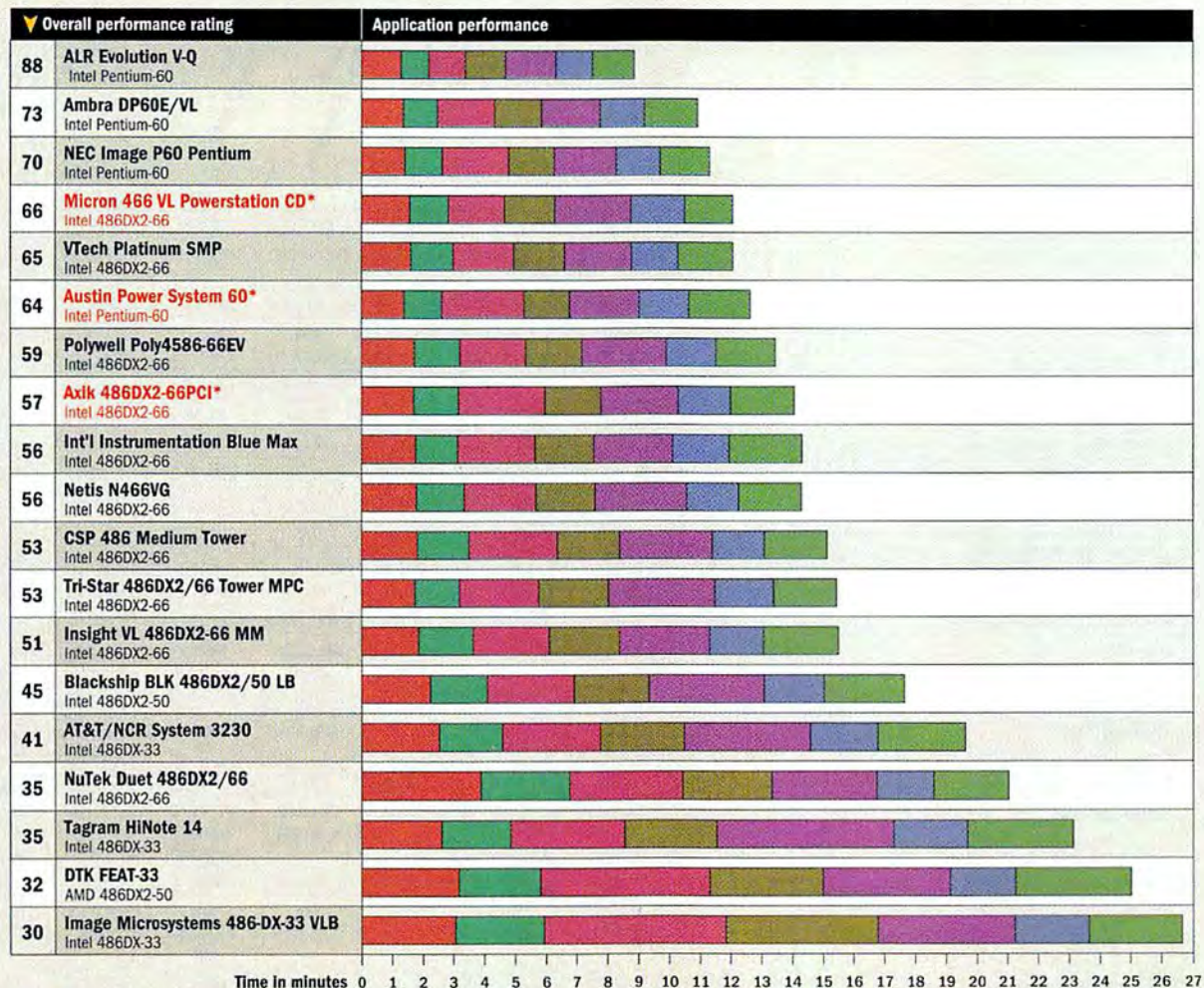
Zeos Ambra Model 486SX-25

PROS: Economy price
CONS: 25-MHz performance, one expansion slot obstructed by game port
 Performance always counts big with *PC World* readers—so it takes an exceptional price to overcome a low-powered CPU in our ratings. The Zeos Ambra Model does have an attractive \$1391 price to balance against its pedestrian 486SX-25 processor. You get 8MB of RAM, a 128K secondary cache, and a 1MB integrated graphics accelerator, but just a 14-inch monitor and a 204MB hard drive.

Expandability is less than perfect. Two of the three free 16-bit slots take only very short cards. And one slot is obstructed by a game port, as the case has no port cutouts. Just two free drive bays complement the hard disk and single floppy drive, although both are externally accessible. Finally, while two of the four 72-pin SIMM sockets are available for adding RAM, the sockets are buried beneath the hard drive.

Zeos support is good, with a 24-hour toll-free line and a year of on-site service for \$49. Despite the eye-catching price, it's hard to recommend this PC. Today, 486SX-25s offer a lot less bang for the buck than their 486DX and 486DX2 cousins. And a few hundred dollars more buys a dramatic increase in performance. (Note: Zeos's Ambra line has no connection with Ambra Corporation.) *Zeos Int'l, 800/423-5891, 612/633-4591 Reader service no. 735*

From ALR: A Red-Hot Pentium—the Fastest PC Yet!



*Best Buy

Systems are arranged in order of overall performance, with the fastest at the top. The overall performance rating is a normalized, weighted average of all our performance tests, and a higher value is better. Since the individual tests are normalized and weighted to reflect typical business use, one system's overall performance rating may be better than another's even though it takes longer to complete all tests.

Methodology

We tested each system as supplied by the manufacturer using the version of DOS supplied. If we installed Windows, we performed the default installation. We configured Windows with an HP LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We set video resolution to 800 by 600 pixels in 256 colors, using the supplied video driver where possible. We loaded the test applications and files and test automation software and scripts.

Word for Windows 2.0

We worked with 1-, 9-, and 28-page business documents. Operations included creating, saving, opening, scrolling, editing, checking spelling, formatting, previewing, and printing.

Excel 4.0

We opened a financial statement and a mortgage analysis and performed several data extracts, entered new data, altered calculations, formatted, scrolled, moved blocks, previewed and printed, and saved.

Paradox for Windows 1.0

We used a custom form to add a number of records to an existing table, performed several queries, and generated a report.

Freelance for Windows 1.0

We built a six-page presentation using a standard template, clip art, text, and charts; applied several views to the presentation; previewed each view with varying fade effects between each pair of slides; and saved the presentation.

WordPerfect 6.0 for DOS

We performed a variety of editing, formatting, preview, and printing tasks on documents ranging from a single-page memo to a long report. Due to memory requirements, the amount of free memory for DOS in the first 1MB dramatically affects this test.

1-2-3 Release 3.4 for DOS

Using the graphical Wysiwyg add-in at standard VGA resolution and working in three different files, we created and altered formulas, built graphs, saved, and printed.

Paradox 3.5

We tested running Paradox 3.5 under Windows in a DOS box. We entered data, searched records, updated, and generated reports from a simple customer list.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

FEATURES COMPARISON: THIS MONTH'S CONTENDERS

More Pentiums, More RAM, More Disk Space

● Yes

○ No

n/a = not applicable

Standard features

	ALR Evolution V-0	Ambra DP60E-VL	ATI & NCR System 3230	Austin Power System 60	Adik 486DX2-66PCI	Blackship BLK 486DX2-50 LB	Computer Sales Professional 486 Medium Tower
Selling price as of 12/1/93 ²	\$6473	\$3999	\$2610	\$3079	\$2398	\$1995	\$2199
CPU (Intel unless other specified)	Pentium-60	Pentium-60	486DX-33	Pentium-60	486DX2-66	486DX2-50	486DX2-66
CPU/upgrade socket	273-pin	273-pin ZIF	238-pin ZIF	273-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF
BIOS	Phoenix 1.00.32B	Phoenix 1.2 R 0.06	NCR 7/23/93	AMI 1.00.03 AFI	Award 9/27/93	AMI 4/4/93	AMI 11/11/92
Installed/maximum RAM (MB)	16/1024	8/64	8/32	8/128	8/128	8/32	8/32
30-pin or 72-pin SIMMs	72-pin	72-pin	72-pin	72-pin	72-pin	30-pin	30-pin
SIMM sockets/number free	16/12	4/2	8/0	4/2	4/2	8/0	8/0
Secondary RAM cache installed/maximum (K)	512/512	256/1024	64/256	256/256	256/512	256/256	256/256
Case style	tower	desktop	compact	compact	tower	tower	tower
Free externally accessible 3 1/2-inch/5 1/4-inch drive bays	1/10	0/3	0/1	0/1	1/2	0/2	0/2
Free internal 3 1/2-inch/5 1/4-inch drive bays	1/0	1/0	0/0	1/0	2/0	0/1	4/1
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	7/0/0	6/0/0	0/3/0	0/3/0	0/4/0	0/3/0	0/3/0
PCI or VL bus slots/number free ⁴	3 VLB/1	2 VLB/1	0/0	3 PCI/2	3 PCI/2	3 VLB/1	3 VLB/2
Hard disk	Conner CP30544	Seagate ST3610N	WD Caviar 2340	WD Caviar 2420	Maxtor 7345SR	WD Caviar 2250	WD Caviar 2420
Size (MB)	544	540	340	420	345	250	425
Adapter	4MB VLB OEM DC680T	integrated	integrated	integrated	integrated	512K VLB Prom- ise DC420	VLB OEM
Floppy drives (MB)	1.44	1.44	1.2, 1.44	1.44	1.2, 1.44	1.2, 1.44	1.2, 1.44
Graphics adapter	Paradise Accelerator VL Plus	VLB Acer 685 Graphics Accelerator	integrated	Diamond Viper PCI	PCI OEM Windows Accelerator	VLB Orchid Fahrenheit VA	Paradise Accelerator VL Plus
Installed VRAM/DRAM (MB)	0/1	2/0	0/1	0/2	0/1	0/1	0/1
Monitor	ALR CTX Flexview 3X NI	Ambra UVGA	NCR	Austin GBVCA-15	ADI Microscan 3G	MGC XGA 1406	Goldstar 1510
Screen diagonal (inches)/dot pitch (mm)	14/.28	15/.28	15/.28	15/.28	14/.28	14/.28	15/.28
Modem fax/data speed (kilobits per second)	n/a	n/a	n/a	n/a	n/a	9.6/2.4	n/a
Sound board	○	○	○	○	○	○	○
CD ROM drive	○	○	○	Sony CDU31A	○	○	Sony CDU31A
Sequential data transfer rate (kilobytes per second)	n/a	n/a	n/a	300	n/a	n/a	300
Parallel/serial/mouse/MIDI-game/audio/SCSI ports	1/2/1/ 0/0/0	1/2/1/ 0/0/1 ⁵	1/2/1/ 0/0/0	1/2/0/ 0/0/0	1/2/0/ 0/0/1 ⁵	1/2/0/ 0/0/0	1/2/0/ 1/0/0

Service and support

Warranty (years)	5 ⁶	1	3	2	1	1	1
30-day money-back guarantee	●	●	●	●	●	●	● ⁸
On-site service price for first year	\$9.95 ¹⁰	free	free ¹¹	free	free	free	free
Turnaround policy (days at service center)	3	2	1	1	2	2	1
Daily toll-free phone support (hours)	11	24 ¹²	24	18	12	9	12 ¹³
Weekend support	●	●	●	●	● ¹⁴	○	○
BBS	●	○	●	●	●	●	●
Fax	●	○	○	●	●	●	●

¹The Duet's Mac components included a 128-pin non-ZIF 68030 CPU socket, 8MB RAM expandable to 32MB, 8 30-pin SIMM sockets, 128K cache expandable to 256K, 170MB Quantum ProDrive LPS hard drive, integrated drive controller, 1MB VRAM integrated graphics adapter, one serial port, and one mouse port.

²All systems priced as configured with DOS 6.0, Windows 3.1, VGA and a color monitor, a keyboard, and a mouse. Selling price is either direct or based on vendor estimate.

³Mac-alike side has two free 32-bit NuBus slots.

⁴Free VL slots can accept 16-bit ISA cards.

⁵Internal port only.

DTK FEAT-33	Image Microsystems 486-DX-33 Vesa Local Bus	Insight VL 486DX2-66 MM	BEST BUY Max Business Partner International Blue Instrumentation	Micron 466 VL Powerstation CD	NEC Image P60 Pentium	Netis N466VG	NuTex Duet 486DX2/66	Polywell Poly4586-66EV	Targem HiNote 14 Tower MPC	Tristar 486DX2/66	Vtech Platinum SMP
\$1695	\$1599	\$3499	\$2744	\$3599	\$5749	\$2669	\$4035	\$4585	\$2327	\$4965	\$3600
AMD 486DX2-50	486DX-33	486DX2-66	486DX2-66	486DX2-66	Pentium-60	486DX2-66	486DX2-66, 68030-33	486DX2-66	486DX-33	486DX2-66	Dual 486DX2-66
238-pin	238-pin ZIF	238-pin	238-pin ZIF	238-pin ZIF	273-pin ZIF	168-pin	168-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin	dual 168-pin ZIF
AMI 11/11/92	AMI 11/11/92	Award 4.20	AMI 8/8/93	Phoenix 1/1/88	Phoenix/NEC 1.00.07	AMI 8/8/93	Microld 3/19/93	AMI 6/6/92	AMI 6/6/92	AMI 11/11/92	SystemSoft 1.01 2068-04
4/32	4/32	16/128	8/32	16/64	8/192	16/32	8/32	16/256	8/32	16/32	16/128
30-pin	30-pin	30-pin	30-pin	72-pin	72-pin	30-pin	30-pin	72-pin	30-pin	30-pin	72-pin
8/4	8/4	8/4	8/0	4/0	6/4	8/4	8/0	4/3	8/0	8/4	4/3
128/256	256/256	256/256	256/256	256/256	256/256	256/256	128/256	256/512	256/256	256/256	256/256
minitower	compact	tower	tower	desktop	desktop	compact	minitower	tower	minitower	tower	desktop
1/0	1/2	0/3	0/2	0/1	0/2	1/2	1/2	1/1	1/0	0/1	0/1
0/1	0/0	0/0	0/1	1/0	2/0	0/0	0/0	0/3	0/0	2/2	0/0
0/4/0	0/3/1	0/3/2	0/4/0	0/4/0	3/0/0	0/4/1	0/1/0 ³	4/0/0	0/4/0	0/1/1	0/4/0
2 VLB/0	3 VLB/1	2 VLB/0	3 VLB/1	2 VLB/0	2 PCI/1	2 VLB/0	0/0	3 VLB/2	2 VLB/1	3 VLB/1	2 VLB/0
Conner CP30344	WD Caviar 1210	WD Caviar 2420	Conner CP30344	Conner FilePro CFA540A	WD Caviar 2540	WD Caviar 2340	Conner CP30170	Maxtor MXT-5492	WD Caviar 2250	OEM DCI-360 removable	Conner CP30544
344	210	420	344	540	540	340	170	540	250	420	544
VLB DTK PTI-245	VLB OEM	VLB OEM	2MB Promise DC4030-VL-2	4MB Promise DC4030VL-1	integrated	2MB Promise DC-4030VL	Promise DC200	4MB ASUS EISA SC-100	OEM VLB GP-4032	16MB VLB DC-680	integrated
1.2, 1.44	1.2, 1.44	1.2, 1.44	1.2, 1.44	1.44	1.44	1.2, 1.44	1.44	1.2, 1.44	1.2, 1.44	combo	1.44
VL34	VLB Hercules Dynamite	STB Power Graph VL-24	Genoa Windows VGA24 8500VL	VLB Diamond Viper	Diamond Viper PCI	Diamond Viper VLB	integrated	Actix Systems Graphics Engine Ultra VL Plus	OEM VLB GP-4032	Matrox MGA Impression VL	VLB Diamond Stealth 24
0/1	0/1	0/2	1/0	2/0	2/0	2/0	1/0	2/0	0/1	3/0	0/1
DTK CDD-1401	Viewsonic 6E	CTX CMS-1561 Multiscan	Samsung Sync- Master 15C low radiation	Mag Innovation MX17F	NEC MultiSync 5FG	View Magic/ CA1565	KFC flat-screen noninterlaced Multiscan	ADI Microscan 4G	Proton PM-1561A	Microscan 5A	OEM N-1528
14/.28	14/.28	15/.28	15/.28	17/.26	17/.28	15/.28	17/.26	15/.28	15/.28	17/.26	15/.28
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
○	○	Media Vision Spectrum 16	○	○	○	○	○	○	Audio 16	Aztech Sound Galaxy NX Pro 16	○
○	○	Texel DM-3028	○	Mitsumi CRMC-FX001D	MultiSpin 3xi	○	○	Texel DM 3028	OEM CR-562-B	Texel DM 3024	Chinon
n/a	n/a	335	n/a	300	450	n/a	335	335	300	300	300
1/2/0/ 0/0/0	1/2/0/ 1/0/0	1/2/0/ 1/0/0	1/2/0/ 0/0/0	1/2/0/ 0/0/0	1/1/1/ 0/0/1	1/2/0/ 1/0/0	1/1/1/ 0/0/0	1/2/0/ 0/0/1	1/2/0/ 0/0/0	1/2/0/ 1/0/0	1/2/1/ 1/0/0
2	1	1	1	1	3	1	1	2/5 ⁷	1	2	3
○	●	●	●	●	●	●	○	● ⁹	●	●	●
\$75	free	○	free	free	free	\$120	○	\$75	free	free	free
3	2	2	1	2	3	2	1	3	2	2	none
9	24	24	12	11	12	10	9	9	9	12	8
○	●	●	●	● ¹⁴	○	● ¹⁴	○	●	● ¹⁴	○	●
●	●	●	●	●	●	●	●	●	●	●	●
●	○	●	●	●	●	●	●	●	●	●	●

⁶Five years parts and labor on ALR parts, 15 months parts and labor on peripherals.

⁷Two years most parts, five years labor.

⁸45-day money-back guarantee.

⁹15% restocking fee for nondefective returns.

¹⁰One-time registration fee.

¹¹Three years free on-site service.

¹²One year free technical support.

¹³9 hours on Friday.

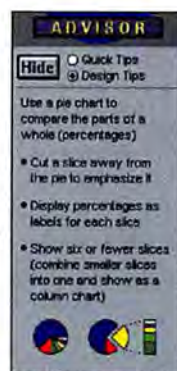
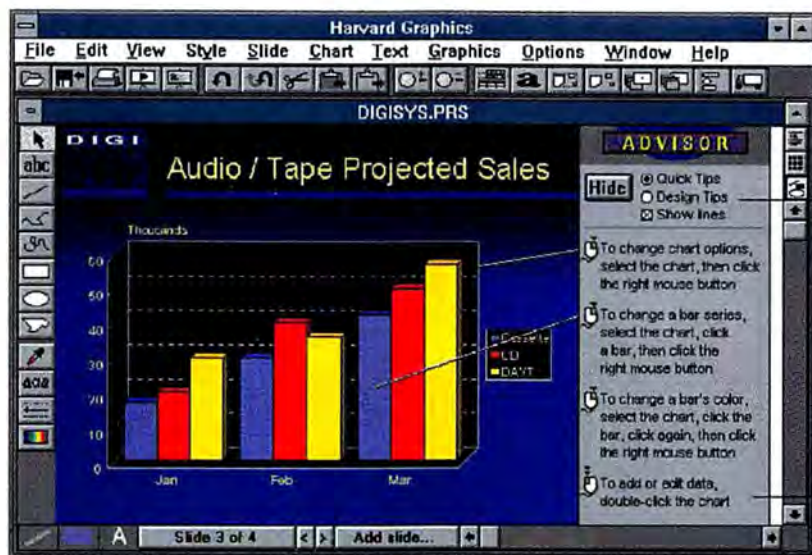
¹⁴Saturday only.

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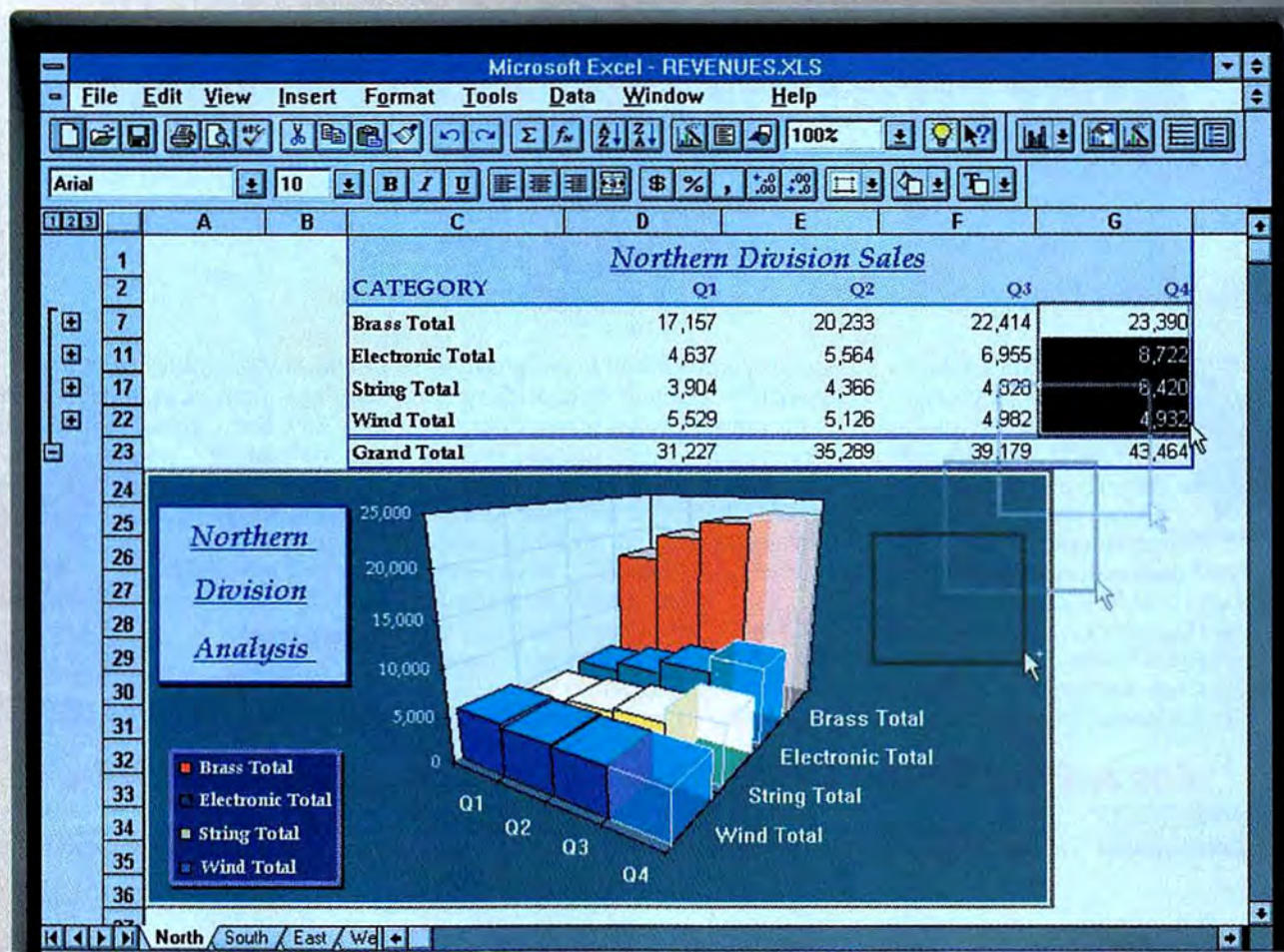


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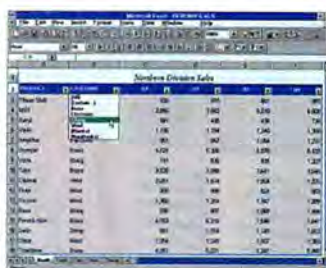
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Microsoft Office

WINDOWS WORD PROCESSORS



Wizards

V E R S U S

Coaches

WIZARDS, COACHES, TIPS OF THE DAY, and other automated tools are hallmarks of the newest Windows word processors. Our own wizard evaluates the top three packages and picks the best. BY GEORGE CAMPBELL

You've been hearing about the new breed of Windows word processing programs: You're probably wondering if they live up to their powerhouse reputations. Are they as easy to use as their vendors maintain? Will they run well on your current equipment, or will you have to add the cost of a hardware upgrade to your software purchase?

There's no question that you now have a slimmer field to choose from. Over the last few years, the word processing market has boiled down to just three major players. In this review, we try out the best-selling Windows programs: Lotus Ami Pro 3.01, Microsoft Word 6.0 for Windows, and WordPerfect 6.0 for Windows. And since there's still a significant core of DOS diehards, we also check out the new

Microsoft Word 6.0 for DOS and WordPerfect 6.0 for DOS—the last DOS word processors selling in significant volume.

The new Windows products are inviting: Interfaces are friendlier, and many tedious tasks have been automated. Templates in all three programs make it a snap to produce complex documents such as newsletters and reports, while Wizards and Coaches in Word for Windows and WordPerfect, respectively, guide you through other complex chores. Word for Windows even pops up a Tip of the Day every time you start the program. Powerful style sheets let you format your text with a mouse click or keystroke, and you can copy existing formatting to other paragraphs, pages, or documents simply by painting it in with the mouse. Even basic editing tools are improved, with drag-and-drop editing now the standard.

The Cost of Upgrading

The power and usability come at a price—of which the cost of the program is often the smallest part. While all five programs list for \$495 each, street prices are much lower, and updates and competitive upgrades are even more economical. In addition, you can purchase any of the Windows products as part of a cost-effective office software suite, which also includes spreadsheet and database or presentation graphics programs plus other useful business apps.

But you have to match the increased capabilities with pumped-up hardware muscle: Requirements for hard disk space run as high as 33MB for a full installation—and for an optimum install, you'll need 8MB or more of RAM to run Word 6.0 for Windows or WordPerfect 6.0 for Windows without an application slowdown. Note: Memory requirements listed for the DOS applications refer to *available* RAM. If you don't have at least a fast 386 with plenty of RAM and a big hard disk, performance will probably be disappointing.

Easing Tough Jobs

Improved graphical interface tools, such as special tool bars for graphics, tables, and other modules, help ease document preparation. For example, if you're working on a table, you can use a special set of icons to speed the task. These new word processors also cooperate better with other programs on your system. Object Linking and Embedding (OLE) and the new OLE 2.0 capabilities in Word for Windows make inserting data from other applications almost automatic (despite a few annoying bugs, which will be eradicated in a maintenance release that should be out by the time you read this). If you link data to a spreadsheet, for example, it will be updated dynamically as the data changes.

Flexibility is another key interface issue. All these programs let you issue commands from menus by using keyboard shortcuts or graphical tools. WinWord and WordPerfect even pop up context-sensitive menus when you right-click on any item, from text to tool bars; Ami Pro displays formatting or dialog boxes with a right click.

Even the office word processing whiz used to quail at the thought of a complex mail merge. Well, no more. These jobs have become

tions. Capable drawing programs let you create your own graphics, text-based logos, and other special effects. To dress up data, you can create tables and enter data manually—or import it from a spreadsheet and convert it to a graphical chart for visual impact.

Getting Your Work Together

No document is an island, and many major works involve input from several people and incorporate data from more than one application. You'll find powerful tools here for work groups and long documents, plus easy integration with other Windows apps. Work-group members can insert comments and use revision marking and tracking to monitor changes. File management is also important. You can search for, preview, and manipulate files within these programs. Importing files from and linking to other applications is also a simple move. Networked users will appreciate the LAN tools—including E-mail capabilities—included in these programs.

Not everyone works alike, so these programs offer various customization tools. WordPerfect is the keyboard master, letting you remap every key, while WinWord lets you assign a shortcut sequence to any program command. Ami Pro is more limited in its capabilities but does let you assign macros to shortcut keys. You can even customize menus, adding or removing commands at will. Corporate users can create automated templates, letting others simply fill in the blanks.

These programs offer powerful macro languages, plus easy macro recording to supplement standard commands. Writing a macro? Full-scale online help cuts the job down to size.

The Proof Is in the Testing

Let's face it. These Windows powerhouses can polish off just about any document. They all easily handle basic text editing and offer powerful formatting tools. But before choosing, you need to know how they perform with the kinds of work you typically do. To test them, we worked with a variety of documents.

We created a business letter, with graphical letterhead containing special text effects, then printed it and an envelope. In the process,

we saved the signature block as an *abbreviation*—a short name used to quickly insert text and graphics—and tried to save the logo in the same way. We also created new formatting styles.

Next, we put together a ten-page monthly sales report, which included data links to an Excel 4.0 spreadsheet, a chart created

from that data, plus different heading and body text styles and bulleted and numbered lists. We ran a spell checker and grammar checker on the document, then printed it.

To test long-document and work-group tools, we compiled a 100-page annual report, full of multipage tables holding data from WK1 spreadsheet files. We added charts, scanned photos, borders, and heavy formatting (including binding offsets for printing). We organized the report with the programs' outliners and created a master document to hold subdocuments. To test import tools, we inserted a formatted WordPerfect 5.1 for DOS document and a large ASCII text file. We created footnotes and endnotes and added a table of contents and an index. To check the drawing modules, we created a colorful organization chart. We even mixed landscape and portrait

No document is an island: Many involve input from several people and contain data from multiple apps. Work-group tools and easy integration with other programs give Windows word processors the edge.

almost simple, with easy import and insertion of existing data, plus dialog boxes that step you through the process. All programs also offer data entry forms for creating and editing mail merge data. Printing envelopes and labels—another job that used to require a lot of cut-and-try—is now a simple task.

Printouts Never Looked So Good

Attractive documents can play a key role in competing for customer dollars. Few of us can afford to hire design consultants. Fortunately, word processor publishers have packed design know-how into every box. Included templates offer excellent layouts for a range of projects, from memos to newsletters. All three Windows programs import a variety of image file formats and have useful clip-art collec-

Best Buy

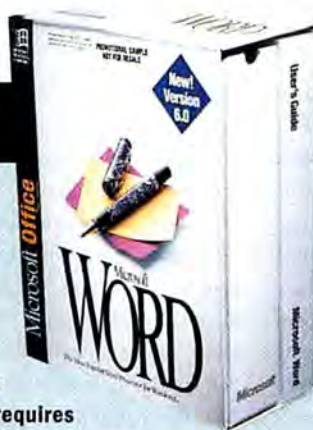


Awarding a Best Buy was relatively easy in this review.

Microsoft Word 6.0 for Windows assembles vastly powerful advanced word processing features into a Best Buy package that works to the user's advantage. While the program requires state-of-the-art hardware to perform at its best, it makes the complex job of creating today's visually exciting documents a pleasure.

WordPerfect 6.0 for Windows rates as number two and offers an even broader feature set than WinWord—but without all the usability improvements seen in that entry. However, it's very customizable.

Ami Pro 3.01 is still an excellent word processor, with a clear, logical interface and exemplary tools for creating complex, stylish documents that look almost desktop published. It can handle any word processing task, but it can't match some of the features in the two new programs—at least in this version.



pages within the document and added headers and footers. We tried bookmark features, jumped from place to place in the document, and thoroughly tested the programs' search and replace tools. We also tested scrolling performance and work-group features such as revision marking and tracking, annotations, and networking tools. We then printed the document to test printing performance.

Next we created a typical four-page newsletter (including pages that mixed two- and three-column layouts), used bordered text boxes to hold additional text, and created a headline with white text on a black background. We imported a piece of clip art and a scanned, gray-scale TIFF image (which spanned parts of two columns to test text wrapping). We attempted to create an order blank with text oriented sideways, and we also tested kerning, tracking, leading, and other desktop publishing features. We then printed several collated, double-sided copies.

To check mail merge capabilities, we created a one-page sales letter, linking it to a 730-record DBF database file. We inserted fields for an address block, plus a paragraph that would print only if the recipient lived in Texas. We then printed letters for recipients living in Texas and Washington. Finally, we printed a set of matching address labels on standard Avery 5160 laser printer labels.

During testing, we tried each program's editing and formatting tools. We also recorded several macros and edited one using the program's macro language. When necessary, we consulted the manuals and help facilities. To check command flexibility, we tried different methods of getting the desired results. We also used the program's file management tools to search for and preview document, data, and graphics files and move them into a project directory.

Throughout the tests, we timed performance and monitored the quality and stability of the screen display in all modes. Many users are moving to these programs from WordPerfect 5.1 for DOS, so we checked the ease of transition from that program's commands.

We called technical support under an assumed name three times for each program—after solving a typical problem ourselves—and noted the speed and accuracy of the support. We also checked the

quality of online support on CompuServe. Software industry support policies are changing, but all three companies still offer support at no charge, although only WordPerfect provides a toll-free line. To learn more about the changing face of support, see "The End of Free Support" in this issue.

You'll find the results of our trials in the individual program reviews and in our new Features Comparison, which rates each program's feature set.

The Winning Combination

All these programs are very capable word processors. That said, Word 6.0 for Windows offers the best mix of performance, features, automation tools, and ease of use—making it a clear Best Buy. While numerous WinWord bugs have been reported, with some acknowledged by Microsoft, none showed up in our tests. Microsoft promises a speedy bug-extermination release. (For more details, see this month's *Bug Watch* in *Consumer Watch*.) WordPerfect 6.0 for Windows comes in second, hampered somewhat by slow screen performance and its overall interface complexity. WordPerfect

Corporation also says the program's bugs should be corrected in an interim release early this year (possibly by the time you read this).

Ami Pro 3.01—from a slightly older generation and not as capable overall—remains an excellent choice for projects requiring desktop publishing-like layout features, but falls a bit behind. However, a new version to be released sometime midyear will definitely bear watching. Besides, on an older machine Ami Pro, with its thrifty use of hard disk space and memory, may be your best choice.

George Campbell is a contributing editor for PC World. He can be reached on PC World Online (see page 12 for contact information).

For more information about all products in this article, circle reader service no. 901.

Ami Pro 3.01

PROS: Super layout, publishing, and graphics handling; logical menus

CONS: Paragraph styles only, limited text-art tools, no OLE 2.0 support, no toll-free support

Ami Pro 3.01 is a mature release of a popular program. A new revision with expanded capabilities should be available sometime midyear. Although Ami Pro's features can't match those of its newly updated competition, its masterful handling of complex page layouts and its logical interface make it a favorite for many users. In addition, its relatively light hardware requirements will be a relief to users who are squeezing the maximum life out of older PCs.

Ami Pro is set up clearly and logically, with sensible menus and commands. For example, all page layout functions are under the Page menu, and every style-related function is under the Style menu. The program's customizable SmartIcon tool bar makes it easy to create shortcuts for many common tasks—although getting a description requires a right-click on icons, unlike WordPerfect and WinWord's automatic techniques.

For the letter project, I created my own layout rather than starting

with one of the program's many templates. There's no graphical text tool module, so the logo in the letterhead had to be simple. But importing and positioning graphics is easy, since Ami Pro inserts imported graphics in a movable frame. Right-clicking the graphic let me format the frame in the Modify Frame Layout dialog box. Another frame held text for the letterhead and an accent line. I wasn't able to store graphics or frames as glossary entries, though.

I expanded a glossary abbreviation for a frequently used address, then typed the letter's text. Ami Pro's drag-and-drop text editing tools simplified selecting and moving text, and creating a signature block as a glossary entry took just a couple menu commands. A right-click on the text popped up the Modify Style dialog box—allowing font changes, alignment, spacing, and more. Background printing was very fast. The Style menu let me save the letter as a style template for later use. Overall screen appearance and stability were excellent, and I had clear previews at all stages.

Reports With Charts and Styles

For the sales report, I used a supplied template. A preview revealed that the template included paragraph styles for headings, bulleted lists, headers, and footers. As I typed, I selected text styles from a status-line list box or using function keys.

I created a table with the right number of columns before importing the Excel 4.0 file (with 1-2-3 files, turning on a check box in the import dialog box creates the table automatically). A tables SmartIcon set, accessible by clicking a status line button, helped with table formatting. This last function can't match the ease of Word 6.0 for Windows' Table AutoFormat feature, but Ami Pro does make creating a chart a snap. I just selected the table data, copied it to the clipboard, clicked the chart SmartIcon, and created a 3-D column-style chart—with legends—in seconds. To add text later, I merely double-clicked the chart and loaded it into the drawing module.

After clicking another SmartIcon, I added a bulleted list and chose from the bullets available in the Modify Style dialog box. Finally, I used the Page menu's Modify Page Layout to set up margin offsets to handle two-sided printing, then printed the document.

For the long report, I used the same template but created several new heading styles. I then turned on Ami Pro's outlining mode with its tool bar. Ami Pro's outlines can hold headings and body text and

can automatically become table of contents entries. Unfortunately, I found the Master document tools clumsy, since markers for subdocument files don't appear on screen as in the other programs.

Ami Pro did well importing WordPerfect 5.1 files, except it handled some fonts incorrectly. I was able to reformat the imported text by selecting previously formatted text, clicking the format painting icon, and dragging over the new text. I created a table by importing a large WK1 file. To switch it to landscape, however, I had to insert a page layout before and after the table. Creating charts from parts of the table data was effortless, as was importing the TIFF file. Ami Pro's brightness and contrast controls helped improve the image, and scaling it with the sizing handles on the enclosing frame was no sweat. In short, the drawing tools made creating an organization chart a relatively simple task.

Ami Pro can't mix footnotes and endnotes in the same document, but you can add dated, initialed annotations at will. These appear as yellow markers, which you double-click to view. Revision marking displays text changes in your choice of colors, and the handy revision review lets you look at each revision or accept or reject all of them at once. For network use, you can lock revisions and annotations using the Doc Info dialog box. Multiple users can read files simultaneously but must save them under different names.

Bookmarks are easy and can preselect text when you jump to a mark. You can mark index entries individually, create a concordance file of text to index, or use an included macro to mark all occurrences of an item. However, when you generate a table or index, Ami Pro creates new documents, which you must insert manually. Printing speed roughly equaled Word 6.0 for Windows' results.

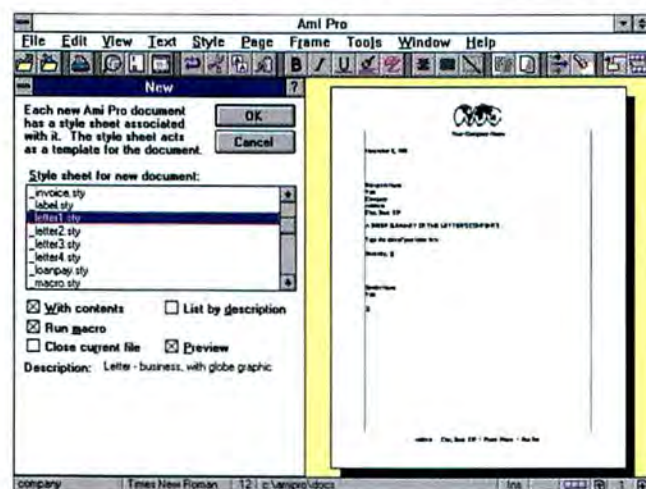
Read All About It...

The newsletter project showed off Ami Pro's formatting skills. Starting with a supplied two-column newsletter layout, I added a three-column section, using Ami Pro's flexible frames. These frames act like documents of their own, complete with columns, tabs, and margins. Graphics look good on screen and on paper, although you can wrap text only around the whole frame. The all-inclusive Modify Frame Layout dialog box makes creating text boxes for calling out quotes simple and lets you create white text on a black background.

Lines and borders all became part of the frames used in the newsletter. Typographical tools, such as kerning and tracking, are limited, but it's simple to rotate text in the drawing program to create an order blank. Layout and formatting went very quickly, as did printing, with cursor control regained in less than 10 seconds.

The mail merge went well, too. Ami Pro's three-step merge process—controlled in a dialog box—imported the DBF data in seconds, showing me a list of fields that stayed on the screen as I inserted the address block. With the help of the program's Power Fields, inserting conditional text to print only for some recipients was easy as well. Before printing, I clicked the Conditions button and entered conditions to print only the Texas and Washington addresses. Finally, printing labels was almost as easy: I used the supplied label style sheet as a template for a new document, then I followed the same procedure that I used for printing the letters.

Ami Pro's macro language is similar to BASIC, with macros edited in the normal editing window. Macro recording tools work flawlessly and let you assign the macro to keystrokes before recording, as in WinWord. Lotus included a handy macro that can assign any



AMI PRO'S AUTOMATED TEMPLATE SELECTION process lets you see a full-page, graphical preview of the document you're about to create.

macro to a menu. The program's file management tools let you alter file attributes and also include a move command. File-searching tools are limited to a macro supplied with the program. Although you can search for text inside files, the process is a crawl compared to WordPerfect's indexed QuickFinder. Batch printing is also handled by a macro, rather than an option in the file manager.

Handy Helpers

The learning aids, help, and manuals are quite good, although the interactive tutorial is brief and basic. Unfortunately, there's next to no documentation for network operations. Transition tools for Word-

Perfect 5.1 for DOS users are excellent, however, with hand-held demonstrations of Ami Pro commands when you press WordPerfect keystroke combinations.

When I phoned tech support, I found the waits brief and the staff knowledgeable and helpful. Lotus also has a forum on CompuServe, where users and Lotus staff answer questions quickly.

Overall, Ami Pro is still a solid performer, although it lacks text-art features and some of the new automated ease-of-use and OLE 2.0 tools found in Word 6.0 for Windows. It interacts extremely well with other Lotus applications, which mostly share the same interface. That's a big point in Ami Pro's favor if you're a dedicated

DOS Best-Sellers

Although Windows is becoming the environment of choice for most PC users, others are sticking to their DOS. Either their hardware doesn't support the demanding Windows environment, or they feel more comfortable with their DOS favorites. And although vendors are focusing on Windows, both Microsoft and WordPerfect offer new versions of their DOS word processors. We tested these and included the results in our Features Comparison table.

Microsoft Word 6.0 for DOS

Word is one of the longest-living DOS word processing programs. In this new version, Microsoft preserves the ability to run on even an 8088 CPU. Needing less than 6MB of disk space for a full installation, it fits on even the smallest hard disk, and you need only 512K recommended (384K minimum) of available memory to run it.

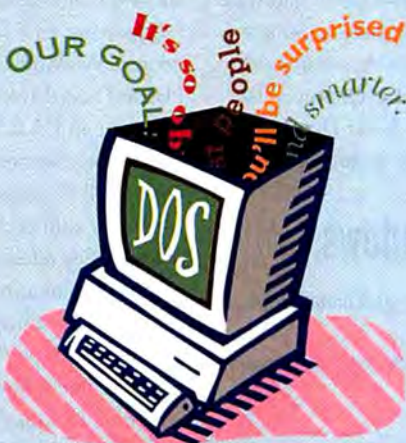
Despite these modest requirements, Microsoft added support for TrueType fonts, drag-and-drop text editing, improved table features, and automated features for bullets, envelopes, and labels. (HP DeskJet users will have to forgo the TrueType support, however.) The interface structure closely resembles that in Word 6.0 for Windows, down to the ribbon, rulers, and semigraphical shortcuts. Italic and boldface appear on the editing screen, but you must switch to the noneditable page preview for a look at documents as they'll look on paper.

The program includes tools to help WordPerfect 5.1 for DOS users make the transition, the Grammatik grammar checker, and a step-by-step mail merge helper.

Graphics import tools, decent multiple column support, and multiple document display

make almost any job possible, even if some graphical tasks aren't as easy as in WinWord. Even work groups are supported by annotations and revision tracking tools.

This word processor can't equal the Windows programs we examined, but it's more than capable of handling most chores. Since



it's the last remaining new word processor that can run on any PC (including small notebooks), it's going to be popular with users who demand excellent performance on modest platforms.

WordPerfect 6.0 for DOS

This new DOS version of the world's best-selling word processor looks and feels like a Windows program and shares most features of WordPerfect's new Windows version. That would be great news for users stuck with a PC that won't run Windows, except that WordPerfect 6.0 for DOS needs at least a 386 CPU, up to 16MB of disk space, and additional extended or expanded memory for good performance. While it will run on a 286 with just 480K of available RAM and 7MB of disk space, its performance under those con-

ditions is painfully slow, and access to features is limited. WordPerfect promises to keep WordPerfect 5.1 for DOS on the market, and WordPerfect fans with less-capable PCs will find this a better fit.

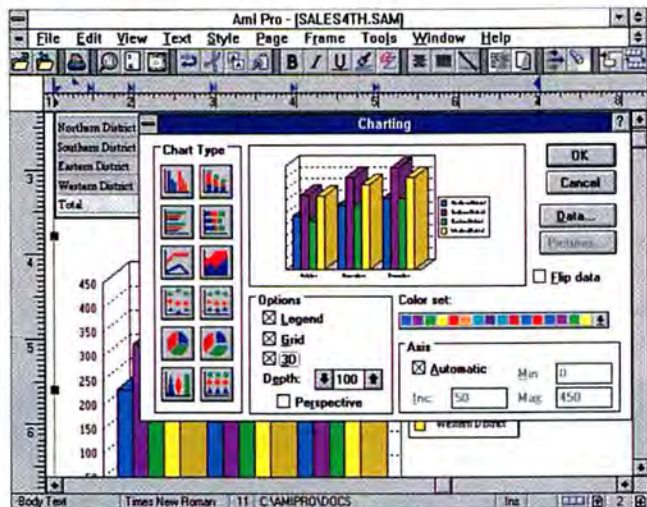
Version 6.0 will appeal to users who have powerful systems but for one reason or another choose not to install Windows. It's a full-scale graphical word processor with multiple viewing magnifications, including a thumbnail preview not available in the Windows version. You get graphical shortcuts like customizable icon bars for quick command entry, Windows-like dialog boxes, plus drag-and-drop text editing and multiple-document handling.

WordPerfect 6.0 offers a powerful macro language and style formatting capabilities. The program even supports TrueType, PostScript, Agfa Intellifont, and BitStream Speedo fonts.

Layout chores are simplified by the program's new interface, which allows easy dragging of graphical elements anywhere on the page. You also get limited drawing tools. Tables are as powerful as in the Windows version, and text can wrap around the contours of graphical images.

You even get the QuickFinder file searching tools. But you have to give up the OLE and DDE support of the Windows version, along with the multitasking capabilities in that graphical environment.

If you're a Windows-phobe with a system that can support this program properly, WordPerfect 6.0 for DOS may be an excellent choice, giving you the benefits of a graphical word processor. If you are working on anything less than a very fast 386, though, you'll want to stick with WordPerfect 5.1 for DOS or switch to Word 6.0 for DOS.



AMI PRO'S CHARTING MODULE is exceptionally fast and easy to use, requiring a minimum of decisions to create colorful charts.

1-2-3 fan or are attracted to Lotus SmartSuite 2.0 for Windows. To balance against Ami Pro's shortcomings, its hard disk and memory requirements are a modest 15MB and 4MB, respectively. Its stable, accurate screen displays and performance on less-capable hardware (all the way down to 286s) are additional enticements. So if you need super page layout tools or are stuck with less-than-state-of-the-art hardware, Ami Pro 3.01 is a fine choice. And even power users may be lured by Lotus's forthcoming release, *Lotus Development Corp.*, 800/831-9679, 404/391-0011 **Reader service no. 607.**

Microsoft Word 6.0 for Windows

PROS: Automated text entry, formatting, and corrections; great drawing tools and envelope and label handling

CONS: No image processing, heavy hardware requirements, no toll-free support, initial-release bugs



This new and major revision of Microsoft's powerhouse word processor offers a well-planned combination of powerful, easy-to-use features and automated functions. Those, combined with generally trouble-free operation and excellent overall performance, make it a rock-solid Best Buy. The only serious problem is the heavy hardware ante to get into the game. A full installation gobbles 25MB of disk space, and you'll do best with at least 4MB of system RAM. Granted, a feature-poor minimum installation uses just 6MB of disk space. But while the program will run even on a 286, you'll be frustrated by its sluggish performance on anything less than a very fast 386. This update is obviously designed to take advantage of the muscular 486s and Pentiums of the nineties.

Once the program is installed, its tutorial and *Quick Results* manual introduce an amazing feature set and the best automated tools in this group. WordPerfect 5.1 for DOS users can even turn on automated help, to learn while using familiar keystrokes.

As soon as I began the test letter, I saw the value of the new automated tools. The Letter Wizard helped me enter address information and then showed previews of three layouts. It offered to create an envelope, too. The envelope layout dialog box even handled POSTNET bar codes and, uniquely, the important FIM bar code

(located near the stamp), which helps speed mail delivery.

I created a new letterhead, using the WordArt tool to turn a company name into a striking logo, then added address information and an accent line. I typed *teh* instead of *the*, and WinWord's AutoCorrect feature fixed the misspelling as soon as I pressed the space bar—almost as if it had been reading my mind. I immediately added corrections manually for some of my other typical typos, although I could have done so easily during a spelling check. I even added a company name and an abbreviation (a short name used to quickly insert text and graphics) to the AutoCorrect list. WinWord's AutoText glossary feature let me store the logo as an abbreviation too—a unique capability. AutoText can even store fully formatted tables and other objects. Printing was fast, and cursor control returned almost instantly.

Turning to the sales report, I started from scratch rather than using another supplied template. Since I needed additional heading styles, I used the Style command in the Format menu to assign them to shortcut keystrokes. Like Ami Pro, WinWord lets you set all aspects of a style in a single dialog box, using file folder-like tabs to display options. New in this version are character styles, which apply to selected text rather than to entire paragraphs. Also new are powerful kerning tools. Another powerful, unique feature is the 100-level undo command.

Importing an Excel 4.0 spreadsheet is easier than in Ami Pro, because WinWord automatically places the data in a table. Although I lacked a final Excel 5.0 release, Microsoft promises you'll be able to create an OLE 2.0 link, then double-click on the data to use Excel's interface right in the document. This in-place editing power bodes well for users of the latest version of Microsoft Office. (While Microsoft admits that some OLE 2.0 bugs need correction with a maintenance release, I didn't encounter them in my tests using the OLE 2.0 mini apps bundled with Word for Windows.) Finally, I used the almost magical Table AutoFormat feature to pick a design complete with borders and shading from a previewed list. To move the table freely, however, I had to insert a frame surrounding it.

After selecting the table, I created a default chart in seconds, although I could have altered it with the extensive options in the Microsoft Chart module. Incidentally, Word 6.0 for Windows will share this module with other Microsoft programs.

When creating bulleted lists, Word 6.0 for Windows now keeps adding bulleted lines until you click the icon again. Oddly, page layout commands are in the File menu rather than in the Format menu. Once you find the commands, however, adding a gutter margin for duplex printing is easy. Cursor control returns almost immediately when you're printing.

In the annual report project, I found the outlining and master document tools to be the best in any of the programs in this group. The outliner has its own tool bar and collapses and expands to show any outline level. You can promote or demote an entry's level by dragging a screen marker. Each outline level automatically gets a heading style and becomes a heading in the document and an entry in the table of contents. While in the outliner, I also created subdocuments by clicking an icon. These appear as small icons, which you can double-click to edit the subdocument. Word for Windows' automated help is always evident. To teach you the function of all tool bar icons, the program pops up a balloon next to any icon when you briefly hold the mouse pointer over it. **continued on page 166**

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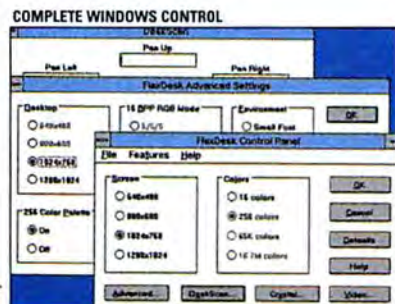
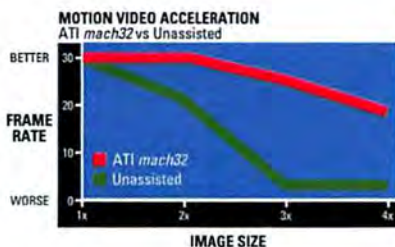
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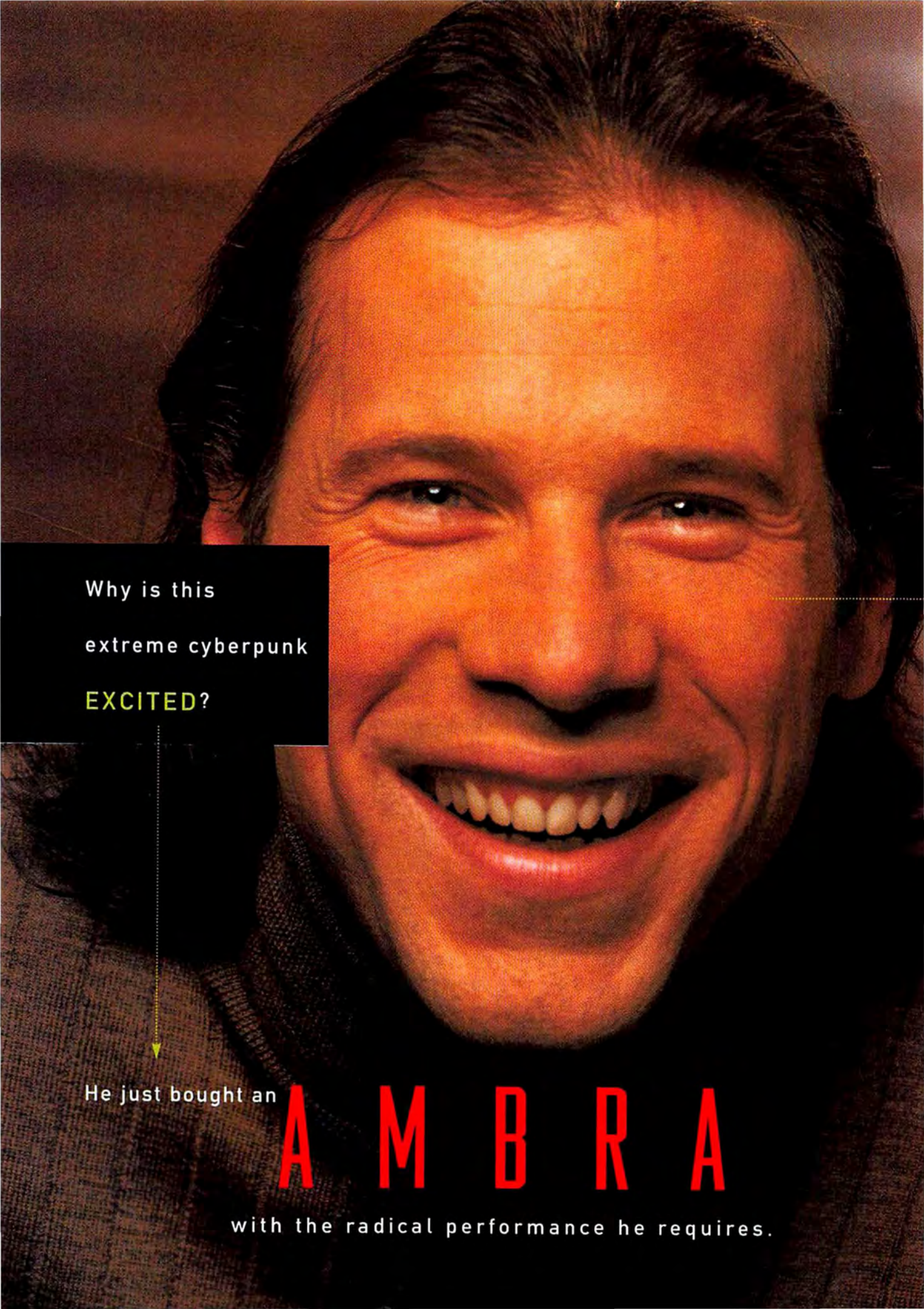


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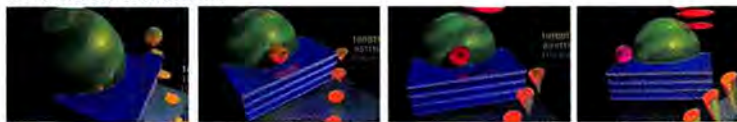
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WinWord's format painting tools work well, too. You can paint formats once or continuously by single- or double-clicking the format painter icon. Inserting a multipage WK1 file in a table is simple, and marking the heading rows takes just a single command. However, WinWord then takes its time repaginating the document. Switching the table pages to landscape orientation means altering page settings for the rest of the document, then moving to the end of the table to reset the orientation.

The gray-scale TIFF file popped in quickly, but I missed the brightness and contrast controls of Ami Pro and WordPerfect. Also, WinWord still insists that pictures be attached to text rather than the page until you add a frame. Ami Pro handles the placement better.

Creating the organization chart was a snap. I just called up WinWord's drawing tool bar and drew right on the page. This unique feature makes it incredibly easy to add lines and other drawing elements to a document. There's even an icon for creating callout boxes for text, which you can connect with a line to any point on the document.

You can now mix footnotes and endnotes, and work-group tools—like annotations and revision marking and tracking—function flawlessly. Document summary information is excellent, and the program's Find File command opens a capable file management system. But searches for text using Find File are slower than with WordPerfect's indexed QuickFinder.

Index and table of contents marking and creation are relatively easy, and the program formats these tables automatically, inserting them into the document. Bookmarks can preselect text, and the program's search and replace tools are extremely powerful and fast, even letting you use unique sound-alike fuzzy-logic searches.

Before printing the long report, I used the thumbnail view to see eight pages at once on screen. To move a graphic, I simply dragged it to a new page. Another unique feature lets you drag objects between documents on screen or even between applications.

The News Wizard

For the newsletter project, I selected yet another WinWord Wizard. Choosing the Modern newsletter option, I filled in a few dialog boxes to supply a title and other information. The program offered automatic help screens as I worked on this project.



WORD FOR WINDOWS OFFERS A CLEAR VIEW of its professionally designed automated templates, along with format choices.



WORD FOR WINDOWS' WORDART MODULE is an OLE 2.0 app. When you use it, the module's menus and interface replace WinWord's.

Creating a two-column section in a three-column layout wasn't as easy as Ami Pro's efficient multicolumn frames, although WinWord's columns are much improved, allowing easy creation of uneven column widths. But the program still doesn't offer WordPerfect's parallel columns for side-by-side text blocks. And I couldn't wrap text around a graphic's contours. I added a large, initial drop cap to one paragraph, using a menu command. I then used the drawing tools to create lines and borders right on the page and used the program's kerning tools to adjust two headline characters.

The one job I couldn't do in the newsletter was create the order blank, because Word for Windows can't rotate text except in the WordArt module, which wasn't suitable for this purpose. As with the other projects, printing went quickly.

Like all these programs, Word for Windows offers a three-step dialog box for mail merges. There's even a catalog option for printing continuous lists such as address books. While I edited the main document, the mail merge tool bar let me insert field names and commands. Of all the programs, Word for Windows alone offers a preview button to pop data from an actual record into the document to check your layout. You can also use automatic error checking before printing. Conditional commands inserted from the tool bar made it easy to insert special text for some recipients, and it's easy to set record-selection conditions. Label printing follows the same process flawlessly.

In other areas, WinWord's Visual Basic-like macro language—not the new Visual Basic for Applications that's used in Excel 5.0—is extremely capable, and you can assign recorded macros to menus, tool bars, or keystrokes even before recording them. The macro editing process is made easier by a tool bar containing functions specific to macro editing, and you can record program commands rather than type them. Macro help is extensive and includes examples you can paste into your own macros.

Help Unparalleled

WinWord's help and learning tools are unequalled. From the exclusive Tip of the Day, which pops up when you start the program, to the well-constructed manuals to help buttons in error boxes that help you understand and fix the error, WinWord gives you superior

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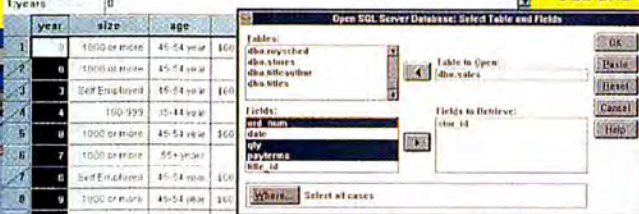
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Technical support, while not toll-free, is accurate, although, as with other Microsoft products, you may encounter long waits from time to time. Support on CompuServe and other online services, however, is quite good.

Bottom line, it's almost impossible not to fall in love with this program. Everywhere you turn, WinWord has a new tool, help screen, or method for making your work easier. While the program has become more complex, that complexity is cleverly disguised by careful design and automation.

It would be impossible *not* to give a Best Buy to an application with this kind of power. For optimum performance, I suggest using a fast 486 with plenty of RAM and a hefty hard disk. If you've been waiting to upgrade your hardware, Word 6.0 for Windows may be all the incentive you'll need. *Microsoft Corp., 800/426-9400, 206/882-8080 Reader service no. 608.*

WordPerfect 6.0 for Windows

PROS: Powerful set of flexible, customizable features; strong publishing features; spreadsheetlike tables; toll-free support

CONS: Slow editing in complex documents, complex menus, heavy hardware requirements, flawed handling of previous-version files

WordPerfect 6.0 for Windows offers the most powerful and customizable feature set of any of these programs. That enormous list of new features comes at a cost, however. Requiring an almost unbelievable 33MB of disk space, a minimum of 4MB of RAM, plus the fastest CPU you can find, it may send users of previous versions scrambling for hardware upgrades. Bugs in the initial release, plus a sometimes confusing interface and some incompatibilities with 5.x documents, may be reason enough for many users to wait for an interim release.

Installation is the first stumbling block. Since the program can't overwrite version 5.1 or 5.2 without crashes, cautious users will need enough disk space for both versions, and those who delete their old version may be frustrated when version 6.0 scrambles the fonts in documents created in earlier versions. Finally, super-VGA users employing 256-color graphics modes should include the program's /FL startup switch to avoid slow operation and crashes.

Once installed, however, the program offers impressive new features, including powerful tables with all the formulas of a spreadsheet, border styles galore, charting tools, Coaches (which walk you through projects), and a large set of well-designed templates. Add the totally customizable interface, and you quickly see how powerful this program is. WordPerfect still supports the widest variety of printers on the market with its native printer drivers, although most users will opt for a Windows driver. Finally, interface tools let you personalize this program beyond all others. Feature bars pop up as needed for tables, mail merges, and other functions; and button bars can hold any program command or function.

Working on the letter project was almost fun. I chose one of the five ExpressDoc letter templates, which included a graphical letterhead design, then chose the recipient's address from the unique address book in the opening dialog box. I set up letterhead information in the Personal Info dialog and saved it as a default for future letters. Drag-and-drop text editing worked well, but I missed

Word 6.0 for Windows' AutoCorrect feature when I mistyped.

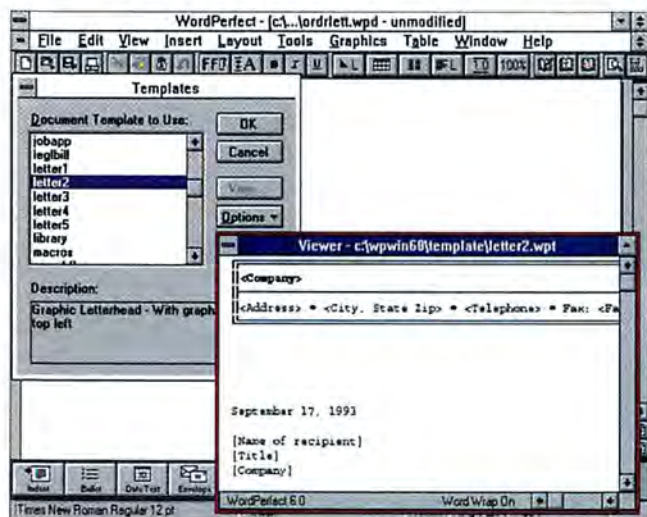
I added a border around the page, picking from a long list of pre-set styles. Then I clicked the Watermark icon and dropped a Watermark image behind the text. WordPerfect automatically sized one of its WPG images to fit. Printing went smoothly in the background, although I didn't regain cursor control quite as quickly as in WinWord. Envelope creation was automatic and offered POSTNET bar codes—but not FIM codes.

In the sales report, I tested the program's new table features. After importing an Excel 4.0 spreadsheet directly into a table, I added a new row to it and performed some calculations, inserting formulas from the table feature bar. This program's spreadsheet functions go far beyond the others. But when I wanted to format the table, I had to do so in several steps—a far cry from WinWord's one-step Table AutoFormat feature. Creating a chart, on the other hand, was quite easy with the extensive charting options; however, I found it difficult to change colors, and the charting module (part of the drawing program) took up the whole screen.

I used another ExpressDoc template for the sales report. I found several spots where I could click to edit placeholder text. Adding bulleted lists was simple using the button bar's bulleted list icon. A right-click on the customizable button bar displayed a list of all available button sets, and I could drag the whole button bar anywhere, even out of the window onto the Windows desktop. A right-click anywhere in WordPerfect displays an appropriate menu, and WordPerfect's title bar gives a description of buttons when you place the mouse pointer over them.

When it came time to print, though, I got bogged down in the program's menus. Setting gutter margins for two-sided printing was confusing, since I had to delve two menus deep to find the Binding Options dialog box and then had to make manual calculations to get the offsets right.

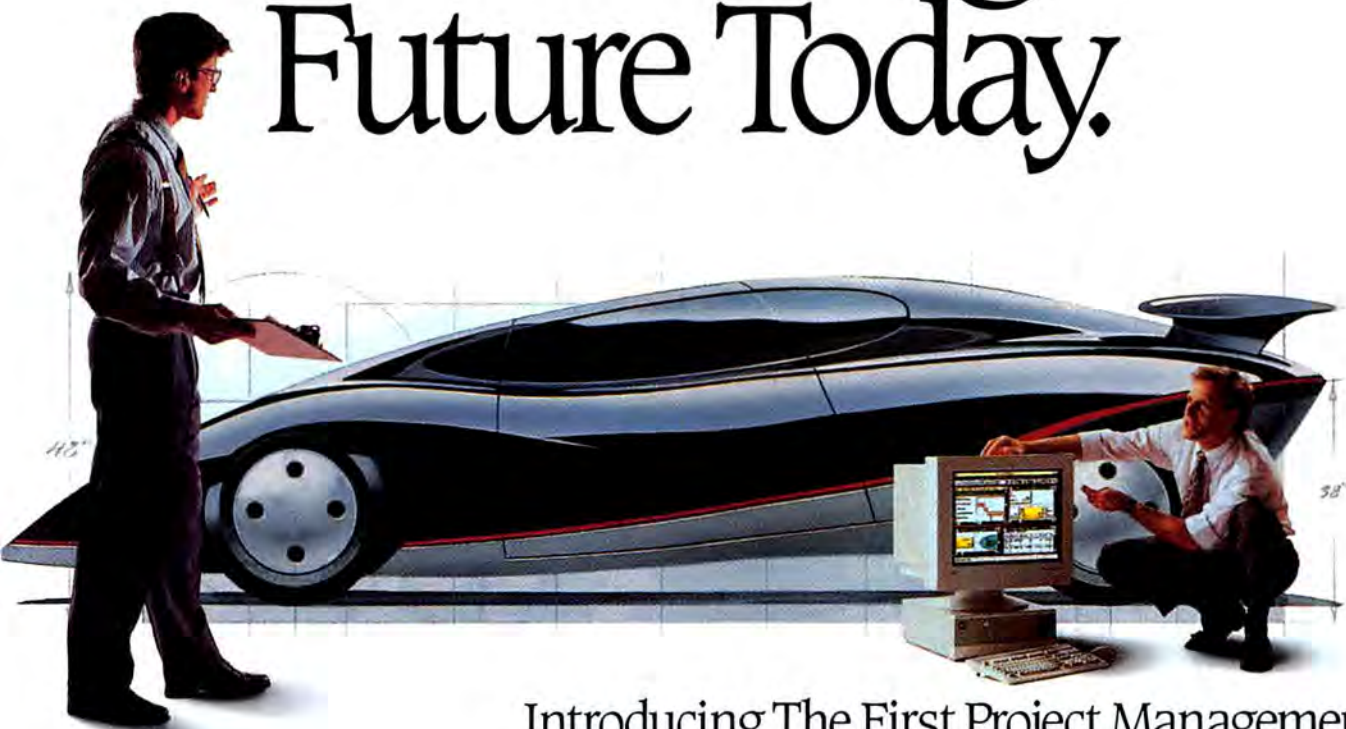
The annual report project demonstrated some other awkward menu logic, although WordPerfect's help pointed out the commands I needed. I couldn't set up styles for text in an all-inclusive graphical dialog box, as I could in Word 6.0 for Windows and Ami Pro. Instead, I used the Styles Editor dialog from the Layout menu, then issued formatting commands from menus, with no graphical



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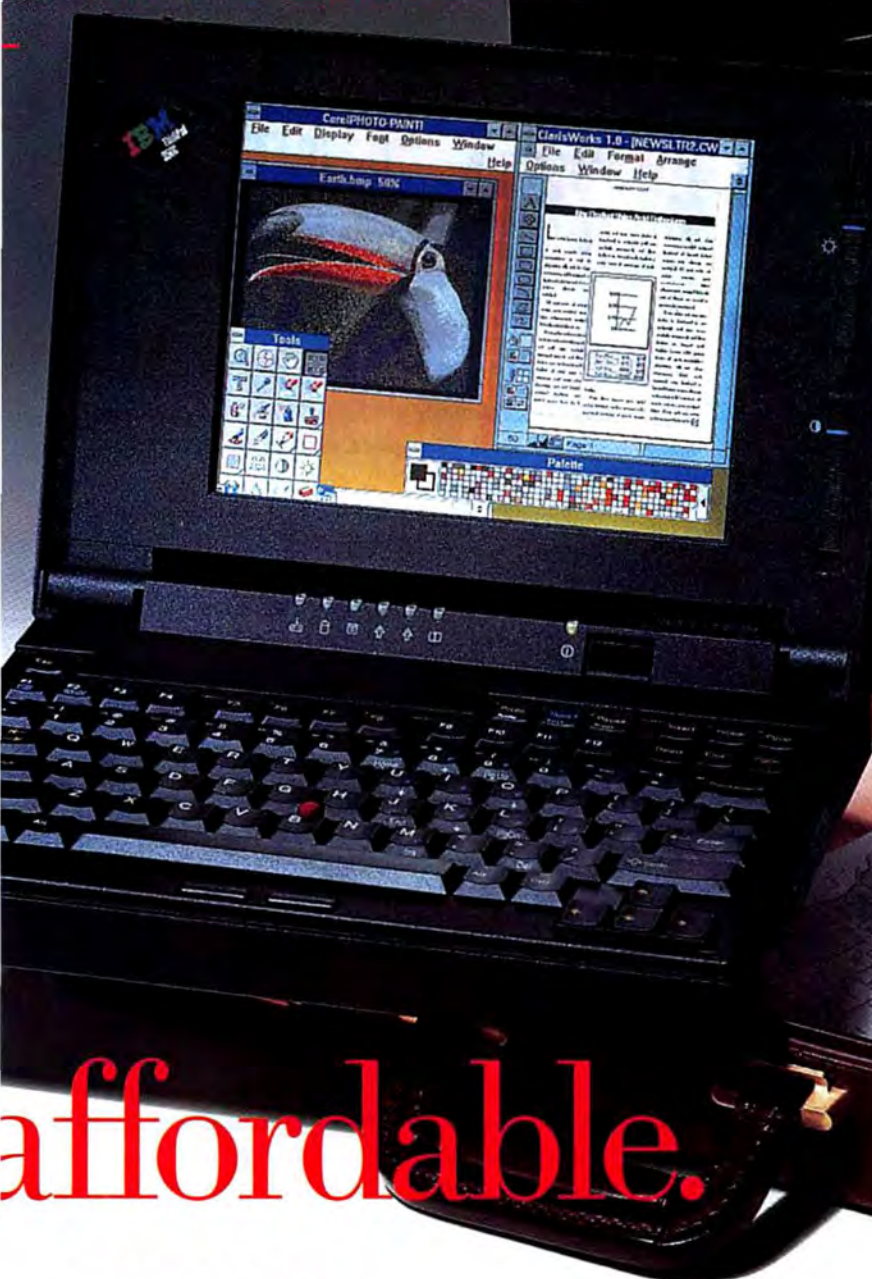
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preview. Still, WordPerfect's styles are the most powerful of those in any of these programs and can handle characters, paragraphs, graphics boxes, and borders.

Creating a multipage table from a WK1 spreadsheet file was easy, though, as was creating a repeating heading row. Switching from landscape to portrait mode requires two trips to the Paper Size dialog, which is two levels deep in the Layout menu. The WordPerfect Draw module made short work of the organization chart. Importing ASCII and WordPerfect 5.1 files was also no problem. I encountered bizarre font changes when I imported a WordPerfect 5.2 file, but format painting tools let me drag a new format over the offending text.

I found WordPerfect's outliner less effective than WinWord's, but outline numbering is still excellent, and you can create a master document with icons for subdocuments in the outliner. I had to manually mark table of contents entries, but a handy feature bar sped the process. Index entries can come from a concordance file or from marked text; and formatting these lists, while not automatic, is flexible. WordPerfect also handles other lists and tables very well.

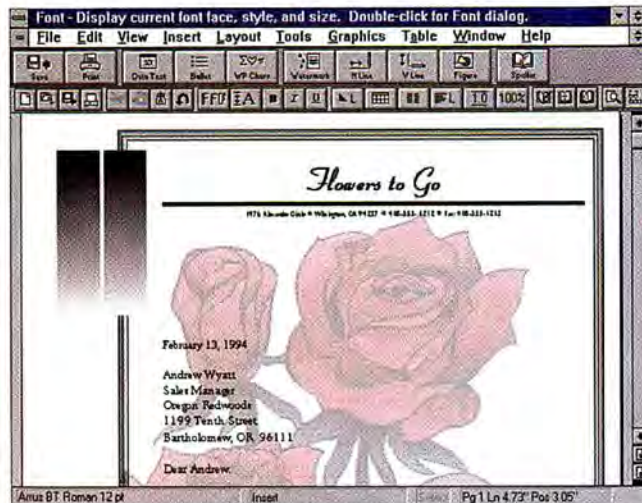
Revision tracking isn't as seamless as in Ami Pro and WinWord, since you must use WordPerfect's Compare Document feature on saved files to view and handle revisions. Annotations work well, though, and the feature bar can help you insert users' initials and dates. Work-group users can lock annotations, and multiple users can open files in read-only mode. WordPerfect makes it easy for individual LAN users to have customized versions of the program, including their own styles and interface setups.

WordPerfect's abbreviation or glossary feature can save formatted text, but not graphics or other objects. Bookmark features are excellent, and I found the program's instant QuickMark valuable for marking and jumping to a preset location. Printing the long document took somewhat longer than in the other two programs, and WordPerfect's own background print spooler, which you can't turn off, took almost a full minute to return cursor control.

WordPerfections and Imperfections

The newsletter project, started from scratch, revealed both features and flaws in the program. Some of its abilities are great—it can wrap text around the contours of a graphic, set up parallel columns for side-by-side text, and create text boxes that can rotate text for order blanks. These, combined with the powerful TextArt feature from Bitstream and the drawing module's ability to make text follow a curve, made the newsletter's design go quickly. I imported a grayscale TIFF file easily, and I could control its contrast and brightness. On the other hand, a line inserted between columns printed right through a text box that spanned those columns. Worse, the program couldn't keep up with my typing when graphics and columns were on screen. Then, when I held down the <Backspace> key to delete text, the cursor disappeared, making it difficult to control the deletion. On the upside, WordPerfect offers outstanding kerning controls and can create lines anywhere on the page.

The mail merge offered another feature bar for inserting field names and extensive merge commands. Importing the DBF file took several minutes, because the program had to import every record before I could use the data. The graphical three-step merge dialog, though, equals those in the other two programs. Conditional merge tools worked well, and printing was simple. Labels for the



WORDPERFECT FOR WINDOWS' UNIQUE WATERMARK feature automatically sizes and fades out graphics, with text overlaid on top.

merge took just a few minutes to create using the Labels command in the Layout menu.

WordPerfect offers a laundry list of features in other areas. Its macro language, mostly shared with the WordPerfect DOS version, is complete—if a bit harder to use than the BASIC-like WinWord and Ami Pro languages. Unfortunately, you must convert macros from previous versions manually. The Command Inserter button on the macro feature bar lets you insert and format macro commands. Recording macros is a snap, but you can't assign the macro to an icon or menu during recording.

The file management tools are excellent and are available in all file-oriented dialog boxes. The unique QuickFinder tool lets you hunt down text within any file almost instantly once you've indexed the files. File viewing—for all types of formats—is quite good. There's even a method for automatically paginating and printing folded booklets, a useful feature exclusive to WordPerfect.

WordPerfect's ability to customize every aspect of the program, from menus to graphical interface tools, is unmatched, and you can customize document templates to create special versions of the program for individual users or tasks. Help, too, is more than adequate, although the program's brief tutorial is no match for WinWord's. Oddly, the program has limited help for users of previous versions, falling behind its competitors in this area. I also missed WinWord's clever help for explaining error messages. The program's main manual is well indexed and is more task-based than in earlier versions. Phone support is still toll-free, accurate, and well staffed to prevent excessive delays. While WordPerfect offers only file-downloading support on CompuServe, there's an active and helpful WordPerfect users' forum.

WordPerfect 6.0 for Windows is powerful beyond question and will make techie users and third-party add-on developers happy. For individual users who just need to get the job done, however, the more difficult access to those features may be a deterrent. The program's heavy hardware requirements, along with slow editing in complex documents, may induce some upgraders to wait until their hardware is up to speed. A bug-fix release is inevitable and is already announced for release early this year. *WordPerfect Corp.*, 800/451-5151, 801/225-5000 **Reader service no. 609.**

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FEATURES COMPARISON

The Verdict After Rating the Features: Word for Windows Is Number One

USING OUR FEATURES COMPARISON TABLE

For this review, we're comparing the programs' features in a new table format. Rather than just list features, we rate them from 0 to 5. Ratings are based on a combination of performance, depth, and usability for each feature set. A category's overall rating is a simple average of all specific ratings. A chart of features doesn't provide enough information to give you the insight you need when choosing a program as personal as a word processor. It's not enough just to know whether or not a feature is supported. You also need insight into the evaluation process—the opportunity to see the ratings we give to each feature. Finally, we average all the major categories for our overall rating for each product. As a result, you can look at the products feature by feature or category by category—or compare the products' overall values side by side.

RATING	SCALE
0	Feature not available
1	Poor
2	Fair
3	Good
4	Excellent
5	Outstanding

HOW WE TESTED

Considering the range of PC equipment our readers use, we felt that just running these programs on a single, state-of-the-art business PC would present too narrow a view. So we worked with two computers. One was a Zeos 486DX2-66 with 16MB of RAM, a 340MB hard disk, and a Diamond Stealth Pro VLB local bus video adapter. The second was a 25-MHz Gateway 2000 386 with 8MB of RAM, two 212MB hard disks, and a Tseng ET-4000-based video adapter. For network testing, we used LANtastic 5.0, with its NodeRunner thin Ethernet cards.

We did simple, stopwatch-based performance testing on the Zeos 486, using documents as identical as possible in all programs. We eyeballed the programs on the Gateway 2000 machine to see how they would do on a less state-of-the-art PC. We used a Hewlett-Packard LaserJet IIID for printing.

	BEST BUY Am! Pro 3.01 for Windows	Word 6.0 for Windows	WordPerfect 6.0 for Windows	Word 6.0 for DOS	WordPerfect 6.0 for DOS
Standard features					
List price	\$495	\$495	\$495	\$495	\$495
Disk space (minimum/ maximum)	5MB/ 15MB	6MB/ 25MB	10MB/ 33MB	1.5MB/ 5.5MB	7MB/ 16MB
Memory (minimum/ recommended)	2MB/ 4MB	4MB/ 8MB	4MB/ 6MB	384K/ 512K	480K/ 520K

Interface

Logical menus					
Mouse handling					
Keyboard handling					
Help					
Tool bars					
Command flexibility					
Editing views					
Multiple-document handling					
Display quality					
Dialog boxes					
File management					
Interface overall rating	4	4.45	4	2.82	3.64

Text editing

Text entry					
Search and replace					
Drag-and-drop editing					
Text-entry shortcuts					
Access to special characters					
Text editing overall rating	3.4	4.8	3.6	3.2	3.6

Layout and formatting

Style handling					
Drag-and-drop formatting					
Search-and-replace formatting					
Included templates					
Automated formatting tools					
Font support					
Bulleted and numbered lists					
Kerning and tracking					
Tab handling					
Envelopes and labels					
Multiple column tools					
Page borders					
Page-break tools					
Headers and footers					
Page numbering					
Boxed-text tools					
Multipage layouts					
Portrait, landscape in same document					
Layout and formatting overall rating	4	4.28	4.17	2.61	3.28

	BEST BUY Ami Pro 3.01	Word 6.0 for Windows	WordPerfect 6.0 for Windows	Word 6.0 for DOS	WordPerfect 6.0 for DOS
Graphics					
File import					
Graphics processing					
Drawing tools					
Charting tools					
Graphical text tools					
Border tools					
Frame tools					
Text wrapping					
Scaling and cropping					
Equation editor					
Backgrounds and fills					
Captioning					
Graphics overall rating	3.92	4	4.25	1.83	3.25

Tables					
Table creation					
Multipage-table handling					
Spreadsheetlike formulas					
Table formatting					
Tables overall rating	3.75	4.25	4.25	2.75	4

Interoperability					
OLE (Object Linking and Embedding)					
DDE (Dynamic Data Exchange) links					
Word processor file importing					
Data file importing					
Spreadsheet file importing					
Shares documents between versions on different operating environments					
Interoperability overall rating	4	4.17	4	1.33	2.17

Automation and customization					
Included macros					
Macro recording					
Macro language					
Macro editing					
Assign macros to menus and tool bars					
Auto-templates					
Custom keyboard					
Aids on line					
Automation and customization overall rating	3.88	4	3.88	2.5	3.75

Long documents					
Outliner					
Master document tools					

	BEST BUY Ami Pro 3.01	Word 6.0 for Windows	WordPerfect 6.0 for Windows	Word 6.0 for DOS	WordPerfect 6.0 for DOS
Long documents cont'd					
Bookmarks					
Footnotes, endnotes					
Binding offsets					
Search-and-replace performance					
Table of contents, index tools					
Cross-referencing					
Long documents overall rating	3.63	4.38	3.75	3.25	3.63

Work-group tools					
Annotations					
Voice annotations					
Revision tracking					
Version control					
LAN operations					
E-mail tools					
Work-group tools overall rating	3.83	4.17	3.83	2.33	3.17

Proofing and reference					
Spelling checker					
Grammar and style					
Thesaurus					
Proofing and reference overall rating	3.67	3.33	3.67	3.33	3.33

Printing and mail merge					
Background printing					
Batch printing					
Printing speed					
Printer support					
Gray-scale image quality					
Envelope and label printing					
Merge data formats					
Merge data tools					
Merge document creation					
Conditional merge tools					
Printing and mail merge overall rating	3.7	3.8	3.8	2.7	3.6

Help, tutors, and support					
Tutorial tools					
WordPerfect 5.1 for DOS transition tools					
Documentation					
Online help					
Phone support					
Help, tutors, and support overall rating	3.60	4.2	3.2	3.4	3.2

Overall value rating	3.78	4.15	3.87	2.67	3.38
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W 09668	Lotus 1-2-3 for Windows 1.1 - 3"	\$308.98
W 12397	Lotus 1-2-3 4 for Windows Upgrade - 3"	\$98.98
W 09723	Lotus Ami Pro 3.0 Competitive Upgrade - D	\$94.98
W 12015	Lotus Improv for Windows - 3"	\$94.98
W 11193	Lotus Organizer for Windows - D	\$98.98
W 11978	MS Encarta - C	\$79.98
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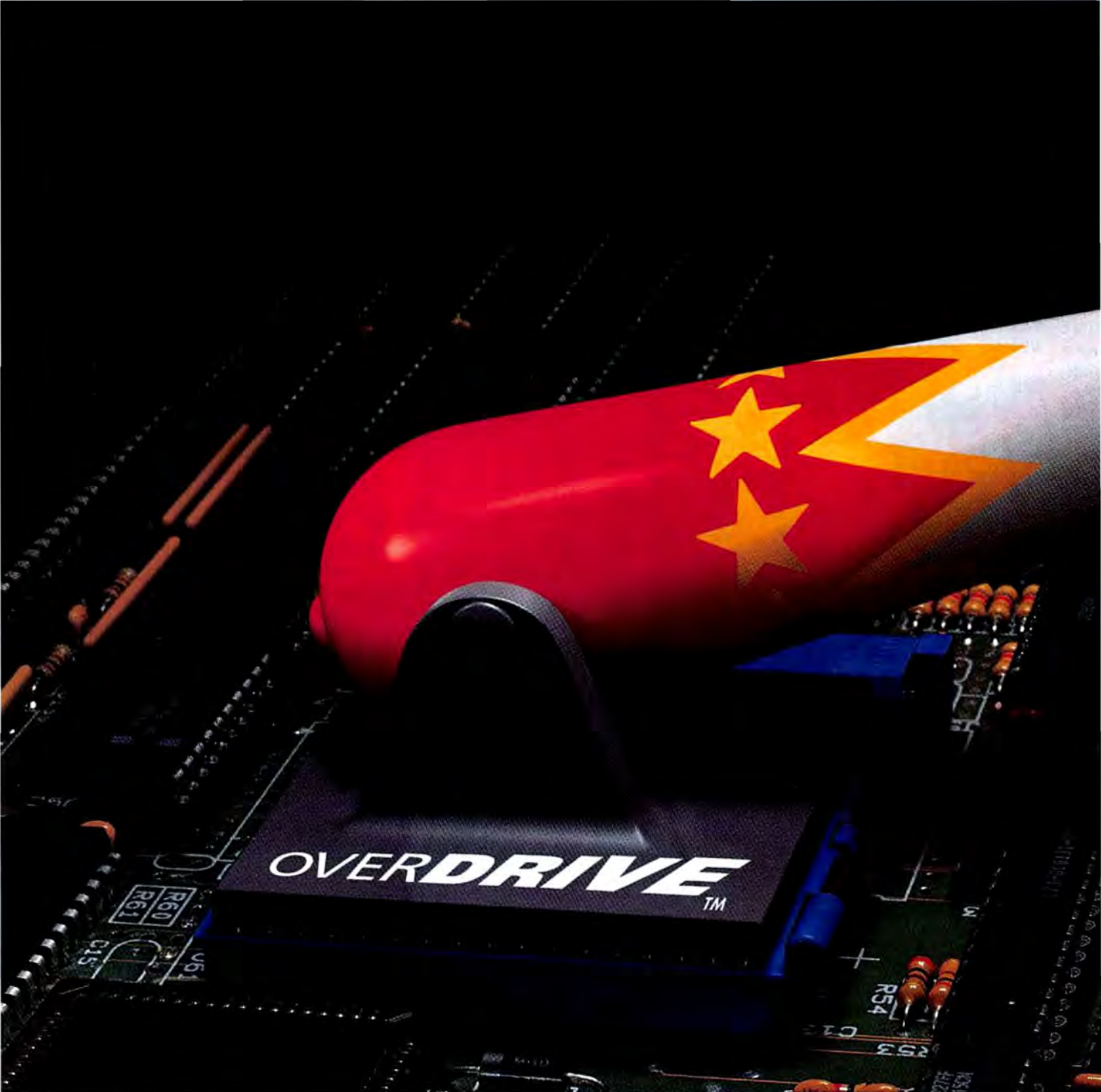
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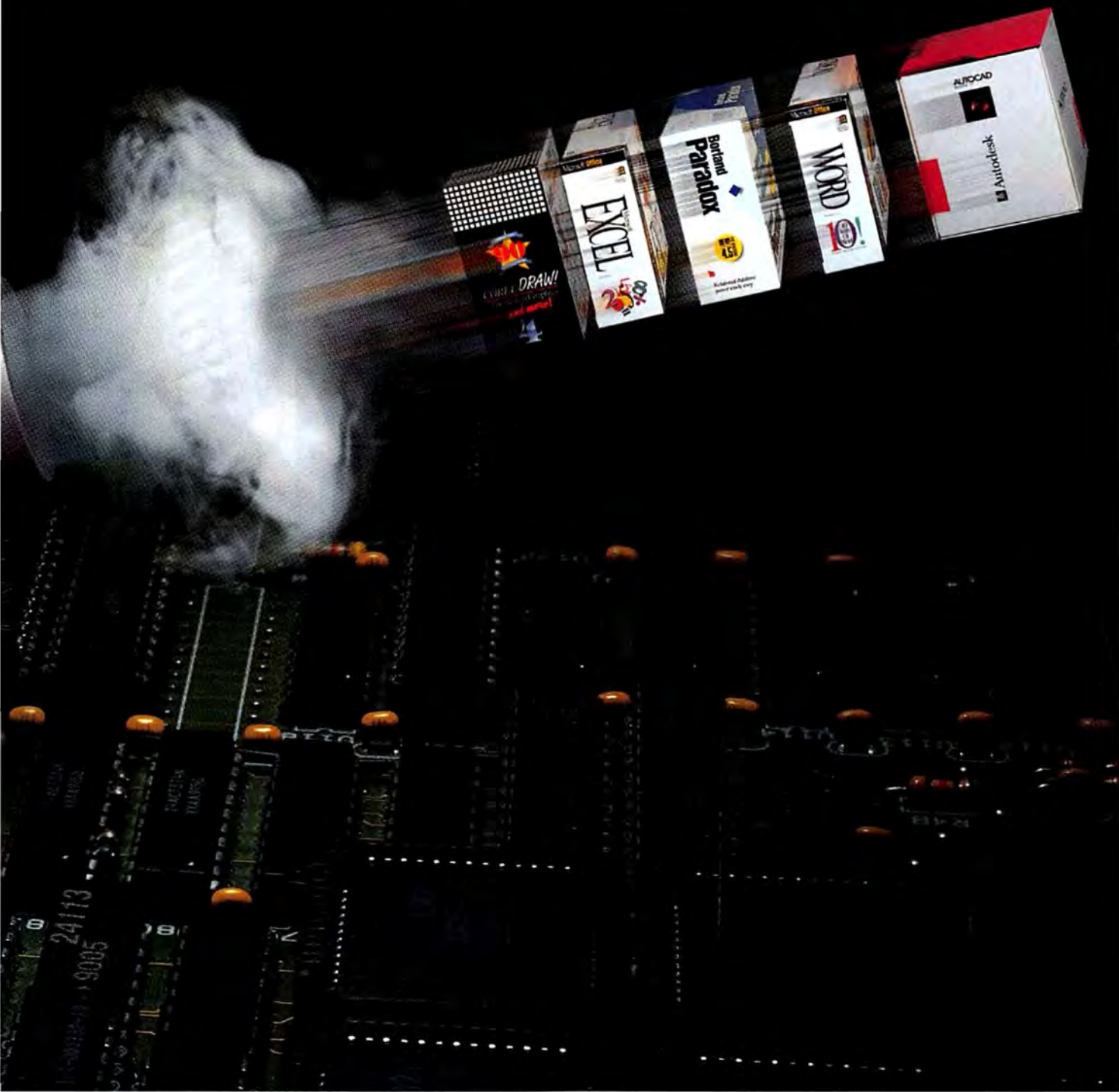
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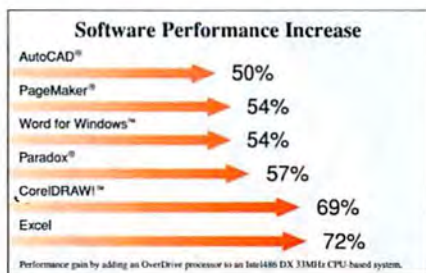
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Edited by Dan Miller and Shane Devenshire

100 SPREAD SHEET TIPS

If you had to make do with one application for all your computing needs, what would it be? We'd go with a spreadsheet. Spreadsheets are not only prodigious number-crunchers, they can also handle

everything from database work to desktop publishing. Ironically, the more powerful these apps become, the more help users need in uncovering the wealth of features hiding beneath the surface. So chances are, no matter how long you've been using your favorite spreadsheet, there are still plenty of tricks you don't know.

That's why we put out the call to our network of contributing editors, power users, and in-house experts at Borland, Lotus, and Microsoft, asking them for tips that work in any spreadsheet as well as short, sweet tricks for 1-2-3, Excel, Improv, and Quattro Pro. In reader surveys we've asked you which spreadsheets you use most and allotted space for each program on the basis of your responses. Our goal: to give all of you, from tyros to seasoned veterans, an idea or two (or sixty) to help you work faster and smarter.





UNIVERSAL TIPS

1. Ask for Help

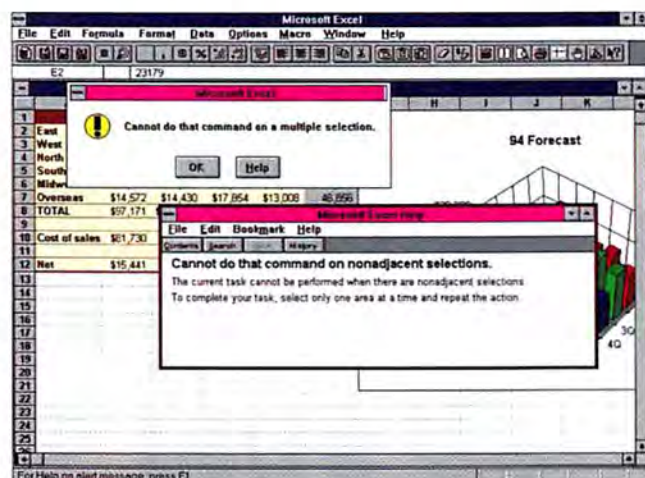
It's so obvious, most people miss it: When 1-2-3 (releases 1.1 and 4.0) or Excel (versions 4.0 and 5.0) displays an error message in an alert box, select *Help* (in 1-2-3 1.1 and Excel) or **<F1>** (in 1-2-3 4.0) instead of OK. You'll be surprised at how often the context-sensitive help screen will point you to the error's solution.

2. Use <F9> to Recalculate

If you're editing a formula and want to see its results, press **<F9>**. To enter the calculated value in the active cell, press **<Enter>**. To return to the formula, press **<Esc>**. Excel users can even choose to calculate only a portion of a formula on the formula bar by highlighting that part before pressing **<F9>**.

3. Add Comments to Formulas

Adding comments to your formulas can make your worksheets much easier to understand and, if necessary, to debug. In Quattro Pro (versions 1.1 and 5.0) and 1-2-3 (releases 1.1 and 4.0), you can add comments by typing a semicolon at the end of the formula and then typing your text. In both Quattro and 1-2-3, your text will show up only when you are editing the formula. In Excel, you add your comments as a cell note: Simply choose *Formula • Note* and comment away.



GET CONTEXT-SENSITIVE HELP for error messages in 1-2-3 and Excel by choosing *Help* instead of OK.

4. Prevent Insertion of Rows or Columns

There's an easy way to prevent the insertion of unwanted rows and columns in 1-2-3, Excel, and Quattro Pro worksheets. Start by moving to the cell in the rightmost column and bottom row of the worksheet; in an empty worksheet, you can do this by pressing **<End>**, **<Down>**, **<End>**, **<Right>**. Next, enter some text in this corner cell; it doesn't matter what you enter, any text will do. To get back to cell A1, press **<Home>** (**<Ctrl>**+**<Home>** in Excel).

From then on, when you or anyone tries to add a column or row to the sheet, your application will issue an error message. If you're sharing a worksheet, and you don't care if other users edit the contents of individual cells but don't want them adding new rows or columns, this technique could come in handy.

Region	State	1990	1991	1992	1993	1994	1995	1996	1997
East	Connecticut	\$199	\$208	\$215	\$204	\$206	\$207	\$207	\$207
East	Delaware	\$60	\$66	\$66	\$61	\$272	\$412	\$412	\$412
East	Maine	\$119	\$173	\$129	\$122	\$544	\$707	\$707	\$707
East	Maryland	\$179	\$259	\$194	\$184	\$815	\$652	\$652	\$652
East	Massachusetts	\$219	\$317	\$237	\$224	\$996	\$1,395	\$1,395	\$1,395
East	New Hampshire	\$40	\$58	\$43	\$41	\$181	\$217	\$217	\$217
East	New Jersey	\$258	\$375	\$290	\$265	\$1,178	\$1,295	\$1,295	\$1,295
East	New York	\$557	\$807	\$602	\$571	\$2,537	\$1,892	\$1,892	\$1,892
East	Pennsylvania	\$278	\$403	\$301	\$266	\$1,268	\$966	\$966	\$966
East	Rhode Island	\$20	\$29	\$22	\$20	\$91	\$82	\$82	\$82

YOU CAN ADD COMMENTS TO FORMULAS in 1-2-3 and Quattro Pro by typing a semicolon and then the comment.

5. Custom Fills

Let's say you frequently include the names of your department staff in worksheets. Instead of typing in the names every time, you could instead use the automatic fill tools available in the latest versions of 1-2-3, Excel, and Quattro Pro (Fill by Example in 1-2-3, AutoFill in Excel, and SpeedFill in Quattro Pro) and customized fill sequences to let your spreadsheet do the work for you.

In 1-2-3, you enter custom lists by editing the file `FILL.S.INI`, which should be in the `\123R4W\PROGRAMS` subdirectory, with a standard text editor. Enter your first custom fill list under a new section titled **[SET 4]** (`FILL.S.INI` already defines fill sets 1 through 3). Enter the items as you want them to appear in the series, preceding each with **ITEMx=**, where *x* is the number of the item in the list; the first item would be **ITEM1**, the second **ITEM2**, and so on. Enter one item per line. If you want the case always to stay the same, enter **case=exact** on a separate line anywhere in the list. To use your custom fill, enter an item from it, then select the item and the range you want to fill, and choose *Range • Fill by Example*.

Excel 5.0 makes custom fills especially easy. You can import an existing list from a worksheet by highlighting the list, selecting *Tools • Options*, choosing the *Custom Lists* tab, and clicking the *Import* button. You can type a list directly into Custom Lists' List Entries box and then select *Add*. To add a list to a worksheet, enter one of the items from the list in a cell, and either drag the fill handle over the target range or highlight the range and select *Edit • Fill*.

Quattro Pro uses virtually the same procedure as 1-2-3. You record your custom fill lists in the `[SpeedFill]` section of the file `QPW.INI`, which should be in your `WINDOWS` directory. The format is *Staff=John, Betty, Harriet, Igor*, where *Staff* is the name of the fill sequence. If your `QPW.INI` doesn't have a `[SpeedFill]` section, you can simply add it. Enter the items exactly as you wish them to appear in your worksheets. To add one of your lists to a notebook, enter one of its items at the beginning of the range that will contain the list, highlight that range, and click the *SpeedFill* button.

6. Name Your Worksheets

1-2-3 (release 4.0), Excel (version 5.0), and Quattro Pro (versions 1.0 and 5.0) all mark open sheets with a tab, which you can use to select sheets or move from sheet to sheet. These tabs are most useful

when they contain descriptive names. If, for example, you collect sales data for separate regions in different sheets, you can simply name those sheets by region—North, South, and so forth. To name a worksheet, double-click (or right-click in Quattro Pro) its tab and enter a name. In 1-2-3 and Quattro Pro, these names can be up to 15 characters long; Excel allows up to 31 characters.

7. Blocking Cells Across the Worksheet

As you build a spreadsheet, you may need to make identical changes in widely scattered areas of your sheet. Instead of making these changes piecemeal, do it in one fell swoop by selecting noncontiguous cell ranges.

To do so, hold down the **<Ctrl>** key while using the left mouse button to select the cells. Keep the **<Ctrl>** key pressed and mark off another block. The noncontiguous blocks will now respond as one unit to any formatting change, as well as to commands that delete cell contents, search and replace, and fill cells with data. (This tip does not work in 1-2-3 for Windows 1.x.)

8. Changes Top to Bottom

You can also apply changes to a single range on several different worksheets at the same time. First select the block in the first page. Then select the other sheets you want to change. In 1-2-3 release 1.0 and 1.1, anchor the first sheet's range using **<F4>**, then use **<Ctrl>** **<Page Up>** to select more sheets.

1-2-3 release 4.0 and Quattro Pro also let you select only contiguous sheets: Hold down the **<Shift>** key and click with your left mouse button on the tab of the last worksheet in the 3-D range. You can use the same technique to select contiguous sheets in Excel 5.0, but that program also lets you bore through *discontiguous* worksheets. To do so, hold down **<Ctrl>** while clicking the tabs of the individual sheets. When you're done selecting, go ahead and make your changes on the top sheet. They'll automatically take effect on every selected sheet as well.

EXCEL

9. Online Resources

Have a question but don't want to wait on hold for tech support? You can also contact Microsoft directly via modem. The company bulletin board service is at 206/936-6735 (set your modem to no parity, eight data bits, and one stop bit). Microsoft also has forums on CompuServe, America Online, and GEnie. Select **Help • Technical Support** in Excel 5.0 for a complete list of support options.

10. Range Rover

If you want to select a large range of data, just put the active cell indicator anywhere in the data and press **<Ctrl>** **<Asterisk>** or **<Ctrl>** **<Shift>** **<8>**. Excel will highlight the range for you.

11. The End of the Line

When you're editing a formula in the formula bar and you've selected some characters, pressing **<Delete>** or **<Backspace>** will delete the selection. Pressing **<Ctrl>** **<Delete>** without any characters selected will delete everything from the insertion point to the end of the line; with characters selected, that key combination will delete everything from the beginning of the selection to the end of the line.

12. Deleting Discontiguous Records

Let's say you want to weed out records from an Excel database. Excel won't let you highlight and then delete discontiguous lines, but there is a work-around. Start by inserting a new column to the left of the database; at the top of the column, enter the title **Dummy**.

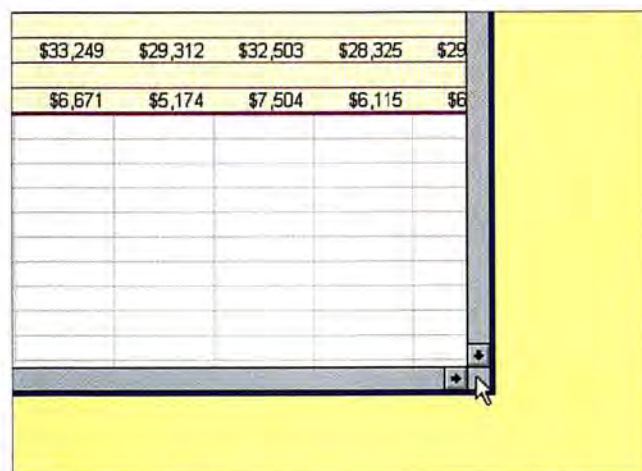
Next, go through your list and enter an **x** in the new column next to each record you want to delete. When you've reviewed all the records, highlight the entire database, including the dummy column, and select **Data • Set Database**. Move to a blank area of the worksheet, enter **Dummy** in one cell and the character **x** in the cell underneath, then highlight both cells and select **Data • Set Criteria**. Choose **Data • Delete**, and the records you've selected will disappear.

	DUMMY	PHONE	STATE	CITY	NAME
1		204-555-4903	MB	Winnipeg	Winnipeg PCUG
2		301-555-3716	MD	Rockville	CPCUG MIX
3		301-555-1379	MD	Rockville	CPCUG S/W Library4/1
4	X	302-555-7847	DE	New Castle	DVUG
5		303-555-9245	CO	Grand Junction	Colorado West UG
6	X	313-555-1310	MI	Warren	DKUG R88S
7		404-555-8938	GA	Atlanta	IBM PCUG
8		404-555-2447	GA	Atlanta	Atlanta PCUG
9		406-555-1470	MT	East Helena	HUGE
10	X	408-555-9712	CA	Scotts Valley	Assoc PCUG
11	X	413-555-9552	MA	Westfield	PVCC UG
12	X	415-555-7850	CA	San Francisco	SF PCUG
13	X	501-555-5644	AR	Conway	Conway PCUG
14		503-555-3871	OR	Portland	Navell UG
15		510-555-7093	CA	Walnut Creek	DVPCUG
16		512-555-2598	TX	Austin	Centex PCUG
17	X	512-555-3722	TX	Corpus Christie	CAUG-PC
18		502-555-9706	AZ	Phoenix	Phoenix PCUG
19	X	606-555-1808	KY	Lexington	Bluegrass PCUG

USE A DUMMY COLUMN TO MARK RECORDS in an Excel database, then delete them with a single command.

13. Another Way to Maximize

Most users know that they can maximize a Windows application or document by clicking on the up arrow in the upper right corner of its window. Many users also know that you can maximize a document window by double-clicking on the title bar. Excel offers a third way to maximize a document window: Double-click on the square in the window's lower right corner, where the horizontal and vertical scroll bars intersect.



DOUBLE-CLICK ON THE SQUARE at the bottom right corner of a document window in Excel to maximize your window.



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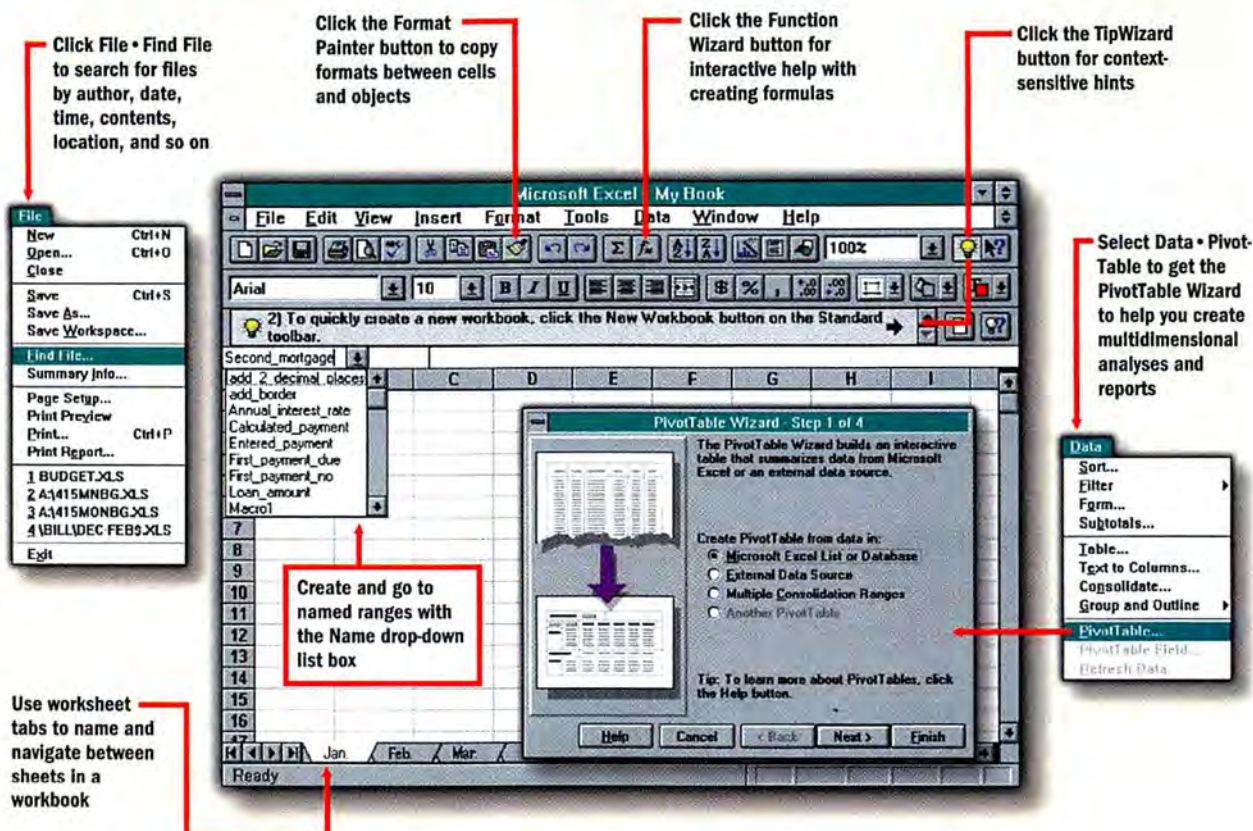
Auto macro conversion



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14. Backward Autofilling

Most Excel users know how to create data series quickly by dragging the fill handle down or to the right. But few realize that you can also use these tools to fill cells up or to the left. Let's say you have two adjacent cells in Excel containing the numbers 4 and 5. If you highlight these two cells and then drag the fill handle to the right, Excel will fill the cells to the right with 6, 7, 8, and so on. But if you drag the fill handle to the *left* instead, the cells in that direction will fill with 3, 2, and 1.

15. Erasing Cells With Autofill

You can also use autofilling in Excel to *delete* the contents of cells. Just select the range you want to clear and drag the fill handle into it; the cells will turn gray as you pass over them. Release the mouse button, and the cell contents of the grayed-out cells will be gone.

16. Supercharged Scroll Bars


It's no secret that you can drag the scroll boxes within the vertical and horizontal scroll bars to move your worksheet within its window. To let you know which row or column will appear at the top or left side of the window, Excel displays its number or letter in a box on the far left side of the edit line. However, this technique navigates through only the active section of the worksheet. If you want to scroll further, hold down <Shift> as you drag the scroll box. Once again, Excel will show you the row or column that will end up on

top or leftmost in the edit line, but you'll be able to scroll to any row or column in the sheet.

17. Copying Multiple Attributes

The Edit•Paste Special command is handy for copying single attributes (formulas, values, formats, or notes) between cells or from one worksheet to another, but you can also use it to copy some attributes—say, values and formats—without copying all of them. To do so, select the range to be copied and copy it. Now select the destination, choose *Edit•Paste Special*, and click *Values*. While the original source cells are still highlighted, select *Edit•Paste Special* again, but this time select *Formats*.

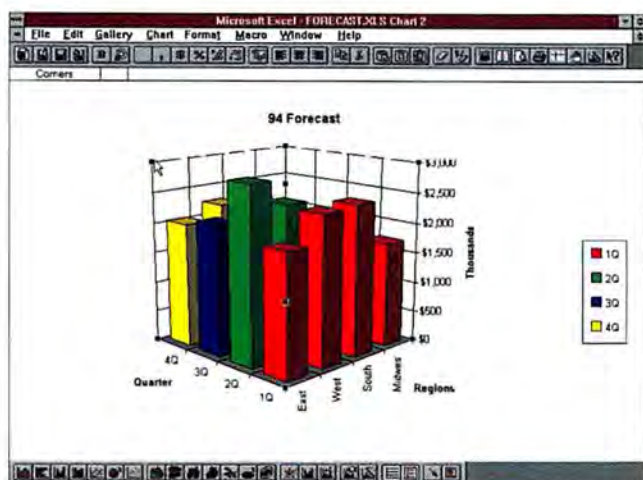
18. Change Charts With the ChartWizard

Want an easy way to change the data series in a chart? Ask Mr. Wizard. First select the chart, then click the *ChartWizard* tool. Excel will switch to the worksheet that contains your data and display the Step 1 dialog box. You can now type the new range in the Range text box or use the mouse to select it from the worksheet. When you are done, click the  button (Excel 4.0) or the *Finish* button (Excel 5.0) to display the revised chart.

19. Rotating a 3-D Chart

You can view 3-D charts from virtually any angle just by using your mouse. First double-click the chart to edit it. Then click on one of

the chart's corners. The word 'Corners' should appear on the left side of the editing line, and black squares should appear around the chart. To rotate the chart, drag any one of the black squares with your mouse. If you hold down **<Ctrl>** while rotating the chart, the outlines of the data markers will remain visible as you rotate the chart. To reset the chart to its original perspective, choose **Format•3-D View•Default•OK**.



VIEW A 3-D CHART FROM VIRTUALLY ANY ANGLE in Excel by clicking and dragging on one of its corners.

20. Double-Click Chart Objects

If you want to reformat a chart object while editing a chart, just double-click the object to bring up the Patterns dialog box in Excel 4.0 and various Format dialog boxes (such as Format Axis, Format Data Series, and so on) in Excel 5.0. To format an individual series marker (as opposed to the series as a whole), double-click the marker while holding down **<Ctrl>** (Excel 4.0) or, after selecting the series, click once on the marker, then double-click it (Excel 5.0).

21. Objects in Charts

Tired of using the same old graphs over and over? What if instead of graphing your sales revenues with a plain line you could use a line of dollar signs? How about a stack of widgets on a bar chart to show this month's sales?

To pull off this neat little trick, switch to the document that contains the picture or object you want to use; you can also use your favorite draw program to create an object of your own. In either case, the object should be approximately as wide as the data marker it's replacing. Copy the object to the Clipboard; in most applications, this means selecting the object and then choosing **Edit•Copy**. Switch to your Excel chart, select the marker or series you're replacing, and choose **Edit•Paste**. Double-clicking the new data marker brings up the Patterns dialog box in Excel 4.0 or the Format Data Point or Format Series dialog box in Excel 5.0, all of which let you stretch or stack the object.

22. Combine the Best of Autoformats

Excel comes with Autoformats, prepackaged combinations of text, cell, and column formatting that can quickly and easily give worksheets a professional look. The only problem with Autoformats is that you can't customize them. You can, however, mix and match

their attributes. If, for example, you like the number formats of the Financial 1 format and the color scheme of the Classic 2, you can put them together in two easy steps.

After selecting the range to be formatted, choose **Format•Autoformat**, then the *Financial 1* format. Next choose **Format•Autoformat** again. This time select *Classic 2* and click the *Options* button. The dialog box will expand to reveal six check boxes. Deselect all but the Patterns check box and choose **OK**.

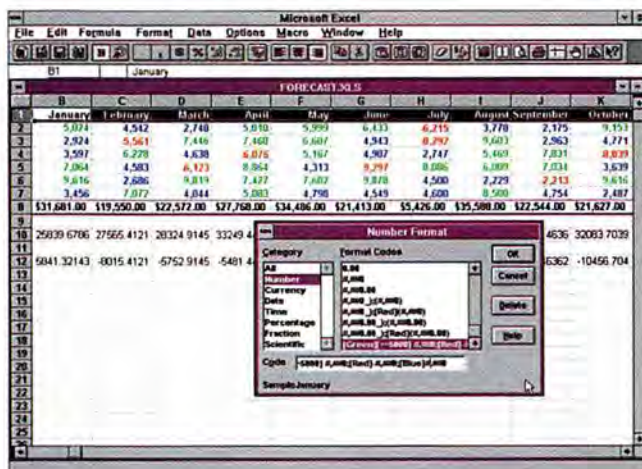
23. Use Wild Cards in Number Formats

Few users take full advantage of Excel's extensive number-formatting tools. For example, the asterisk tells Excel to repeat the next character as many times as it takes to fill the column width. Suppose you're creating a financial worksheet that shows negative numbers in parentheses, and you want the open parentheses to align on the left edge of every cell. Start by selecting **Format•Number** in Excel 4.0 or **Format•Cells•Number** in Excel 5.0. In the All or Number categories, select the format **#,##0.00_);(,###0.00)**. Click in the Code window to enter editing mode, and add an asterisk and a space after the open parentheses. To finish, press the **OK** button to apply the new format and add it to the list for future use.

24. Conditional Color Coding

Most Excel users know you can format cells to show negative values in red. Few know you can use color to make other ranges of values stand out.

For example, to make values greater than 5000 display in green, negative values in red, and all other values in blue, type **[>5000][Green] #,##0;[Red]-#,##0;[Blue] #,##0** in the format code box. The format code has three sections, divided by semicolons. The first section covers positive numbers, the second negatives, and the third any values that fall outside of the conditions in the first two. In the first two sections, you have the option of defining the range by putting a conditional operator (**<**, **>**, **=**, **<=**, **>=**, or **<>**) and then a value in square brackets. Next, to set the color for that condition, you specify the color in square brackets, choosing from black (the default), blue, cyan, green, magenta, red, yellow, or white, or using **[Color n]**, where **n** is a number from 1 to 16 in Excel 4.0 or from 0 to 56 in Excel 5.0. Finally, you specify the number format itself.



COLOR WORKSHEET VALUES CONDITIONALLY by defining a custom number format.

25. Creating a Worksheet Template

If you frequently use worksheets based on the same layout, such as expense reports, create them from a template. First, set up a worksheet with the formats and formulas you want to appear in the template. Next, choose **File•Save As**, then select **Template** from the Save File as Type drop-down list. Give your template a name (Excel will automatically give it the extension XLT) and save it in Excel's XLSTART directory. Next time you choose **File•New**, your template's name will appear as a choice in the New dialog box. If you want to use this template every time you start Excel or select **File•New**, call it **SHEET.XLT**.

26. Switching to Other Apps

Thanks to Excel 4.0's Switch add-in tool, you can add tool-bar icons that make switching to Microsoft Word, PowerPoint, or Project as easy as clicking your mouse. To add one or more of these icons, select **File•Open**, open Excel's Library directory (if you haven't installed the add-in library, go back to your original Excel disks and install it now), and choose the file *switch.xla*. A dialog box will open, displaying the Word tool and a list of Excel tool bars. Select a target tool bar and click **Add** (or **Skip** if you don't want to install this tool). The PowerPoint tool will appear next and then the Project tool; in each case, you have the option of adding the new tool or not. When you're done, click **OK**. Once you've added an icon to a tool bar, you can put it where you want by using **Options•Toolbar** to show the tool bar, selecting **Options•Toolbar** again, clicking **Customize**, and dragging the icon to a new location (just be sure you don't drag it off the tool bar unless you want to remove it).

Excel 5.0 comes with these application-switching tools built in. In Excel 5.0, you select **View•Toolbars**, then press **M** to scroll down the Toolbars list to 'Microsoft,' and click it or press **<Space>** to put a check in its box. Select **OK** and a floating tool bar appears, complete with icons for launching Word, PowerPoint, Access, FoxPro, Project, Schedule+, and Mail. As with any Excel 4.0 or 5.0 tool bar, you can shape its floating window and drag it to any location between the menu and status bars.

27. Editing Tool Bar Buttons

In Excel 4.0, if you wanted to change the icon on one of the tool bar buttons, you had to use a draw program to create an image, copy it to the clipboard, return to Excel, and paste the image onto a blank button. Excel 5.0 has made this procedure much easier. First, bring up the tool bar containing the button you want to edit. Click the tool bar with your right mouse button and choose **Customize**. Click the button you want to edit with the right mouse button and select **Edit•Button Image**. Using the bit-map editor, make changes to the button face, and then click **OK**.

28. Install a File-Naming System

Now that Excel 5.0 has added a Find File command, it's worth your while to develop a good keyword system to help you identify and keep track of your files. A few suggestions: Always include a keyword for the client, department, or project the file relates to. You might also want to assign a description of the type of worksheet—for example, Budget, Analysis, or Projection. If you apply a good keyword system consistently, you can virtually guarantee yourself protection against file amnesia.

1-2-3/WINDOWS

29. Online Resources

To contact Lotus directly, you can dial its bulletin board service at 617/693-7000 for all modems from 1200 bps to 14.4 kbps, and 617/693-7001 for 9600 bps and 14.4 kbps modems (set your modem to no parity, eight data bits, and one stop bit). You can also get in touch with the company via CompuServe.

30. New @Functions

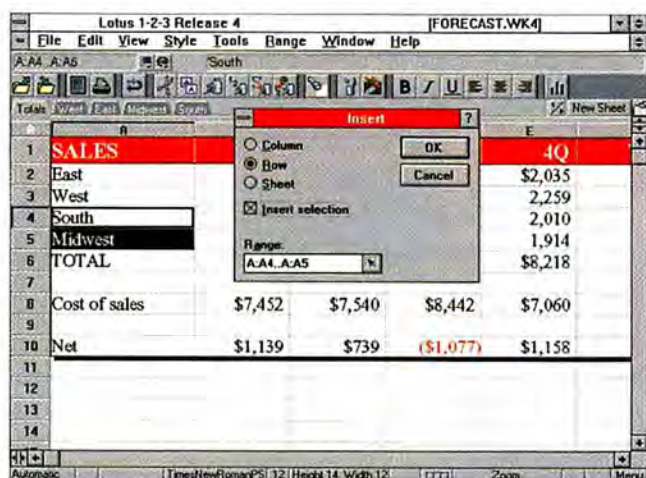
With release 4.0, Lotus has added some particularly handy new @functions for general business users. On its own, @SUBTOTAL performs the same function as @SUM, but it comes in handy when you use it in conjunction with @GRANDTOTAL, which adds up all the cells in a range with @SUBTOTAL in their formulas. @PUREAVG is identical to @AVG except that it ignores cells containing labels; @PURECOUNT, @PUREMIN, and @PUREMAX perform their calculations in the same intelligent manner.

31. Delete and Insert Locally

Have you ever used the **Delete•Rows** command to remove unneeded rows from a table, only to find out that you've also lost some very needed data from another part of the sheet? In release 4.0, you can guard against this by using the **Delete selection** option.

Let's say you've got two tables set up next to each other, and you want to delete cells A3..A4 from the first table without removing any of the other cells in rows 3 and 4. To do so, select range A3..A4, choose **Edit•Delete**, leave the Row radio button checked, but click the **Delete selection** check box. Then click **OK**.

You can also use this technique to *insert* locally. If, for example, you wanted to insert three blank cells between A3 and A4, you'd select a three-cell range starting with cell A4 and including the two cells below it. Then select **Edit•Insert**, select the **Row** button, click **Insert selection**, and click **OK**.

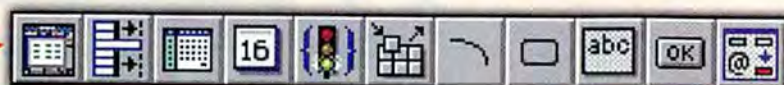


INSERT LOCALLY WITH 1-2-3'S Insert selection guide.

32. Wide-Open Ranges

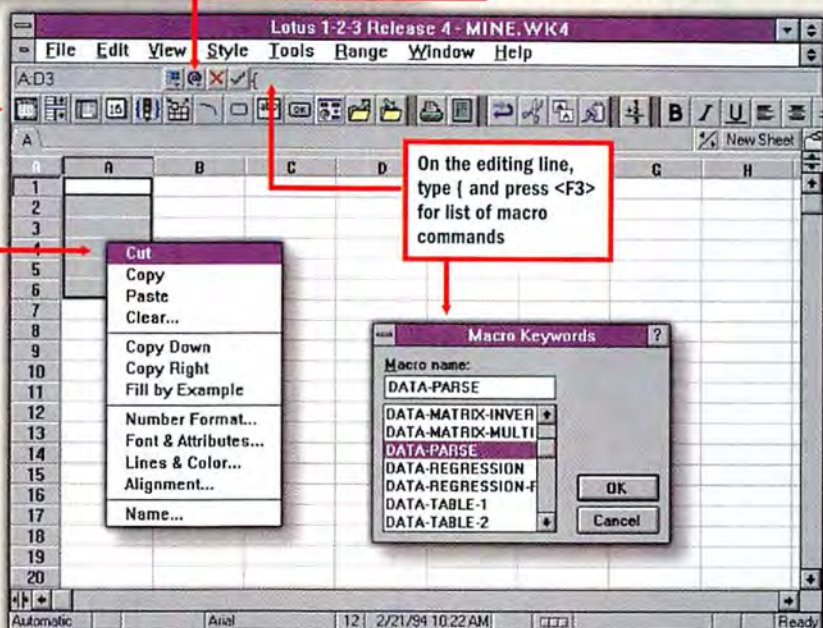
Suppose **File•Print Preview** shows you that your print range is one column too wide to fit on a single page. Release 4.0 can reduce a range just enough so its columns fit on a page. To start, click the **Page Setup** icon or **File•Page Setup**. Open the Size drop-down list

TOP NEW FEATURES: 1-2-3 RELEASE 4



- New SmartIcons, left to right**
- Hide parts of the 1-2-3 window
 - Size a column to fit widest entry
 - Select a template
 - Enter today's date
 - Run a macro
 - Customize SmartIcon sets
 - Draw an arc
 - Draw a rounded rectangle
 - Create a text block
 - Create a macro button
 - Audit cells

Right-click an object (here a selected range) to pop up a context-sensitive menu



Click the @ button for a customizable list of @ functions (more than 120 are new)

and select *Fit columns to page*. Then click *OK*. You can also choose to fit the rows to a page, fit the whole print job to a page, or apply a specific reduction or enlargement percentage.

33. Customize the @Function List

You can add the @functions you use most to the menu of functions that drops down when you click the edit line's @ icon. To do so, start by clicking the @functions selector, then click *List All*. In the resulting dialog box, click the *Menu* button to display the Current Menu list. Choose the function you want to add from the @functions list (you can narrow your search by selecting one of the function categories from the Category drop-down list), select the menu item you want your function to follow on the list, and click *Add*. To customize the list further, you can add separators to the drop-down list by clicking the *Separator* button. You can also remove functions from the list with the *Remove* button. When you're finished tailoring the drop-down list, click *OK*.

34. Make Your Own Set of SmartIcons

Just as you can customize your list of @functions, you can also customize your SmartIcons.

To do so, first select *Tools • SmartIcons* to open the SmartIcons dialog box. Click the down arrow in the top drop-down list and select the set containing the icons you use most. Click the *Save Set* button, and in the resulting dialog box, type a palette name in the Name of set box and a file name (without an extension) in the File name box. Click *OK*.

To populate your new palette, drag icons from the Available icons

list on the left to the list on the right. To remove an icon, drag it off the right-hand list. You can rearrange your set by dragging icons to new positions and create spaces between icons by dragging the Spacer tile from the Available icons list over the icon you want it to precede. When your new set is finished, click *OK*.

Remember: If you decide to reorder your SmartIcons later, you can do so by holding down **<Ctrl>** and dragging the icon to a new location.

35. Protect Charts From Changes

Charts in release 4.0 don't occupy a range of worksheet cells; instead, they "float" in front of the worksheet. If you insert, delete, or change the size of rows or columns underneath the chart, its size and aspect ratio may change.

To protect a chart from such changes, select the chart and then select *Edit • Arrange • Fasten to Cells*. Click *Top left cell only* and *OK*. Subsequently, your chart won't resize when you change the cells underneath it.

36. Glue Drawn Objects Together

To keep two or more text boxes or drawn objects aligned, it's a good idea to join them together.

Start by clicking the first object you want to join, and then select additional objects by clicking them while holding the **<Ctrl>** or **<Shift>** key. Finally, select *Edit • Arrange • Group* or use the Group icon to create one object from many.

Now that the items have been joined, you can move or resize them without disturbing their alignment.

MEET ELOQUE

TO KNOW 1-2-3 IS TO LOVE AMI PRO.

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Ami Pro and 1-2-3 are beyond compatible. They're actually con-

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Everyone knows Lotus® 1-2-3®, the most popular, most usable spreadsheet in the world. Now it's time you got to know Ami Pro®, the Windows™ word processor designed to complement 1-2-3.

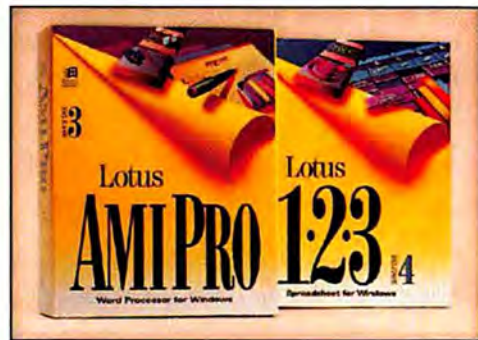
Those who know Ami Pro, know why it wins rave reviews from industry experts time after time. Like the fact that it's consistently rated easiest word processor to use.

THEY SHARE MORE THAN LOOKS

As impressive in words as 1-2-3 is in numbers, it also has special advantages for 1-2-3 users. Because it's the only word processor designed specifically to complement and enhance your spreadsheet. Ami Pro not only looks like 1-2-3, it

behaves identically – with shared menus, common user interface, spell check dictionary and SmartIcons.® So if you use 1-2-3, you already know how to use Ami Pro.

The integration between the two is so complete that incorporating your 1-2-3 data into an Ami Pro document is automatic and almost instantaneous.



*Call for a list of eligible word processors. Education-priced Lotus products not included. Offer valid in US only. Not to be combined with any other offer. Have your 1-2-3 version and Lotus Organizer is a trademark of Lotus Development Corporation.

1-2-3's NOT TWIN.



The unique Collect and Copy feature lets you quickly gather any number of charts or data ranges from any number of 1-2-3 files and arrange them within a single Ami Pro document, dynamically linked through OLE and DDE. You just click on the 1-2-3 Collect and Copy SmartIcon and Ami Pro instantly takes you into your spreadsheet and guides you through the process.

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1-2-3/DOS CLASSICS

We know that there are plenty of you out there who are perfectly happy (and productive) using 1-2-3 in one of its many non-GUI guises. We have not forgotten you. Sure, some of these tips may have been around for a while. But, like 1-2-3 itself, these golden oldies still pack plenty of punch.

52. Ride the Range

Need to resize a range? With the range highlighted, press the <Period> key. This will move the cell pointer from corner to corner. Once the cell pointer is in the appropriate corner, you can use the cursor keys to enlarge or shrink the range.

53. Go Home

You can use the mouse to move to the home cell (A1) from any point in a worksheet. Just click the little square at the intersection of the row numbers and column letters. This is the equivalent of pressing the <Home> key.

54. Copy Every Nth Cell

You have a column of numbers from A1 to A100, and you want to have a subtotal in column B of every ten cells in column A (B10 subtotals A1..A10, B20 subtotals A11..A20, and so forth). To copy a formula every ten cells, enter the first formula in cell B10 (which would be @SUM(A1..A10)), select /Copy, enter B10..B90 as the range to copy, enter B20 as the destination, and voilà—the formula in column B is copied every ten cells and adjusts relative to the cell addresses.

55. Incremental Fills

To fill a spreadsheet column with dates a week apart, start by selecting /Data • Fill. After highlighting the range to fill, enter the starting date as the start value. In release 3.x, you can enter the date as 4/1/94; in release 2.x you must use the format @DATE(94,04,01). After pressing <Enter>, type in a step of 7, press <Enter> again, and type in either an actual ending date or 99999 as the end value. You can, of course, use increments other than 7. Don't forget to format the range as dates.

56. Replace Zeros With Text

If you'd prefer to have zero values appear as 'None' or some other text, select /Worksheet • Global • Zero • Label, and enter the appropriate text. This won't be saved as a default setting, so you will have to reset it for every session.

57. Compress Multipage Reports

Set a print range in WYSIWYG by choosing :Print • Range • Set, highlighting the range, and pressing <Enter>. If the range doesn't fit on one page, click the mouse or press <Esc> to return to WYSIWYG Print Settings and choose Layout • Compression • Automatic • Quit. Preview it again, and you'll see that the range fits on a single page.

58. Edit Links With Search and Replace

If you want to change a worksheet link from one file to another, use search and replace.

For example, to change a range's references from DOGS.WK1 to CATS.WK1, choose /Range • Search, select the range, enter DOGS as the text to search for, and choose Both and then Replace. Enter CATS as the text to replace with and then choose All. When you press <Enter>, all of your links will be automatically updated.

59. Use <F3> to Display Lists

People often overlook the <F3> key. From any command that requests you to fill in a file name, pressing <F3> will bring up a full-screen list of files. <F3> also works with any command that can use range names. If, for example, you have several named print ranges, and you select /Print • Printer • Range, pressing <F3> will bring up a list of your print range names; pressing <F3> again will expand the list to full screen. The same technique works in copy, move, and many more commands.

60. Display the Current File's Name

Would you rather know the name of the file that you're working on than the date and time? Choose /Worksheet • Global • Default • Other • Clock • Filename. Instead of the date and time, the file name (assuming the worksheet has one) will be displayed in the lower left corner of the screen. At this point, you can make the new setting permanent by selecting Update • Quit. If you want this setting to be in effect for the current session only, select Quit.

QUATTRO PRO

37. Online Resources

Like Microsoft and Lotus, Borland maintains a bulletin board service for its users. The BBS number is 408/431-5096 (set your modem to no parity, eight data bits, and one stop bit). You can also contact Borland through the forums it maintains on CompuServe, GENie, and BIX.

38. Leave Out the @

When you're entering an @function in a formula, and the function isn't the first term in the formula, you can save a keystroke by omitting the @. For example, if you type A1*I2+sum(a2..a8), Quattro Pro will automatically insert the @ symbol in front of sum. It will also capitalize characters in references and functions, where and when it's appropriate.

39. Quick Function and Macro Lists

Remember the <F3> key. In Quattro Pro for Windows 1.0, <Alt>+<F3> brings up a list of all @functions; in 5.0, it brings up a list of @function categories. In both, <Shift>+<F3> calls up a list of macro command categories.

40. Save Layouts With Named Settings

Let's say you have a single notebook and it contains several reports. Let's also say each report requires its own print settings. Instead of revising the print settings each time you need to output a report, you can use Named Settings. This feature lets you save all the settings from the File • Print and File • Page Setup dialog boxes—page orientation, margins, headers and footers, and virtually everything else you might want to specify when printing.

To create a Named Setting, select File • Named Settings • Create, then type a name for your setting in the Create Printer Settings dia-

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TOP NEW FEATURES: QUATTRO PRO 5.0 FOR WINDOWS

Click the @ button while in editing mode for a list of function categories (more than 250 are new)

Click the Block Center button to center text above a multicolumn block

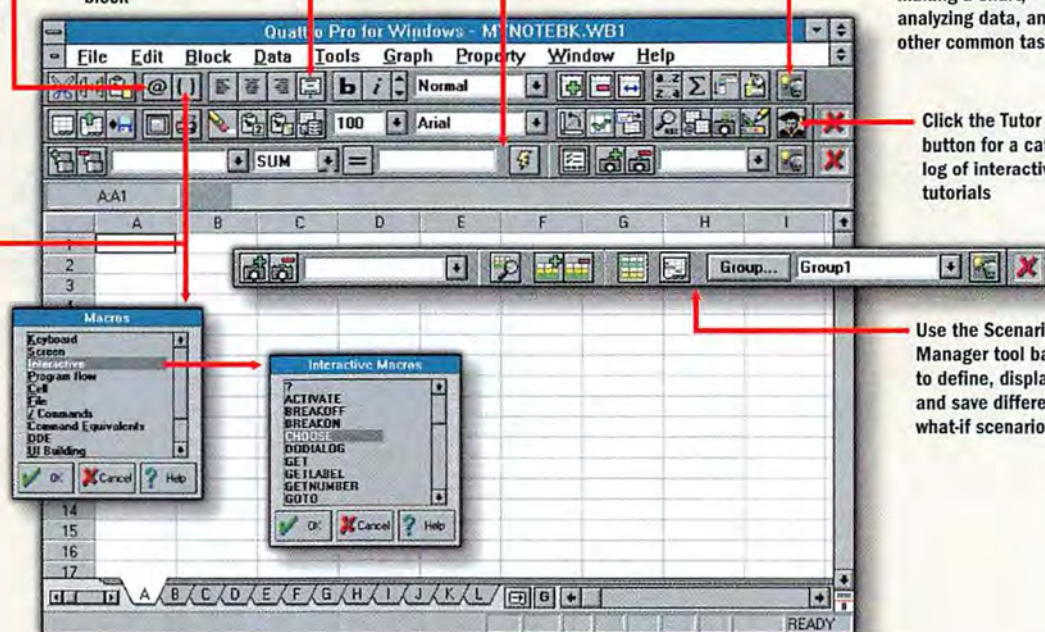
Use the Consolidator tool bar to consolidate blocks of data

Click the Expert button for step-by-step guidance to making a chart, analyzing data, and other common tasks

Click the Macros button while in editing mode for a list of macro command categories

Click the Tutor button for a catalog of interactive tutorials

Use the Scenario Manager tool bar to define, display, and save different what-if scenarios



log box. To apply a Named Setting, choose *File • Named Settings*, highlight the name of the setting you want to use, and click *OK*.

41. Use Wild Cards in Database Queries

Remember that you can use wild cards when searching a database in Quattro Pro. Let's say you're looking for all records with *Baltimore* in the City column. If you use *Baltimore* in your criteria table, entries such as *Baltimore MD* and *City of Baltimore* won't be found. The solution: Use the asterisk (*) wild card as the first and last character in the criteria table, as in **Balti**. Following the DOS conven-

tion, you can also use question marks to search for single characters; entering *415-??-???* in the criteria table would find all records with phone numbers in the 415 area code. Finally, the tilde (~) acts as a "not" operator, so entering *~415-??-???* as the criteria would find every number *outside* the 415 area code.

42. Moving Formulas Without Changing References

When you move a formula by cutting and pasting, its references adjust relative to its new position. For example, if you cut the formula *=A1* and paste it three cells lower, the formula will change to *=A4*.

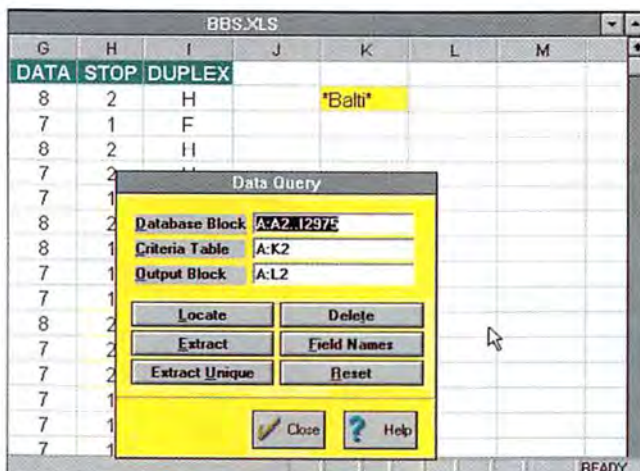
If you don't want the references to adjust after the move, just select the cell and drag it to a new location. (To drag a cell, put the mouse pointer anywhere on it, hold down the left mouse button, and, after the pointer changes to a hand, start dragging.)

If you want to *copy* a cell without changing its references, select the cell, enter Edit mode (press <F2> or click the input line), highlight the formula, and click the Copy button (or press <Ctrl>-C or <Ctrl>-<Insert>). Move to the destination cell, enter Edit mode again, and press the Paste button (or press <Ctrl>-V or <Shift>-<Insert>).

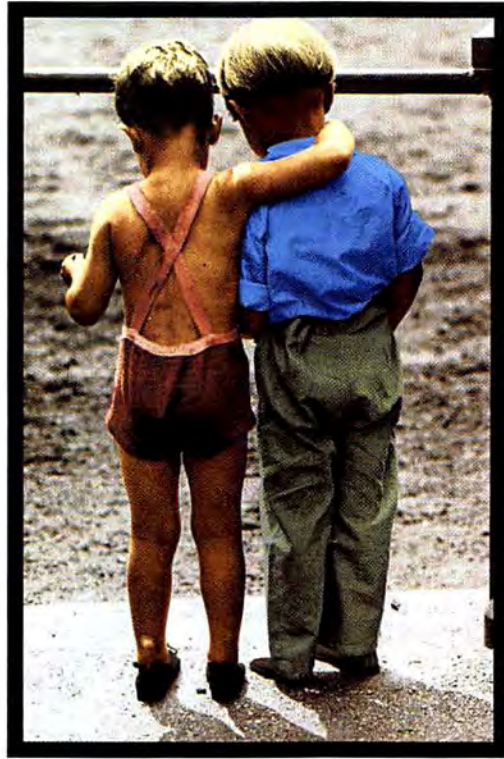
43. Change Right Mouse Click

Users of Quattro Pro 5.0 for Windows who liked QPW 1.0's use of the right mouse button to access the Property Inspection dialog box (and who don't mind losing the quick menus accessed by using the right mouse button in version 5.0) can get the old right-mouse-button behavior back. Just use a text editor to add the line *RightMouseInspect = 1* to the file QPW.INI.

continued on page 199



USE WILD CARDS IN QUATTRO PRO DATABASE QUERIES to find or exclude all entries containing a particular text string.



Remember how simple life used to be?

It still is.



At AT&T/NCR.

When you were young, your world was your own. And nobody was more important than *your best friend*.

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- Windows TurboCharger Video w/1MB Video RAM (upgradable to 2MB)
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\$3,405 or \$124/month

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- 16MB RAM at 70ns (expandable to 64MB)
- 256KB External Cache
- 3.5" Floppy Disk Drive
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- SVGA Server Video w/512KB Video RAM (upgradable to 2MB)
- 14" SVGA VESA Flicker-Free .39mm Monitor

\$3,600 or \$132/month

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- Intel486DX/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
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- 12MB RAM at 70ns (expandable to 64MB)
- 64KB External Cache (upgradable to 256KB)
- 3.5" Floppy Disk Drive
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- Diamond Viper Video (Weitek P9000) w/2MB Video RAM
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or \$73/month
(Mono)

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- 4MB RAM (upgradable to 20MB)
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- Front-Mounting Cableless Trackball
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or \$154/month
(Active Color)

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- 4MB RAM (upgradable to 12MB)
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- Local Bus Video w/Dual Video Display
- Trackball
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or \$103/month
(Mono)

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IMPROV

44. Speed File Access With Apply Styles

You can reduce the time it takes to open, save, and close files: Right-click on a cell, select *Settings*, and check the *Apply styles to all views* box in the InfoBox's View page. Because it will have less information to deal with on a detailed level, Improv's performance will improve.

45. Change Formatting With Views

You can apply different formats to a worksheet, without changing the original, by creating new views of it. To do so, uncheck *Apply styles to all views* in the InfoBox's View page. Because it will have less information to deal with on a detailed level, Improv's performance will improve.

46. Reopen Closed Windows

When you close a worksheet (or script, view, or presentation window) without closing the model, the sheet's icon goes gray in the model's Browser. If you want to reopen the sheet, just double-click on the grayed icon.

47. Just Browsing

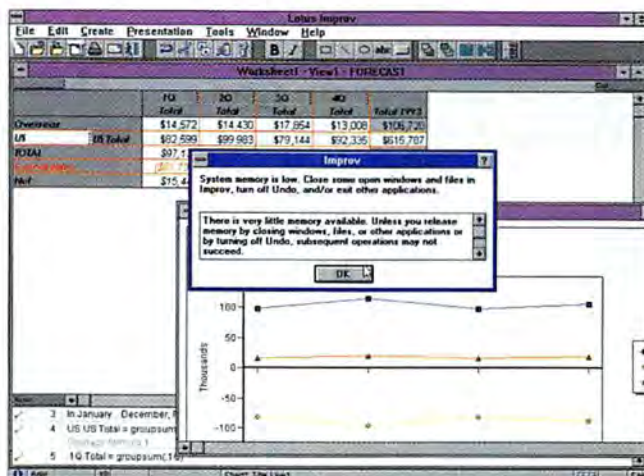
You can use the Browser tool for all kinds of worksheet management chores. It will let you name, copy, delete, or add notes about each worksheet, view, presentation, and script. You can also use the Browser to copy from one model to another. For example, to copy a worksheet from *SALES93.IMP* to *SALES94.IMP*, start by opening both models. Click *SALES94.IMP*, then choose *Browser* from the Window menu. Move back to *SALES93.IMP*, open its Browser, select the worksheet you want to copy, and choose *Edit • Copy* (or press **<Ctrl>+C**). Click the *SALES94.IMP* browser window, then choose *Edit • Paste* (or press **<Ctrl>+V**).

48. Make Formulas More Readable

Improv's English-like formulas are already easier to decipher than traditional spreadsheet formulas, and you can make them even more readable by inserting spaces between arguments and by controlling line breaks. You can also use line breaks to organize long,

Cost of sales	\$25,840	\$27,565	\$28,325	\$33,249	\$29,312	\$32,503
Net	\$5,841	\$3,107	\$6,493	\$6,671	\$5,174	\$7,504
Message	UH OH GOOD JOB! NOT BAD UH OH GOOD JOB!					
Row						
✓ 1	In Overseas .. Net, Total 1994 = @sum(January .. December)					
✓ 2	In January .. December, Net= TOTAL-Cost of sales					
✓ 3	In January .. December, TOTAL=US Total+Overseas					
✓ 4	US US Total= groupsum(US)					
	Overlaps formula !					
✓ 5	In February .. December, Message Col(THIS) =if(NetCol(THIS) > NetCol(PREV)*1.25,"GOOD JOB", if(NetCol(THIS) > NetCol(PREV),"NOT BAD", if(NetCol(THIS) > 9 * NetCol(PREV),"UH OH", "SO HOWS YOUR RESUME?"))					
6						

MAKE IMPROV FORMULAS EVEN MORE READABLE by adding spaces between arguments and controlling line breaks.



CONSERVE MEMORY IN IMPROV by turning off options in the **Tools • User Setup** dialog box.

complex formulas into discrete, easier-to-read sections. Improv will automatically wrap formulas that exceed the width of the screen, but you can change the wrap by inserting a return character at any point—press **<Ctrl>+Enter**.

49. Let Improv Write Your Formulas

When you're inserting a function into a formula, you can save time and keystrokes by having Improv automatically insert the function's first parameter. To do so, first select the cell, range, or item you want to use as the parameter. After moving to the formula pane, select the function from the pop-up function list. When the function appears in the formula pane, the selection will appear in the function's parentheses.

50. Be Selective About Your Style

Want to change the fonts, fills, or colors used on item names without changing those assigned to the cells in the worksheet? Use the **Edit • Select Item Names** command before selecting a new style.

51. Conserve Memory

Improv can be a real memory hog. If the program warns that you're low on memory, select **Tools • User Setup**. Turn off *Enable Edit Undo* and *Replicate styles when adding items* and, in the *Overlap Info* dropdown list, make sure you haven't selected *Audit*. Restart Improv and you should have a bit more free memory. If you're still getting low-system-memory warnings, even when **Help • About Improv** shows you have adequate memory resources, you can disable this warning by adding the line **NoTrashDetect=yes** to the [Improv] section of your **IMPROV.INI** file (found in the **WINDOWS** directory), then restarting Improv.

Dan Miller is an assistant editor for PC World. Shane Devenshire is a consultant from Walnut Creek, California. Contributors include Michael Munroe and Berl A. Pitt (via America Online), Barry Schnur (leader of Spreadsheet Special Interest Group and Phoenix PC Users Group), Ralph Soucie (author of Excel Power Techniques, Que Corporation), the editors of PC World and PC World Lotus Edition, and members of the staffs of Borland International, Lotus Development Corporation, and Microsoft Corporation.

Top 10 Windows Accelerators: Hercules Comes On Strong

Welcome to the first *PC World* graphics board update. These reports give you the latest information on price, performance, and features of Windows graphics accelerators. We've chosen 14 popular boards and tested them using our new graphics benchmark, the Windows Integrated Test Suite (WITS). This test uses Windows 3.1 applications—Microsoft Word for Windows, Microsoft Excel, CorelDraw, Aldus Photostyler, QuarkXPress, and Lotus Freelance Graphics—to re-create the graphical demands of common software tasks such as scrolling a page and drawing an image. What you get is a real-world measure that lets you compare board performance. To aid buyers, we also consider the estimated street price and important features—such as refresh rates and quality of documentation—to rate overall value. We then rank the ten best products, and will update the list quarterly as new boards break into the Top 10.

When it comes to graphics hardware performance, few things are as important as driver software. Drivers let the graphics board and the PC communicate and are critical to performance. Building a board is easy—the rocket science is in the drivers. For example, the Number Nine #9GXE board got a 10 percent speed boost when we

installed the latest drivers. In fact, the cheapest way to add punch to your hardware is to get new drivers from the board vendor.

For working in dazzling color, almost any board with 1MB of RAM supports 24-bit true color at 640 by 480 resolution. While this capability is nice for occasional work with 24-bit color, serious image editing requires true color at 1024 by 768 and 1280 by 1024. Of the boards with this capability, only the 3MB Number Nine #9GXE broke into the Top 10 in overall value. Two others, the 3MB Matrox MGA Impression and the 4MB STB Pegasus, are also excellent for true-color work, though their high price kept them off our chart.

Another consideration is the bus that the board plugs into. ISA, VL, and PCI buses differ in performance, especially in high color modes. The VL bus versions of the Hercules and Number Nine boards enjoyed a 15 percent speed advantage over their ISA counterparts. A VL board, if your system has slots for it, is preferable.

WITS was developed by John Peddie Associates, a consulting firm specializing in PC graphics technology. John Peddie and Fred Dunn are the principal officers of John Peddie Associates.

With graphics hardware performance, few things are as crucial as driver software.

TOP 10 ACCELERATORS

TOP 10

ACCELERATORS

		Overall value	street price	Estimated price	Windows Integrated Test Suite scores							Bus	RAM (MB/type)	Driver date	Chip	number	Reader service
					Word 6.0 for Windows	Excel 4.0	3.0	CorelDraw	1.1	Photoshpyr	3.1.1						
1	Hercules Dynamite VL Pro 510/623-6030	85	\$180	12.3	13.8	12.6	11.5	15.3	5.7	VL	2/D	9/14/93	ET4000/W32i	738			
2	Hercules Dynamite Pro 510/623-6030	83	\$180	12	12.1	12	10.7	14.9	5.3	ISA	2/D	9/14/93	ET4000/W32i	738			
3	miro miroCrystal8S 408/727-1558	77	\$195	10.7	11	9.2	11.1	13	3.1	VL	1/D	11/19/93	86C805	739			
4	Paradise Ports o' Call 714/932-5000	72	\$235	10.9	10.5	11.7	11.6	13.5	2.7	VL	1/D	5/11/93	90C33	741			
5	Diamond Viper VLB 408/736-2000	70	\$389	12.4	15.8	12.1	11.4	13.7	5.6	VL	2/V	9/17/93	P9000	740			
6	ATI Graphics Ultra Pro 905/882-2600	68	\$330	12.3	13.1	10.9	11.4	12.8	4.5	VL	2/V	11/4/93	68800	743			
7	Number Nine #9GXE (VL) 617/674-0009	67	\$465	11.7	12.3	9.1	10.4	13.7	4.1	VL	3/V	10/18/93	86C928	746			
8	Number Nine #9GXE 617/674-0009	67	\$465	11.4	12.1	8.4	9.6	12.8	4	ISA	3/V	10/18/93	86C928	746			
9	Diamond Stealth 24 VLB 408/736-2000	66	\$175	11.7	9.8	10.7	11.1	13.9	3.1	VL	1/D	10/6/93	86C805	740			
10	STB Horizon ISA 214/234-8750	55	\$119	10.6	6.8	9	11.2	12.3	2.5	ISA	1/D	10/20/93	GD5426	745			

Methodology Boards were tested on a 486DX2-66 system with 8MB of RAM and 256K of secondary cache. Application scores are the factor by which a board exceeds our baseline system, an unaccelerated ET4000-based VGA adapter on a 386DX-25 with

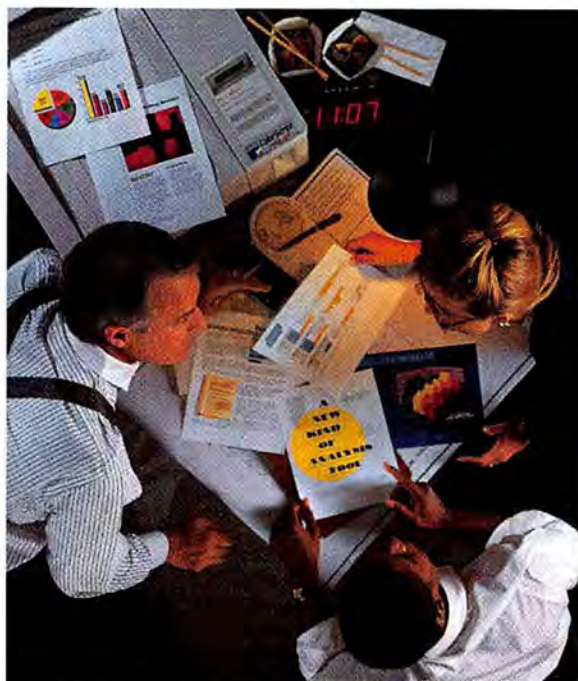
8MB of RAM. The overall value score combines ratings of overall performance, estimated street price, and product features. For all scores, higher is better.

For more information about all products in this table, circle reader service no. 903.

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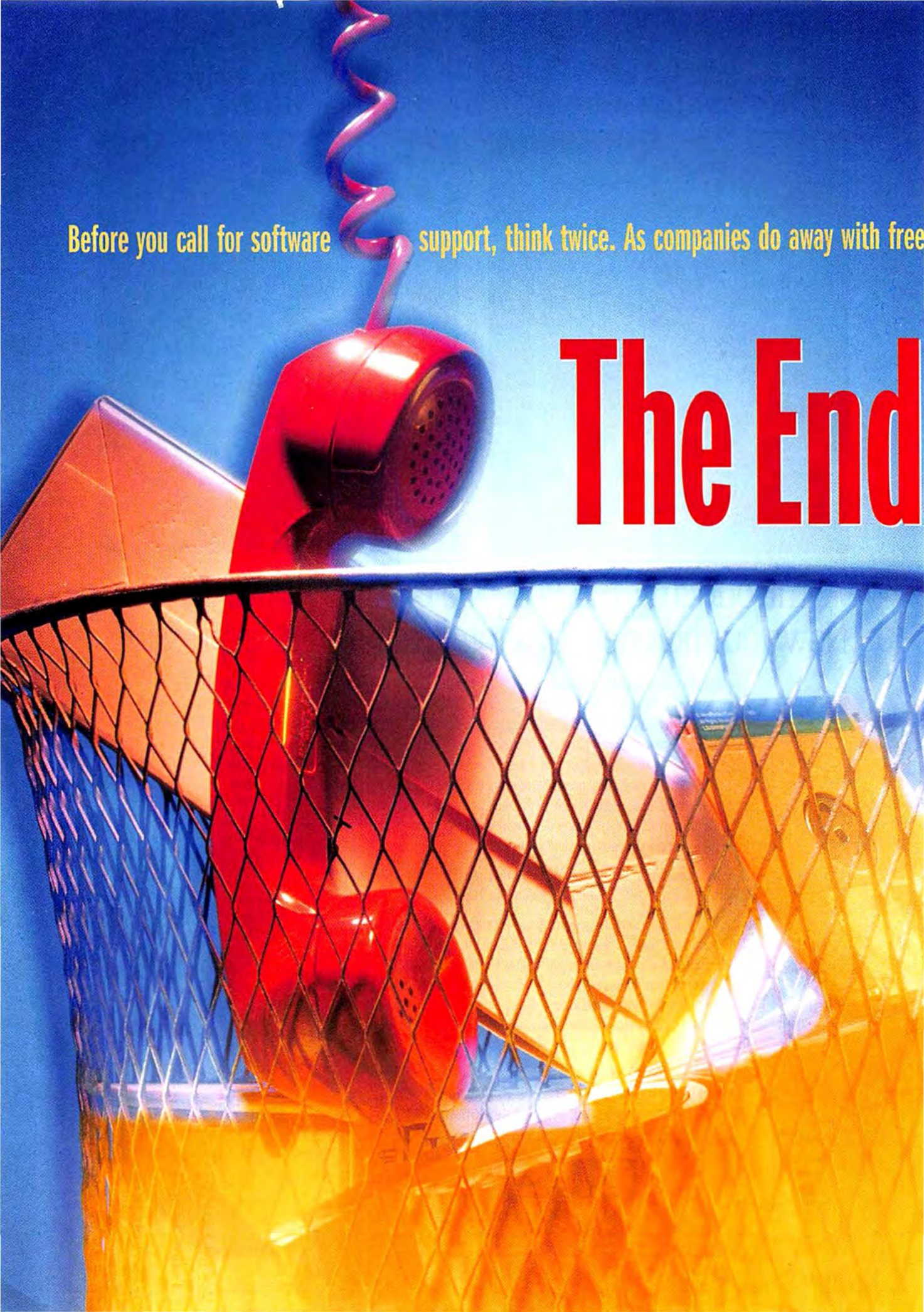
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in major cities in the U.S.

Before you call for software support, think twice. As companies do away with free

The End



support, you'll pick up the tab. How much will it cost you, and who should you pay?

of Free Support

A revolution is currently under way in the software industry. And even if you don't care about world politics or the latest comings and goings of the software giants, you will care about this because it's going to hit you right where it counts: in the bank account.

One by one, software companies are doing away with free phone support; they're limiting your calls, instituting 900 lines so you will have to pay by the minute, and setting up a host of corporate plans that don't come cheap. They're charging for a lot of the services that used to be included in the price of software. And that's a trend that could change the way you think about buying—and using—software.

Not long ago, technical support was a given. It came

By Jeff Angus

ROBERT CARDIN

with the software and was available as often as you needed it, for as long as you used the product. Support was what separated software from many other consumer purchases; it was also one of the reasons why software was so expensive. But the Siamese twins have been separated: Software and the support you get for it are no longer one entity. This means you have to think about two purchases instead of one when you buy software.

What's Going On?

Microsoft opened the floodgates on fee-based technical support last September when it revamped its offerings and instituted several pay-for-support plans. Archrivals Borland International and Lotus Development, along with a host of other software companies, quickly followed suit. Lotus expanded its fee-based options, and Borland moved to a mostly fee-based support program (the exceptions being installation questions and questions answered by automated response systems). Despite some initial resistance, even

WordPerfect—which was militant about free support—joined the ranks by limiting free support to 180 days for business applications and by offering a fee-based corporate support plan. And Central Point, a company whose success was based on ultraresponsive free support, has fallen into line with a mix of free and fee-based services. The list seems to grow daily as more and more companies implement fee-based support plans.

According to Jeff Tarter, editor of *Soft-letter*, a monthly newsletter covering the software industry, Microsoft paved the way for other companies to charge for support; it took Microsoft's dominance to remove the risk from such a drastic change. And Tarter believes it's right for companies to follow Microsoft's lead. "Vendors are making the right decision in adding premium services, as long as they see it as an addition to, not as a substitute for, free service," he says.

And if you take a look at Microsoft's plan, that's just what the Redmond, Washington, behemoth is doing. For the company's most widely used products—DOS, Windows, and Windows for

PC Companies, Third-Party Support Firms Compete for Your Dime

The new pay-for-support plans claim to offer something for everyone—from the novice who just needs the answer to a setup question to the department guru who's always stretching an application to its limits. In general, you should have to pay only for as much service as you need, without spending more than the cost of the application itself. But what happens if you've bucked the trend toward suite buying and use applications from a variety of different companies? Must you shell out money to each company for a separate support plan and wade through a stack of phone numbers and support policies before you can pick up the phone?

Maybe not. The new support plans announced by software developers are making headlines, but they aren't your only option. A handful of PC companies and third-party support firms are selling one-stop service—a single source to answer all your software questions. And there are some compelling reasons—not the least of which is cost—to take a look at the rest of the marketplace.

A Small but Growing Group

Right now only two PC companies—Dell and IBM—are selling technical support plans for a range of software applications. The plans average about \$150 per year and cover most major business applications, plus leading utilities and consumer software packages such as Intuit's Quicken. Many users may find it an appealing concept—after all, who better than

the PC maker to identify hardware-software conflicts? The lure of getting an answer to any question in one call is attractive indeed.

"Customers get a lot of convenience by calling one place for both software and hardware support," says Bob Johnson of Dataquest. "But they should realize that the hardware vendor's main area of focus is still its hardware." He doesn't dismiss PC makers as a viable choice, though, noting that they have a good reason to offer solid software support: If they make a bad impression with their software support, it will sour your opinion of their hardware.

Like PC makers, third-party support firms—companies such as Corporate Software of Canton, Massachusetts, and Software Support of Heathrow, Florida—are tied to a single application and so claim to be better equipped to answer questions on a diverse range of products. Corporate Software's services are geared toward businesses looking to buy annual support packages. Software Support has both corporate and individual plans (the individual plan is \$199.95 a year; corporate plans vary).

The strength of either of these options is independence. Third-party providers and PC

makers don't have a vested interest in any single application. And, since they are committed to supporting a variety of different products, they'll be able to tackle the tough questions on integration and interoperability. Where critics say these groups fall down, though, is in their inability to provide the

depth of knowledge about an application that you can get from the software developer—and in being on top of all the latest changes, whether they're newly identified bugs or recently released maintenance upgrades.

If you ask support professionals in software companies (not an unbiased group, to be sure), they'll probably tell you PC companies and third-party providers are a couple years away from being able to provide viable support. But Dataquest's Johnson disagrees. "That's complete crap," he says. "On the average, [third-party providers] are doing a better job than the vendors, and providers like Corporate Software have been doing it for years."

Johnson believes that third-party providers shine when it comes to problems that go beyond a description of basic features and functions and slip into advanced use or multi-program problems—the precise area in which



Workgroups—customers are entitled to free support, but only for 90 days from the first call. Electronic assistance—fax, automated voice response systems, and online forums—is free forever. (Microsoft, like many other software companies, is encouraging the use of “alternative” support options, hoping to take the load off the phones for all but the most pressing calls.) For desktop applications such as Word, Excel, Microsoft Office, and Access, among others, the standard you-pay-for-the-call-but-nothing-else-as-long-as-you-own-the-product approach still operates.

Why all the hype about service plans? Because software companies will be encouraging you to buy them. The bait? The promise of better service. You'll call on an 800 line and even get VIP treatment: Your calls will be moved to the front of the queue and answered by someone familiar with your computer's configuration, most commonly used applications, and a history of your problems.

“Diverse service offerings are a way to make the customer feel secure in a purchase decision. We're not trying to sell more services,

we're trying to sell more product by providing more security,” explains Paul Stanton, Microsoft's marketing manager for product support services.

Revolution or Evolution?

The recent flurry of announcements from the industry giants may seem like a sudden switch, but the movement away from free support has been happening for some time. A number of factors in the software industry have led to the slow but steady introduction of pay-for-support plans.

Software companies are responding to the same forces, all of which are making them rethink the cost of providing technical support, says Colleen Byrum, a consultant at Customer Service Consulting of Bainbridge Island, Washington, who helps vendors design, implement, and repair their technical support functions. The culprits are: shrinking margins due to dramatic price cuts, increased call volume, and the recent arrival of telephone and computer technologies that make fee-based plans more feasible.

But Tomec Smith, chair of InfoCenter Market Research and publisher of its newsletter, *PC Pulse*, sees things differently. “I think the person that really started it was Philippe Kahn [CEO of Borland International] when he yanked the floor out of software pricing,” Smith is referring to Borland's introduction of the now-famous “competitive upgrade program,” which the company launched to lure 1-2-3 and Excel users to its Quattro Pro spreadsheet. Everyone responded to the Borland move by dropping their own prices and later by offering their software in bargain-priced suites. As a result, you can now buy Microsoft Office, say, for less than what you used to pay for a word processor and a spreadsheet. (In 1990 Word for Windows 1.0 cost \$495; nowadays you can buy Microsoft Office for \$750, and that includes Microsoft Mail, Word, Excel, and PowerPoint.) “I think the whole movement toward pay to play for technical support is a response to competitive pricing,” adds Smith.

A case in point: When Central Point Software sells upgrades to its massive PC Tools utilities package for around \$50, “a couple of support calls can wipe out all the margin,” says Teresa Warsop, Central Point's U.S. customer operations manager. Yet the competitiveness of the utilities market makes it impossible for the company to charge any more for its product.

At the same time that margins have been slashed, companies have seen a dramatic increase in the number of calls coming in to their technical support depart-

many users claim that software companies run into trouble.

Joe Jacoboni, president and CEO of Software Support, adds, “Our people go through the same training as the software vendor's support staff. I'd stack my best customer support representative against any support representative at the publisher.”

Not What It Seems

You may find that the choice between hardware company, third-party supplier, and software developer isn't really yours in the end, anyway. Third-party support providers often play a hidden role in the support offered by both software and hardware companies. For example, if you write a check to Dell for an annual software support plan, the services are actually being provided by Software Support (which also handles some support for Borland, Dell, Corel, Software Publishing Corporation, Media Vision, XTree, Strategic Mapping, and others). Many analysts think that more hardware and software companies will go this route in the near future. Similarly, if you pick up a support contract from the store where you bought your new computer or software package, you'll find a third-party supplier on the other end of that phone number, too.

Jacoboni believes specialization is the wave of the future in the software industry. The software publishers will specialize in writing and marketing code, he says, and will want to commit fewer resources to providing support. “As

more third-party support suppliers spring up,” Jacoboni adds, “publishers will let go of more and more support.”

If you opt to use the hardware vendor for all your support needs, you may not get some of the advantages you imagine. Sure, you have to pay only one bill, but if the hardware vendor outsources, you still won't be calling one number for all your hardware and software questions. Though the hardware manufacturer may share information with the software provider, you aren't talking to the people who made your machine.

What should you do? Ask a lot of questions. Don't assume that your PC maker provides a one-stop call. Call the PC maker or third-party provider before you sign on and ask detailed questions about its service (hours of operation, number of packages supported, staff training, the number of staff people answering the phones, and so on). Then test the services. Most service providers will allow a demo call or two. What happens when support is stumped by a question? Are you left to fend for yourself, or does it contact the relevant companies and work with you until the problem is resolved? Ask a few questions to which you already know the answers, to test support's understanding of a package. Then ask a few questions that have stumped you and see if you understand the answer.

Remember—it's your dime. Make every minute count.

—Christina Wood and Jeff Angus

ments. "Buyers have shifted their training and support needs onto the backs of the [software] sellers," writes Gary Lewis in the September issue of *PC Pulse*, noting that PC training is one of the first items to go when finances get tight. So not only are managers installing the latest, most complex software, they are giving their employees less training and internal tech support. With nowhere else to go, employees turn to the software company. The result, say software executives, is that corporate customers have been pressing for better support and expanded programs. And these kinds of services are expensive. The idea behind charging for support is that

the people who want better, faster service will be willing to pay for it, and those who don't need it won't have to spend the money.

Vendors are also looking to discourage calls from software pirates, calls from people who rely on tech support rather than turn to the manual or online help, and calls about other publishers' products. These calls clog up phone lines, slow the software publisher's response time, and eat into a publisher's revenue. Vendors hope that charging for the phone call will discourage these gratuitous calls and allow them to focus primarily on what they consider the more legitimate inquiries.

Service and Support at a Glance¹

Company	GENERAL INFORMATION					OPTIONS				ALTERNATIVE SERVICES	
	Length of free support	Hours supported	Number of products	Average time on hold	Who answers the phone	Annual plan (cost for individual user)	Cost of pre-paid pack of questions	900 line	800 line	Faxback	Online services
SOFTWARE DEVELOPERS											
Borland International 800/523-7070	Unlimited ²	6 a.m. to 5 p.m., M-F (PST)	All Borland products	Info not available	Depends on service	\$129 for all applications or all languages	n/a	●	●	●	CompuServe, BIX, GENie
Computer Associates 800/225-5224	90 days through toll number	7 a.m. to 7 p.m. (EST) ³	All CA products	5.2 minutes	Human	Price depends on product	n/a	○	For annual plan buyers	○	CompuServe
Lotus 800/553-4270	90 days ⁴	Around the clock ⁵	All Lotus products	13 minutes Windows, 10 minutes DOS	Automated	\$129	n/a	●	● ⁶	●	BBS, CompuServe
Microsoft 800/936-3500	Unlimited for desktop applications ⁷	6 a.m. to 6 p.m. M-F (PST)	All Microsoft products	90 percent of calls within 1 minute ⁸	Automated	\$195 ⁹	\$750 for 10-pack ¹⁰	●	●	●	BBS, CompuServe, Internet
WordPerfect 800/451-5151	180 days from first call for business apps ¹¹	7 a.m. to 6 p.m. M-F	All WordPerfect products	1 minute	Human	n/a	n/a	○	●	●	BBS, CompuServe, WordPerfect, Spaceworks
HARDWARE VENDORS											
Dell 800/568-4335	Unlimited for DOS and Windows ¹²	Around the clock	150	1.5 minutes	Automated	\$139	n/a	○	For duration of support	●	BBS
IBM Personal Software Solution Center ¹³ 800/992-4777	According to software warranty	Around the clock	150+	n/a ¹⁴	Human	n/a	n/a	○	●	●	CompuServe
IBM/PS/1 Voice Connection 919/543-9708	First call free	12 p.m. to 9 p.m. M-F	10	n/a ¹⁴	Automated	\$159.95	n/a	○	●	●	BBS, Prodigy, America Online
THIRD PARTY ¹⁵											
Software Support 800/873-4357	n/a	Around the clock	125+	1.5 minutes	Automated	\$199.95	100 calls \$2250; 500 calls \$9375	●	●	●	BBS

¹ Table based on service plans for individual callers.

² For installation and configuration questions.

³ For most products.

⁴ Ami Pro support beyond 90 days.

⁵ For 1-2-3. All others 8:30 a.m. to 8 p.m. M-F.

⁶ Except for Ami Pro.

⁷ 90 days for operating systems and development tools.

⁸ Company goal; response time not guaranteed.

⁹ For desktop applications; prices vary for other products.

¹⁰ For desktop applications, operating systems, and development tools.

¹¹ 90 days for work-group applications.

¹² DOS and Windows supported by Dell; applications supported by Software Support.

¹³ For ThinkPad, PS/2, and ValuePoint.

¹⁴ Company refused to supply information.

¹⁵ There are other third-party support providers (see sidebar), though they don't offer individual plans.

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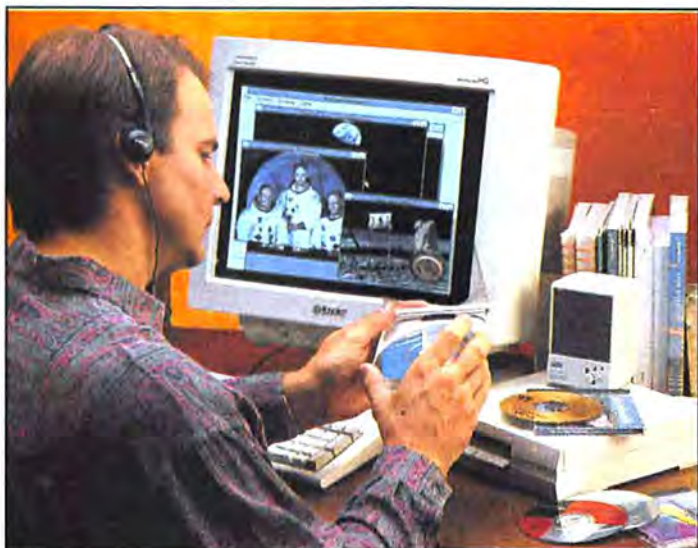
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A Rational Reaction

InfoCenter's Smith says charging for support is a rational reaction to the current economic situation: "But it's one that the users don't want at all. They want support from the publisher, but they don't want to pay for it." He likens fee-based technical support to the price wars in the airline industry. Customers want lower prices, so vendors cut services. "But users don't believe software companies can't afford to pay for support."

Smith thinks many customers will refuse to buy software from companies that charge for support. If they have no choice but to pay, he believes, customers will choose the option of paying by the minute. That means they will be thinking about every minute of every call, and their expectations for the kind of support they get on the phone will likely go up.

Bob Johnson, associate director for software services research at Dataquest, a market research firm in Framingham, Massachusetts, thinks that it's about time the vendors charged for support. "As vendors continue to wake up to customer support needs for integrated, complex, or mission-critical applications, they realize the high expense it brings." Still, he worries that the quality of the *free* support may drop as a result. If that happens, customers will feel that they are being manipulated into buying support services—even though they were told that some basic services would be provided free of charge.

"I'd never pay the manufacturer to support our software," says an office manager who coordinates PC use at a dentists' practice in Tacoma. "It gives them a market incentive to produce poor documentation and buggy programs." She would prefer to pay a third-party provider who can learn about her company's individual needs and whose business is more similar in size to her own (see "PC Companies, Third-Party Support Firms Compete for Your Dime").

What to Expect

At first glance, the new service-and-support offerings are mighty confusing. The number of alternatives available is beyond counting. There is, however, a basic theme: Free support is limited to a finite period beginning with your first support call. After that, you get a

menu of fee-based options. You can choose from a blanket service contract offering unlimited support for a year, a pay-per-use plan, a pay-by-the-minute plan, or a special premium call-in service.

Those are the basics of a plan instituted by Seattle-based Aldus, which pioneered such options in 1989. On the menu of its cafeteria plan: 90 days of free service for regular support calls, and fee-based services after that. "More than anything else, charging for some services meant we *had* to deliver quality service to our customers," says John Archdeacon, Aldus's director of technical services.

Many companies believe that implementing a fee-based program will cut down on calls, but Aldus didn't see a noticeable change. Does this mean the new model for service and support is flawed? If call volume doesn't decrease, will we be paying for the same level of service we used to get free?



More than anything else, charging for some services meant we had to deliver quality service to our customers. —John Archdeacon

Those That Don't

Not all software vendors are following the big guys' lead. Claris, a leader in Macintosh software and a newcomer to the Windows environment, is a partial nonconformist. The company has multitiered fee offerings beyond the free ones, but it has more visibly unbundled the service from the software. "Our support products come in a shrink-wrapped package just like any other product," says Sid Saleh, a support programs manager at Claris. "That package is a reference resource and a key part of the offering."

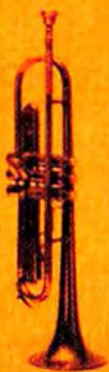
The package consists of a binder with important phone numbers, a tab for the newsletters you get a subscription to, and room for disks. The newsletter contains answers to common questions, tips and tricks from experts, detailed how-to articles, and coupons for additional training materials.

Traveling Software, the maker of LapLink, didn't get with the program at all. The company is sticking to its old model of free support. "That's our chance to deal with the customer and make them glad they bought from us," says Mark Eppley, chair of Traveling Software. Eppley believes that companies charging for basic support have often designed their products badly and are trying to recover the costs of technical support that poor program design causes.

Other publishers, including Farallon Computing, a network software company, and Intel's Personal Computer Enhancement Division, are committed to not charging for support either. Dataquest's Johnson feels that some companies will try to use free support to gain a competitive edge and differentiate their products, but he doesn't think that situation will last. He believes that "as support costs get in the way of acceptable timeliness and accuracy," these vendors will lose customers.

The Short Term

Will the fee-based plans succeed? Based on extensive customer surveys and focus groups, Microsoft, Aldus, and others believe they will. In fact, consultant Byrum says customer satisfaction ratings have been higher than average for some companies that rely heavily on 900 lines for all technical support. The implication: Customers



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will happily pay for support if it means they'll get better service.

But InfoCenter's Smith says users don't want to pay for support—regardless of the level of service they'll receive. He backs up his claim by quoting a recent survey his group conducted: "Only about 25 percent of users use technical support, and our research says those people don't want to pay." Forty percent of the 1121 home users InfoCenter surveyed said that if they were forced to pay for support, they wouldn't purchase services from the publisher. Smith thinks that home users will consider support when they buy the software and will avoid companies that charge for support, or they'll look for software that won't require extra assistance. So, while corporate customers may be willing to pay for support, home users will probably just go without or rely on whatever limited free support they can get.

Who Ya Gonna Call?

So should you stick with your software developers—even if it feels like they're sticking it to you—or should you look elsewhere for the answers to your technical questions? And what about training—can it help you reduce your reliance on outside sources of support?

If your business can afford the up-front costs, "the best way for the consumer to control cost is internal training," says David Tremblay, research director at the Software Publishers Association. "A PC requires as much skill as a power lathe," he adds, "but companies that would never think of letting an inexperienced person operate a lathe don't apply the same standard to the PC."

Tarter of *Soft-letter* believes training makes sense in straightforward installations (for example, 25 word processors in a typing pool who are all using the same product). "But if you're talking about an engineering department where they use a scad of different programs intermittently, training isn't the solution," he concludes. A staff that uses a variety of applications will probably need some on-call help, either internal or external.

Kay Kendall is head of the Instructional Media Department at Oregon Health Sciences University in Portland. Her department supports 7700 computer users who work on three platforms and use 15 major applications, and she does it all with the equivalent of five full-time staff members. The support department gets high marks from its users because Kendall takes an unusual approach to support, offering intensive personalized training and careful matching

of programs with the personality and aptitudes of the individual.

"Before you give someone a program to work with, you have to understand that person and how they work and think," says Kendall. "You tell them, 'Having introduced this tool into your work life will change the way you work.'"

But not everyone has the budget to invest in extensive training programs, and there's no guarantee that training will eliminate the need for support down the line. If your company is small, you could make the commitment to get up to speed on the program during the initial free support period: You can designate one person as the in-house expert who makes it a priority to learn everything he or she can while that call to the developer is free. Or, if you're technically proficient, make the decision to go bare: Skip the support option altogether and support yourself.

Either way, you can always charge a call to your credit card if you get into trouble.

If you think you need support, who should you pay to answer your technical questions?

If most of your applications are from a single developer (Lotus, Microsoft, Borland, and WordPerfect are all pushing their suites), then it clearly makes sense to opt for a plan from that company. But what if you use products from a range of developers? Must you shell out money to each of them for support?

Not necessarily. A handful of companies offer third-party support on a range of popular software packages. For an annual fee, you go to one company for answers to all your software questions. Similar services are also available from some PC makers.

No Change Is Final: The Next Cataclysm

In the next couple of years we'll likely see the options get sorted out; more changes will inevitably follow those of the last few months as users, software companies, and third-party providers adjust to the New World Order.

Kendall believes that managers will gradually reduce the need for support by using software that fits the humans who use it, noting that costly support plans will push users to buy software that's easier to learn and use. And that pressure by the consumer will force publishers to create software that doesn't require extensive support or that has support built directly into the program.

Clariss's Saleh agrees. "As support systems settle down to an even level, service quality will become pretty uniform across the industry, so this whole debate is about a temporary Band-Aid on the real problem: program design." He believes support will become uniform but the software won't. Customers faced with having to pay for support will take a closer look at the products they buy and choose those that don't need support. "In a few years the support issue will go away."

Some software companies may go away, too.

Jeff Angus is a Seattle-based freelance writer. Christina Wood is an assistant editor for PC World.



Companies that primarily use paid 900 phone service get higher customer satisfaction scores than average. —Colleen Byrum

HELP LINE Q & A

Tip of the Month

A SAFE MOV AGAINST PHONE LINE POWER SURGES: Most people plug their PC into a power strip that has a surge protector and think they're adequately protected against power surges. But what about the phone line that runs from your modem or fax-modem? Like a power cable, it too can be the path for a surge.

You can save tens or even hundreds of dollars when protecting your modems—or answering machines, fax machines, and telephones—if you buy a Metal Oxide Varistor (MOV) and install it yourself. MOVs are quarter-size devices that absorb voltage surges and cost about \$2 at your local Radio Shack (part number 276-568). They're exactly the same as the devices found in surge suppressors costing \$20 or more. Install one MOV across each phone line at the box where the line enters your building (called the subscriber network interface, or SNI). You'll have protection equal to—or better than—what you get from an expensive prepackaged gizmo. If you're uncomfortable with the idea of installing surge protection on your own phone lines, you can still protect the devices connected to them by buying a power strip with phone jacks and surge protection for both the power lines and phone lines.

Brett Glass, Contributing Editor



More Megahertz for Nothing?

Q I own a 25-MHz 486 PC. I recently stumbled over a description in the user manual of the speed-select jumper. This jumper allows me to switch the entire system's clock rate to 33 MHz. So, of course, I immediately opened the case and set the jumper for 33 MHz. PC Tools now reports that I have a 486-33, and my own stopwatch test shows that things are running faster.

My question is, have I found one of the secrets of the universe, or am I going to see smoke coming from my CPU someday?

Bruce D. Cramer, Mannheim, Germany

A You're a gambling man, Bruce. You probably won't see smoke coming from your computer, but running your CPU at a clock speed higher than it's rated for could burn it out. There's no difference in design between 25-MHz and 33-MHz chips—the difference is in the testing. After a batch of chips is made, Intel tests them to see if they run reliably—25-MHz chips are tested at 25 MHz; 33-MHz chips are tested at 33 MHz. In any case, you should install a

heat sink on the chip to keep it running as cool as possible, and make sure you apply the proper heat-conductive silicone grease between the chip and the heat sink. And when it destroys itself or your motherboard, just remember that you're the one who placed the bet.

A New Zipper

Q I downloaded a file called DT-BOOK.ZIP from PC World Online. When I tried to unzip it, I got the message 'Warning—I don't know how to handle this file'. Only one file in the archive was unzipped. What's wrong?

Wayne Patenaude,
Laval, Quebec, Canada

A That message appears when you try to use an older version of PKUNZIP.EXE to unzip a file that was created with a newer version of PKZIP.EXE. PKZip 2.04G, the most recent version, is the de facto standard for file compression on BBS's and online services. If you don't have it, you will not be able to decompress most of the files you find online—whether they're on CompuServe, America Online, or any other ser-

vice. You can download PKZip 2.04G from PC World Online's library (see page 12 for more information).

Seeing the Little Picture

Q I need to send many graphics files to my associates via modem. I usually send them through CompuServe Mail or as attachments to an MCI Mail message. While I always compress graphics files with PKZip, I'd like the files to be small to begin with. Which graphics format (for example, TIFF, PCX, or GIF) is likely to be the smallest?

Rod Ream, Alhambra, California

A If you want the image to arrive exactly as it was before you compressed it, and your goal is to minimize the number of bytes you transfer (which will save on connect time charges), starting with the smallest graphics file may be counterproductive. PKZip actually works best when the original file is large and redundant. Therefore, your best strategy is to start with a PCX or BMP file, which uses little or no compression, respectively, and run it through PKZip.

If you don't mind if the image is just a hair fuzzier when it arrives at its destination, another option is using JPEG (Joint Photographic Experts Group) compression. This type of compression is *lossy*, which means every pixel in the uncompressed image might not be exactly the same as it was in the original. But in return for the slight distortion, you'll get far greater compression than PKZip can deliver.

You can get free JPEG compression and decompression software for 386-compatible microprocessors by downloading the file JPEG4386.ZIP from PC World Online.

Leave the Light On?

Q I don't leave my computer on all the time. I was told that turning a PC on and off each day might make the wires brittle. Is that true?

JimJ62 via America Online

A *PC World* associate editor Lincoln Spector, writing as advice columnist Dr. Deeram, once quipped that you should turn your PC off only when it's turned on. But seriously, turning your PC on and off won't make the wires brittle. Many power cycles will shorten your PC's life in other ways, however: Power surges and changes in temperature are not good for soldered connections and delicate semiconductor components. On the other hand, leaving the computer on 24 hours a day consumes energy and can strain components that move, such as the disk drive and fan bearings. And monitors deteriorate quickly if left on all the time.

My usual advice is to find a happy medium between too many power cycles and too much wasted energy. If you use the machine all day, leave it on 24 hours. If you use it less frequently, turn it off when you're finished. If you're at the keyboard on weekdays but not on weekends, leave it running Monday through Friday and turn it off when you go home Friday night. But no matter which on/off pattern you choose for the system unit, if you're away from the

machine for more than half an hour, always turn the monitor off in order to prevent deterioration.

Bad Bit

Q The hard disk on my computer contains a file named JDEFAULT.PIF that I cannot move or delete. I discovered this file when, during a backup, the computer told me it could not open the file to back it up. When I installed MS-DOS 6.0's DoubleSpace, DOS warned me that it could not compress or move this file. When I try to delete the file from DOS, I get the error message "Too many parameters". When I try the same thing in Windows' File Manager, I get a similar error message. The hard drive shows no bad sectors. What is wrong and how can I fix it?

Ernest D. Wilkes, Macon, Georgia

A Your problem is a compelling example of how a single erroneous bit can confuse a computer. Apparently, your machine flipped one bit of an ASCII character when writing a file name to your hard disk's Windows directory, changing the name _DEFAULT.PIF into JDEFAULT.PIF. Unfortunately, DOS doesn't allow the J (right square bracket) character in a file name, so from that moment on, DOS was unable to accept any command having to do with that file.

To fix the problem, you'll need a low-level disk editor such as Norton's DiskEdit. Use the editor to review the file's directory. (DiskEdit's directory view will recognize that the file name isn't legal and will display it in red.) Change the J character to an underscore (_), save the change, and then you'll be able to manipulate the file via DOS, Windows' File Manager, or the utility of your choice.

Demystifying Hits and Misses

Q Tip 39, "Checking on SmartDrive" [*"75 Tips for Windows and DOS,"* July 1993], says to divide the number of cache hits by the number of misses; if you get a result of 7.5 or more, Smart-

USER GROUP OF THE MONTH

Los Angeles Computer Society

March's user group tips come from the Los Angeles Computer Society. LACS's newsletter contains hardware and software reviews, technical tips, and commentaries and offers a Quick Consultants list that tells where members can get telephone support from expert volunteers. The society also operates an electronic bulletin board service with more than 1 gigabyte of virus-free public-domain software and shareware. The organization's general meeting is held on the second Tuesday of the month, and the society maintains 15 special interest groups focusing on such topics as word processing, desktop publishing, utilities, spreadsheets, hardware, Windows, QuickBasic, xBASE, and others.

For more information, contact Stephanie Nordlinger at P.O. Box 661189, Los Angeles, CA 90066-9589, or call 310/471-2726. The LACS bulletin board number is 310/827-8171. Annual dues are \$36.

Reader service no. 601

ZIPPING TO FIT: I frequently need to zip many files to a floppy disk. Unfortunately, the size of the zipped file sometimes exceeds the size of the disk. While I can use PKZip's multidisk feature to make the files span more than one disk, I often use the -ex switch for maximum compression, allowing all the files to fit on the disk. For example, I might enter the command PKZIP A:BACKUP -ex C:\DOWNLOAD*.TXT to compress all TXT files as much as possible.

Cary Harwin

Los Angeles Computer Society



Drive is doing a good job of caching.

I have a 386DX-40 PC with DOS 6.0 and 8MB of RAM. SmartDrive uses 2MB under both DOS and Windows. For some reason, my ratio of hits to misses is consistently less than 2.5. What am I doing wrong? Should I allocate more RAM for the cache?

*Garvey J. Dyer,
Silver Spring, Maryland*

A Judging from the many letters we've received, that tip has caused a lot of concern about cache efficiency. But don't worry—you're not doing anything wrong. Your cache performance is actually fairly typical for a 2MB SmartDrive disk cache.

Here's how to evaluate your cache's performance. The most popular measure of cache performance is called the *hit rate*, which is computed by taking the number of hits, dividing it by the total number of hits *and* misses, then multiplying by 100 to express the result as a percentage. If your ratio of hits to misses is 2.5, the hit rate is a little more than 71 percent.

Tip 39 said to consider increasing the cache size if you had a hit-to-miss ratio of 7 or less—a hit rate of 87.5 or less. But in fact, users who access a variety of files rarely get such good performance. I wouldn't start experimenting with my cache's settings unless its hit rate dropped below 66 percent. And if your hit rate is above 80 percent, I think it's doubtful that you'll see any significant improvement in performance if you give the cache more RAM. In fact, you may want to take some RAM back from the cache to allow more room for other programs.

Space Stumper

Q I have PC Tools 8.0 and Stacker 3.0. When I look at the available space on my hard drive using PC Tools, I find 5.3MB free on drive C: and 1MB available on drive D:. But when I use CHKDSK at the DOS prompt, it says I have 19.6MB available on C: and 1MB on D:. Why this discrepancy? How many megabytes do I really have left on my C: drive?

Mark Gluckman, Phoenix

A If you've set up Stacker 3.0 in the usual way, DOS sees your compressed Stacker volume as C: and the physical drive on which it resides as drive D:. Both DOS and PC Tools agree that you have 1MB of uncompressed space on your physical drive. But PC Tools doesn't agree with the estimate Stacker gives DOS: that under ideal conditions, you'll be able to store up to 19.6MB more data on drive C:.

In general, when you're using disk compression, DOS's DIR command will give you the compressor's best estimate of the remaining space. But there's no way to calculate the exact amount of data you'll be able to store on the drive before it fills up; it depends on how compressible that data is. If you're storing text files, which are very compressible, you may be able to get even more than 19.6MB of data on the disk. On the other hand, if you're storing ZIP files (which aren't compressible at all), you'll be lucky to squeeze more than 9MB of data into the remaining space.

Space Stumper, Part II

Q Does DOS 6.0's DoubleSpace lie about being able to fit more data on a disk? I recently compressed my 3½-inch floppy disks with DoubleSpace. I had a program that fit on an uncompressed disk but would not fit on a DoubleSpace disk. Does DOS 6.0's DoubleSpace have a bug?

Peter Ta, Covina, California

A You have probably forgotten to mount the floppy disk's compressed volume—using the command DBLSPACE /MOUNT—after you insert the floppy in the drive. If you fail to do this, any files you write to the floppy disk will go to the small, uncompressed portion of the drive, which will fill up almost immediately.

If this is your problem, consider buying Vertisoft's SpaceManager add-on program, which automatically mounts DoubleSpace floppies when you insert them in the drive. Alternatively, you can switch to Stacker or SuperStor, which both have built-in auto-mounting features. You can also upgrade to DOS 6.2, which includes auto-mounting.

Serial Sanity

Q When I format a disk, it gets a serial number. How do I format a disk without one? How do I eliminate the serial number from a formatted disk?

Joseph P. Kresl, Cleveland

A When IBM and Microsoft were developing OS/2, they tried to come up with a scheme that would let an operating system tell one disk from another when users were shuffling them in and out of drives. Volume labels weren't good enough because they might not be unique and because so many users don't supply volume labels when formatting disks. Instead, the OS writes a random number called the *volume serial number* to the disk. This number uniquely identifies the disk so that DOS can recognize it. (It's possible for two disks inserted into the same system to have the same number, but the odds of that happening are one in several billion.) DOS utilities were also updated when this scheme was instituted. To keep the numbers unique, DISKCOPY doesn't copy a disk's volume serial number when making a copy; it picks a new one. And DISKCOMP ignores the volume serial number; disks copied via DISKCOPY appear to be exact copies.

Alas, the only way to get rid of the volume serial number, which is stored in the disk's boot sector, is to use a binary disk editor to blot it out. If you want to format disks without volume serial numbers, you'll need to use a FORMAT program from a version of DOS before 5.0. If you do this, I recommend renaming the program to something other than FORMAT.COM. Then use SETVER to get it to run on your current DOS. For example, you could rename DOS 4.0's FORMAT.COM to FORMAT4.COM, put it in your DOS directory, and issue the DOS command SETVER FORMAT4.COM 4.00. Put DEVICE=C:\DOS\SETVER.EXE in CONFIG.SYS, reboot your PC, and FORMAT4 will be available for use.

By Brett Glass

Brett Glass is a contributing editor for PC World. Help Line welcomes your questions (see page 12 for contact information).



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SPREADSHEETS Q & A

Year-to-Date Calculations in Any Windows Spreadsheet

Q I'm tracking statistics for a racquetball tournament, and I need to set up columns for the team names, the number of games won and lost this week, running totals of the number won and lost in the tournament to date, and the percentage of wins. Each week, I want to enter and print just the current week's won and lost numbers and have the running total incorporate those values. And while you're at it, how do I calculate the rank order of the teams?

Kevin J. Sullivan, Pittsburgh

A This situation crops up whenever users need to keep running totals—for example, in tracking actual versus budgeted expenditures throughout the year. I call it the year-to-date problem. There are two approaches. One is straightforward: Keep all the data, then hide the stuff you don't want to print. The other uses a "posting" macro to update the current running totals.

For the keep-the-data method, set up your worksheet like the top worksheet in **FIGURE 1**, with Won and Lost columns for each week of the tournament, totals for Won and Lost that add up all the weekly wins and losses, and columns for percentages and ranks. When it's time to print this week's version of the sheet, first use your program's column hiding feature to conceal the columns that contain the previous weeks' data. This method retains your data, letting you track down earlier data entry errors.

But if you don't want to retain the weekly won and lost values, use the posting macro instead. The example at the bottom of **Figure 1** shows the situation as it might appear at the end of a few weeks. The current week's won and lost data is kept in one range (B3..C7); the totals as of the end of the previous week are in another (I3..J7). A set of simple formulas (D3..E7) adds these together to yield the current running totals. After entering the current week's data, you'll print your report and then run the macro, which converts the current totals into the previous week's totals and erases the current week's numbers to prepare for new data.

To create the formulas for this example in Excel 4.0, 1-2-3 for Windows release 4.0, or Quattro Pro for Windows, type **+I3+B3** into D3 to calculate the current won totals, **+J3+C3** into E3 to calculate the current lost totals, and type **+D3/(D3+E3)** into F3 to calculate the percentage of wins. If you're using Excel, enter **=RANK(F3,\$F\$3:\$F\$7)** into G3 to calculate the rank order; for 1-2-3/W or Quattro, use **@RANK(F3,\$F\$3..\$F\$7)**.

Notice the RANK function in G3, which calculates the rank of an item (F3) in a list (\$F\$3..\$F\$7). Copy the formulas in D3..G3 to the remaining data cells in rows D through G. Then use your spreadsheet's range-naming command to set up the range names **PREVIOUS_TOTALS** for I3..J7, **TOUR_TOTALS** for D3..E7, and **WEEK_DATA** for B3..C7.

Now record the macro: Turn on your spreadsheet's macro recorder (in Excel

Quattro, *Values only*), and click **OK**. Press **<F5>** again, select **WEEK_DATA**, then press **<Delete>** (and if necessary, click **OK**) to clear the cells. Stop the macro recorder, and you're all set. Notice that the previous week's totals in I3..J7 are used only by the macro: Omit them from your report.

Counting Selectively in Excel 4.0 and 5.0

Q I have a column of numbers in Excel. Is there a way to enter a formula or function in just one cell to count up how many of the numbers are between two values? The COUNT function will count all the numbers, but what if I want to count only those, say, from 100 to 200?

Michael Poirier, Albany, New York

A Here are two alternatives. The first uses an array formula, and it's for version 4.0 (it also works in Quattro Pro for Windows); the other uses COUNTIF, which is new to version 5.0.

First the array method: Go to the cell you want your count result in and enter **=SUM((range>100)*1)-SUM((range>200)*1)**, where *range* is the address for the cells your numbers are in. Instead of pressing **<Enter>** after you type in this formula, you press **<Ctrl>+<Shift>+<Enter>** to enter it as an array.

The first part of the formula counts the number of values equal to or greater than 100. Then the logical expression *range*>100 tests each cell in your range and yields an array of TRUE and FALSE values; multiplying by 1 converts the TRUES and FALSEs to ones and zeros, and the SUM function adds up the ones and zeros to give the count. The second expression counts the values above 200 in the same way, and the difference between the two expressions including 100 and 200.

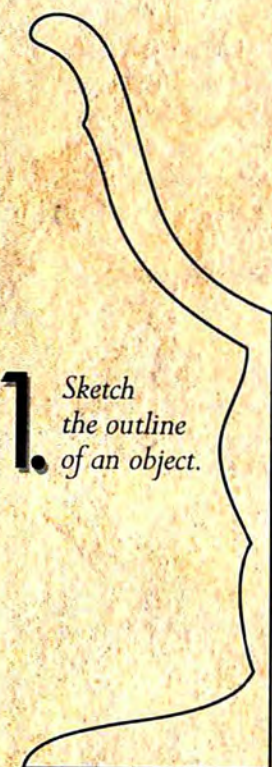
The second approach uses the same logic, but thanks to the new Excel 5.0 COUNTIF function, you don't need the array. Just use the formula **=COUNTIF(range,">100")-COUNTIF(range,">200")** and press **<Enter>** after typing it.

Team	Week 1	Week 2	Week 3	Tournament	Percent	Ranking
Sox	2	1	2	5	60%	3
Fox	2	1	2	5	44%	4
Box	2	1	2	5	57%	2
Knox	1	1	1	3	60%	1
Clocks	0	2	2	4	33%	5

Team	This Week	Previous Totals
Sox	2	18
Fox	2	16
Box	2	23
Knox	0	15
Clocks	0	9

FIGURE 1: TWO SOLUTIONS TO THE YEAR-TO-DATE PROBLEM. The top window shows the "save-it-all" method; the bottom window uses a macro to post the current data to the tournament totals.

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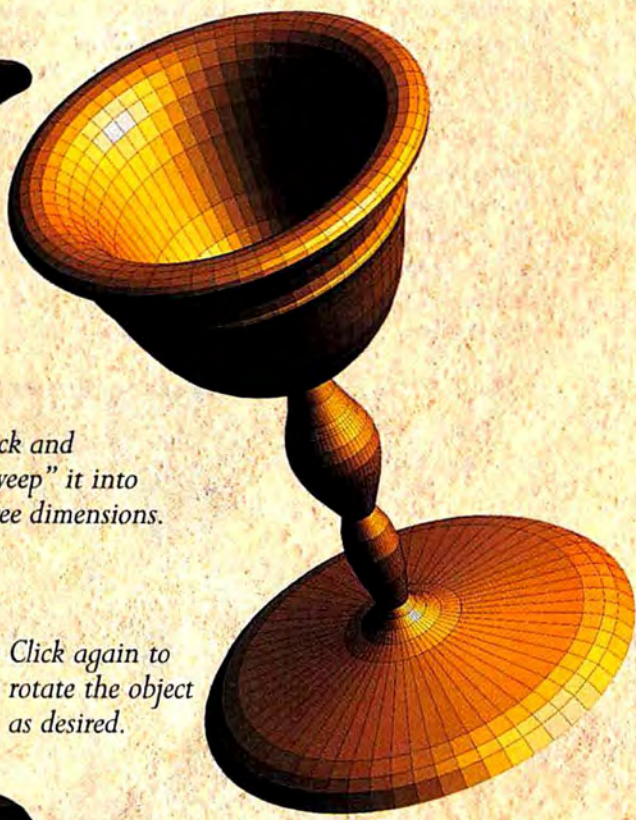


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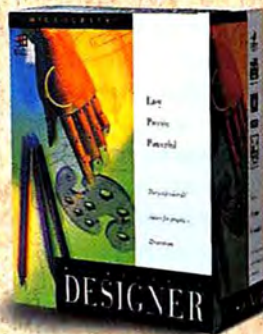
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Master Class: Excel 5.0 Goes 3-D, You Go Bananas

Years after the feature was introduced in 1-2-3 release 3.0, Excel 5.0 has finally adopted a 3-D interface, complete with Quattro-style worksheet tabs. These 3-D files are terrific for keeping your work organized, and in this month's "Master Class," I'd like to show you how to use them most effectively. In the example shown in FIGURE 1, I've set up a sample budget with a separate worksheet for each division of a fictitious company, a summary sheet to roll up the division data into a set of grand totals, and a chart sheet to display the summary data as a stacked bar chart. Use this figure for reference.

Basic navigation. When you open a new Excel 5.0 workbook, it contains, by default, 16 sheets, named Sheet1, Sheet2, and so on. The names are visible on the tabs. To switch from sheet to sheet, you can either simply click a sheet tab, or press <Ctrl>-<Page Up> and <Ctrl>-<Page Down> to flip forward and backward. As you begin to lay

same proportions it will have when you print it; to make it fill the window like an Excel 4.0 chart, select **View • Sized with Window**.

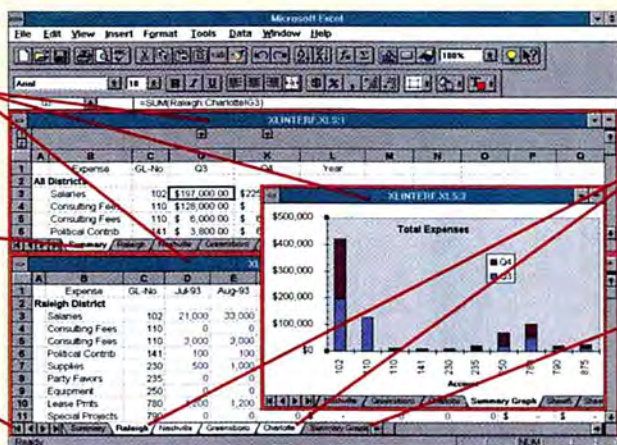
Working with sheets as a group. In many applications, your workbook will contain many sheets that need to be formatted the same way—in this case Raleigh, Nashville, Greensboro, and Charlotte. To perform the same activity on several sheets at once, click the first sheet (Raleigh), then hold down the <Shift> key and click the last one (Charlotte), or use the <Ctrl> key to select noncontiguous sheets. The grouped sheet tabs turn white. Now adjust the column widths, fonts, numeric formats, and so on for any sheet, and your changes will appear on all the selected sheets. To cancel the group, choose an unselected sheet, or right-click one of the selected sheet tabs and choose **Ungroup Sheets**.

Creating group formulas. A similar technique is involved in creating a

Multiple windows let you compare worksheets.

Click a tab to select a sheet; double-click to assign a sheet name.

Use these buttons to scroll through sheet tabs.



<Shift>-click or <Ctrl>-click tabs to select multiple sheets for group operations; drag a tab to rearrange sheets.

Drag here to adjust the size of the horizontal scroll bar.

out the sheets, you'll want to assign new names to them to identify their contents: Double-click a sheet tab, select **Rename**, then enter a suitable name in the dialog box.

Rearranging sheets. Just drag a sheet tab into a new position (look for a triangular mark to indicate the new position as you drag) or right-click a sheet tab, select **Move or Copy**, then choose a new position for the sheet in the dialog box. The latter technique is useful when you have dozens of sheets in a file.

Adding more tabs. You can expand the size of the horizontal scroll bar by dragging the divider that's just to its left (see Figure 1). In addition, you can use the buttons at the left of the sheet tabs to scroll through the tabs. The outermost buttons take you to the first and last sheet, respectively.

Adding more sheets. To insert a new sheet before a sheet, right-click a sheet tab, select **Insert**, and choose **Worksheet**; or press <Shift>-<F11> (or <Alt>-<Shift>-<F1> if your keyboard has only ten function keys). To make the new sheet a chart as in the figure, choose **Insert • Chart** instead, and Excel will launch the ChartWizard. When you've finished with the ChartWizard, your chart appears with the

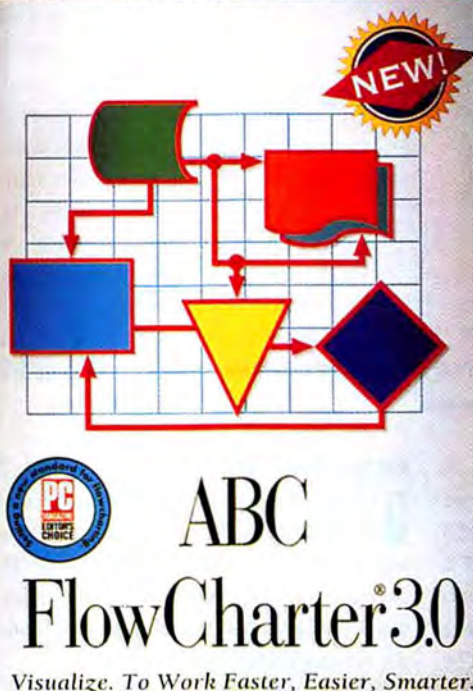
FIGURE 1: EXCEL'S NEW INTERFACE lets you organize your work and build 3-D formulas—but it can confuse you when you are trying to print multiple worksheets.

3-D formula, like the one shown in cell G3 in the Summary window. That formula adds the salaries for all divisions for Q3.

The formula is `=SUM(Raleigh:Charlotte!G3)`; it adds the numbers in cell G3 of each sheet from Raleigh to Charlotte. To create it, you select G3, type `=SUM(`, click the **Raleigh** sheet tab, select cell G3, then hold down <Shift> while you click the **Charlotte** tab, type `)`, and press <Enter>.

Printing. This is the only really confusing aspect of 3-D worksheets. To print the entire contents of one sheet, just choose **File • Print** (or **File • Print Preview**). To print multiple sheets, select a group of sheets as described previously, then execute the command, and you'll get each sheet on a separate page. If you want to print just a subsection of a sheet, you'll find that the old **Set Print Range** command is gone; instead, choose a worksheet tab, select **File • Page Setup**, click the **Sheet** tab at the top of the dialog box, click in the **Print Area** field, then click on the worksheet and select the range you want to print. Now repeat the process in each sheet in which you want to select a print range. When you're ready to print, select the sheets you want in your report, and choose **File • Print**.

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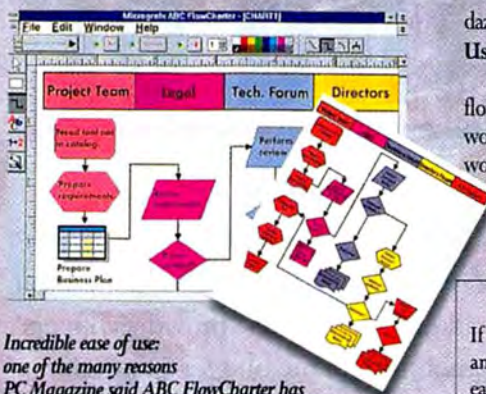
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C15		=SUMIF(B2:B13,"Baseballs",C2:C13)				
	A	B	C	D	E	F
1	Client	Product	Amount			
2	Bilbo	Baseballs	\$7,010			
3	Bilbo	Footballs	\$3,903			
4	Bilbo	Mouseballs	\$253			
5	Credo	Baseballs	\$473			
6	Credo	Footballs	\$3,979			
7	Credo	Mouseballs	\$8,594			
8	Dumbo	Baseballs	\$6,465			
9	Dumbo	Footballs	\$7,692			
10	Dumbo	Mouseballs	\$8,693			
11	Elbo	Baseballs	\$8,228			
12	Elbo	Footballs	\$6,164			
13	Elbo	Mouseballs	\$9,707			
14						
15		Total Baseballs	\$22,176			
16						

FIGURE 2: EXCEL 5.0'S NEW SUMIF FUNCTION lets you sum only those values in a range that match your specifications.

For readers interested in this common spreadsheet task, I should say a little more about COUNTIF and its equally useful companion, SUMIF. Take a look at **FIGURE 2**, which shows a portion of an Excel 5.0 workbook that contains a list of clients and the amount each spent on three products. The formula in C15, =SUMIF(B2:B13,"Base-

Not Your Average Excel Formula

Q I have a long list of numbers in an Excel worksheet, and I need a formula that will return the one that is nearest to the average value. For example, if the numbers are 1, 2, 5, 6, and 7, the average is 4.2, and the nearest value in the list is 5.

Bill Jones, High Point, North Carolina

balls",C2:C13), sums the purchases for 'Baseballs.'

The formula then looks in B2:B13 for 'Baseballs', and it sums the corresponding values in C2:C13. While it's true that the same results could be obtained with an array formula, the functions SUMIF and COUNTIF are a lot easier to understand and use.

A I'll pass along a solution from Bob Umlas, a noted Excel consultant based in Palisades, New York. Let's say your numbers are in a range named *Values*, entered in a single column or row. Enter the formula =INDEX(values,MATCH(MIN(ABS(values-AVERAGE(values))),ABS(values-AVERAGE(values)),0)) and press <Ctrl>-<Shift>-<Enter>.

In this formula, ABS(values-AVERAGE(values)) yields an array of deviations—the differences between each number and the average—as positive numbers. (Negative deviations convert to positive ones so they can be compared to the average.) MIN finds the smallest deviation, and MATCH yields the position of that minimum in the array of deviations. Finally, INDEX returns the number from the original list of values in that position. Whew!

By Richard Scoville

PC World contributing editor Richard Scoville is a software training consultant based in Chapel Hill, North Carolina. Spreadsheets welcomes your questions. See page 12 for contact information. ■

COMING UP

• Feast for Your Eyes: 17-Inch Monitors

Tired of squinting to view text and graphics on a 14-inch screen? Our review of 17-inch monitors—starting at \$730—points you to the best buys on the market today. We also provide a buyers' guide to low-cost 15-inch monitors for the budget-minded.

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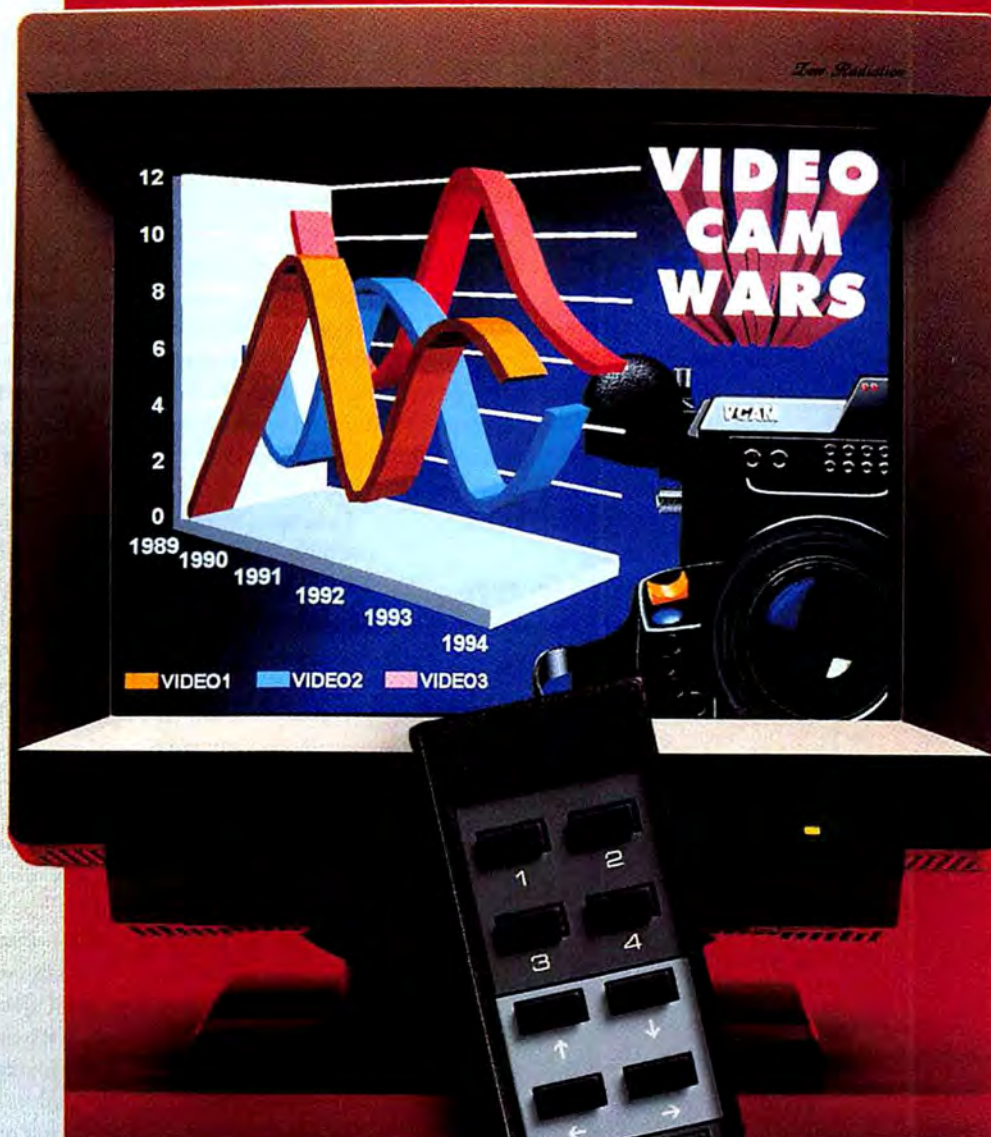
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WORD PROCESSING Q & A

Duplex Printing in Word for Windows 2.0

Q I'd like to save paper by printing multipage documents on both sides of the page in WinWord 2.0. Even though my HP DeskJet printer doesn't support duplex printing, I thought I could still fake duplexing by printing the odd-numbered pages of a document, reinserting the paper, then printing the even-numbered pages on the backs of the previously printed pages. Can you think of a way to do this?

*Jonathan Tin Lap Ng,
West Vancouver, British Columbia,
Canada*

```
Sub MAIN
Msg$ = "This macro prints odd then even pages."
Response = MsgBox(Msg$, "OddEven Macro", 49)
If Response <> - 1 Then Goto Getout
Dim Dlg As DocumentStatistics
GetCurValues Dlg
NumPages = Val(Dlg.Pages)
X = 1
While X <= NumPages
  FilePrint .Range = 3, .From = Str$(X), .To = Str$(X)
  X = X + 2
Wend
If NumPages = 1 Then
  Msg$ = "One page document. Printing completed."
  MsgBox Msg$, "OddEven Macro", 48
  Goto GetOut
End If
Msg$ = "Re-insert pages in printer so page 1 feeds first."
MsgBox msg$, "OddEven Macro", 48
Msg$ = "When ready to print, click OK."
MsgBox Msg$, "OddEven Macro", 16
X = 2
While X <= NumPages
  FilePrint .Range = 3, .From = Str$(X), .To = Str$(X)
  X = X + 2
Wend
If NumPages Mod 2 = 1 Then
  Msg$ = "Printing done. Remove last page from tray."
  MsgBox Msg$, "OddEven Macro", 48
End If
GetOut:
End Sub
```

FIGURE 1: PRINTING ODD THEN EVEN PAGES with this WinWord macro lets you print on both sides of the page.

A You've discovered one of WinWord 2.0's most annoying inadequacies. When you need to print on both sides of the page but don't have a duplexing printer, you're pretty much stuck printing one page at a time. The solution is a macro that takes care of odd/even printing automatically. I've written one and I'm glad to pass it along. You'll find the complete text of the macro in **FIGURE 1**. Here's the drill:

First, open a multipage document to use just for testing purposes. Select **Tools•Macro**, type a name (try **OddEven**) for your macro in the Macro Name text box, then select **Edit**. WinWord will open a second document and display the Macro Editor button bar.

Now, type the text from Figure 1 between the Sub MAIN and End Sub lines. When typing the lines that begin with **Msg\$ =**, include the quotation marks and type the text between them without entering any hard returns. When you're done, check your typing carefully, select **File•Save All**, and answer **Yes** to all the subsequent dialog boxes.

Before closing the macro's window, however, you'll need to run a test. Use **<Ctrl>•<F6>** or the **Window** menu to switch back to your multipage document. Select **Tools•Macro**, pick your new macro from the Macro Name list, and then select the **Run** button. A series of Printing boxes should flash on screen for each of the document's odd pages. When those

pages are done printing, the macro will prompt you to reinsert them for the second pass. If WinWord displays an error message during your tests, switch back to the macro document and check your typing carefully. WinWord will help by highlighting the line where the error occurred. Once the macro works correctly, select **File•Save All** again to make it permanent.

Since you'll probably use this macro repeatedly, why not add it to WinWord's File menu? To do this, select **Tools•Options**, then click the **Menu** icon. Choose **&File** in the menus list, select **OddEven** from the macro list, then type **Odd/Even Printing** in the Menu Text box. Click **Add**, then click **Close** to finish the job. From then on, whenever you need to print odd and even pages for a document, select **File•Odd/Even Printing**.

If you don't trust your typing skills, you can download the file **ODD-EVN.DOT** from PC World Online (see page 12 for more information). After opening the file in WinWord, follow the on-screen instructions to install the macro and add the menu command to your copy of WinWord. Alternatively, you can always upgrade: WinWord 6.0 has added odd/even printing as a standard feature.

Extra-Large Characters in Word for Windows

Q A document I'm preparing in Word for Windows 2.0 needs to include a few characters larger than the 127-point maximum size allowed by the program. Is there a way to do this?

Gerald B. Lord, Salt Lake City

A Sure, but putting monster characters on a page takes some doing. Instead of using text formatting to make huge characters, you have to create them as graphics. To start, select **Insert•Object**, then choose **Microsoft Drawing** in the Object Type list and select **OK**. (If this utility doesn't appear in the list, install the Microsoft Draw utility from your original WinWord disks.)

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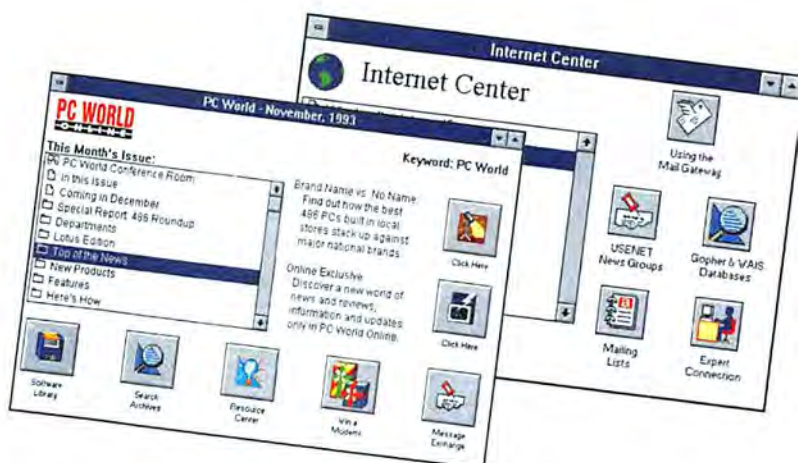
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You'll see the Microsoft Draw window. Maximize the window, then select **Text•Font** and pick a font from the list. Next, select **Text•Size•Other**, type **250** in the Size box, and click **OK**; no matter how big you want the type to appear in your original document, you must specify 250 points here. Click the **A** button at the left of the screen, then click in the editing area and type your text. Typically, you'll have room for only one or two letters.

Now, after clicking the text cursor on the arrow button, select **File•Exit and Return to Document** to insert the image in your document, and answer **Yes** to the dialog box that appears. Before doing anything else, select **Insert•Frame** to surround your image with a frame. You can resize the characters with the sizing handles on the frame or reposition them by moving the frame. Since WinWord handles the image like any other graphic, you can specify the way other text wraps around it in the dialog box that appears when you select **Format•Frame**.

Where Are My WinWord Bullets?

Q Whenever I try to insert a custom bullet into a WinWord 2.0 document, I see something like {SYMBOL 91 \f "Wingdings" \s 20 \h} on screen where the bullet should be. When I print the document, the bullets come out just fine, but the codes still look terrible on screen. How can I fix this?

Jason Kama, *Pahoa, Hawaii*

A What you're seeing is known as a "field code," used internally by WinWord to specify the special bullet character. To see the bullet instead, all you need to do is select **Tools•Options**, click the **View** icon, then uncheck the **Field Codes** check box in the 'Show Text with' area. Your new setting becomes the default, so whenever you insert a bullet, you'll see it, not a field code, on screen.

Paragraph Spacing in Ami Pro

Q I like a little space between my paragraphs, but not the full line space that's inserted when I press <Enter> twice in Ami Pro. Is there a way to

adjust the spacing between paragraphs?

David Sellman,
La Grange, Georgia

A No problem—Ami Pro lets you specify the paragraph spacing for any style. To do this, place your cursor in a paragraph that uses the style you want to modify. Select **Style•Modify Style**. Choose **Spacing** in the Modify box, then use the scroll bar arrows to increase the **Below** setting in the Paragraph Spacing box. To specify the spacing in units other than inches, click the button below the measurements to cycle through the available scaling options. You'll see an example of the new spacing in the preview window. When you're satisfied with how the spacing looks, select **Save**, then **OK**.

Now when you press <Enter> after typing a paragraph, the next paragraph will automatically jump down the distance you set; there's no need to press <Enter> twice, as you were before.

Most likely, you'll want to make your spacing changes permanent. To do this, select **Style•Save as a Style Sheet**. To save your changes as the default style (_default.sty), click **OK**. Click **Yes** to confirm that you want to overwrite the existing style sheet.

Reverse-Order Printing in WordPerfect 5.1 for DOS

Q The Canon BJ-200 printer I use with WordPerfect 5.1 for DOS feeds printed pages face up. That means multipage documents come out in reverse sequence and have to be sorted. Is there a way to make WordPerfect print document pages in reverse order?

Ruth A. Wilson, *Seattle*

A Sadly, WordPerfect 5.1 for DOS has no built-in command for reverse-order printing. But a simple macro you can create in the macro editor can do the job for you.

Start by pressing <Home> then <Ctrl>

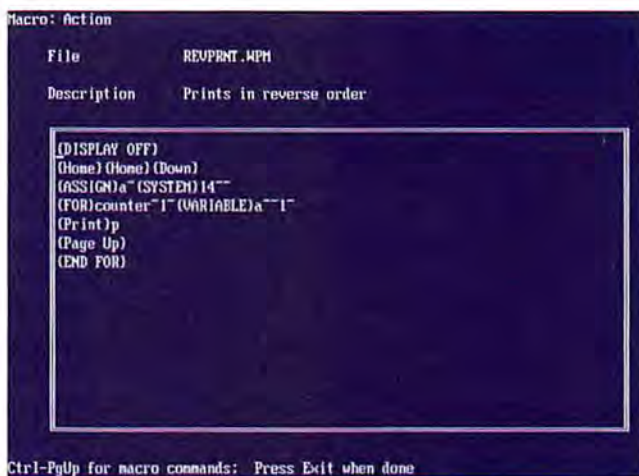


FIGURE 2: PRINT DOCUMENTS IN REVERSE ORDER with this simple WordPerfect 5.1 macro.

<F10>. At the Define macro prompt, type a name for your macro (try **REVPRNT**), then press <Enter>. At the Description prompt, type **Prints in reverse order** and press <Enter>. You'll see the macro-editing screen. To create the macro, which should look like **FIGURE 2**, press the keystrokes exactly as listed below. Be careful: The slightest typing mistake will keep the macro from running. Pay special attention to the tilde (~) characters; they're very important.

```
<End><Enter>
<Ctrl><F10><Home><Home><Down>
<Ctrl><F10><Enter>
<Ctrl><Page Up>a<Enter>a~
<Ctrl><Page Up>sy<Enter>14~<Enter>
<Ctrl><Page Up>f<Enter>counter" 1~
<Ctrl><Page Up>v<Enter>a"" 1~<Enter>
<Ctrl><v><Shift><F7>p<Enter>
<Ctrl><v><Page Up><Enter>
<Ctrl><Page Up>en<Enter><F7>
```

After creating the macro, test it on an existing multipage document. To run the macro, press <Alt><F10>, type **REVPRNT**, and press <Enter>. Your document should print in reverse order. If there's a problem, retype the macro, being more careful with your keystrokes. You can download this macro, ready to use, as **REVPRN.WPM** on PC World Online.

By George Campbell

George Campbell is a contributing editor for PC World. Word Processing welcomes your questions (see page 12 for contact information).

Stalking the Wild DMA Conflict

Q I'm having problems with DMA conflicts. I recently installed Norton Backup for Windows, and when I ran the compatibility test, the program reported a DMA conflict. As a result, Norton can perform only a slow backup. What is a DMA conflict and how can I eliminate it?

*Mark C. Windisch,
Sewickley, Pennsylvania*

A DMA, which stands for direct memory access, refers to a technique that allows programs to access memory and transfer data to devices (like a tape drive) without relying on the PC's microprocessor. DMA can boost performance significantly, and Norton Backup uses the technique to read the hard disk it's backing up as it writes to a floppy drive or tape drive. However, there are

a limited number of DMA channels—like lanes on a highway—and collisions are bound to occur if two or more peripherals, drivers, or programs vie for the same channel. That's why Norton is having trouble using this speed trick on your machine.

The first step to clearing a path is enlarging Windows' default DMA buffer setting, which at 16K may be too small. Open SYSTEM.INI and add the line **DMABufferSize=32** to the [386Enh] section. (You can save yourself time opening any key system files by using Windows' Sysedit utility. Choose **File•Run**, type **SYSEDIT**, and click **OK**. Select the SYSTEM.INI window, make the changes, and then exit.) Save the file, exit and reenter Windows, run Norton's compatibility test again, and see if it will configure the program for "fastest" (DMA) operations.

If that doesn't solve the problem, Norton may be tussling with another program or with some peripheral. Potential culprits include network boards, sound cards, screen savers, mice, and even fast video drivers. Do the simple stuff first: Turn off your screen saver, switch to Windows' vanilla VGA or super-VGA drivers, and disable any other suspect programs; then try running Norton's compatibility test again. If fast backups are approved, start adding back the disabled programs one at a time, and run the Norton compatibility test until you nab the culprit.

If Norton is still choking, try this tack: Open AUTOEXEC.BAT and CONFIG.SYS and fol-

low the same approach—disable drivers (except, of course, for EMM386.EXE or HIMEM.SYS), terminate-and-stay-resident programs, and so on by typing **REM** at the beginning of the appropriate lines. Save the files, reboot, load Windows and Norton Backup, and run the compatibility test. If the fast DMA mode is okayed, start adding back the disabled programs one at a time until the problem child is identified.

And if *this* doesn't work, pop open your PC's hood and start removing suspect devices such as fax boards, CD ROM adapters, network cards, and the like, and run the Norton compatibility test as described until you get fast DMA backups approved.

Once you have fingered the errant program or device, check its user manual or call the manufacturer and find out how to reconfigure it. In some cases, it's simple; you just change a jumper or load the software with a different parameter. However, in other cases you may have to forgo fast backups or whatever is causing the problem.

A Cleaner DOS Prompt

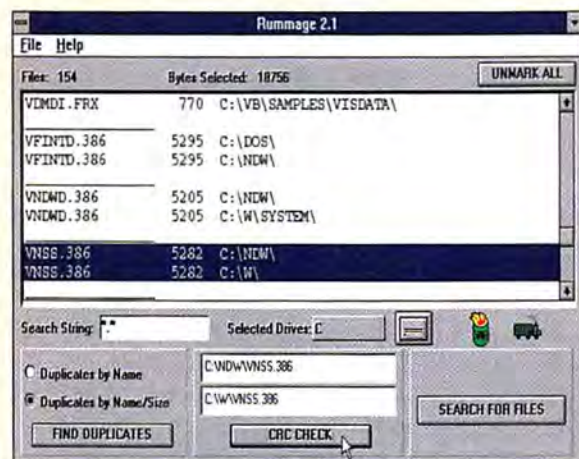
Q I've tweaked SYSTEM.INI to suppress the exit instructions that appear whenever I run a DOS prompt under Windows, but unfortunately I can't get rid of Microsoft's copyright message. Can I eliminate this annoying commercial?

Thomas Berger, Gibbstown, New Jersey

A 'Tis easy as pie—all you need is a single switch, either in the DOS prompt's Program Item Properties dialog box or in its PIF.

But first a review: By default, a DOS prompt run under Windows initially displays a reminder that Windows is still running and notes how to switch from or exit the DOS session. To eliminate this message, you simply open SYSTEM.INI in a text editor and add the line **DOSPromptExitInstruc=0** to the [386Enh] section. Save SYSTEM.INI and restart Windows to eliminate this

Windows Toolbox



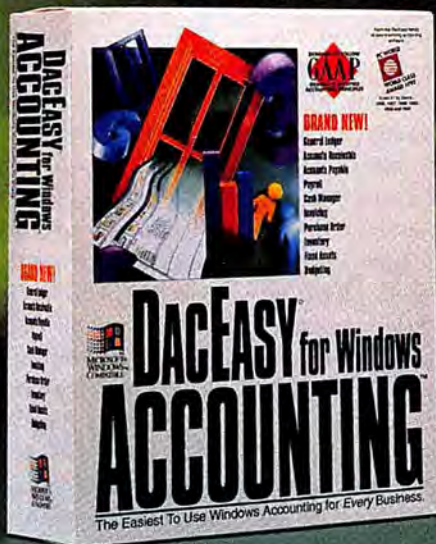
You never realize how messy things are until you do a thorough housecleaning. Run Robert Schlackman's Rummage 2.1, for example, and you'll discover unkempt stacks of duplicate files on your hard disk that should have been deleted years ago. Rummage ferrets out redundant files by matching name, or both name and size; it lets you verify they're duplicates with a cyclical redundancy check (CRC) function; and it allows you to move or delete files on the spot. The registration fee is \$10. You'll find RUMMGE21.ZIP on PC World Online and other online services (see page 12 for information). Reader service no. 701

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pesky piece of persnickety pedagogy.

However, if you'd rather not mess around with INI files, there's a simpler solution that not only wipes out this instructional intrusion but foils Microsoft's commercial as well—and it doesn't require restarting Windows.

Here's what to do: Select the *MS-DOS* icon, press **<Alt>-<Enter>** to open the Program

desired image, and confirm your choice.

If you use a PIF to fine-tune your DOS prompt sessions, do this instead: Run Windows' PIF Editor, select *File•Open* and the appropriate PIF (probably *DOSPRMPT-PIF*). Type **/k cls** in the Optional Parameters text box, save the file, and exit the Editor. Then open the MS-DOS icon's Program Item Properties dialog box and make

Item Properties dialog box, and in the Command Line text box type **C:\COMMAND.COM /k cls** (the **/k** switch runs the DOS command that follows it, in this instance **cls** or "clear screen"). Click *OK* and you're done. If Windows replaces the colorful MS-DOS icon with a generic version, just return to the Program Item Properties dialog box, click *Change Icon*•*OK*, select the

sure the PIF is referenced on the Command Line.

The next time you double-click the MS-DOS icon, your DOS prompt will have the minimalist look you've been seeking.

A Calculated Law of Averages

Q Is there a simple way to get Windows' Calculator to average a series of numbers automatically?

Jana Hoffmann, Richmond

A You bet—provided you use the program's Scientific mode. Start Calculator and choose *View•Scientific*. Click *Sta* to open the Statistics Box, then *Ret* to return to the main Calculator window. Enter each number, and instead of pressing the plus key, click *Dat*, which sends the number to the Statistics Box. When you're finished, click *Ave*, and the average is magically calculated. The numbers you've entered remain in the Statistics Box for further calculation. For example, to total the numbers in the Statistics Box, click *Sum*.

If you made an error in the Statistics Box,

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click *Sta*, select the number, and click *CD* to clear the item. You can also move a number in the Statistics Box to the main Calculator window by selecting the number and clicking *Load*. To empty the Statistics Box, click *CAD*.

More on Moving TrueType

Q In the "Relocating TrueType" tip in the October 1993 column, you claimed that TrueType's FOT files cannot be moved from the \WINDOWS\SYSTEM directory. This is not true—in fact, it's easier than fussing with TTF files. With TTF files, you have to remove the fonts from the Control Panel, relocate the TTF files, then return to the Control Panel and "add" the fonts back to the system.

To relocate FOT files, simply move them from your \WINDOWS\SYSTEM directory to the subdirectory of choice. Then open WIN.INI, locate the [fonts] section, and add the path statement to each TrueType font in the list. For example, you'd change Times New Roman (TrueType)=TIMES.FOT to Times New Roman (TrueType)=C:\TTYPE\TIMES.FOT. Save the file and restart Windows. That's it.

Jose Carlos Robles Ponce, Mexico City

A Thanks for the correction. These changes can make disk housekeeping a whole lot easier—and speed up the display of crowded directory windows in File Manager as well.

Batching in Windows

Q Somebody told me that you can automatically run a special batch file called WINSTART.BAT whenever you load Windows. I need to load a network driver, erase TMP files, and do other DOS operations before starting Windows. Is this batch file the answer?

Tariq Amin, Rochester, Minnesota

A Probably not. WINSTART.BAT is a special-purpose batch file that loads memory-resident programs (TSRs) that can be used *only* by Windows applications, not DOS programs that run under Windows. And Windows programs that rely on DOS utilities are rare birds.

The operations you need to perform don't require anything special. Just create a batch file that carries out the necessary chores and ends with the WIN command,

which starts Windows. Alternatively, you could simply add these tasks to AUTOEXEC.BAT so that they run before you load Windows when you boot your system. Make sure you reference any TSRs that will be needed by all DOS programs run under Windows.

If only one or two DOS programs require a certain TSR, you may want to create a batch file to run from within Windows, loading the utility and the DOS program at

the same time. The TSR will be available only to the program in question, so you won't waste memory when running other DOS applications.

By Scott Dunn

Scott Dunn is a contributing editor for PC World and coauthor of 101 Windows Tips (Peachpit Press, Berkeley, California, 1992). Windows welcomes your questions (see page 12 for contact information).

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Circle 176 on reader service card

OS/2 Q & A

Reducing Desktop Clutter

Q I have a lot of programs and a lot of projects, and my desktop is cluttered with icons. How can I clear it out?

Traci Kurilla, Bayfield, Wisconsin

A One of WorkPlace Shell's biggest advantages is that you can put folders inside folders. For instance, you could keep only two folders on your desktop, one called Home and another called Work, and keep all your other folders inside them. You create a new folder by right-clicking on an existing one, selecting *create another*, typing a name into the New Name text box, and pressing <Enter>. You move an existing folder into another by right-dragging it.

In your Home folder, you could store folders called Finance, Games, and Friends. Your Finance folder might contain a checkbook program, the OS/2 calculator, and a tax preparation program. Your Friends folder could contain your word processor, an address database, a party invitation, and another folder containing recently written letters.

In your Work folder, you might include folders for E-mail, proposals, and each customer project you're working on. The Smith Project folder might have icons for word processing, spreadsheet, and graphing programs, as well as several documents for this client. It's smarter to organize your desktop by the projects you're doing, rather than by application.

Simplifying Command Prompts

Q Graphic user interfaces are fine, but sometimes it's easier to just type in a command. However, I'm confused by all the choices in the Command Prompts folder. Do I need them all?

Charlie Steaderman, Denver

A The Command Prompts folder contains icons for full-screen and windowed prompts for DOS, Windows, and OS/2 command line sessions. But unless you've got some ancient OS/2 1.x full-screen applications, the only icon you need is the OS/2 windowed one, since it supports the others.

You may want to place a shadow of this icon on your desktop for easy access. While holding down <Ctrl>-<Shift>, right-drag the OS/2 Window command prompt icon from your Command Prompts folder to the desktop. Double-click it, and a windowed OS/2 command prompt comes up. Since OS/2 is a superset of DOS, any DOS command you know probably has an OS/2 equivalent, so you can still use TYPE, COPY, CHDIR, FORMAT, and other familiar commands.

What about DOS programs? No problem. Just type in the name of a DOS program and press <Enter>. Assuming the program is in the current directory or a directory in your AUTOEXEC.BAT's PATH statement, the OS/2 window will go away and a DOS window will pop up with your program.

And if for some reason you must have a DOS prompt, you can still get one. Just type **COMMAND** at the OS/2 prompt, and a DOS command line window will replace the OS/2 one.

You can also launch a DOS session from an OS/2 session and have both of them up at the same time. Just create a one-line OS/2 batch file called DOS.CMD: **START /WIN/C COMMAND**. Once you've saved DOS.CMD to your OS2 directory, all you need do is type **DOS** at the OS/2 command prompt and you'll get a separate DOS prompt window.

Here's how it works: **START** tells OS/2 to start a new session instead of replacing the current one. The **/WIN** command tells OS/2 to create the session in a window; otherwise you'll get a full-screen DOS session. The **/C** parameter orders OS/2 to keep the window open until you quit whatever program you're launching from the batch file. The program you're launching is **COMMAND**, which you close by typing **EXIT**.

By Lou Miranda

Lou Miranda is a senior systems analyst at Poliac Research in Burnsville, Minnesota. OS/2 welcomes your questions (see page 12 for contact information).

From Windows to OS/2

Increasing Performance With a Swap File:

Windows and OS/2 both let you improve performance by creating swap files. A swap file acts as virtual memory for your PC; when Windows or OS/2 runs out of real memory, it uses the swap file to store some of the extra data temporarily.

Windows lets you change the swap file settings in the Control Panel using the 386 Enhanced icon's Virtual Memory button. OS/2, on the other hand, keeps its swap file settings in the CONFIG.SYS file, where you can change them with a text editor. OS/2's swap file is called SWAPPER.DAT.

To change your swap file settings, look for the line in CONFIG.SYS starting with 'SWAPPATH='. The full statement will look something like 'SWAPPATH=C:\OS2 2048 4096'.

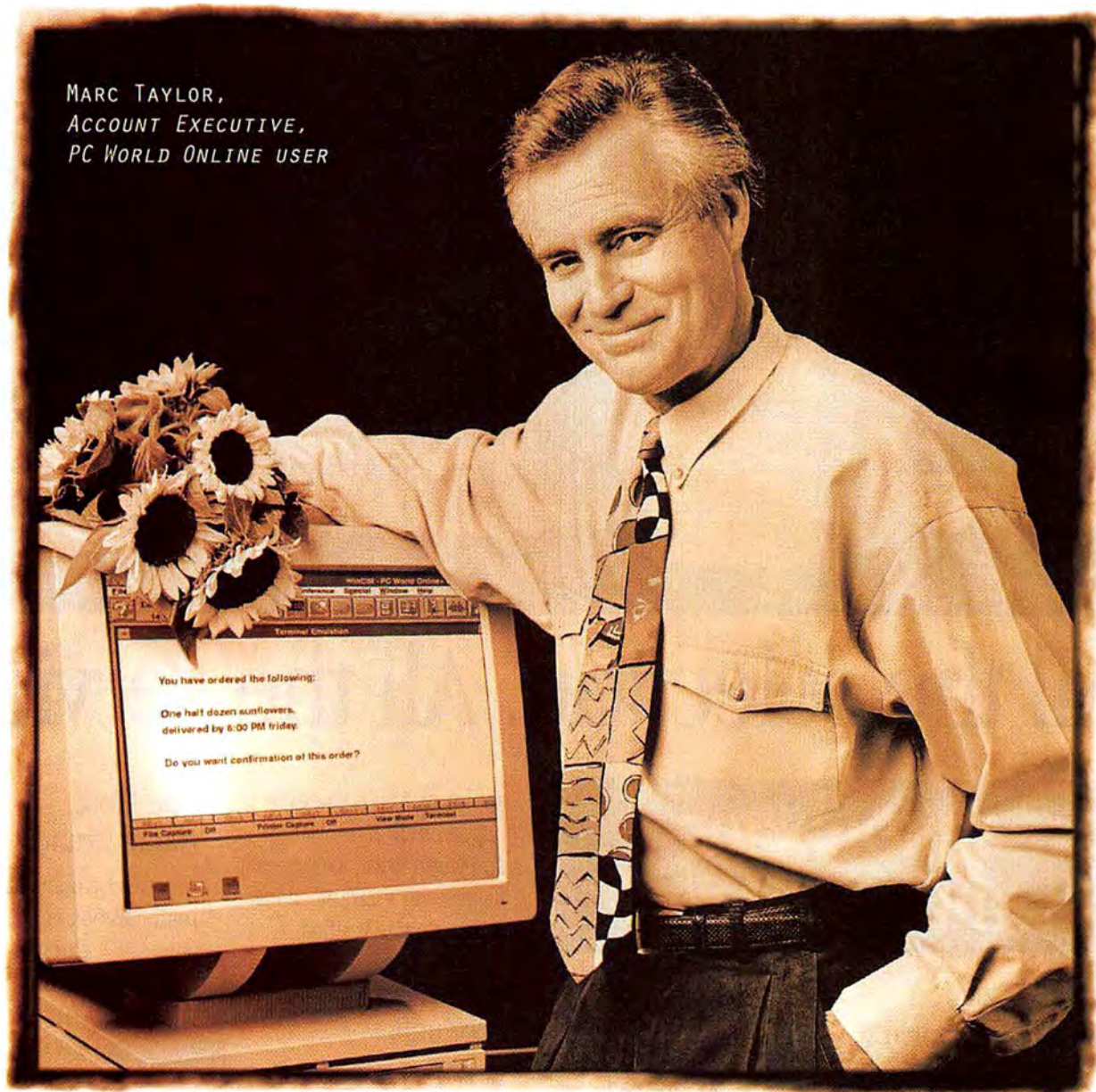
The first parameter, C:\OS2, is a directory on your hard disk. You can modify this entry if you want your swap file stored in a different directory or hard disk. For example, you may want to place it on the disk partition with the fastest access.

The second parameter tells OS/2 the minimum amount of free disk space to leave on your hard disk (2048K). It needs the limit because the swap file can grow and shrink, and if it grows too much, you won't have room for anything else.

The third parameter tells OS/2 how much space to allocate for the swap file initially (4096K). Even though SWAPPER.DAT can grow and shrink, it will operate most efficiently if its space is allocated all at once, so that it isn't fragmented. If you have enough space to spare, I would recommend using a swap file of 10MB to 15MB.

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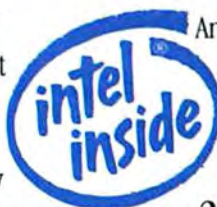
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DATA MANAGEMENT Q & A

Mass Printing dBASE Reports by Date

Q At the end of each month, I must print several sales reports using dBASE III Plus. Because I use the REPORT command's FOR clause to select by date which records to report on, I must tediously type in multiple REPORT commands at the dot prompt. Can you suggest an easier way?
Sam Green, Los Angeles

A You can create a simple dBASE program that asks you for the dates you want to report on and then plugs them into the various REPORT commands you now enter by hand. **FIGURE 1** shows a simple example.

You can create your own program with any text editor; to use the one that

comes with dBASE, enter **MODIFY COMMAND MONEND** at the dot prompt. (If you use another program, save your file as **MONEND.PRG**.) When you create your file, use the names of your own data file, report formats, and date fields, as noted in the program's comment lines. Repeat the two lines for the REPORT command for each report you want to run, changing report and data field names accordingly. My sample **MONEND.PRG** is available on PC World Online (see page 12 for information).

Once the program is created, simply enter **DO MONEND** at the dot prompt when you're ready to print your reports. You'll be prompted for the start and end dates for the period you want to report on, and then dBASE will do the rest. I

devised the sample program so it will automatically display as the start date the first day of the previous month and '94 as the current year. The current date is shown as the end date for the report. You can revise the program to use other defaults if you like.

Field Edits in Paradox

Q I'm new to Paradox 4.0 and can't figure out one thing. When I want to change a value in a field, I have to backspace over the whole thing and reenter it. Is there a way that I can edit it properly?

D. Myers, Boston

A With the cursor in the field you want to change, press **<Ctrl>F** or **<Alt>F5**; this will bring you into what Paradox calls Field View. Here you can truly edit, with the cursor keys moving the cursor from character to character instead of from field to field, and **<Home>** and **<End>** taking you to

USER GROUP TIP

Printing Months in FoxPro

I often need to export a date field from my FoxPro database for use in a word processor. If I simply export the field using **COPY FIELD Date TO filename DELIMITED**, the date looks like '19930110.' To make it easier to read, I insert a character field called **Exportdate**, which has a length of 10, in the database. I then **USE** the database and enter **REPLACE Exportdate WITH DTOC(date) ALL**, where **date** is the name of the date field I'm exporting. I then type **COPY TO newfile FIELDS Name, Exportdate DELIMITED** putting the fields I want to export in between **FIELDS** and **DELIMITED**. If I want just the month, I substitute **CMONTH(date)** for **DTOC(date)**.

*Tom Rombouts
Los Angeles Computer Society*

the beginning and end of the value. When you're finished editing, press **<Enter>** to get out of Field View.

Seeing Stars in Paradox for DOS

Q I've got a Paradox 4.0 multitable form with a lot of number columns. To make them all fit across the screen, I used **Field*Reformat** to shrink each field down to just a few characters. But now when I use the form, Paradox displays asterisks instead of numbers. What did I do wrong?

Martin Waring, Oklahoma City

A For some reason, Paradox for DOS requires you to include four extra spaces (five if you need to show negative numbers) for each number field in a form. If you can't spare the extra space and a field contains nothing but integers

```
* Substitute the name of your data file for
* FileName in the next line
USE FileName

startdate = CTOD(STR(MONTH(DATE())-1) + "/01/94")
enddate = DATE()

CLEAR
@ 10,10 SAY "Enter report start date: "
@ 10,40 GET startdate PICTURE "@D"
READ
@ 12,10 SAY "Enter report ending date: "
@ 12,40 GET enddate PICTURE "@D"
READ

CLEAR
@ 23,30 SAY "Printing reports..."

* Repeat the next two lines for each
* report you want to print.
* Substitute the name of your report form
* for REPORT1 and the name of your date
* field for DateField.

REPORT FORM REPORT1 FOR DateField >= startdate;
.AND. Date <= enddate TO PRINTER

CLEAR
```

FIGURE 1: PRINT MULTIPLE REPORTS using a date range with this handy dBASE program.

(whole numbers), use *Modify•Restructure* to change the field type to **S**, for short number; then Paradox won't need the extra space.

Quick Selects in Paradox for Windows

Q When I'm designing forms and reports with Paradox for Windows, I sometimes want to select several objects so I can move or otherwise change them at the same time. I know I can press <Shift> and click the objects one at a time, but this is tedious when there are dozens of objects involved. The Edit menu has a choice for Select All, but this doesn't help unless I want to work with all or almost all of the objects in the window. Is there a quicker way to highlight a lot of items at once?

Lou Romero, Van Nuys, California

A Yes. Press <Shift>, click, and drag to create a box around the items you want to select. When you release the mouse key, all the objects in the box will be selected.

Time-Stamping Paradox for DOS Records

Q I use Paradox 4.0 to enter details on the telephone calls I make to clients. Every time I record a new call, I enter the current date and time. It would be great to get Paradox to do this for me, but I don't want to do any programming. Can you help me?

Eric Downey, Houston, Texas

A Yes, I can. You can use Paradox's SETKEY command to set up a hot key for time-stamping records. You'll have to use a few programming commands, but it's not a big deal.

Select *Scripts•Editor•New* to create a script called **INIT** in the directory where you keep your Paradox files. If the script already exists, use *Scripts•Editor•Open* to edit it. Either way, add the line **SETKEY 20 [date field] = TODAY() [time field] = TIME()** to the script, where *date field* and *time field* are the names of the fields you want to date and time-stamp. The '20' in the command is the ASCII key code for <Ctrl>-T, and the command tells Paradox to put the current date and time into the fields you name when you press that key combination. There's nothing special about <Ctrl>-T; to use a different key combination, simply substitute another key code number. Your PAL documentation includes a table of ASCII key codes in an appendix.

When you use SETKEY, it's important to keep all the commands you want associated with a hot key on one line. Luckily, a line can have as many commands as you like. For example, you could add 'MOVETO [Notes]' to the SETKEY line to have Paradox move the cursor to a field called Notes after the other fields get stamped.

After you've added the line, select *Go* from Paradox's script editor menu to play the script and activate the new hot key. You

won't need to play the script again, though; Paradox runs the INIT script automatically when you load the program.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World and the author of The Paradox 4.0 Handbook (Bantam Computer Books, New York, 1992). Data Management welcomes your questions (see page 12 for contact information). ■

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PUBLISHING & PRESENTATIONS MAKEOVER

The Right Tool for the Job

That old gray spreadsheet ain't what it used to be. Take the case of accountant and 1-2-3 user Larry Rotstein. He uses his spreadsheet not only for number crunching but for publishing *The Owner/Manager*, a bimonthly newsletter for his self-employed clients. How does he do it? He uses WYSIWYG, a 1-2-3 DTP add-in that lets him work with fonts, graphics, and other fancy effects.

But although 1-2-3 is *capable* of assembling a newsletter, it's not the best tool for the job. The nonprofessional designer needs all the help he or she can get—starting with the right tools.

So what's our advice for Rotstein? First, we'd tell him to get out of character-based DOS and into a graphical user interface (GUI) such as Windows or OS/2. Newsletters are inherently graphical and, as a result, are much easier to create in a graphical environment.

Next, we'd steer him toward an application that's designed to work with text. Since he's devoted to 1-2-3, we'd suggest Lotus's Ami Pro: it will integrate seamlessly with 1-2-3, and it has a robust set of layout tools.

Making Arrangements

Of course, finding the right tools is only half the battle. Rotstein still has to put them to good use. Putting ourselves in his shoes, we set about redesigning his newsletter with Ami Pro.

The masthead at the top works well enough as is. We did move *The* closer to the center, which makes the title hang together better visually. We also reduced the size of the date and issue information under the title.

The body of the page needs more help. The two-column format, coupled with the split masthead, divides the page too starkly. We moved to a three-

column format instead. Taking advantage of Ami Pro's flexibility with fonts, we replaced the original's sans serif Swiss face with a serif typeface in the body text and masthead.

We also changed the column layout. In the original, WYSIWYG has inserted spaces between words to keep the column widths consistent. This leaves wide, unsightly spaces on the page—what designers call *rivers*. We switched to a *ragged right* layout, which means the right side of each column forms a jagged line, individual words are spaced evenly, and the rivers dry up.

Who's Number One?

We then set about rearranging the elements of the page in order of importance. In the current design, the first thing you look at is a box in the upper left corner of the page, proclaiming that this is the newsletter's first issue. Though the announcement is undoubtedly important to Rotstein, his readers will be more drawn to the story "Should I Incorporate?" which we therefore moved to the top.

Next we turned to the chart in the lower right corner of the original. It's too large for the page, it strays too far into the left-hand column, and it's just plain hard to read. We narrowed it down to a single column and reduced its detail so only the most fundamental information remains. We also used the handy charting tools of 1-2-3 for Windows to make the chart more visually appealing.

While we applaud Mr. Rotstein's ingenuity, the switch to a GUI environment and a tool designed specifically to work with text should help him create a better-looking product in less time.

By David Brickley and Dan Miller

The redesign was performed by David Brickley, a designer based in Moss Beach, California. Dan Miller is an assistant editor for PC World. Publishing & Presentations welcomes your document and presentation makeover candidates. See page 12 for contact information.

Before

The

Owner Manager

Issue #1

July 1993

ISSUE

Welcome to our first issue. We will keep you informed on accounting, tax and other financial matters affecting you. As our newsletter banner suggests, we will offer ideas and suggestions to benefit present and future owner/managers. If there are specific issues you would like us to cover, feel free to contact us.

Should I Incorporate?

For new businesses starting out and profitable unincorporated businesses this question is asked more than any other. The following chart highlights some of the pros and cons of incorporation.

Pros	Cons
limited liability	cost of setup
lower income taxes	record keeping
more credibility	possible double taxation
estate freezing	more regulations
transferable ownership	cost to windup

On the Pro side, limited liability and lower income taxes are the most common reasons to incorporate. Limited liability means that the shareholders of the corporation may not be liable for actions carried out by the corporation. The most common example is where a corporation goes bankrupt owing monies to unsecured creditors. These creditors cannot recover the monies owed to them from the shareholders of the corporation. However, in some cases directors of the corporation may be liable for actions of the corporation. In addition, some creditors such as banks, require security from the shareholders if the corporation borrows monies from the bank. This security may be mortgages taken out against the shareholder's home. In a future newsletter a lawyer will review some methods available to protect corporate assets from creditors.

Does Incorporation save income taxes?

Generally speaking yes. Figure 1 shows a chart comparing the various marginal personal income tax rates in Ontario with Canadian active business corporation income tax rates at various taxable income levels. As the chart shows, once income exceeds approximately \$60,000 the difference in income tax rates between personal and corporate is 30%. This offers substantial savings as illustrated below.

Mr. A earns \$100,000 before income taxes from his business. Mr. A requires \$70,000 for personal use and the remaining \$30,000 is reinvested in the business. As an unincorporated business, Mr. A will pay \$15,700 of tax on the \$30,000 of profit leaving only \$14,300 to reinvest in the business. As an incorporated business Mr. A's company will pay only \$6,700 on tax on the \$30,000 profit left in the corporation, leaving \$23,300 to reinvest, an extra \$9,000 over the unincorporated business. If the \$70,000 profit required for personal living expenses is pulled out of the corporation as salary, the income tax on the \$70,000 is approximately the same whether earned through a corporation or not. However, if Mr. A has minor children, additional income tax savings can be achieved through income splitting. These savings could be as high as \$5,000 per child after tax. In addition estate planning/freezing is available.

Personal & Corporate Income Tax Rates Comparison

(Figure 1)

The Owner Manager

Issue One

A newsletter for the friends and clients of Rich Rotstein and Katz Chartered Accountants

July 1993

Should I Incorporate?

For both business start-ups and

from creditors.

Does incorporation save income taxes? Generally speaking, yes. Figure 1 compares the various marginal personal income tax rates in Ontario with Canadian active business corporation income tax rates at various taxable income levels. As the chart shows, once income exceeds approximately \$66,000, the difference between personal and corporate tax rates is 30 percent.

This difference can offer substantial savings to incorporated individuals. Let's take the example of Mr. A. Mr. A. earns \$100,000 from his business before income taxes. He requires \$70,000 for personal use, and the remaining \$30,000 is reinvested in the business. As an

unincorporated business, Mr. A will pay \$15,700 of tax on the \$30,000 of profit, leaving just \$14,300 to reinvest in his business. If, on the other hand, Mr. A files as an incorporated business, he will pay only \$6,700 of tax on the \$30,000 profit left in the business, leaving \$23,300 to reinvest--\$9,000 more than if he'd filed as an unincorporated business.

If the \$70,000 required for personal living expenses is pulled out of the corporation as salary, the income tax on the \$70,000 is approximately the same whether earned through a corporation or not. However, if Mr. A has minor

limited liability and lower income taxes are the most common reasons to incorporate. Limited liability means that the shareholders of the corporation may not be liable for actions carried out by the corporation.

an example is if the corporation goes bankrupt and the shareholders cannot recover their investment from the corporation.

- Pros & Cons -

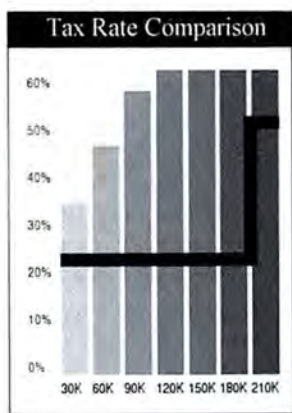
Limited Liability
Lower Income Taxes
More Credibility
Estate Freezing
Transferable Ownership

Cost of Setup
Record Keeping
Possible Double Taxation
More Regulations
Cost to Wind Up

However, in some cases directors of the corporation may be liable for actions of the corporation. In addition, some creditors, such as banks, require security from the shareholders

may be the

have a methods to assets



Corporate Tax Rate vs. Personal Tax Rate: The vertical bars represent the personal tax rate; the line represents the corporate tax rate.

additional income can be realized through the corporation. These savings can be as high as \$5,000 per year. In addition, estate planning is available through corporations which can substantially reduce the income taxes payable (continued)

Our First Issue

Welcome to our first issue. We will keep you informed on accounting, tax and other financial matters affecting you. As our newsletter banner suggests, we will offer ideas and suggestions to benefit present and future owner/managers. If there are specific issues you would like us to cover, feel free to

5 Don't skimp on the graphics: Not only do they convey information, they make an otherwise drab page more inviting.

COMMUNICATIONS Q & A

When Is E-Mail Private?

Q When I send E-mail through online services like CompuServe or MCI Mail, how private is it? Can employees of these services read my mail?

•Hannah Benkart, Lima, Ohio

A Most online services will assure you that your E-mail is completely safe from prying eyes, but this may not be the case. We called a couple of the more popular services to find out what they do to keep your E-mail private.

Most of the services we spoke to admit that some employees can gain access to users' E-mail. Debra Young, spokesperson for CompuServe, says, "There's always a remote chance that a programmer may see a message." Paul Putong, manager for mail support at MCI Mail, concurs. "There's a small

"any intrusions into [your] privacy could not be hidden from their bosses," he says. "Nobody's going to be able to read your E-mail secretly." The real threat to E-mail privacy, he points out, is from law enforcement officials. According to a provision of the Electronic Communications Privacy Act, the government can require an online service to keep backups and supply them on request.

Your E-mail may be more vulnerable on smaller, less formal services. Mail on the Internet, for example, may be stored in numerous host computers before it's sent to the addressees; there's no guarantee it isn't being read by others along the way. Many computer bulletin board operators inform callers that E-mail privacy isn't guaranteed.

The bottom line is that you should use the same discretion on a public E-mail system as you would on your company's network. Never write anything in E-mail that could be personally or professionally damaging. If you must

write something private, encrypt it prior to posting. One of the best encryption programs is Philip Zimmerman's Pretty Good Privacy freeware utility. It's available on PC World Online as PGP/ZIP (see page 12 for information).

Finally, remember that most violations of E-mail privacy occur because of carelessness with passwords. *Never* share your password with anyone or use the same password on two systems. And always choose your password carefully; don't use something obvious like your name, your phone number, or the brand of your computer.

V.42 Trials and Tribulations

Q I have a new V.42 14.4-kilobyte-per-second modem, but I'm having problems connecting to other 14.4-Kbps modems. Sometimes I'll connect and get a message that the modems have made an MNP/REL link, but the connection breaks soon after that. Other

times, gibberish spills over the screen right after connect. What's going on?

Steven Sorensen, Scotts Bluff, Nebraska

A It sounds like your modems are suffering from V.42bis incompatibility. V.42bis is the data compression portion of the V.42 error-correction standard. In your case, the two modems can't agree on how they're going to compress data; in modemesec, we'd say their V.42bis handshaking is unsuccessful. During the handshaking, one of the modems is giving up on V.42bis and falling back on MNP 5 compression instead. The other modem, expecting V.42bis compression, gets stymied and drops the connection. The two V.42 modems' compression falls out of sync, and you get gibberish on your screen. The symptoms are not uncommon; incompatibility among this breed is epidemic. So what's the cure?

First, make sure your modem is set up correctly. Find the command in your modem manual for AutoReliable Mode or something similar. This command forces the modem to negotiate the best protocol it can with its counterpart. For my modem, the command is \N3, but yours may be different. Enter the modem setup section of your comm software and splice this command into your modem's initialization string. Next, follow the same procedure to make sure you have RTS/CTS or hardware flow-control enabled.

If the modems still won't connect, you may have to turn off data compression. First edit your modem initialization string to turn off MNP 5. If the problem persists, turn off V.42bis the same way. No compression means slow online E-mail connections, but it will speed up transfers of compressed files.

By Judy Heim

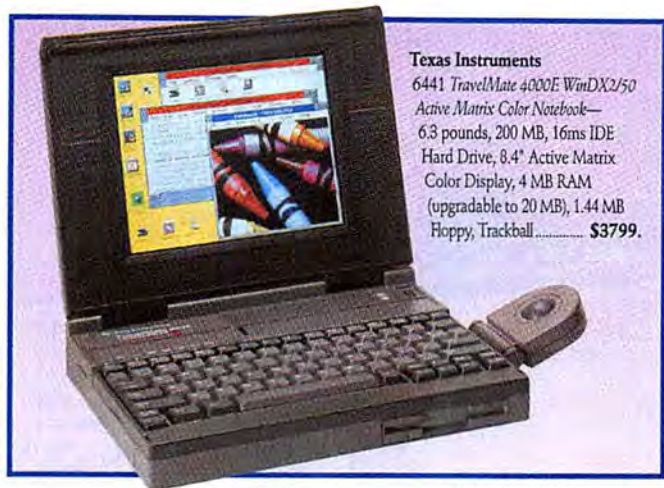
Judy Heim is a contributing editor for PC World and editor of Online Investor, a newsletter about using online services to track and manage investments. Communications welcomes your questions. See page 12 for contact information.

Most online services will assure you that your E-mail is completely safe from prying eyes, but this may not be the case.

group of people who, to troubleshoot customer problems, may have to look in people's mailboxes."

Even though their employees can theoretically gain access to your mail, the big online services insist that safeguards built into their systems thwart snooping. The first step, according to Young, is to perform background checks on all new hires who might have access to users' E-mail. The next step is to make it tough for employees to access the mail. Upendra Gupta, manager of applications development for Sprint-Mail, says that "a customer service rep can look at the envelope, but they cannot read the text." Most services have systems that alert management if a subscriber's mailbox security is violated.

According to Mike Godwin, legal service counsel for the Electronic Frontier Foundation, these and other security measures should safeguard your privacy. Employees of these services know that



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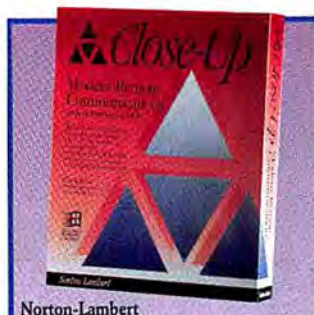
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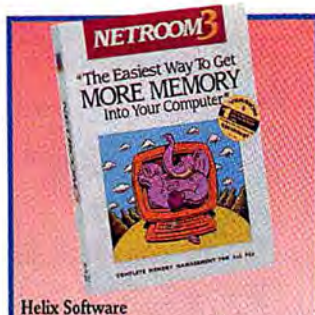
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HARDWARE Q & A

Parallel Versus Serial Printers

Q The laser printer I want to buy gives me a choice of a parallel or a serial interface. Which is better?

Cindy Claxton, Rochester, New York

A As a general rule, opt for the parallel interface. Parallel data moves along 8 bits at a time, while serial data transmits 1 bit at a time, so print times are faster with a parallel port. And why waste one of your PC's serial ports? You seldom use parallel ports for anything but connecting printers, while serial ports are commonly used for modems, mice, and other devices. They're also harder to configure than parallel ports.

So why do printer manufacturers offer two interface options? Because if your printer isn't near your PC, you'll need to go serial. Parallel printer cables should generally be no longer than 10 feet, though you can probably get away with 15 before you start losing data or getting printer errors. Serial printer cables can be as long as 50 feet.

Get a New Driver!

Q I'm satisfied with my new super-VGA video board except for one thing. Sometimes when I'm working on a Windows document at 800 by 600 resolution, colorful little bits of junk appear on screen. This seems to be a particular problem when I use my paint program. Do I have a defective video board?

John Hull, San Antonio

A No, but you have a funky *driver*. Designed to enable hardware to talk to software, drivers are little programs (usually supplied by the hardware manufacturer) that often seem to have been released before they're ready. Some companies take more care developing drivers than others, but far too many video drivers exhibit the kind of problem you describe.

Call the video board company and make sure you have the most recent revision of your board's Windows driver set (you need a different driver for each

resolution and color density). If not, the company will mail the set to you on disk free of charge, or you can download it from the company's bulletin board system. One warning, though: Sometimes the new driver corrects an old problem but creates a new one.

Fast Machine, S-l-o-o-o-w Floppy Drives

Q I recently upgraded from an old Compaq portable with 360K floppy drives to a new 386 with 1.2MB and 1.44MB floppy drives and a hard disk. To my surprise, it takes much longer to access floppy disks on the new machine. How can I speed things up?

Robert Dehoney,

Isle of Palms, South Carolina

A You can't. The reason it takes longer is that the new drives must determine the floppy format (1.2MB or 360K, 1.44MB or 720K) before they can access the disk. Your old Compaq's drives were set for double-density disks, period, so there was no lag time. The best solution is to break the floppy habit as soon as possible and copy as much as possible to the hard disk.

When Slower Is Better

Q A while ago you mentioned that some PCs have a "turbo" button that actually slows down the system when you push it. My PC doesn't have one, but if it did, my problem might be solved. I have a golf program that runs way too fast on my new system. Is there any way I can slow my system down?

Milton Jerabek, Muncie, Indiana

A When you run them on a fast machine, many games accelerate beyond any human ability to play them. Fortunately, you can slow most PCs down to the pace of an 8-MHz IBM AT, which should be slow enough. Consult your system manual—sometimes you can throttle down with a keyboard command. If not, start your system's configuration routine, which you do on most systems by running a floppy-based

utility or by pressing a key combination such as <Ctrl>-<Alt>-<Esc>, <Ctrl>-<Alt>-<Insert>, or <Ctrl>-<Alt>-S (or try pressing <Esc> while your system does its power-on self test). You'll see a menu option that says something like 'Default speed'. Choose the slowest option, save the change, and restart your system. Happy golfing!

Are Two Disks Caches Better Than One?

Q My system has a caching controller board with 4MB on it. Can I get even better performance by using disk caching software as well?

James Council, Camarillo, California

A Probably not, so adding a software cache would be a waste of memory. You'd also run the risk of a conflict between the cache controller and the disk caching software, which could slow down your system or crash it. If you think that you need a bigger cache—for a huge data base, say, or a network server—you can either add memory to the card (if it will let you) or disable the controller's cache and opt for a bigger software cache. I've never seen a consistent, demonstrable difference between the performance of software caches and hardware caches, except in cases where the CPU is constantly pushed to the limit (a data base server that provides processing services to an entire work group is one of the few examples that I can think of).

Pushing the Memory Envelope

Q I've heard about new SIMMs [single inline memory modules] that come in 8MB and even 16MB sizes. My system has a total of four SIMM sockets, all of which contain 4MB SIMMs. Can I increase my memory beyond 16MB by replacing some of them with 8MB SIMMs?

Brian Siener, Terre Haute, Indiana

A Theoretically, yes. A good share of systems sold within the past few years can hold 32MB or more, but

check your manual or call your manufacturer's tech support to be sure.

While you're checking, make certain your system lets you mix and match SIMMs of different memory densities (1MB, 4MB, 8MB, and so on), and find out whether there are any restrictions on the combinations you can add.

Because your system has four SIMM sockets, it probably uses 72-pin SIMMs instead of cheaper, more common 30-pin SIMMs, which means you can add SIMMs one at a time instead of having to add them four at a time. If you're lucky, your system will let you install SIMMs of different densities in any combination, so that between 16MB and 32MB, you'll have a choice of any configuration except 23MB, 27MB, 30MB, and 31MB.

The trick is to keep as many of those original 4MB SIMMs as possible. For instance, you might think you want only 18MB, but that would mean you'd have to replace all four 4MB SIMMs with two 8MB SIMMs and two 1MB units. Go for 20MB instead, and you'll need only swap one 4MB SIMM for an 8MB one.

Math Coprocessors: Cyrix or Intel

Q I have a 386 PC and want to get a math coprocessor. I'd like to buy a Cyrix FastMath—it costs the same as an Intel 387, and it's supposed to be faster. Will it work in my system even though I have an Intel CPU instead of a Cyrix CPU?

Rich Banh, Alhambra, California

A Absolutely. Cyrix was in the math coprocessor business before it began making CPUs, and its FastMath coprocessors are designed as alternatives to Intel 387s. They're compatible with virtually any software a 387 can run (some hardware diagnostic software may hang when it encounters a FastMath chip, but that's about it). In the highly unlikely event that you encounter a problem, the Cyrix chip comes with a limited lifetime warranty.

Stash That Manual!

Q I don't have the manual for my fax-modem board, and the manufacturer seems to have gone out of business. I need to reconfigure the board for COM2. It has three DIP switches and four jumpers. Is there a standard setting? I really don't want

to buy a new board just because I don't have the manual.

Larry Mormino, Cary, North Carolina

A Unfortunately, you may have to do just that. If you didn't keep the manual or never got one, you're out of luck if the manufacturer evaporates. Every board is different, and guessing at settings can play havoc with your PC. These days a no-name 9600-bps fax-modem costs only about \$50, so

buying a new one won't clean you out. The moral? Make sure you have documentation on every board and drive (not to mention the system) when you buy a PC. If you're missing anything, order it from the manufacturer pronto and keep it in a safe place.

By Eric Knorr

Eric Knorr is a contributing editor for PC World. Hardware welcomes your questions. See page 12 for contact information. ■



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Once you discover just how easy it is to install a backpack CD-ROM drive to your computer, you'll never be inconvenienced by conventional installation methods again. Just plug backpack into your computer and you're ready to go. No interface cards, hardware conflicts or expansion slots required. Because of its unique printer port interface, backpack fits all IBM PC compatibles and portables regardless of CPU speed. In addition, a built-in audio circuit with both headphone and line output jacks allows for connection of sound cards or Hi-Fi. You can run thousands of your


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Circle 200 on reader service card

STAR-DOT-STAR TIPS

Good Archive Is the Best Defense

When you finally get AUTOEXEC.BAT and CONFIG.SYS tuned correctly for your system, it's frustrating to have an installation program come along and add, change, or delete lines. D-FENS.BAT [FIGURE 1] protects these and other important files like WIN.INI and SYSTEM.INI by saving the last five versions in a directory you specify.

D-FENS.BAT uses the /M option of DOS's XCOPY command, which

copies only files that have the Archive attribute. (Whenever a file changes, DOS sets this attribute so the system will know that it needs backing up.) XCOPY /M also clears the Archive attribute after the copy, so it's copied only once each time it changes.

To use D-FENS.BAT, add a line to your AUTOEXEC.BAT for each file you want to archive. Four parameters are expected on the command line: the drive and directory where the file resides, the name of the file (without the extension), the extension, and the archive directory. For example, to protect AUTOEXEC.BAT, insert the command **CALL D-FENS C:\AUTOEXEC.BAT C:\ARCHIVE**.

Remember to create the archive directory (in this case, C:\ARCHIVE) beforehand and to use CALL to run D-FENS.BAT from within another batch file. Every time your system reboots, D-FENS will check C:\AUTOEXEC.BAT and, if its Archive attribute is set, copy it to C:\ARCHIVE\AUTOEXEC.001. Prior versions (up to four) are kept as AUTOEXEC.002 through AUTOEXEC.005. I use D-FENS for AUTOEXEC.BAT, CONFIG.SYS, WIN.INI, and SYSTEM.INI. The XCOPY command is available only in DOS 3.3 and later, so you'll need at least this version of DOS to run D-FENS.BAT.

*Malcolm Michael,
Castro Valley, California*

Editor's note: Michael created this utility to save older versions of configuration files, but it's also excellent for word pro-

cessing documents, spreadsheets, and other files you update regularly. For years, I've used a similar technique to save older versions of my phone directory and to-do lists to another hard disk. Not only does it allow me to undo inadvertent changes, it serves as an automatic backup; I've recovered nearly current versions of these files after losing data to a corrupted DoubleSpace Compressed Volume File. You can also download D-FENS.BAT from PC World Online (see page 12 for more information).

Looking for Lines in WordPerfect 5.1

The June 1993 *Star-Dot-Star* column features a macro that counts the lines in a WordPerfect 5.1 file. I have a method that's simpler and doesn't necessarily require a macro. To use it, finish and save your file. Then go to the top of it by pressing <Home> twice, then <Up>. Next, press <Shift>-<F6> (Format), L (Line), N (Line Numbering), and Y (Yes). Go to the bottom of the document by pressing <Home> twice, then <Down>, then <Shift>-<F7> (Print), and finally V (View Document). You'll see your document on screen with the lines numbered consecutively. The last line contains the total lines. Exit the document without saving it so the line numbers won't show when you print it.

Russ Whitworth, Fisherville, Ontario

Editor's note: This procedure displays an on-screen preview of the document with line numbers in the left margin—handy for reviewing the document and counting lines. While this method doesn't have to take the form of a macro, it's helpful to record it as one so you won't have to remember all the keystrokes. If you have another macro that calculates line count, you'll still want to use the macro in last June's column, because (unlike this approach) it can store the line count in a variable.

Backup Boon

If you've ever used MS-DOS's BACKUP utility, you may have wondered what directory or directories were

```
@Echo Off
If x%4==x Goto ErrUsage
If Not Exist %1\%2.%3 Goto ErrFilMiss
If Not Exist %4\NUL Goto ErrBakMiss
If Not Exist %4\%2.001 Goto FirstBak
XCOPY %1\%2.%3 %4 /m /v > NUL
If Not Exist %4\%2.%3 Goto EndItAll
Echo Backing Up %1\%2.%3 To %4
If Exist %4\%2.005 Del %4\%2.005
If Exist %4\%2.004 Ren %4\%2.004 %2.005
If Exist %4\%2.003 Ren %4\%2.003 %2.004
If Exist %4\%2.002 Ren %4\%2.002 %2.003
If Exist %4\%2.001 Ren %4\%2.001 %2.002
Ren %4\%2.%3 %2.001
Goto EndItAll

REM ***** First Backup Of A File
:FirstBak
Echo Initial Back-Up Of %1\%2.%3 To %4
Copy %1\%2.%3 %4\%2.001 > NUL
Goto EndItAll

REM ***** Error Conditions
:ErrFilMiss
Echo D-FENS.BAT: The file %1\%2.%3 does not exist.
Goto EndItAll
:ErrBakMiss
Echo D-FENS.BAT: The directory %4 does not exist.
Goto EndItAll
:ErrUsage
Echo Usage: D-FENS drive:\subdir file ext drive:\subdir
Echo (use drive letter without \ for root directory)
Echo Example: D-FENS C:\Windows Win Ini C:\Archive

:EndItAll
```

FIGURE 1: BACK UP KEY FILES AUTOMATICALLY to the location you specify by CALLing D-FENS.BAT from your AUTOEXEC.BAT file.

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PCW3/94

USER GROUP TIP

Norton Commander
Quick Finds

While managing files in Norton Commander, I'll inevitably need to search for a file or files containing specific text. Instead of moving to another program, I press <Alt><F7> to load Commander's built-in file finder. Not only can I use Commander to find the files, but I can quickly view the ones it's found while Commander searches for more. I can move (<F5>), copy (<F6>), or delete (<F8>) selected files as well.

Allan Greenberg

Los Angeles Computer Society

backed up to a particular set of disks. DOS doesn't give you any way to discover this information, so I've written a utility called RESTHELP.COM that will provide it for you. To use this program, insert the first disk of the backup in a floppy drive and type **RESTHELP A:** or **RESTHELP B:** (depending on which drive contains the floppy). RESTHELP will respond with the **RESTORE** command required to restore the files to the directory from which they came. RESTHELP works by scanning the **CONTROL.OO1** file on the backup disk for the directory from which the files were originally backed up.

Daniel A. Smith,

Follansbee, West Virginia

Editor's note: This utility works only with MS-DOS 5.0 and earlier. MS-DOS 6.0 and 6.2 replace **BACKUP** with the **MSBACKUP** program, but many users, wary of reported problems with Microsoft's latest DOSes, have postponed upgrading. If you're using MS-DOS 6.0 or 6.2, don't bother with RESTHELP.COM. Unlike **BACKUP**, **MSBACKUP** is not a command-line utility; it writes its archive files differently and lets you see the contents of a disk backup before restoring. If you're still using an earlier version of MS-DOS, however, or you've decided to keep your old **BACKUP** and **RESTORE** programs around for command-line simplicity, use the **DEBUG** script in **FIGURE 2** to create **RESTHELP.COM**. To compile the program, transcribe

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Circle 60 on reader service card

n resthelp.com

```
E100 EB 6E 00 08 00 75 03 E8 4D 69 73 73 69 6E 67 20
E110 70 61 72 61 6D 65 74 65 72 2E 0D 0A 24 46 69 6C
E120 65 20 61 63 63 65 73 73 20 65 72 72 6F 72 2E 0D
E130 A0 24 43 3A 5C 24 00 00 0D 0A 20 52 45 53 54 4F
E140 52 45 20 24 00 00 00 00 5C 2A 2E 2A 0D 0A 24 00
E150 41 3A 5C 43 4F 4E 54 52 4F 4C 2E 30 30 31 00 00
E160 BA 08 01 EB 03 BA 1D 01 B4 09 CD 21 B4 4C CD 21
E170 BE 80 00 AC 3C 00 74 E8 29 C9 88 C1 BF 50 01 AC
E180 3C 60 7C 02 2C 20 3C 41 7C 07 3C 42 7F 03 AA EB
E190 04 E2 EC EB CB B8 40 3D BA 50 01 CD 21 72 C6 89
E1A0 C3 B8 00 3F B9 FF 00 BA 00 02 CD 21 72 B7 BA 38
E1B0 01 B4 09 CD 21 BA 16 50 01 B4 02 CD 21 BA 16 51
E1C0 01 B4 02 CD 21 B2 20 B4 02 CD 21 BA 32 01 B4 09
E1D0 CD 21 BE 8C 02 BA 14 80 FA 00 74 07 46 B4 02 CD
E1E0 21 EB F2 BA 48 01 B4 09 CD 21 B4 4C CD 21
RCX
EE
W
Q
```

FIGURE 2: SPEED DOS 5.0 RESTORES USING RESTHELP.COM.
The program scans your backup disks and supplies the correct path information for the RESTORE command line.

the listing carefully into a plain ASCII text file called RESTHELP.SCR (using an editor such as the EDIT program that comes with MS-DOS 5.0). Then enter the command **DEBUG < RESTHELP.SCR** and press <Enter>. The program RESTHELP.COM will appear in the current directory. You can also download RESTHELP.SCR or RESTHELP.COM from PC World Online.

Instant Install for Windows Apps

Think that performing multiple installations of Windows apps developed in-house requires an elaborate setup program like those included with commercial programs? At our network site we've figured out how to install programs with a simple batch file.

First, the batch file creates a new directory for the application and copies the application's files into that directory. Next, it copies a ready-made Program Manager group file (with the extension GRP) to the Windows directory. Finally, the batch uses a utility called INIMAN from Saber Software to add that group to the [Groups] section of PROGRAM.MAN.INI and to give it a unique group number. When the user next starts Windows, the application appears in the new group. If we want to install the applica-

tion in an existing group, we name the group in which the application first appears 'Temporary Group,' and instruct the user to move the application's icon from the temporary group to its final destination and to delete the temporary group afterward.

*Ghassan Karam,
Geneva, Switzerland*

Editor's note: This tip demonstrates a clever way to install Windows applications from a DOS batch file. One key feature of this technique is that it copies a premade GRP file to the user's disk. This sidesteps the dangers of messing with the internals of Windows' GRP files (which

use an undocumented, proprietary binary format). The batch file uses Saber Software's INIMAN utility to change PROGRAM.MAN.INI, a text file that can also be modified by a simple BASIC program. (INIMAN, part of Saber Software's LAN Workstation product, is a utility whose job is to modify INI files automatically and safely. It can even do the updates transparently as Windows users log on to a network.) Two catches: First, it won't work with commercial programs that come with their own setup or install utilities; second, the user can't be in Windows at the time the batch file is run. The batch file should therefore check to make sure it's not running in a Windows DOS session (using a utility such as INWINEQ1, featured in the December 1991 *Star-Dot-Star*, or by first issuing DOS's EXIT command) before installing the app.

LAN Workstation \$179, \$39 for additional nodes; Saber Software Corp.; 800/338-8754
Reader service number 606

By Brett Glass

Brett Glass is a contributing editor for PC World. Star-Dot-Star welcomes your tips, macros, batch files, and short programs (see page 12 for contact information).

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The interface consists of a title bar, menu bar, Button bar, Power bar, document work space, and status bar. To open a menu, click it or press <Alt> or <F10>, then press its underlined letter. Right-click a bar, text, selection, margin, graphic, parts of some dialog boxes, or other object to open a context-sensitive shortcut menu.

Note: Keys to press are shown here in **boldface**. Keys to press simultaneously are joined by a hyphen. A bullet (•) links menu, option, and button names in a series.

CUSTOMIZING THE DISPLAY

Display draft/page view	<Ctrl>-<F5>/<Alt>-<F5> or View • Draft/Page
Display two-page view	View • Two Page
Magnify/shrink view of document	 or View • Zoom, select or set percentage
Display full-page view	<Shift>-<F5> or View • Zoom • Full Page • OK
Display full-page page view	 or <Alt>-<F5>-<Shift>-<F5>
Show/hide current Button bar	 or View • Button Bar
Show/hide Power/status bar	View • Power Bar/Status Bar
Show/hide ruler bar	<Alt>-<Shift>-<F3>; or  , Set Tabs; or View • Ruler Bar
Move Button bar to floating window or app window's edge	Click on empty area of bar and drag to new location
Show/hide vertical/horizontal scroll bars	Cancel selection (if any), File • Preferences, <Enter>, Vertical/Horizontal • OK • Close

Fold Here

Show/hide title, menu, and other bars	<Alt>-<Shift>-<F5> or View • Hide Bars (<Esc> also redisplay bars)
Show/hide nonprinting characters	<Ctrl>-<Shift>-<F3> or View • Show
Show/hide formatting codes	<Alt>-<F3> or View • Reveal Codes
Display headers and footers/footnotes/endnotes	Display document in page or two-page view
Set default directories; modify menu, Button, Power, or status bar; and set other preferences	File • Preferences, select category, select subcategory for Display or File, set options, OK or Close, Close







MOVING THE CURSOR AND SELECTING TEXT

Move WPW's flashing cursor, or insertion point, by clicking the destination or by using commands shown in this section. Select text by dragging the mouse pointer over it or by holding <Shift> and moving the cursor.

Move to beginning/end of word	<Ctrl>-<Left>/<Ctrl>-<Right>
Move to beginning/end of line	<Home>/<End>
Move to beginning of previous or current/next paragraph	<Ctrl>-<Up>/<Ctrl>-<Down>
Move to top/bottom line of previous or current/next screen	<Page Up>/<Page Down>
Move to beginning of previous/next page	<Alt>-<Page Up>/<Alt>-<Page Down>
Move to beginning/end of document	<Ctrl>-<Home>/<Ctrl>-<End>
Select word	Double-click word
Select sentence	Triple-click sentence or click left margin or Edit • Select • Sentence for current sentence
Select paragraph	Quadruple-click paragraph or double-click left margin or Edit • Select • Paragraph
Select page/document	Edit • Select • Page/All
Cancel selection	Move cursor using mouse or keyboard




Note: To select adjacent words, sentences, or paragraphs using the mouse, hold down the mouse button after the last selection click and drag the mouse.

EDITING TEXT

Cut selection to clipboard	 or <Ctrl>-X or Edit • Cut
Copy selection to clipboard	 or <Ctrl>-C or Edit • Copy
Paste from clipboard	 or <Ctrl>-V or Edit • Paste
Move selection	Drag to destination or cut and paste
Copy selection	Hold <Ctrl>, drag; or copy and paste
Search for text	<F2> or Edit • Find, type text, Find Next
Search and replace text	<Ctrl>-<F2> or Edit • Replace
Delete from cursor to beginning/end of word	<Ctrl>-<Backspace>/<Ctrl>-<Delete>
Undo last action	 or <Ctrl>-Z or Edit • Undo
Redo last action	Edit • Repeat
Restore deletion at cursor	Edit • Undelete
Change selection's case	Edit • Convert Case • Lowercase/Uppercase/Initial Capitals
Replace selected word with synonym	 or <Alt>-<F1> or Tools • Thesaurus
Check grammar/spelling of selection or document	 or <Alt>-<Shift>-<F1>/<Ctrl>-<F1> or Tools • Grammar/Speller

FORMATTING AND STYLING TEXT




Unless indicated otherwise, formatting affects selection, or if nothing is selected, subsequently typed text or subsequent text up to the next formatting of the same kind. A style is a named set of formats.

Format document automatically	 or <Alt>-<F8> or Layout • Styles, select style, Apply
Apply/remove boldface	 or <Ctrl>-B or Layout • Font • Bold
Apply/remove italics	 or <Ctrl>-I or Layout • Font • Italic
Apply/remove underlining	 or <Ctrl>-U or Layout • Font • Underline
Set font	 or <F9> or Layout • Font, select font
Set font size	 or <F9> or Layout • Font, select size
Apply superscript/normal/subscript position	Layout • Font • Position • Superscript/Normal/Subscript
Center line	<Shift>-<F7> or Layout • Line • Center
Apply left/right/center/full (excluding last paragraph line)/complete (all lines) justification	 , Left/Right/Center/Full/All; or <Ctrl>-L/<Ctrl>-R/<Ctrl>-E/<Ctrl>-J/<Alt>-J/A; or Layout • Justification • Left/Right/Center/Full/All
Indent current (unselected) paragraph	 or <F7> or Layout • Paragraph • Indent
Hanging indent/double indent current (unselected) paragraph	<Ctrl>-<F7>/<Ctrl>-<Shift>-<F7> or Layout • Paragraph • Hanging/Double Indent
Set page margins	<Ctrl>-<F8> or Layout • Margins
Adjust left/right margins of current paragraph	Layout • Paragraph • Format • Left/Right Margin Adjustment, set margin, OK
Set line spacing of current paragraph	Layout • Line • Spacing, set spacing, OK
Set number of columns	 , Define; or Layout • Columns • Define, Set number, type, spacing, and width, OK
Bullet or number paragraph(s)	 or Insert • Bullets & Numbers, select style, check/uncheck New Bullet or Number on ENTER, OK

Fold Here


WORDPERFECT 6.0 FOR WINDOWS

FORMATTING AND STYLING TEXT (continued)

Set/clear tabs	Display ruler bar,  to select type, click ruler to set, drag tab to position or off to clear
Add border to paragraph(s)	Layout • Paragraph • Border/Fill, select type, OK
Copy selection's format to other text	 or Layout • QuickFormat, select other text,  or Layout • QuickFormat
Create new style	<Alt>-<F8> or Layout • Styles, Create, type name, select type, type format keystrokes, OK
Create new style from selected text	<Alt>-<F8> or Layout • Styles, QuickCreate, type name, select type, OK • Close
Apply style to selection	<Alt>-<F8> or Layout • Styles, select style, Apply



OUTLINING

Selecting Tools • Outline displays the Outline feature bar. Level text is *outline* text; other text is *body* text. An *outline family* consists of the level containing the cursor, its subordinate levels, and those levels' body text. You can have eight levels in your outline, with optional body text below each heading.

Change current or selected text to body text/outline text	 or <Alt>-<Shift>-T
Select outline family	Click number in left margin (Outline bar must be showing; pointer is double arrow)


WORKING WITH TABLES




A WPW table works like a spreadsheet, with cell addresses, formulas, and named ranges. Selecting Table • Formula Bar displays the Formula Bar.

Insert table at insertion point	 or <F12> or Table • Create, set number of columns and rows, OK
Select current cell	Click top or left margin inside cell when pointer is upright or left-facing arrow; or <Shift>-<F8>
Select adjacent cells	Drag across cells or <Shift>-cursor key
Select row(s)	Double-click left margin in cell, drag down/up
Select column(s)	Double-click top margin in cell, drag right/left
Select entire table	Triple-click top or left margin inside cell
Insert columns/rows before/after current cell	Table • Insert • Columns/Rows, set number, Before/After • OK
Show/hide table gridlines	View • Table Gridlines
Delete row(s)/column(s)	Select row(s)/column(s), Table • Delete • OK
Convert selected tabular/parallel text columns to table	Table • Create or <F12>, Tabular Column/Parallel Column • OK
Convert cell contents to text	Move contents to outside of table
Create range name for selected cell(s)	Formula bar's  or <Alt>-<Shift>-N or Table • Names, Create, type name, Close






Promote/demote current text, selected item(s), or selected family	 or <Alt>-<Shift>-P or <Alt>-<Shift>-N or with cursor left of level <Shift>-<Tab>/<Tab>
Move current text, selected item(s), or selected family up/down; keep same level	 or <Alt>-<Shift>-U/ <Alt>-<Shift>-W
Show/hide all sublevels below level with cursor	 or <Alt>-<Shift>-S/ <Alt>-<Shift>-I
Display first n heading levels	 or <Alt>-<Shift>-n
Display all heading levels	 or <Alt>-<Shift>-A
Create outline style	 or <Alt>-<Shift>-O, Define Outline • Create, type name and description, define levels' numbering and styles, OK
Set outline style	Select from  drop-down list
End outline	 or <Alt>-<Shift>-O, End Outline
Hide Outline feature bar	 or <Alt>-<Shift>-C

WORKING WITH FILES


Create new file	 or <Ctrl>-N or <Shift>-<F4> or File • New
Open existing file	 or <Ctrl>-O or <F4> or File • Open
Save open file	 or <Ctrl>-S or <Shift>-<F3> or File • Save
Save open file to other name/directory/format	<F3> or File • Save As, type new name and/or select other options, OK
Print file	 or <Ctrl>-P or File • Print • OK
Preview printout on screen	 or zoom to full-page page view
Go to open file window	Window • 1/2/n
Set default font/font size	Layout • Document • Initial Font; or Layout • Font or <F9>, Initial Font. Select font/font size, OK • OK
Display count of pages, words, characters, paragraphs, lines	File • Document Info

Insert in current cell sum of numbers in cells immediately above	Formula bar's  or <Ctrl>-<Equal> or <Alt>-<Shift>-S or Table • Sum
Insert function in current cell	Formula bar's  or <Alt>-<Shift>-F, select function, OK
Hide Formula bar	Formula bar's  or <Alt>-<Shift>-C

WORKING WITH GRAPHICS

Load WP Draw to create graphic object	 or Graphics • Draw
Load WP Draw with Chart Editor to create chart object	 or Graphics • Chart
Load TextArt to create graphic text object	 or Graphics • TextArt
Insert graphic object	 or <F11> or Graphics • Figure, select object's file name, OK
Insert text box object	 or <Alt>-<F11> or Graphics • Text
Insert spreadsheet/database	Insert • Spreadsheet/Database • Import, select data type, select form, select file name, OK
Select object	Click object
Load object in WP Draw to edit	Double-click object
Size/move object	Select object, drag handle/center

WORKING WITH MACROS

Record macro/Stop macro record	<Ctrl>-<F10> or Tools • Macro • Record
Type macro	Tools • Macro • Macro Bar, type macro (use  to insert commands)
Run macro	<Alt>-<F10> or Tools • Macro • Play
Edit macro	Tools • Macro • Edit

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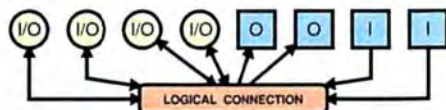
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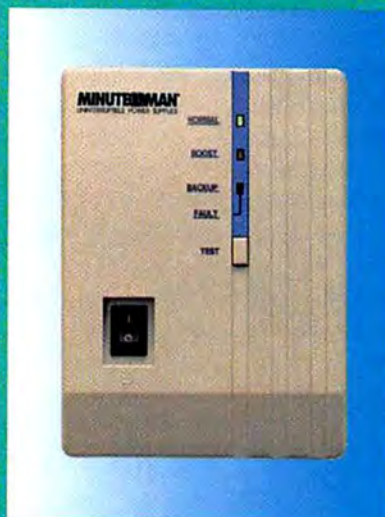
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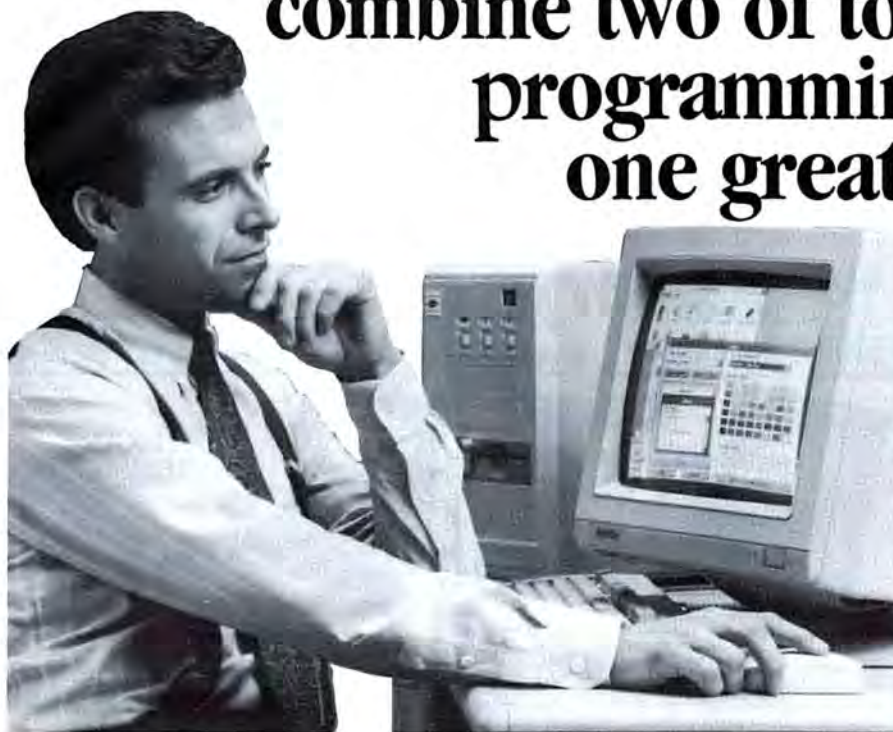
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







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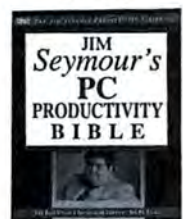
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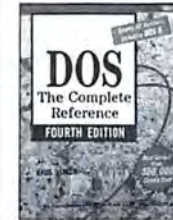
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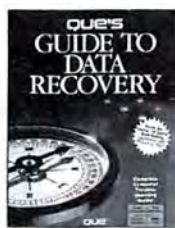
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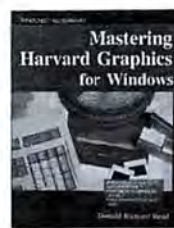
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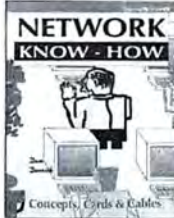
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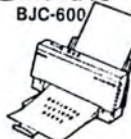


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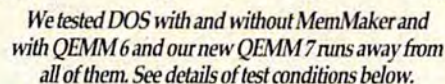
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How we got the chart numbers: CPU—486/33 ALU Power; business VESA machine equipped with 16 megs of RAM and running MS-DOS 6. Comparison systems were downloading the following memory managers: QEMM 1.0, QEMM 4.02, MS-DOS 6.0 MemMaker. In addition to the driver (or drivers) assigned by each memory manager, the following drivers, DOS managers and programs were loaded for all comparisons in the CONFG.SYS file: HIMEM.SYS, DOS-HIGH, HIDE-NO BUFFERS, 16 STACKS, 64 MEGS, CANSYS and CANSYS.SYS, DOS-SHELL, setpoint in the AUTOEXEC.BAT file, VMCTK, MCTK, UNDELETE, LS, CPM, MZBIO.COM, PROK.COM, SETVER, IMANITY.MEM, CPM, SMARTDRV, CPM, PRTSCA.COM, CPM. (Quoted) (With System). (Trademarks are property of their respective owners).

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Entertainment Is More Than Just Games

Up to now, this column has been devoted exclusively to games. But recently I've seen a batch of software packages that are *not* games but promise plenty of entertainment: software toys, multimedia packages, fun audio utilities, and a few unique reference works. In the future I'll be reporting on the most interesting of these as well as games. To give you an idea of what's around, this month's column is devoted to the best nongame products I've encountered.

Saucer-Shaped Blurs

I wouldn't expect to find much overlap between UFO-ologists and PC users. (Mac users are a different story, of course.) But apparently Software Marketing disagrees. It has released UFO, a complete PC guide to close encounters with little green men. Two versions are available: a floppy-based edition with 500 accounts and a CD ROM with more than 1200. You can search for sightings by contact, abduction, crop circles, and cattle mutilation—or all four—and display fuzzy PCX images of saucer-shaped blurs.

Down on the PC Fat Farm

Dieting is never fun. But to make matters worse, most nutritional reference books are sadly limited. It's easy to figure out how much fat is in a Big Mac, but how about the cup of coconut milk you want to put in your curried corn?

Dine Right for Windows is the best nutritional reference source I've ever found in digital or printed form. Not only does it know all about coconut milk (1 cup has 480 calories and 43 grams of fat), but it lets you enter a complicated recipe and instantly calculate calories and grams of fat *per serving*. Is that cool, or what? If you want to get totally serious about your diet, it will even track your meals and come up

with a detailed daily report on how you're doing. Highly recommended.

Hit the Road Jack

I think poring over a map is as fun as going to a movie, so I was ready to love two new computerized touring programs: Expert Travel Planner Gold for Windows and Automap Road Atlas 3.0. Unfortunately, they're both disappointing.

For starters, they redraw the screen if you so much as touch a pull-down menu, and screen redraws take 30 seconds on my 25-MHz 486SX. Zzzzzz....

Worse yet, neither program does what you need it to do. For instance, both will figure your total driving time from start to finish. Big deal. What you *really* want to know is where you'll be stopping for the night. What's so hard about asking how many hours you like to drive each day and using that to calculate probable day-end destinations? Or using that calculation (along with the cost of gas and how much you generally spend on a motel for the night) to approximate the total trip cost? I could practically do the programming myself. The final straw: Expert Travel Planner routed me *off* I5 and *onto* 99 to achieve the fastest trip from San Francisco to Los Angeles! Puh-leez! (Automap has two add-ons for Road Atlas: Automap Destination Europe and Automap Destination Ski.)

Hooray for Cinemania

As a sometimes movie critic, I have a shelf full of film reference books. My favorite for years has been Leonard Maltin's *TV Movies and Video Guide*. But since Microsoft's Cinemania '94 on CD ROM arrived, my copy of *TV*



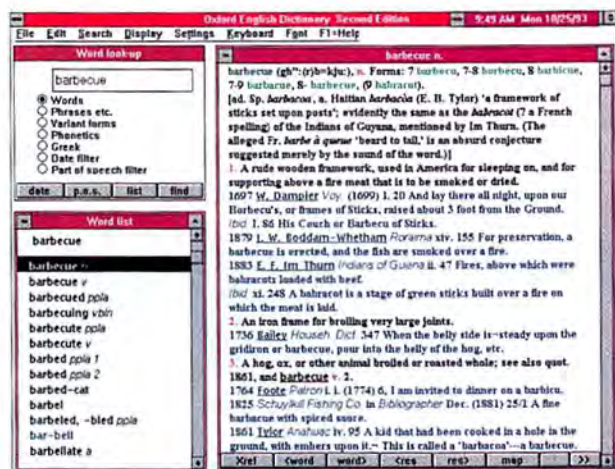
Movies just collects dust.

Cinemania includes the full text of Maltin's book, 2500 reviews by star critics Pauline Kael and Roger Ebert, plus some other excellent film reference works. Better yet, a hypertext index makes it easy to jump among well-researched articles on films and filmmakers, a list of Academy Award winners, a glossary of film terms, and even a gallery of stills, film clips, and sound bites.

But I do have a few complaints: While it's fun to view the little film clips (actually, there are only 20), the one from 2001 is squashed from that wide-screen masterpiece into a TV-shaped window. A more serious problem is that some of the data isn't current. I checked the credits for director Andy Davis, who made the recent hit *The Fugitive*. While his fine 1992 film *Under Siege* rates a stand-alone review drawn from Maltin, his filmography (which comes from a different source, Baseline) ends in 1990. Furthermore, the sound bites are a silly waste of disk space. Do you really need to hear Bogart say "Here's looking at you, kid," again?

Microsoft Cinemania is almost as useful as a shelf full of reference books and nearly more fun than a barrel of Marx Brothers movies.

By Michael Goodwin



THE OXFORD ENGLISH DICTIONARY ON CD-ROM knows more about barbecue than any place north of Memphis.

Still, when the flaws are fixed, Cinemania will be more fun than a barrel of Marx Brothers movies.

Beard to Tail: An Absurd Conjecture

Browsing the *Oxford English Dictionary* has always been one of my favorite pastimes. The *OED* does more than merely define a

word, it traces its usage from the first known example. Did you ever wonder about the origins of the word *barbecue*? It comes from *barbacoa*, a Haitian word first used in 1697 for a framework of sticks used for roasting meat. *OED* then opines on the popular myth of its origin: "The alleged French 'barbe à queue, beard to tail,' is an absurd conjecture suggested merely by the sound of the word."

Like the printed *OED 2nd Edition*, the CD ROM version is fiendishly expensive (\$895). But it's easy to use, with color and different fonts to help you navigate the complicated citations on each word. And the search functions are first-rate.

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• **Microsoft Cinemania '94** \$79.95; Microsoft Corp.; 800/334-4249

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Michael Goodwin is a contributing editor for PC World. He can be reached on PC World Online (see page 12 for contact information). ■

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The Zen of Printing

I've always been happy with my printer—well, most of the time. But there have been times when I'd try to print a page of complex graphics and a few choice fonts and end up with a multipage jigsaw puzzle. Or days when I'd print a really long document and get a chance to brush up on my Russian literature while I waited. (Have you ever tried printing a long fax? Don't.) Now, thanks to a few adjustments, I'm much happier.

It's a truism that you can't have too much memory, and the rule applies to printers as well. Printer memory is still cheap—as little as \$85 on the street for 2MB—and it's easy to install. Not bad, considering the dramatic payoff.

If you're printing graphics in your documents—and with Windows applications, it's tempting—you've got to have a comfortable cushion of printer RAM; on my HP LaserJet III, 2MB is the minimum. Without the extra legroom, when you print complicated pages you'll get truncated, honked-up graphics or, worse, the printer's dreaded 'Out of memory' message.

I don't have the benchmarks to prove it, but I know that my LaserJet prints faster from Windows with 2MB of memory than it did with 1MB, and that it prints a lot faster with 4MB.

Remember that if you do add printer memory, Windows won't have a clue you've done so unless you tell it. Go to Control Panel, launch *Printers*, and highlight the printer you've just added memory to. Click *Setup* and increase the memory indicator, then click *OK* and *Close* to get back to where you started. And don't lie and say you've got more memory than you really do; software that's been lied to has a way of getting even with you.

While you're in *Printers*, you can try a couple other subterfuges. Click *Setup* followed by *Options*. If the 'Print True-

Type as Graphics' option is checked, uncheck it; it can slow down printing because, as the choice indicates, fonts are converted to graphics. Click your way back to *Printers* and open *Connect*. Look at the 'Fast Printing Direct to Port' option. Unless you've got an application that conflicts with direct printing, turn this option on. It lets Windows pass your print job's data directly to the port, bypassing DOS and the BIOS. These changes may help, but I'm not promising anything. Like everything in life, your mileage will vary depending on the application and what you're printing.

Six Hundred Ways to Better Output

But what good is memory if you don't look your best? At 300 dots per inch, the resolution of my LaserJet III didn't do justice to my two newsletters. For a really sharp look, I needed to bump up to at least 600 dpi. But with my current printer running perfectly—HP's seem to last forever—I couldn't justify buying an expensive new printer. Instead, I opted for LPAC's doubleRES IV, a no-nonsense card that plugs into the expansion slot on LaserJet Series II and III printers. Not only does it deliver luscious 600-by-600-dpi output, it was easy to install and gives me an astounding 50 percent increase in printing speed.

The downside? It's a substantial investment, with a list price of \$599 (I found one discounted at \$449). Still, it's cheaper than a new printer. • *doubleRES IV* \$599; *Laser Printer Accessories Corp.*; 619/485-8411, 619/674-1200 (fax). Reader service no. 602

Getting Back Fast

There's no cheap way to increase your printer's resolution, but you can speed up your print jobs for little more than pocket change. Because neither your



printer nor Windows is particularly bright, you can use software to fool them both and get back to work faster. The trick is to use a print spooler, a background program that waits for the printer so you don't have to. A spooler catches data from your fast computer and holds onto it until your slow printer can accept it. Windows thinks it's finished printing, the printer continues to get data, you can go on working, and everyone is happy.

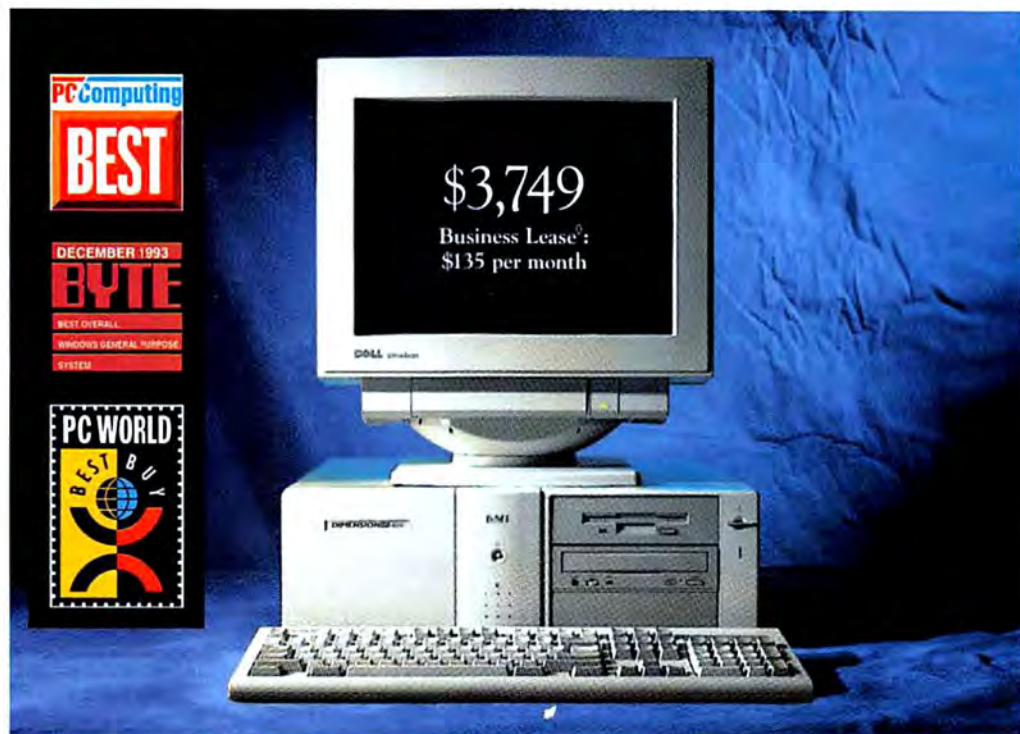
I got to play with a late beta copy of SuperSpool, a great spooler that replaces Windows' Print Manager. Besides getting me back to work a lot quicker, the program gave me control over the document queue by letting me skip over one job to start printing another that I wanted sooner. I can also simultaneously print to two printers attached to separate ports. In fact, once a document is in SuperSpool's queue, I can drag and drop it to another printer (provided both printers are of the same type). • *SuperSpool* \$49.99; *Budget Software*; 303/932-1705, 303/932-0336 (fax). Reader service no. 603

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached on PC World Online (see page 12 for contact information).

By Steve Bass

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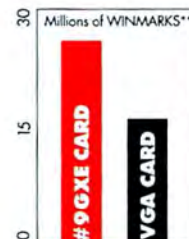
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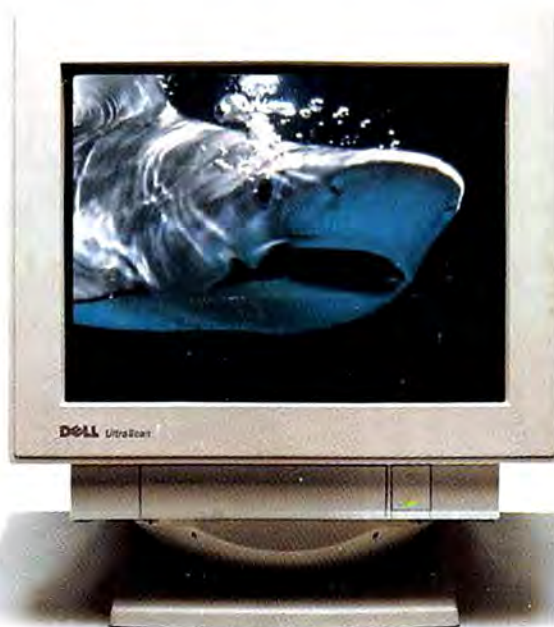
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