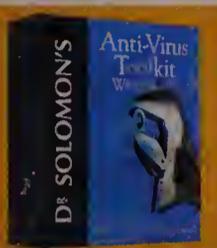


EXCLUSIVE TOP 100! BEST PCs, PRINTERS, MODEMS FOR WORK AND HOME

FIRST  
HANDS-ON TESTS:  
NETSCAPE NAVIGATOR 4.0

# PC WORLD

MARCH 1997



## Virus Killers!

9 Leading Anti-Virus Packages Compared



## No More Film!

Best Buy Digital Cameras From \$199



## Lotus SmartSuite 97

As Good as Microsoft Office 97?

# UNDOCUMENTED SECRETS

## 101 HIDDEN TIPS

For Windows 95, NT, and 3.1

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**What would you like to do?**

How the heck do you create complex tables?

**S**earch

**T**ips   **O**ptions   **C**lose



**What would you like to do?**

- Create a table
- About working with tables
- Use Microsoft Query to retrieve data from an external data source
- Office programs you can use to create a table



**S**ee **T**ips

**O**ptions...

**C**hoose Assistan...

**C**reate complex tables

If you don't like **Sha**  
**pose your question to th**

ress | <http://www.engl.uvic.ca/Faculty>

Dear Bob,

Sorry we had to move up the deadlines. As Shakespeare  
"We are but flies to the wanton gods/They kill us for  
Or something like that. Bear up, and good luck.

Sincerely,  
Jolie Lenehan

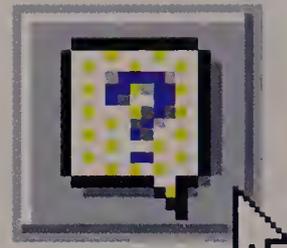


What would you like to do?

How doth one get to the Internet?

# Shakespeare, the little animated dog.

His name is Power Pup, and he's one of the Office Assistants, your personal guides to new Microsoft® Office 97. Office Assistants are designed to help you do things in fewer steps, with better results and less frustration. For instance, if Power Pup sees a shortcut to what you're doing, he'll suggest it. He'll walk you through tasks you need help completing. And you can ask him questions in plain English. There are nine Office Assistants, including the aforementioned bard and pup, a Hoverbot and a sarcastic, slightly bent paper clip. You can customize your helper to offer as much or as little help as you'd like—or you can turn him, her or it off. Microsoft Office 97 has lots of other intelligent improvements, like the overall webbiness, or the automatic correction of formula mistakes in Microsoft Excel. But what may prove invaluable to your mental well-being is that goofy-looking dog. To find out more about the little critters, visit our Web site.

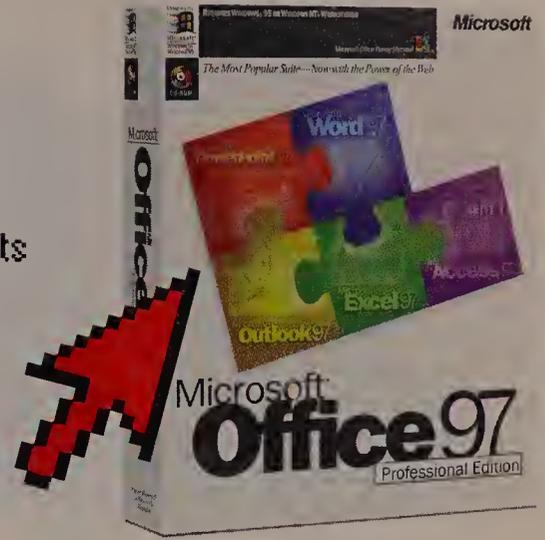


Office Assistant

**Microsoft Office 97 / now /**



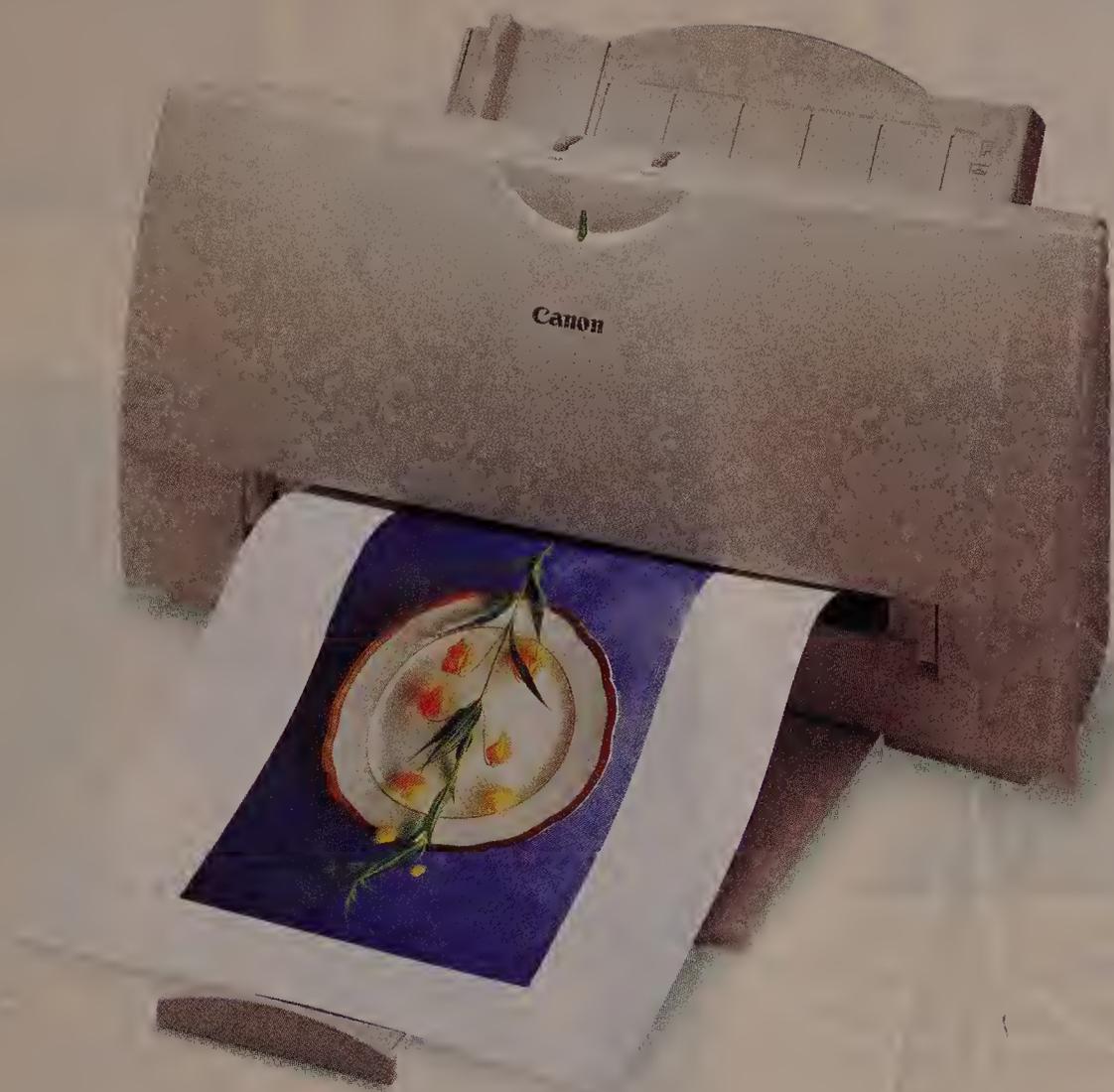
-  **What's New**
-  Getting Help
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-  Editing and Sorting
-  Checking Spelling and Grammar
-  Formatting



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## COVER STORY

- 121 UNDOCUMENTED SECRETS:  
101 TIPS FOR WINDOWS 95, NT, AND 3.X**  
**HOW-TO** Whether it's Windows 95, Win 3.1, or NT 4.0, isn't there always something you wish would work better? Here are the best secret tips and tricks for all versions of Windows.

## FEATURES

- 144 CHEAP SHOTS**  
**REVIEW** Some digital cameras are now priced as low as \$199. We tested ten models to see if they can really save you a trip to the photo kiosk.
- 164 LOTUS SMARTSUITE 97:  
NOW SMART ENOUGH?**  
**PREVIEW** SmartSuite diehards need no longer live with half an upgrade. New Windows 95 versions of 1-2-3 and Organizer help make SmartSuite faster, richer in features, and Web-savvy.
- 180 VIRUS KILLERS: THE BEST SOFTWARE FOR PROTECTING YOUR PC**  
**REVIEW** An effective anti-virus utility is essential. Our Best Buy's features put it a cut above other Win 95 packages.

## SPECIAL REPORT

## THE WEB AND YOUR BUSINESS

- 105 THE PROS TAKE OVER**  
**HOW-TO** New Pentium Pros from HP sweep top positions on both the Workgroup and Enterprise Server charts.
- 109 BUILD YOUR OWN SECRET INTRANET**  
Eager to set up a small intranet at work? Here's how to do it yourself.



246-M1



 Additional material available on PC World Online

## MULTIMEDIA

## 246-M1 TITLE REVIEWS

Real-time World War II gaming strategy in *Command & Conquer: Red Alert*; interactive horror in *A Puzzle of Flesh*; and a unique sci-fi universe in *Rama*.

## 246-M8 HARDWARE REVIEWS

The latest Top 5 CD-ROM drives and the Top 5 sound boards.

## 246-M11 Q&amp;A

Tips to solve your multimedia woes.

**COVER** Digital composition by Nick Fain

## TOP OF THE NEWS

### 60 BROWSER BATTLE LINES

Our first look at Netscape's Communicator and Microsoft's Internet Explorer 4 finds similar features but different strategies.

### 64 BROWSER ACCELERATORS

These programs goose browser performance, but two early products we tested gave mixed results.

### 65 NEW INTEL PACKAGING MEANS EASIER, FASTER UPGRADES

The company's future CPUs will be mounted on processor cards.

### 66 WEB PERFORMANCE ENHANCERS

Products that "push" Web content to your PC are resource hogs and, so far, not very useful.

### 72 IS AN LCD MONITOR IN YOUR FUTURE?

They're getting better and cheaper.

## NEW PRODUCTS

78 PGPcookie.cutter, PGPmail 4.5 Web and e-mail security utilities

79 Philips Velo 1 Windows CE handheld PC

80 MaxiSound Home Studio 64, Home Theater 64 sound cards

80 Panasonic Big 5 SQ-TC510N CD-ROM changer

82 IBM VoiceType Simply Speaking voice-recognition software

82 Netopia Virtual Office

86 Magic Cap for Windows 95

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88 Active-Office for Windows 95

88 Partition Magic 3.0

92 Fujitsu, Xerox small-office printers

94 Cardinal Voyager 33.6-kbps modem

94 Olympus D-300L digital camera

99 FlowCharter 7

99 Policies Now 5.0

101 SamePage 2.0 intranet software

103 GrabIt, Snappy Video Snapshot 2.1 video capture software



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## TOP 100

### 197 FIRST MMX PENTIUMS ARRIVE

**TOP 100** We tested the first MMX Pentiums and one, the Dell Dimension XPS M200s, shot to the top of the Power Desktops chart. Despite the absence of MMX-savvy software, all models registered impressive performance gains.

### 200 POWER DESKTOPS

**TOP 20** MMX PCs from Dell and Quantex and Pentium Pro-200s from HP and IBM are among the heavyweights debuting on this month's Power Desktops chart.

### 210 BUDGET DESKTOPS

**TOP 20** Prices for Pentium-133 systems are dropping like lead balloons. P-133s priced at under \$1900 from Dell, Micron, and Gateway are the top three Budget Desktops.

### 218 NOTEBOOKS

**TOP 20** Subnotes from Toshiba and HP are the latest power notebooks on the chart; a \$200 cut makes the \$1799 Digital HiNote VP our number one budget pick.

### 228 WIN A QUANTEX PENTIUM-200 MMX PC

**CONSUMER FEEDBACK** How satisfied are you with your PC? Fax in this survey for a chance to win a Quantex QP5/200MMX SM-3, a P-200 MMX from the Top 20 charts.

### 231 WORKGROUP PRINTERS

**TOP 10** Added RAM drives the IBM Network Printer 12 to the top of the monochrome workgroup printer chart.

### 235 17-INCH MONITORS

**TOP 10** Mitsubishi's Diamond Pro 87-XTM and the sub-\$700 ViewSonic 17GS and Princeton Graphic EO75 make the chart.

### 237 GRAPHICS BOARDS

**TOP 10** High-res color is the strength of the pricey Diamond Stealth 3D 3400XL, while a low \$139 price helps recommend the Hercules Dynamite 128/Video card.

### 239 MODEMS

**TOP 10** A slew of new modems makes the chart. Our number ones: Practical Peripherals' PC288LCD V.34 external and Motorola's Montana 33.6 PC Card units. ▶

## HERE'S HOW

### 248 ANSWER LINE

 Adding a new hard disk and making it your C: drive; connecting PCs with twisted-pair cable.

### 252 WINDOWS TIPS

 Avoiding Win 95 hang-ups when you shut down; printing out the whole Help file; untangling your log-on.

### 258 SPREADSHEETS

 Identifying the highest average; adding flags in Excel and Quattro Pro.

### 260 WORD PROCESSING

 Reformatting text globally; selecting parts of a table in Word.

### 264 DATABASE TIPS

Making exceptions to rules in Access and Approach with If functions.

### 266 INTERNET TIPS

 Saving a Web page with graphics intact; online investment sites.

### 270 HARDWARE TIPS

 Getting the right resolution and color from your monitor and graphics card.

### 272 MULTIMEDIA TIPS

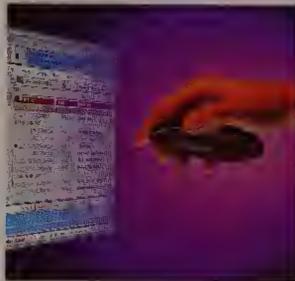
 Essential add-ons for CU-SeeMe Internet videoconferencing software.

### 274 UPGRADE GUIDE

 Build a Windows 95 network, step-by-step.



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## @HOME

### 241 @HOME PRODUCTS

Software for planning a road trip; automated TV channel surfing; battle of the encyclopedias.

### 242 KEEPING UP

Web sites and services for consumers.

### 244 TOP 5 HOME PCS

Dell's Dimension P200v is still our pick for best personal computer for the home; meanwhile, a super-cheap Monorail compact PC just misses the chart.

### 246 HOME OFFICE

Steve Bass has a moral dilemma: Net.Jet makes Web browsing superfast by hogging access to the sites you visit.



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55 **BUGS AND FIXES** More NT bugs; fix AVI in Helix Hurricane; LapLink, WebEx upgrades.

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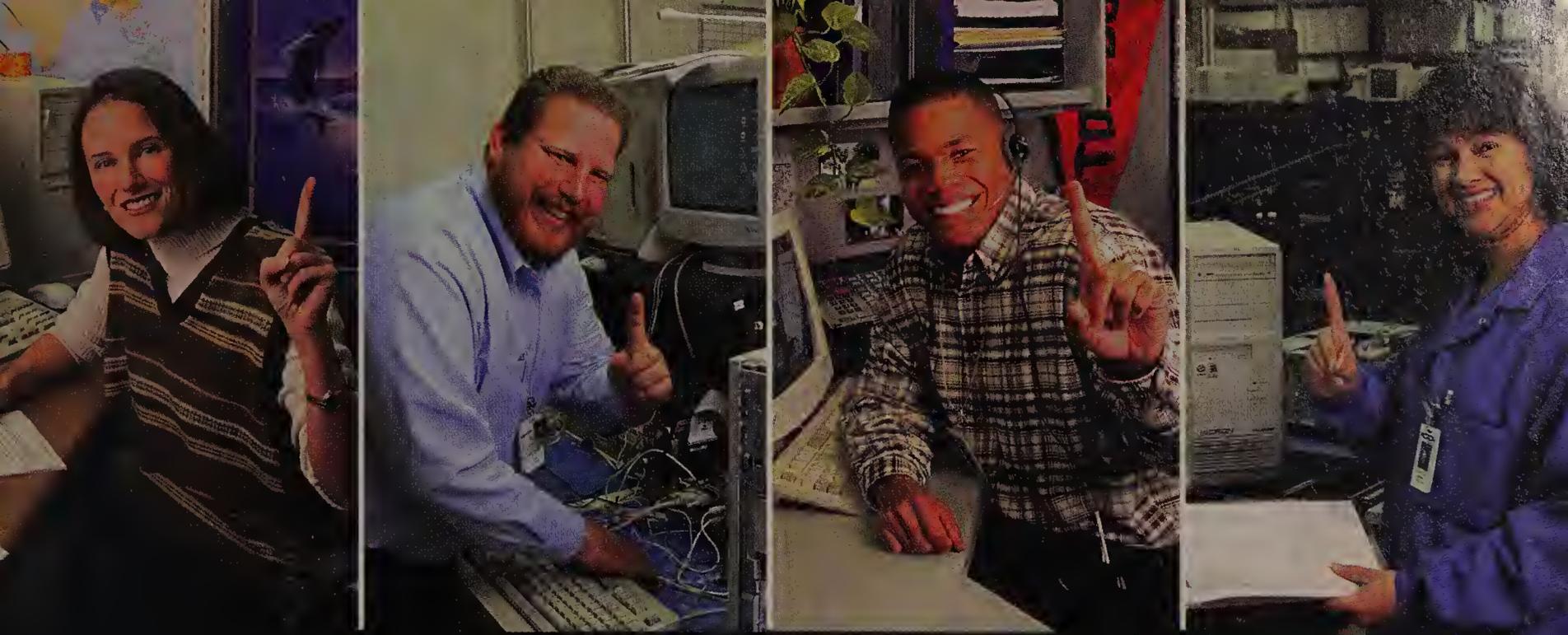
**REVIEW** Multiplayer games let you challenge opponents anywhere in the world. We checked out titles that use new technologies to jack up the stakes in gaming.

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<b>GOOD</b>	<b>GOOD</b>	<b>GOOD</b>
APPLE AT&T COMPAQ DIGITAL HEWLETT-PACKARD	AT&T DIGITAL	DIGITAL HEWLETT-PACKARD
<b>FAIR</b>	<b>FAIR</b>	<b>FAIR</b>
GATEWAY 2000 IBM QUANTEX	GATEWAY 2000 IBM NEC	ACER APPLE AT&T COMPAQ GATEWAY 2000 IBM MIDWEST MICRO QUANTEX

PC World Reliability & Service Survey—*PC World*, December 1996

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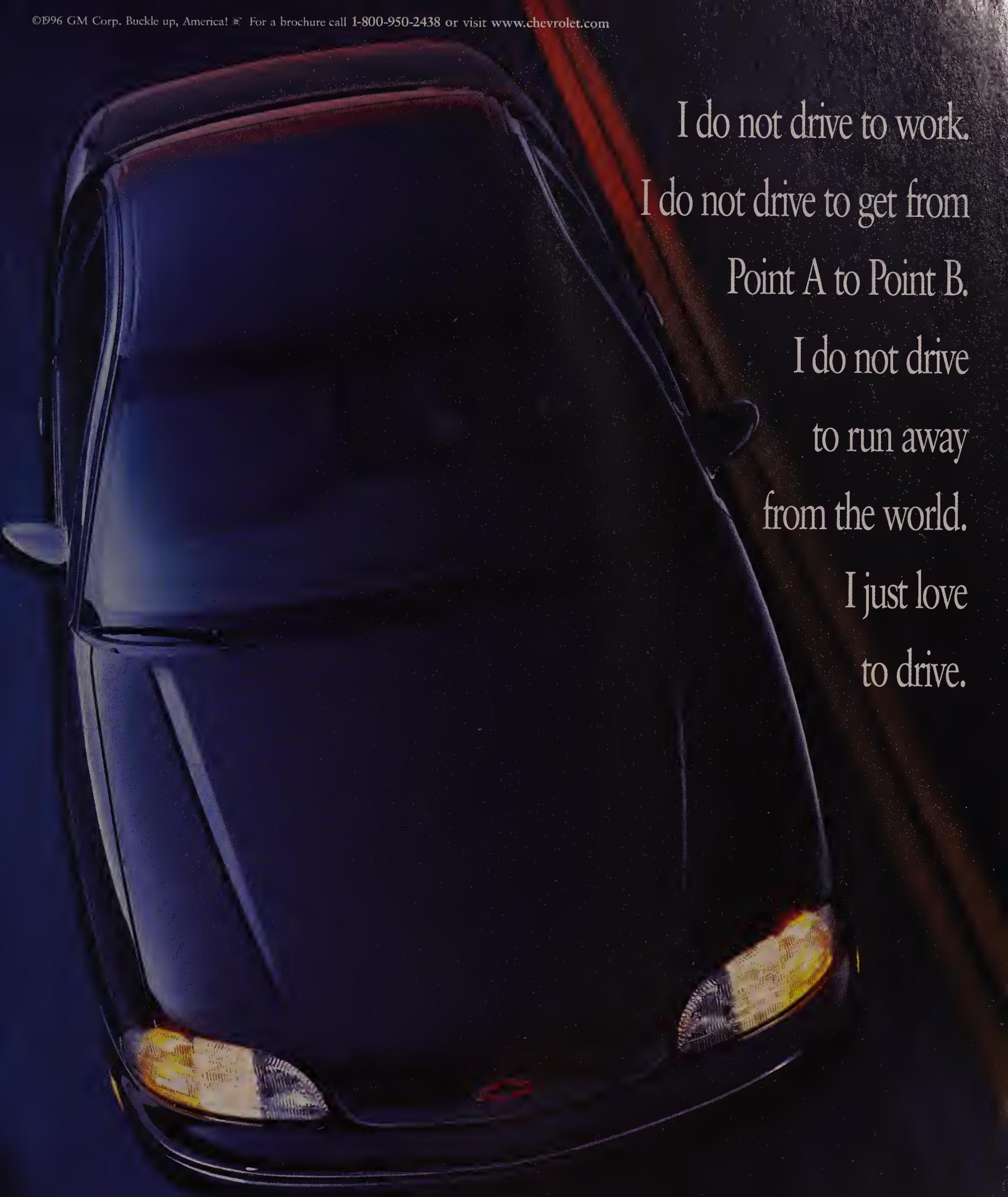
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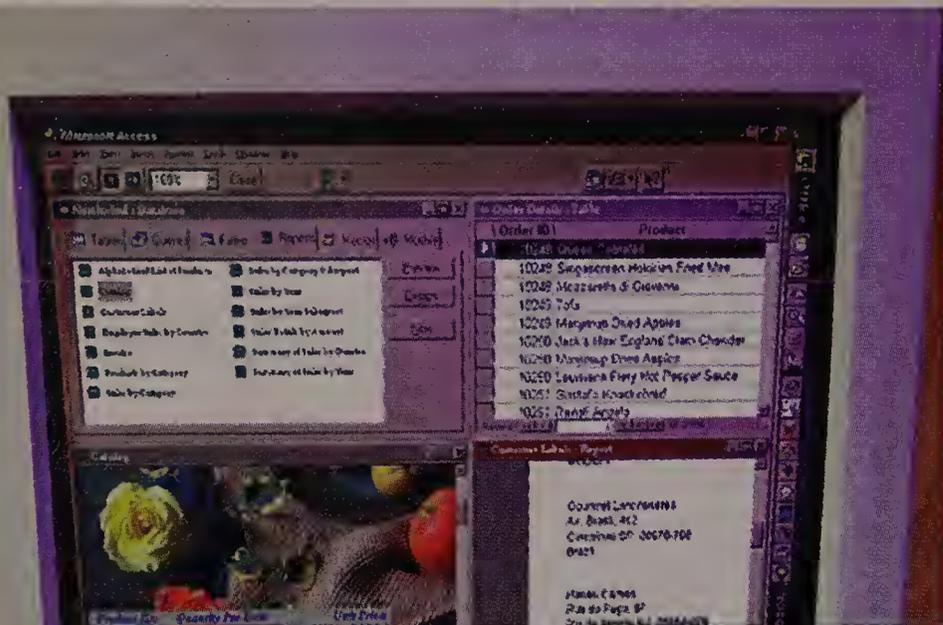
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# Web Broadcasts: The End of Browsing?

ACCORDING TO THE BUZZ these days, we're about to witness a revolution in the way we use the Web: from browsing, where users download or "pull" information from Web sites they visit, to broadcasting, where content providers "push" personalized information via the Internet directly to users' desktops. The result: No more struggling with URLs, search engines, and sites.

Given the frustrations of Web browsing, the "push" concept is simple and appealing: When you connect to the Web, push products work in the background to gather information in topic areas, or "channels," you've chosen and automatically send it to your PC, where you can read it whenever you like. The first and most successful of these products to date, the PointCast Network, broadcasts graphically rich news, weather, sports scores, financial data, even horoscopes and lottery numbers, for free. Following PointCast's lead, a raft of new push products that "netcast" content are in the works. Some follow the PointCast model, varying the types of information they deliver. Some function more like offline browsers, letting you subscribe to selected Web sites, then sending updates to your PC at intervals you select. (Contributing Editor Stan Miastkowski describes several of these products in *Top of the News*, page 66.)

Other products will let companies develop their own channels for broadcasting content to employees over an intranet. Marimba's Castanet, for example, will consist of a "transmitter" that resides on a server and sends information, Java applications, and software to "tuners" on individual desktops.

## BIG PLANS FOR BROWSERS

NEWCOMERS AREN'T THE ONLY ones rushing to get broadcasting products to market. America Online is working on its Driveway broadcasting service, and Microsoft and Netscape are building push capabilities into upcoming versions of their browsers. In the fall, Netscape announced and demonstrated Constellation, an application that will be a component of the company's new Communicator Pro suite (see *Top of the News*, page 60). Scheduled to ship midyear, Constellation will incorporate the



Does all this **frantic activity** signal a **fundamental shift** in how we'll use the Web?  
**Not quite.**

Castanet "tuner" and will let you select Web sites for automatic updating on the desktop.

In the other camp, Microsoft's Internet Explorer 4.0 will let you receive PointCast broadcasts, eliminating the need for proprietary software. And like Netscape, Microsoft is building full push capabilities into IE 4.0 through Active Desktop. With the browser, you'll be able to select from a variety of channels and monitor Web sites that use ActiveX protocols.

## THE PROBLEMS WITH PUSH

SO DOES ALL THIS FRANTIC ACTIVITY signal a fundamental shift in how we'll use the Web? Not quite. Broadcasting information over the Internet is a compelling idea, but in practice, it doesn't deliver. For one thing, current push products demand a lot of resources—on a Pentium-75 PC, performance drags. And as Miastkowski points out, these products work well only if you connect to the Internet through a high-speed line or your company's dedicated T1 line. Even with dedicated connections, though, some companies have banned the use of PointCast outright because of its drain on network bandwidth. And at home, over a 28.8-kbps dial-up line? Well, flipping through TV channels is a quicker way to get news updates. In many cases, simple e-mail newsletters work better.

Compatibility is another issue. If, for example, you want multiple news channels, you'll have a tough time installing and using more than one product at a time. Moreover, most broadcast products require that information be packaged in a proprietary format that the other products can't use. Imagine being able to get CNN only if you have a Sony TV, and CBS only if you own a Zenith. Bad news for information providers and consumers alike.

On the productivity front, these products give new meaning to the phrase "information overload." You'll learn, as one colleague remarked to me, all sorts of things you didn't need to know. And just try to carry on a meeting with PointCast running on your office PC instead of a regular screen saver. Bad news for those with attention deficit disorder.

Finally, by their very nature, push products skirt the Web's most valuable albeit frustrating aspect: the ability to use links to explore and research topics in more depth than any of us ever dreamed.

As is always the case with new technology, push products will improve and standards will develop, but don't expect them to solve all the Web's problems overnight. Web broadcasting will have its place, but browsing and bookmarks are here to stay.

Cathryn Baskin is editor in chief of PC World. ■





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## YOUR TAKE ON: Non-Intel processors ♦ Ethical standards ♦ Registry distress

## CYRIX AND AMD PHOBIA?

IS SOMETHING WRONG with Cyrix- and AMD-based systems or non-Intel 686 chips in general that keeps your magazine from evaluating them? I was surprised to find many such PCs cost \$500 less than comparable Intel-based systems. Why aren't these systems listed in the Top 100, given the good values they appear to be?

Paul Meyer, *Internet*

**Editor's response:** We would never exclude a system from the *PC World* Top 100 because it did not have an Intel processor. We evaluate processors indirectly by scoring a system's performance and price. (We also score design and features, reliability, and quality of support, as you probably know.) We test Cyrix- and AMD-based PCs whenever we get them. But very few large PC vendors use Cyrix or AMD chips, and the number is low even among small vendors. As new Intel, AMD, and Cyrix chips come out, we give CPU-specific performance comparisons in our *Top of the News* section. That's also where we report any problems. —Tracey Capen

## MICRON SUPPORT PRAISED AND CONDEMNED

WHICH PART OF your January issue are we to believe? In *Consumer Watch*, Roberta Furger condemns Micron for lack of quality product support. But in *Top 20 Desktops*, Bryan Hastings lauds Micron for "a superb job of providing service to its customers." Whom are we to believe?

Gary Hopps, *Internet*

**Editor's response:** The point that Roberta Furger was trying to make was that she experienced poor service from Micron, which was uncharacteristic of the company. Overall, Micron's service has been considered excellent. Although most of the units that the company produces do not need to be serviced, some do—as with Furger's computer. The unusually poor response that Furger received from Micron compelled her to investigate. In the January column she reported her findings, including Micron's explanation of why service fell below expectations for a period of time. —Michael Lasky

OS/2 COVERAGE:  
LIFE BEYOND WINDOWS?

IT IS IRONIC that I was just going to write *PC World* about the lack of attention it pays to OS/2 when I read Phil Lemmons' editorial about ethical standards in search engines that steer users to paid



advertisers ["Lies, Damned Lies, and Search Engines," December].

I feel *PC World* is as guilty, in that you give far too little support to OS/2. In December, Warp 4 made the *Bugs and Fixes* and *Top of The News* sections. Both reports were negative. OS/2 has no choice but to be as backward compatible and flexible as possible, and when it does not work 100 percent with a Windows program, that should not be viewed as a major flaw. No version of Windows can run any native OS/2 program. Does *PC World* consider this a major flaw? Give OS/2 a fair shake, and we will see more quality native OS/2 programs.

William Spicher, *Internet*

**Editor's response:** We base our OS/2 coverage on the level of reader interest. *PC World* published an OS/2 how-to column for a number of months and very, very few people read it. We have reviewed OS/2 and found it has real strengths, but those assets do not include usability or, most important, available applications. Moreover, our recent random-sample research shows that plans to adopt OS/2 are falling from already low levels, while adoption of Windows 95 and Windows NT is

on the rise. It's a great shame. All of us would benefit if IBM competed more effectively, giving us a greater choice of operating systems and forcing the software industry into a reasonably competitive balance.

IBM did not fail in this because of press coverage of OS/2, which actually exceeded the level of reader interest in recent years. IBM missed the mark with OS/2 for many other reasons: Repeatedly changing its plans for operating systems. Failing to drum up OS/2 applications. Skipping usability testing on early versions of OS/2 or testing with people who proved sadly atypical. IBM's years of ineptitude with MS-DOS set Microsoft on the road to monopoly, and Microsoft's competence and licensing practices did the rest.

*PC World's* obligation remains to serve its readers by evaluating products fairly. We can't say good Microsoft products are bad just because we like competition, any more than we can ignore the real problems with OS/2. —Phil Lemmons

## REGISTRY HEADACHE

STEPHEN MANES'S ARTICLE "Let 'em Eat Tech Support" [*Full Disclosure*, January] hits the nail right on the head. Publishers such as yourselves should raise a war cry with Microsoft to force them to implement Manes's suggestions. Though I like Windows 95 and its handling of resources and communications, I am ready to throw the whole system into the ocean when I run into a problem with the Registry. Manes's comments are even more apropos since Microsoft refuses to assist anyone with Registry problems. Microsoft has the "take two aspirin and call me in the morning" mentality.

Lorin Albeck, *Internet*

## RIGHT IN THE MIDI

IN THE JANUARY issue, you reviewed the Internet Music Kit, a program that allows people to add MIDI files to their Web pages ["Sound Decisions for Internet Audio," *New Products*]. It seems to me that buying a \$50 program is irrational when this simple HTML tag would work just as well: `<EMBED SRC=midi filename >`

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## LETTERS

autostart=true>. And if your Web page's server isn't set for MIDI files, you could simply FTP your files to a server that is.

*Kenneth Wong, Roselle, Illinois*

**Editor's response:** You're right, you can use an HTML tag to add a MIDI file to a Web site. You can also use FTP as you describe, but this can cause time delays for the music clips. We like Internet Music Kit because it lets you add multiple MIDI files to a site with little time and hassle. —Laurianne McLaughlin

### LOCATING HP SCANJET DRIVER

"SCANNERS FOR THE REST OF US" [January] was an excellent article. After reading the article I went out and bought an HP ScanJet 4P. Afterward, on Hewlett-Packard's Web site I couldn't find the driver to make it scan at 300 dots per inch. The article mentioned that people could download this driver. Where is it?

*Frandon Cole, Cincinnati*

**Editor's response:** The driver is on HP's Electronic Support Center site (<http://hpcc997.external.hp.com:80/cposupport/indexes/sj4cs.html>). On that Web page, the HP ScanJet 4C driver is called 'DeskScan II ver.2.3.1a for Windows 3.X and Windows 95'. Click that link to download the 4C driver, a file called sj120en.exe. This driver will boost the color scanning resolution of the HP ScanJet 4P to 300 dpi. —John Goddard

PC World welcomes your responses, ideas and other letters to the editor. See page 12 for contact information. ■

### CORRECTIONS AND CLARIFICATIONS

IN OUR FEBRUARY Top 100, "Top Power at Budget Prices," the price drop and screen type on the Gateway 2000 Solo 2100 P-120 notebook are incorrect. The price drop from January should have been \$200, and the notebook's screen is a dual-scan display.

Contrary to the impression left by our December *Top 10 Modems*, no downloadable patch is available for fixing a bug in U.S. Robotics' Sportster Voice 28.8/33.6 Fax-modem. If your Sportster modem hangs when you use it in "terminal mode"—typing into a non-WYSIWYG screen like a BBS's—U.S. Robotics will exchange the modem without charge. Call U.S. Robotics' customer support at 847/982-5151.

**SUDDENLY, EUROPEAN STANDARDS ARE A GORGEOUS NECESSITY.**

As 17" becomes the standard for your multiple applications, and applications become more media-intensive, don't just settle for a bigger system. Acquire a better one. A media-ready Nokia 447X.

These are the first monitors in the world to achieve the new VESA standards for display clarity. Their spacious 15.7" viewing area boasts an aperture grill of .25 mm, and refresh rates as lofty as 150 Hz for virtually frozen screens. They are also capable of the ultimate 1600 x 1200 resolution. In other words, these screens are not just larger, they are clearer—which translates directly to improved working conditions and user-sensitivity. You'll also

be relieved to know these are the first monitors to be TCO'95 certified for greatly reduced screen emissions. This

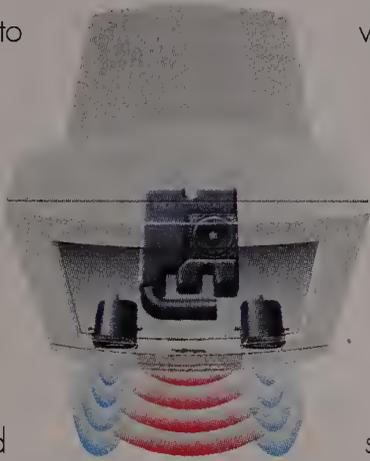
reaffirms Nokia's leadership in the science it pioneered.

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Dual powered stereo speakers in front combine with a sub-woofer in the swivel/tilt base to shape audio at the intimate volumes most suitable for working close to a monitor. Combined with its standard in-bezel microphone, the media-ready series enables the complete convergence of computing and communications.

Which makes the new 447X series a necessity for anyone making full use of their computer.

After all, the best way to meet the standards is to work with the people who set them. Visit us at [www.nokia-america.com](http://www.nokia-america.com) or call 1.800.BY.NOKIA, ask for Dept. N512.



447Xi—High-resolution display, ideal for graphics-intensive applications



447Xav—Professional-caliber display with integrated speakers, sub-woofer, and microphone



447Xavc—Adds to X series features with built-in color video camera



Circle 164 on reader service card

\*Models are continuously upgraded. Size of CRT measured diagonally. Actual viewing size is slightly less. Manufactured and designed in Finland in an ISO 9001 approved environment. ©1996 Nokia Display Products, Inc. Multigraph, Valuegraph, MicroEmission and FullScreen are trademarks of Nokia Display Products, Inc. E-Mail: [bynokia@ool.com](mailto:bynokia@ool.com). Prices and specifications are subject to change without notice. The Energy Star emblem does not represent EPA endorsement of any product or service. All other trademarks are the sole property of their respective companies.



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### More power to you.

Revolutionary Invar Shadow Mask technology delivers some pretty unbelievable numbers. Like resolutions up to 1800 x 1440 at a 76Hz refresh rate.

Model	ViewSonic Professional Series				
	P815	PT813	P810	PT775	17PS
CRT Size/Viewable	21"/20.0"	21"/20.0"	21"/20.0"	17"/16.0"	17"/16.0"
Dot/Aperture Grille Pitch	0.25mm	0.28mm*	0.25mm	0.25mm*	0.25mm
Horizontal Frequency	30-115 kHz	30-107 kHz	30-95 kHz	30-96 kHz	30-86 kHz
Video Input Bandwidth	250 MHz	230 MHz	200 MHz	200 MHz	135 MHz
Maximum Resolution	1800 x 1440	1600 x 1280	1600 x 1280	1600 x 1280	1600 x 1280
Optimal Resolution	1800 x 1440 @ 76Hz	1600 x 1200 @ 85Hz	1600 x 1200 @ 76Hz	1600 x 1200 @ 77Hz	1280 x 1024 @ 80Hz
TCO Certified	Yes	Yes	Yes	Yes	Yes
MSRP**	\$2,195	\$1,895	\$1,745	\$999	\$799

\*Aperture Grille

A whopping 250MHz video input bandwidth. And a horizontal scan rate up to 115KHz. All of which are high water marks in the industry.

Add to that a 0.25mm dot pitch (also the best in the business) and you've got the new standard for high-end CAD, document imaging and other applications where absolute precision is a prerequisite.

The benefits of this new, state-of-the-art P815 are many—and obvious to the eye. The text is the sharpest available today. Period. The images are absolutely flicker-free, virtually eliminating fatigue and eye strain.

The P815 displays more information faster than any monitor you've ever seen before. And with BNC and VGA connectors, you can easily switch between two separate systems.

### Compared to other monitors there is no comparison.

After winning the Byte Spring '96 "Best of Comdex" and "Best of PC Expo" awards, the performance is obviously rated the highest in the industry, but the price is not—it is a real mega value. It comes with ARAG® anti-reflection, anti-glare screen coating, a limited 3 year warranty on CRT, parts and labor (the best in the business), and an optional Express Exchange™ Service program that insures 48 hour replacements.

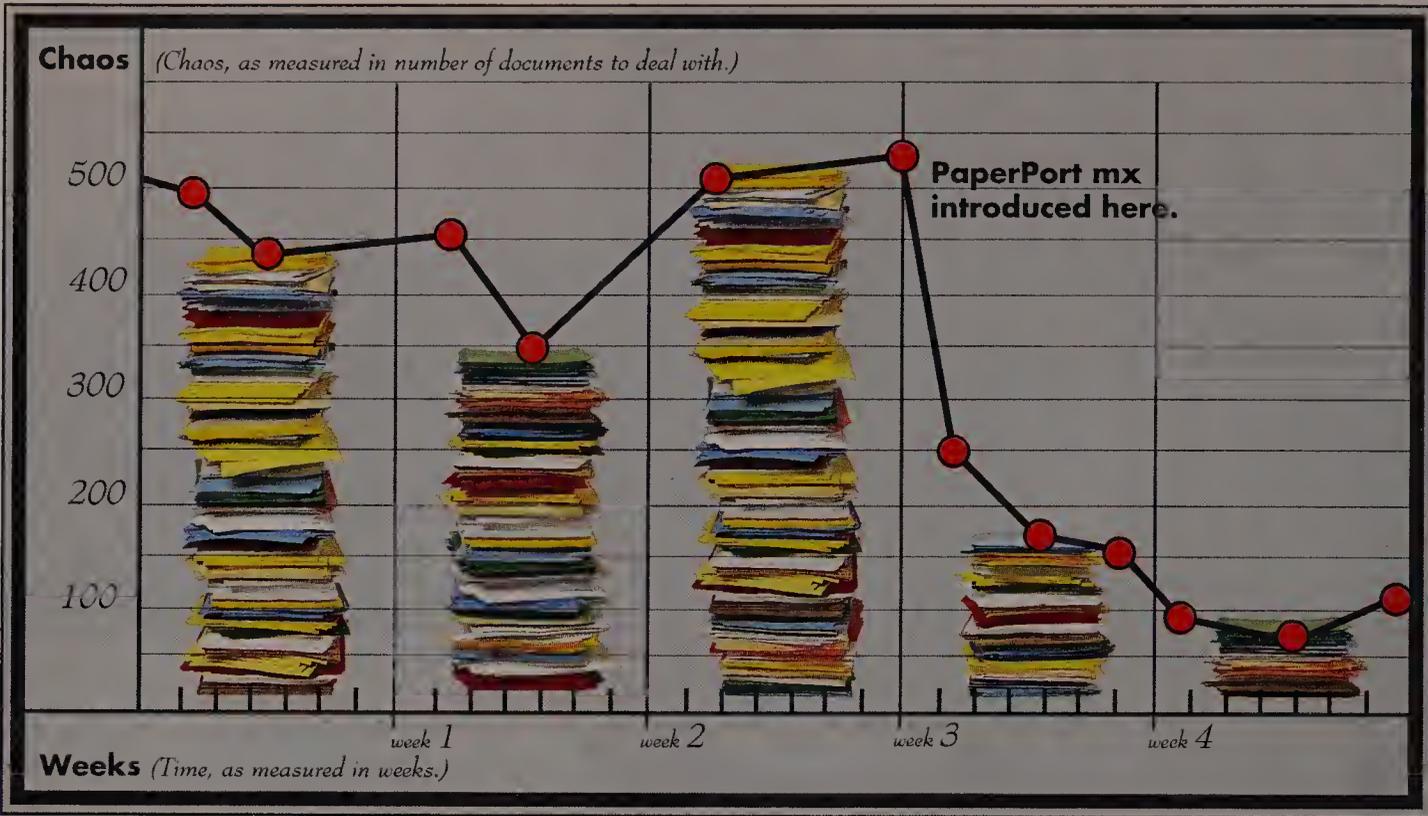
If all this doesn't convince you that the ViewSonic P815 is truly a "mega monitor," then seeing it certainly will. Call (800) 888-8583 and ask for agent 7407 for your nearest dealer.



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# THE BUSINESS STRESS-REDUCTION INDEX



## Sharp drop in chaos; Analysts suspect new PaperPort mx.

<p><b>REDUCE ISSUES DOWN TO THEIR ESSENTIALS.</b></p> <p>The first step in reducing stress is to rid yourself of unnecessary paper. PaperPort mx can scan thousands of words in minutes—from virtually any type of document. Reports. Memos. Letters. Newspaper articles. So you can more easily deal with them. The result is higher productivity. For instance, Toyota's U.S. marketing division deployed PaperPort in its organization and expects to save considerable time and money.</p>	<p><b>IMPROVE YOUR TIME-MANAGEMENT SKILLS.</b></p> <p>Rid your world of unnecessary and time-consuming tasks. For example, retyping. PaperPort mx can handle it for you. Simply take the document you want to retype, and scan it with PaperPort mx. Then PaperPort mx's integrated Xerox TextBridge™ OCR software converts these words to digital format so they can be edited or copied. Literally saving you hours.</p>	<p><b>MANAGE TECHNOLOGY.</b></p> <p>Here's a secret about how to get the technology you have to work harder. Say you want to send a fax. Scan in your document using PaperPort mx, then send a fax using your computer's modem. It saves time (you'll never again have to trek down the hall to fax something). And it's usually cheaper, to boot.</p>	<p><b>SIMPLIFY OPERATIONAL STRUCTURES AND SYSTEMS.</b></p> <p>For instance, your archaic filing system. Instead, use PaperPort mx. Filing things digitally on your computer takes up far less space, but more than that, it helps you pinpoint a specific document later. Just type in a keyword, and PaperPort mx will retrieve it for you.</p>	<p><b>ORCHESTRATE THE PROGRAM FOR CHANGE.</b></p> <p>Don't let its compact size fool you. PaperPort mx is tough enough for even the toughest business environment. For one, it's fully compatible with Windows NT. And at a new lower price, even the most stringent bean counters in your company will be pleased.</p>	
<p><b>BE THE GREAT COMMUNICATOR.</b></p> <p>Use PaperPort mx to scan wads of information directly into reports, proposals, and e-mails. It will even let you send information over the Net—for instance, that contract (or invoice) that needs immediate attention.</p>	<p><b>MEASURABLE OPERATING RESULTS.</b></p> <p>Ah, here's a bonus: PaperPort mx can accomplish all of these things—without hogging space on your desk. It's sleek and small and fits right between your keyboard and monitor.</p>				
			<p><b>FOR ADVICE ON CHAOS-COPING STRATEGIES</b></p> <p>call 1-800-787-7007, extension 210.  <a href="http://www.visioneer.com">http://www.visioneer.com</a>          Or contact an authorized reseller. <b>PAPERPORT mx</b></p>		

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# Quick Information Fix—Web Style

*It's easy to be an informed consumer. Check out these advice-packed Web sites for timely news and tips.*



I'M AN INFORMATION JUNKIE. I get five newspapers a day, and my radio dial is permanently stuck on the local all-news National Public Radio affiliate. Now that I work from home full-time, I sometimes even *miss* those morning and afternoon commutes. Yeah, the traffic was terrible—but it was one of the few times I could listen to an hour of news, uninterrupted.

I now satisfy my information addiction on the Internet, particularly when it comes to consumer-related news and advice. Here,

literally hundreds of public and private consumer agencies congregate to provide a one-stop shop for everything from updates on the latest consumer protection initiatives to complaint forms and information on the cheapest credit cards on the planet.

It's never been easier to be an informed consumer. All it takes is a modem and an Internet hookup. Here's a list of my favorite sites, sure to turn even the laziest consumer into a Nader Raider. While I found most of these sites by searching the Web, you will no doubt find many more just by checking out some of the valuable, time-saving links at each of these sites you visit.

## CONSUMER WORLD

IF YOU BOOKMARK ONLY ONE consumer site, make sure it's this one. It has been around for ages but still offers the most comprehensive set of links on the Internet. Among its useful resources is a Consumer News section that contains updates from the Better Business Bureau, daily reports from the National Fraud Information Center, and news on online scams, courtesy of ScamBusters, an electronic newsletter on Internet-based schemes. The Consumer Agencies section takes you to dozens of state and federal agencies, many of which allow you to file complaints about companies in their jurisdiction or send inquiries directly from their Web pages. There are even links to the customer service Web sites of leading companies, where you can ask questions, find the location of the nearest service center, or just request a replacement for that VCR manual you thought you'd filed away in a "safe" place. (<http://www.consumerworld.org/>)

## NATIONAL CHARITIES INFORMATION BUREAU

THIS IS THE PLACE TO GO if you want to know how your favorite charity is spending your donations. The goal of this organization is to promote intelligent giving and to support the work of nonprofit organizations that meet its rigorous standards. To this end, the NCIB prepares reports on dozens of national organizations. The reports can all be ordered online: You can get up to three reports at no charge, as long as you're willing to wait about four weeks for delivery by snail mail.

The reports are also available for \$5.95 each through the NCIB's fax-on-demand service. Every two weeks the group's site fea- ▶

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PCW-397

## CONSUMER WATCH

tures a new charity whose full report is available online. Also worth a look are the NCIB's tips for givers and a wise-giving guide to charitable organizations. (<http://www.give.org/>)

### INTERNET CONSUMER PROTECTION AGENCY

THIS GROUP IS billing itself as the Better Business Bureau of the Internet, but it's too soon to know how effective it will be in this endeavor. The ICPA is a for-profit business; Web-based merchants register with the ICPA, which then runs a check to verify the legitimacy of the firm and its good business practices. If the company passes muster, it gets to carry the ICPA seal on its home page. In mid-November, only one enterprise, a home-based software reseller in Cornwall, Ontario, was included in the directory. The ICPA is clearly not yet a force, but it may be worth checking out the page periodically to see how things progress. (<http://www.glen-net.ca/icpa/>)

### STATE ATTORNEY GENERAL OFFICES

THIS SIMPLE yet extremely useful page includes the addresses and phone numbers of every state attorney general office in the United States. While this isn't a site that you'll come back to week after week, the list may come in handy if you ever run into problems with an out-of-state merchant. ([http://www.imran.com/Consumers/AG\\_List.html](http://www.imran.com/Consumers/AG_List.html))

### THE BETTER BUSINESS BUREAU ONLINE

THE SERVICE WE'VE BEEN talking about for close to a year is scheduled to go live in the first quarter of 1997. Online businesses that have met BBB standards will display a new "BBB Care" logo. Consumers who click on the logo will be taken directly to the BBB's merchant report for a detailed description of the company and its policies. You'll also be able to check out businesses directly from the BBB's home

page. This part of the service is already available for businesses located in Eastern Massachusetts, Maine, and Vermont. (<http://www.bosbbb.org/searchform.html>) courtesy of the regional BBB office. (<http://www.bbbonline.org/>)

### CARD LEARN

IN THE MARKET for a new low-interest credit card? Want to check out the credibility of an unsolicited credit card application? Then this is the site for you. It's sponsored by the RAM Research Group, publisher of the CardTrak newsletter. The site includes detailed information on all things related to those little plastic conveniences that can cause consumers so many pounding headaches.

You can search for a credit card based on your bill-paying habits: high-

interest, low-fee cards if you pay off your balance every month; low-interest, high-fee cards for everyone else. If the card issuers have company Web sites, links are included. (<http://www.ramresearch.com/cardlern.html>)

### HOW TO RESOLVE YOUR CONSUMER COMPLAINT

THIS PAGE IS WRITTEN BY attorney Richard Alexander, whose law firm sponsors the separate Consumer Law Page (<http://consumerlawpage.com/>), and provides consumers with a detailed step-by-step guide to resolving disputes with merchants and manufacturers. Its common-sense approach starts with contacting the offending merchant and continues through selecting an attorney—a last, and hopefully unnecessary, resort. Bookmark this site; it could come in handy. (<http://seamless.com/talf/txt/complain.html>)

### CONSUMER INFORMATION CENTER WEB

THE GOOD FOLKS at the Government Printing Office in Pueblo, Colorado, are no longer producing paper versions of all their great consumer guides. Fortunately, many of them now are available ▶

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## CONSUMER WATCH

online. One of the most popular, the Consumer's Resource Handbook, provides detailed instructions on resolving disputes and additional information on how to contact many state and federal agencies. The publication is updated annually. You can download all of it, or just the sections you're most interested in. This site also features listings of other informational publications that are offered for sale by the GPO. (<http://www.pueblo.gsa.gov/specpubs.htm>)

### THE CENTER FOR MEDIA EDUCATION

THIS WASHINGTON, D.C.-BASED nonprofit is a leader in the national drive for fair, open media. It led the charge to get television networks to offer 3 hours of educational programming for kids each day, took the lid off electronic redlining—where poor and minority communities are bypassed by new information networks—and started a debate about online marketing to children.

At this site you'll find thorough, groundbreaking reports on media issues that affect all of us. CME's Web page includes copies of its newsletters, discussion of key issues surrounding the use of new media, and excerpts from the Center's reports. (<http://tap.epn.org/cme/intro.html>)

### NATIONAL INSTITUTE FOR CONSUMER EDUCATION

OPERATED BY the College of Education at Eastern Michigan University, NICE was established in 1973 as a clearinghouse for consumer, economic, and personal finance education. This site features terrific primers on leasing a car, obtaining financial aid for college, obtaining credit (targeted specifically at women), and avoiding fraud. Good, useful stuff. Check it out. (<http://www.emich.edu/public/coe/nice/nice.html>)

*Do you have a favorite consumer information Web site? Send the URL or any other comments you have on consumer topics to [consumerwatch@pcworld.com](mailto:consumerwatch@pcworld.com). Roberta Furger is a PC World contributing editor and author of the forthcoming CyberGirls (Warner Books, 1997, 212/522-7200). ■*

## COMING UP

IN APRIL

### INDISPENSABLE INTERNET TOOLS

Overwhelmed by more bookmarks, news-groups, and plug-ins than you can handle? Web utilities can help you surf the Internet swiftly and safely. We find the best bookmark and search tools, offline readers, mail clients, security utilities, and much more.

### THE BEST PLACES TO TELECOMMUTE...

Telecommuting takes more than getting your boss to buy in. We rank 300 cities for telecommuting, evaluating everything from employment rates and local taxes to ISDN access and next-day mail delivery.

### ...AND THE BEST SOFTWARE TO SET UP YOUR TELECOMMUTE

We stayed home but kept on working to give you our take on eight remote access packages. Here are the top ways you can bring your electronic office home or take it on the road.

### EASY STORAGE: IDE HARD DRIVES

Adding storage to your PC used to require patience and technical expertise—but no longer. We test simple-to-install IDE hard drives with capacities of 2GB and up.

### ALSO NEXT MONTH

► **The PC World Top 100:** Updated monthly, this is the most current buyers guide to PCs and peripherals. Check out the Top 20 Power Desktops, Budget Desktops, and Notebooks and the Top 10 Personal Printers, 15-Inch Monitors, Graphics Boards, and Internal Modems.

► **Special Report on Small Office, Home Office:** We'll help you pick the right phone system and technology to run a successful business. Plus our favorite products and services for small offices, including a fast ISDN service and much more.

► **Here's How:** Upgrade Guide to adding an external drive to your PC.

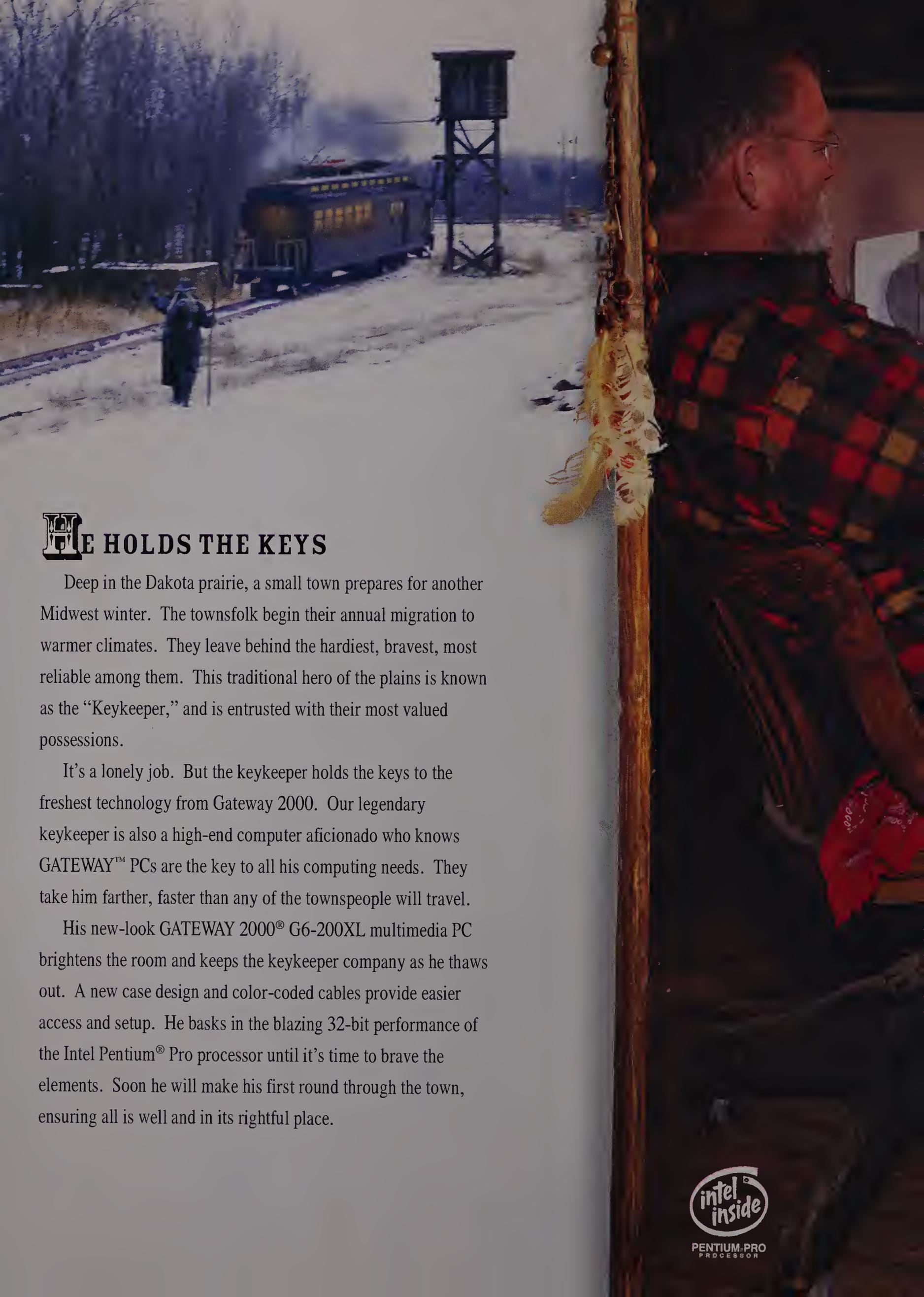
# PC WORLD

THE  
**DAKOTA KEYKEEPER**  
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## HE HOLDS THE KEYS

Deep in the Dakota prairie, a small town prepares for another Midwest winter. The townsfolk begin their annual migration to warmer climates. They leave behind the hardest, bravest, most reliable among them. This traditional hero of the plains is known as the "Keykeeper," and is entrusted with their most valued possessions.

It's a lonely job. But the keykeeper holds the keys to the freshest technology from Gateway 2000. Our legendary keykeeper is also a high-end computer aficionado who knows GATEWAY™ PCs are the key to all his computing needs. They take him farther, faster than any of the townspeople will travel.

His new-look GATEWAY 2000® G6-200XL multimedia PC brightens the room and keeps the keykeeper company as he thaws out. A new case design and color-coded cables provide easier access and setup. He basks in the blazing 32-bit performance of the Intel Pentium® Pro processor until it's time to brave the elements. Soon he will make his first round through the town, ensuring all is well and in its rightful place.



PENTIUM PRO  
PROCESSOR

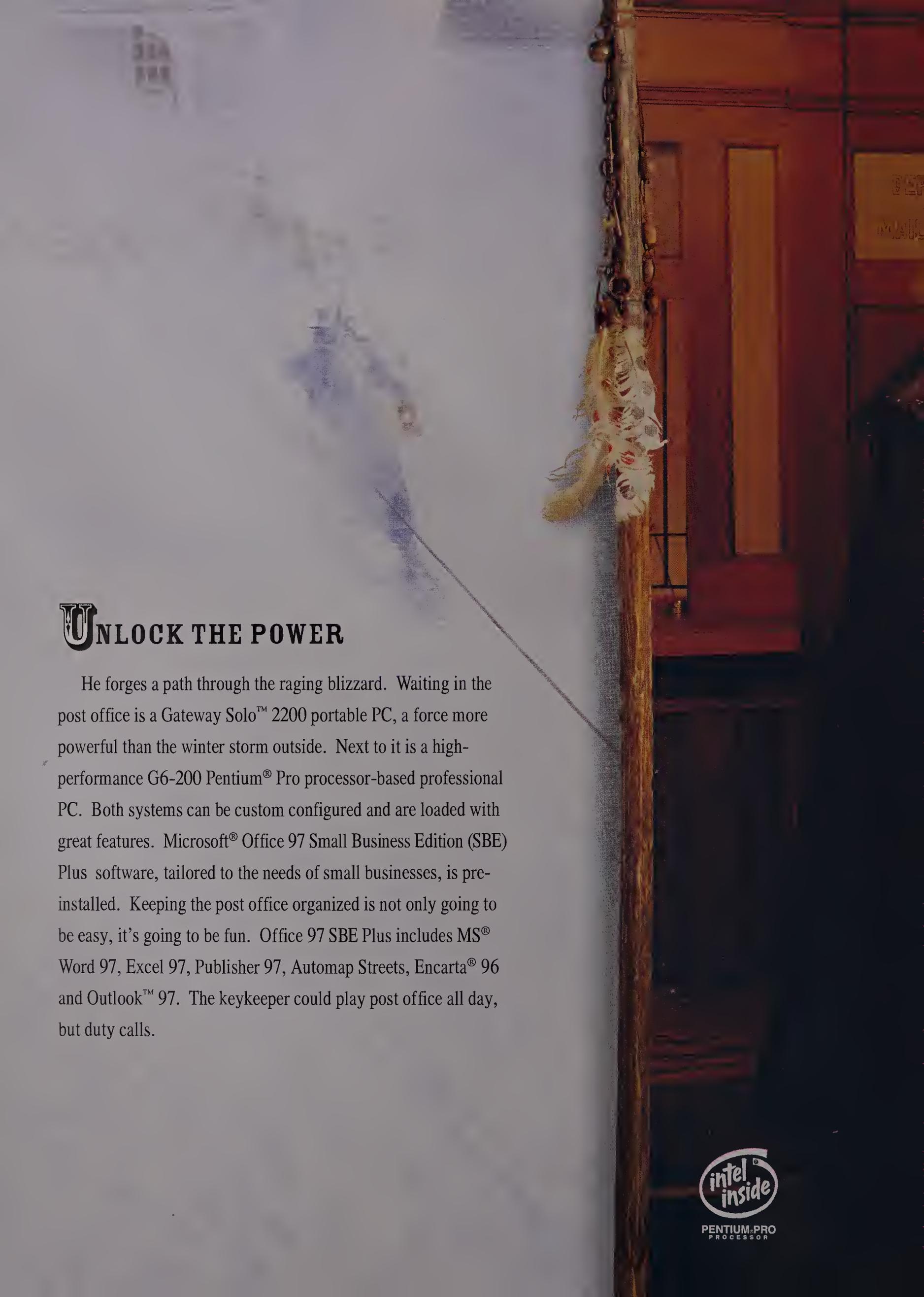


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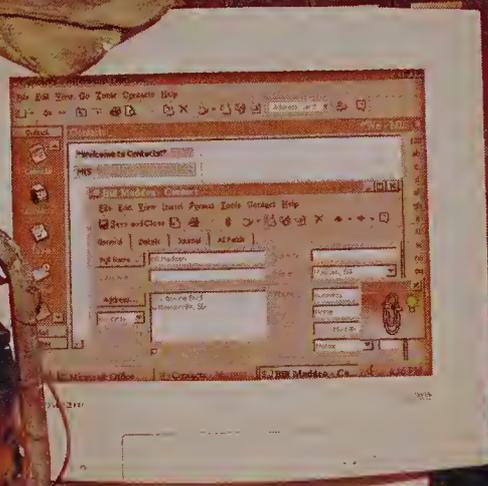
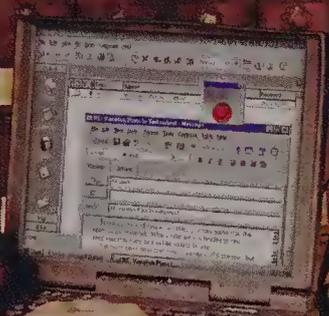
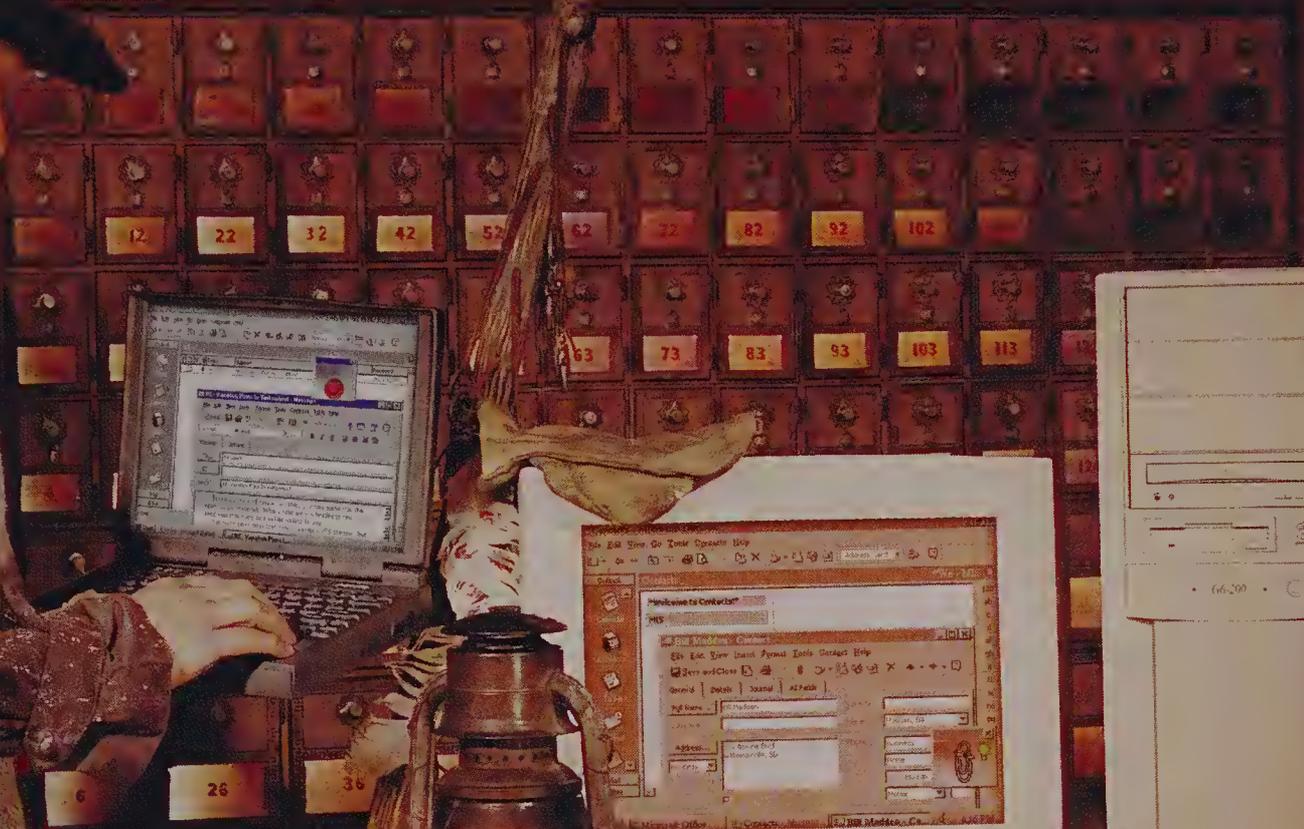
www.gateway2000.com



## UNLOCK THE POWER

He forges a path through the raging blizzard. Waiting in the post office is a Gateway Solo™ 2200 portable PC, a force more powerful than the winter storm outside. Next to it is a high-performance G6-200 Pentium® Pro processor-based professional PC. Both systems can be custom configured and are loaded with great features. Microsoft® Office 97 Small Business Edition (SBE) Plus software, tailored to the needs of small businesses, is pre-installed. Keeping the post office organized is not only going to be easy, it's going to be fun. Office 97 SBE Plus includes MS® Word 97, Excel 97, Publisher 97, Automap Streets, Encarta® 96 and Outlook™ 97. The keykeeper could play post office all day, but duty calls.



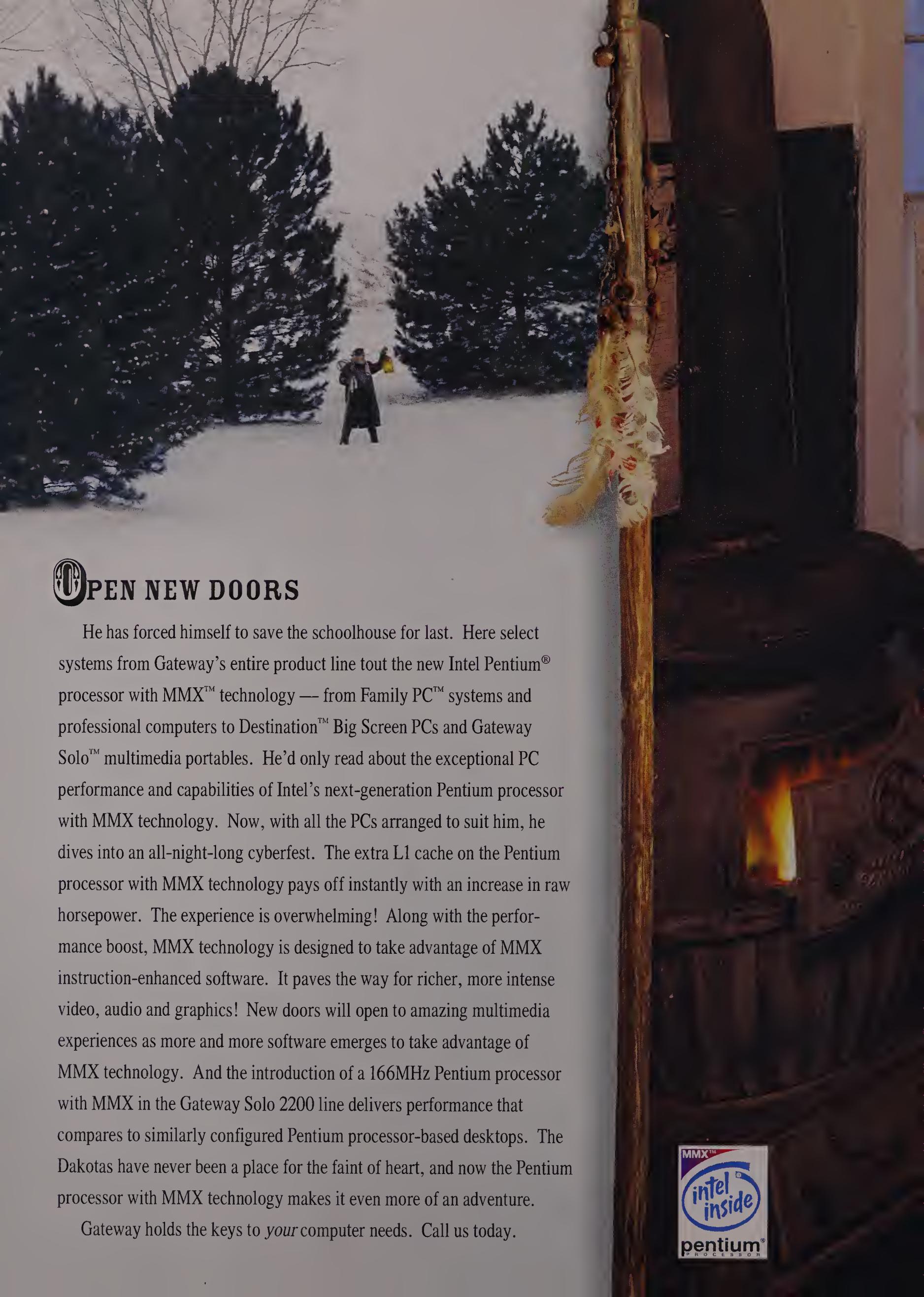


**GATEWAY2000**

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

8 0 0 - 5 5 5 - 2 0 9 9

www.gateway.com



## OPEN NEW DOORS

He has forced himself to save the schoolhouse for last. Here select systems from Gateway's entire product line tout the new Intel Pentium<sup>®</sup> processor with MMX<sup>™</sup> technology — from Family PC<sup>™</sup> systems and professional computers to Destination<sup>™</sup> Big Screen PCs and Gateway Solo<sup>™</sup> multimedia portables. He'd only read about the exceptional PC performance and capabilities of Intel's next-generation Pentium processor with MMX technology. Now, with all the PCs arranged to suit him, he dives into an all-night-long cyberfest. The extra L1 cache on the Pentium processor with MMX technology pays off instantly with an increase in raw horsepower. The experience is overwhelming! Along with the performance boost, MMX technology is designed to take advantage of MMX instruction-enhanced software. It paves the way for richer, more intense video, audio and graphics! New doors will open to amazing multimedia experiences as more and more software emerges to take advantage of MMX technology. And the introduction of a 166MHz Pentium processor with MMX in the Gateway Solo 2200 line delivers performance that compares to similarly configured Pentium processor-based desktops. The Dakotas have never been a place for the faint of heart, and now the Pentium processor with MMX technology makes it even more of an adventure.

Gateway holds the keys to *your* computer needs. Call us today.

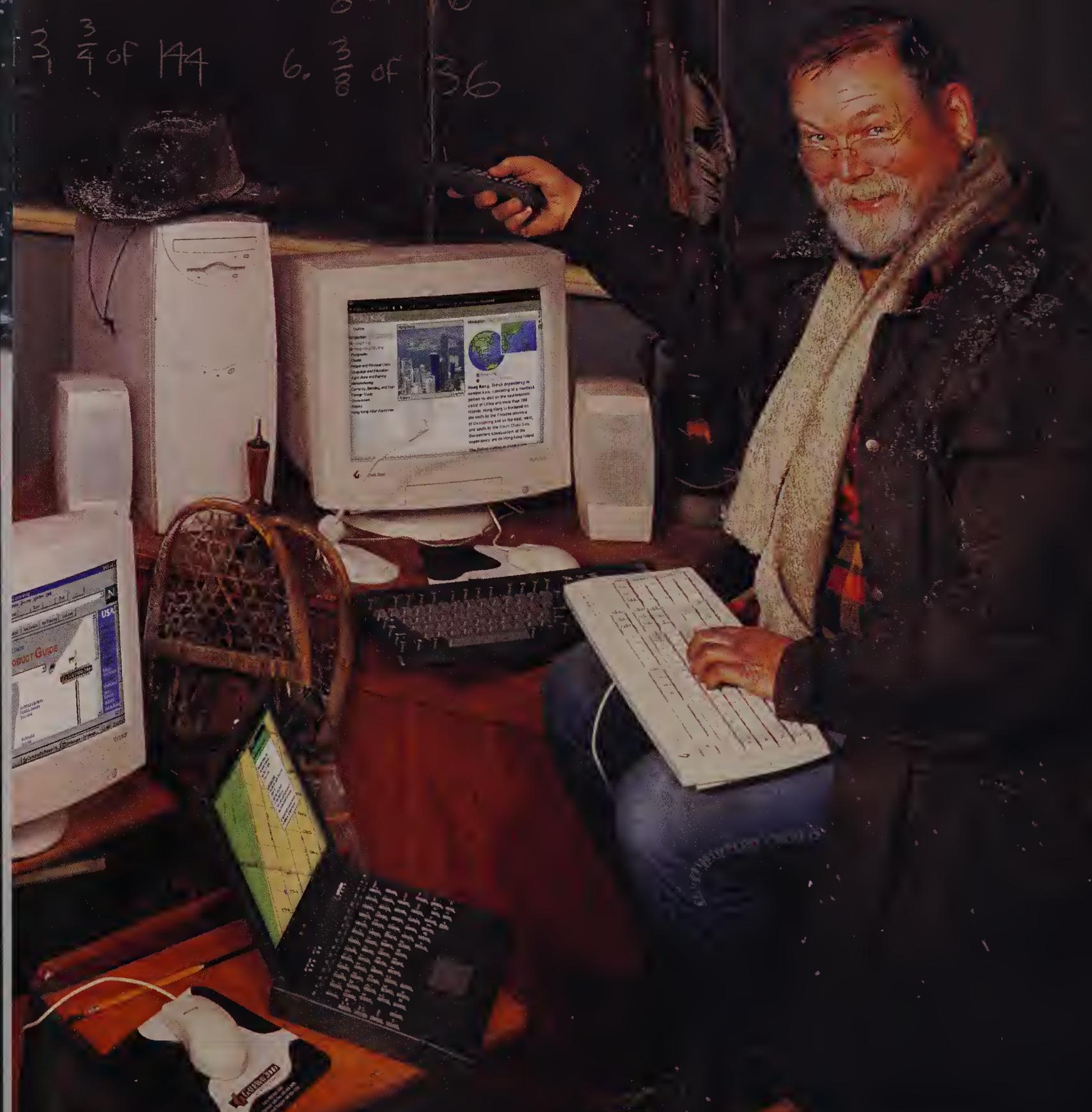




ARITHMETIC

Today's Lesson

- 1.  $\frac{3}{4}$  of 48
- 2.  $\frac{3}{4}$  of 92
- 3.  $\frac{3}{4}$  of 144
- 4.  $\frac{3}{4}$  of 384
- 5.  $\frac{3}{8}$  of 6
- 6.  $\frac{3}{8}$  of 36



 **GATEWAY2000**  
"You've got a friend in the business."®

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www.gateway2000.com

## Destination™ Big Screen PCs

### D5-166

- Intel® 166MHz Pentium® Processor with MMX™ Technology
  - 32MB Synchronous DRAM
  - 256K Pipelined Burst Cache
  - Destination 31" VGA Monitor
  - STB® 2MB VRAM Graphics Accelerator w/ Cable-Ready TV Tuner
  - 2.5GB 11ms EIDE Hard Drive
  - 12X CD-ROM/3.5" Diskette Drives
  - 16-Bit Ensoniq® Wavetable Sound Card
  - TelePath® 33.6 Data\*/14.4 Fax Modem
  - 7-Bay Charcoal-Colored PC Case
  - Wireless Keyboard w/ Integrated EZ Pad™ Pointing Device
  - Wireless Field Mouse® Remote
  - Four-Channel RF Receiver
  - Microsoft® Windows® 95
  - Destination Software Collection
  - MMX Technology-Enhanced Software Bundle♦♦
  - Gateway Gold™ Service and Support\* for Big Screen PCs
  - **DISH™ Network Satellite System\* Offer**
- \$2999** As low as\* \$104/mo.

### D5-200

- Intel 200MHz Pentium Processor with MMX Technology
  - 32MB Synchronous DRAM
  - 512K Pipelined Burst Cache
  - Destination 31" VGA Monitor
  - STB 2MB VRAM Graphics Accelerator w/ Cable-Ready TV Tuner
  - 2.5GB 11ms EIDE Hard Drive
  - 12X CD-ROM/3.5" Diskette Drives
  - ▶ **EasyPhoto™ Drive**
  - 16-Bit Ensoniq Wavetable Sound Card
  - ▶ **harman/kardon® High-Fidelity Sound System**
  - TelePath 33.6 Data\*/14.4 Fax Modem
  - 7-Bay Charcoal-Colored PC Case
  - Wireless Keyboard w/ Integrated EZ Pad Pointing Device
  - Wireless Field Mouse Remote
  - Four-Channel RF Receiver
  - MS® Windows 95
  - Destination Software Collection
  - MMX Technology-Enhanced Software Bundle♦♦
  - Gateway Gold Service and Support\* for Big Screen PCs
  - **DISH Network Satellite System\* Offer**
- \$3999** As low as\* \$138/mo.

### D6-200

- Intel 200MHz Pentium Pro Processor
  - 64MB EDO DRAM
  - 256K Internal Cache
  - Destination 31" VGA Monitor
  - STB 2MB VRAM Graphics Accelerator w/ Cable-Ready TV Tuner
  - 3.8GB 11ms EIDE Hard Drive
  - 12X CD-ROM/3.5" Diskette Drives
  - ▶ **EasyPhoto Drive**
  - 16-Bit Ensoniq Wavetable Sound Card
  - ▶ **harman/kardon High-Fidelity Sound System**
  - TelePath 33.6 Data\*/14.4 Fax Modem
  - 7-Bay Charcoal-Colored PC Case
  - Wireless Keyboard w/ Integrated EZ Pad Pointing Device
  - Wireless Field Mouse Remote
  - Four-Channel RF Receiver
  - MS Windows 95
  - Destination Software Collection
  - Gateway Gold Premium Service and Support\* for Big Screen PCs
  - **DISH Network Satellite System\* Offer**
- \$4399** As low as\* \$152/mo.

## Gateway Solo™ Portable PCs

### 2100 S5-120

- 11.3" DSTN SVGA Color Display
  - Intel 120MHz Pentium Processor
  - 16MB EDO DRAM expandable to 72MB
  - 256K Pipelined Burst Cache
  - 1MB EDO Video RAM
  - Zoomed Video Port
  - 1GB Hard Drive
  - Modular 8X CD-ROM Drive
  - Modular 3.5" Diskette Drive
  - 16-Bit Sound & Stereo Speakers
  - NiMH Battery & AC Pack
  - 85-Key MS Windows 95 Keyboard
  - Carrying Case
  - MS Windows 95
  - MS Works 95
  - Gateway Gold Service and Support for Portable PCs
- \$2299** As low as\* \$80/mo.

### 2100 S5-133

- 12.1" Active Matrix SVGA Color Display
  - Intel 133MHz Pentium Processor
  - 24MB EDO DRAM expandable to 72MB
  - 256K Pipelined Burst Cache
  - 1MB EDO Video RAM
  - Zoomed Video Port
  - 1.3GB Hard Drive
  - Modular 8X CD-ROM Drive
  - Modular 3.5" Diskette Drive
  - 16-Bit Sound & Stereo Speakers
  - Lithium Ion Battery & AC Pack
  - 85-Key MS Windows 95 Keyboard
  - Carrying Case
  - MS Windows 95
  - MS Office 97, Small Business Edition Plus♦
  - Gateway Gold Service and Support for Portable PCs
- \$3349** As low as\* \$116/mo.

### 2200 S5-150

- 12.1" Active Matrix SVGA Color Display
  - Intel 150MHz Pentium Processor with MMX Technology
  - 32MB EDO DRAM expandable to 80MB
  - 256K Pipelined Burst Cache
  - 2MB EDO Video RAM
  - Zoomed Video Port
  - 1.3GB Hard Drive
  - Modular 8X CD-ROM Drive
  - Modular 3.5" Diskette Drive
  - 16-Bit Wavetable Sound & Stereo Speakers
  - Lithium Ion Battery & AC Pack
  - 85-Key MS Windows 95 Keyboard
  - Carrying Case
  - MS Windows 95
  - MS Office 97, Small Business Edition Plus♦
  - Gateway Gold Service and Support for Portable PCs
- \$3899** As low as\* \$135/mo.

### 2200 S5-166

- 12.1" Active Matrix SVGA Color Display
  - Intel 166MHz Pentium Processor with MMX Technology
  - 80MB EDO DRAM
  - 256K Pipelined Burst Cache
  - 2MB EDO Video RAM
  - Zoomed Video Port
  - 2GB Hard Drive
  - Modular 8X CD-ROM Drive
  - Modular 3.5" Diskette Drive
  - 16-Bit Wavetable Sound & Stereo Speakers
  - 28.8 PCMCIA Data/14.4 Fax Modem
  - Lithium Ion Battery & AC Pack
  - 85-Key MS Windows 95 Keyboard
  - Carrying Case
  - MS Windows 95
  - MS Office 97, Small Business Edition Plus♦
  - Gateway Gold Service and Support for Portable PCs
- \$5299** As low as\* \$183/mo.

♦MS Office 97, Small Business Edition Plus includes MS Word 97, Excel 97, Publisher 97, Automap Streets, Encarta® 96 and Outlook™ 97.

♦♦MMX Technology-Enhanced Software Bundle includes Pod™, Eraser™—Turn About, The Ultimate Human Body Version 2.0, and The Third Dimension™.

\*Financing available on approved credit issued and administered by MBNA America® Bank, N.A. Payments based on 36-month term at 14.9% Annual Percentage Rate.

\*Maximum data transfer rate dependent on certain variables including particular modems with which you are communicating, telephone lines, communications software and communications protocols.

\*The Destination 31" monitor is covered by a one-year limited warranty. Call or write for a free copy.

GSA Schedule #GS-35F-3349D



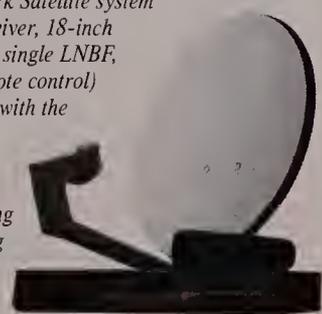
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www.gw2k.com

\*For a limited time, Destination and multimedia system purchases include a coupon for one DISH Network Satellite system

(satellite receiver, 18-inch antenna with single LNBF, infrared remote control) at no charge with the purchase of a one-year subscription to a qualifying programming package from DISH Network

for \$300. Taxes, delivery and installation not included. Satellite system service covers 48 contiguous states and is supported by DISH Network. Residential use only.



Gateway 2000 Quality Management Systems for Customer Hardware Support. Sioux Falls, South Dakota; Desktop & Portable Manufacturing Divisions and Remanufacturing in North Sioux City, South Dakota, are ISO 9002 certified.



**P5-133 FAMILY PC™**

- Intel® 133MHz Pentium® Processor
- 16MB Synchronous DRAM
- 256K Pipelined Burst Cache
- CrystalScan®500 .28dp Monitor (13.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 1.2GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- 16-Bit GATEWAY™ Sound
- Altec™ Lansing ACS-41 Speakers
- TelePath® 33.6 Data\*/14.4 Fax Modem for Windows with Speakerphone
- Mini Tower Case
- 104+ Keyboard & MS® Mouse 2.0
- Microsoft® Windows® 95
- Generations III Software Collection
- Gateway Gold™ Service & Support for Desktop PCs
- **DISH Network Satellite System\* Offer**  
**\$1599** As low as\* \$55/mo.

**P5-166 FAMILY PC**

- Intel 166MHz Pentium Processor with MMX™ Technology
- 32MB Synchronous DRAM
- 256K Pipelined Burst Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2.5GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- 16-Bit Gateway Sound
- Altec Lansing ACS-41 Speakers
- TelePath 33.6 Data\*/14.4 Fax Modem for Windows with Speakerphone
- ▶ **New Look Mini Tower Case**
- 104+ Keyboard & MS IntelliMouse™
- MS® Windows 95
- MS Office 97, SBE Plus♦
- MMX Technology-Enhanced Software♦♦
- Gateway Gold Service & Support for Desktop PCs
- **DISH Network Satellite System\* Offer**  
**\$2199** As low as\* \$76/mo.

**P5-200 FAMILY PC**

- Intel 200MHz Pentium Processor with MMX Technology
- 32MB Synchronous DRAM
- 512K Pipelined Burst Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2.5GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- 16-Bit Ensoniq® Wavetable Sound Card
- Altec Lansing ACS-41 Speakers
- TelePath 33.6 Data\*/14.4 Fax Modem for Windows with Speakerphone
- ▶ **New Look Mini Tower Case**
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- MMX Technology-Enhanced Software♦♦
- Gateway Gold Service & Support for Desktop PCs
- **DISH Network Satellite System\* Offer**  
**\$2499** As low as\* \$87/mo.

**G6-180 FAMILY PC**

- Intel 180MHz Pentium Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2.5GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- 16-Bit Ensoniq Wavetable Sound Card
- Altec Lansing ACS-41 Speakers
- TelePath 33.6 Data\*/14.4 Fax Modem with Speakerphone
- ▶ **New Look Mini Tower Case**
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Gateway Gold Service & Support for Desktop PCs
- **DISH Network Satellite System\* Offer**  
**\$2449** As low as\* \$85/mo.

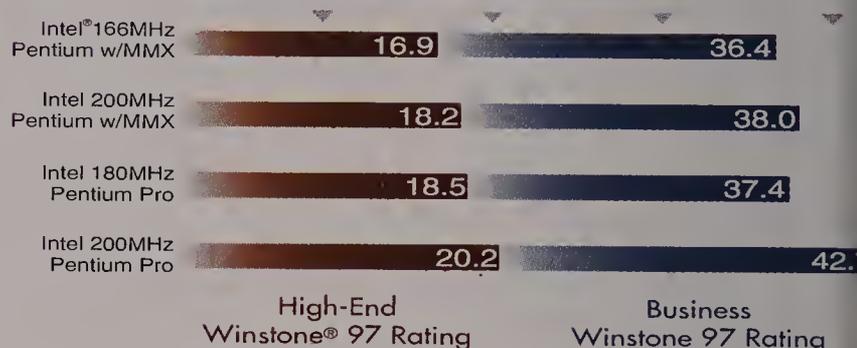
**G6-200 FAMILY PC**

- Intel 200MHz Pentium Pro Processor
- 64MB EDO DRAM
- 256K Internal Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- STB® ViRGE™/VX 4MB, 3-D 64-Bit PCI Graphics
- 3.8GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- 16-Bit Ensoniq Wavetable Sound Card
- Altec Lansing ACS-41 Speakers
- TelePath 33.6 Data\*/14.4 Fax Modem with Speakerphone
- ▶ **New Look Mini Tower Case**
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Gateway Gold Service & Support for Desktop PCs
- **DISH Network Satellite System\* Offer**  
**\$2899** As low as\* \$100/mo.

**G6-200XL**

- Intel 200MHz Pentium Pro Processor
- 64MB EDO DRAM
- 256K Internal Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- STB ViRGE/VX 8MB, 3-D 64-Bit PCI Graphics
- 5.1GB 10ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- CD-Recordable w/ SCSI Controller
- 16-Bit Ensoniq Wavetable Sound Card
- Altec ACS-410 & ACS-251 Speakers
- TelePath 33.6 Data\*/14.4 Fax Modem with Speakerphone
- ▶ **New Look Mini Tower Case**
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Generations III Software Collection
- Gateway Gold Premium Service & Support for Desktop PCs
- **DISH Network Satellite System\* Offer**  
**\$3749** As low as\* \$130/mo.

**Performance Graph**



Ziff-Davis' Winstone 97 Version 1.0 produced scores of 16.9 and 36.4; 18.2 and 38.0; 18.5 and 37.4; and 20.2 and 42.7 Winstone Version 1.0 units on its High-End Winstone 97 suite and Business Winstone 97 suite on Gateway 2000, Inc. PCs configured with 166MHz Intel Pentium Processor with MMX technology, 200MHz Intel Pentium Processor with MMX technology, 180MHz Intel Pentium Pro processor and 200MHz Intel Pentium Pro processor, respectively. All Gateway 2000 PCs tested featured 32MB RAM, 256K RAM cache, 3.8GB hard disk, IDE controller, FAT file system, and no hardware disk cache. Systems include S3 ViRGE/VX graphics adapter; with 4MB VRAM with v1.23m3 driver; 1024x768 with 256 colors; and a refresh rate of 75Hz. Test systems used MS DOS 7.1 and MS Windows 95. All products used in the test were shipping versions available to the general public, and the test and its results were not verified by Ziff Davis.

\*MS Office 97, Small Business Edition Plus includes MS Word 97, Excel 97, Publisher 97, Automap Streets, Encarta® 96 and Outlook™ 97.

♦♦MMX Technology-Enhanced Software Bundle includes Pod™, Eraser™ - Turn About, The Ultimate Human Body Version 2.0, and The Third Dimension™.



Professional Systems

**P5-133**

- Intel 133MHz Pentium Processor
- 16MB Synchronous DRAM
- 256K Pipelined Burst Cache
- CrystalScan500 .28dp Monitor (13.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 1.2GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- Mini Tower Case
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Gateway Gold Service & Support for Desktop PCs
- \$1499** Business Lease\* \$55/mo.

**P5-166**

- Intel 166MHz Pentium Processor with MMX Technology
- 24MB Synchronous DRAM
- 256K Pipelined Burst Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2.5GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- Mini Tower Case
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Gateway Gold Service & Support for Desktop PCs
- \$1999** Business Lease\* \$74/mo.

**P5-200**

- Intel 200MHz Pentium Processor with MMX Technology
- 32MB Synchronous DRAM
- 512K Pipelined Burst Cache
- CrystalScan700 .28dp Monitor (15.9" viewable area)
- 2MB SGRAM, 3-D 64-Bit PCI Graphics
- 2.5GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- Mini Tower Case
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Gateway Gold Service & Support for Desktop PCs
- \$2299** Business Lease\* \$85/mo.

**G6-200**

- Intel 200MHz Pentium Pro Processor
- 32MB EDO DRAM
- 256K Internal Cache
- Vivitron®700 .26dp Monitor (15.9" viewable area)
- STB ViRGE/VX 4MB, 3-D 64-Bit PCI Graphics
- 3.8GB 11ms EIDE Hard Drive
- 12X CD-ROM/3.5" Diskette Drives
- Tower Case
- 104+ Keyboard & MS IntelliMouse
- MS Windows 95
- MS Office 97, SBE Plus♦
- Gateway Gold Service & Support for Desktop PCs
- \$2599** Business Lease\* \$96/mo.

## EXTRAS

(Available to both existing and new Gateway customers.)

### GATEWAY SELECT

Our Gateway Select program lets you know you're getting software that meets or exceeds our standards for quality, value and ease of use.

#### Software

- **Games & Entertainment Pack II** Includes Deadlock™; MechWarrior® 2: Mercenaries™; 9™; Pitfall™; SPQR: The Empire's Darkest Hour™; and PC ProPad. \$99
- **Kid's Backpack™ III** Includes Schoolhouse Rock!™; Grammar Rock™; Sesame Street: Get Set to Learn®; Math Blaster® Episode 2: Secret of the Lost City; Imo & The King™; Putt-Putt® Goes To The Moon™; and Gateway cow-spotted backpack. \$59
- **Finance Pack II (U.S. Shipment Only)** Includes Quicken® Deluxe 6, Quicken Financial Planner™ 2, Quicken Family Lawyer™ 7, Quicken Parents' Guide to Money™ and a Turbo Tax® 96 coupon. \$69

#### Printers & Extras

(Each printer includes cable and ink cartridge.)

- Canon® BJC®-240 Bubble Jet Printer \$189
- Canon BJC-70 Portable Bubble Jet Printer \$299
- Hewlett®-Packard LaserJet 5L Xtra Laser Printer \$399
- Hewlett-Packard LaserJet 6P Laser Printer \$769
- MS® SideWinder™ 3D Pro Joystick \$59
- APC™ Back-UPS® 650 Pro UPS \$329
- Visioneer™ PaperPort Vx™ \$249

#### Service & Support

##### Gateway Gold™ Premium for Desktop Systems

Extended Three-Year On-Site Agreement\*

- Priority 800 Number For Access to Technical Experts  
With system purchase \$99  
Within current on-site service agreement \$129

For our complete line of software and peripherals call GATEWAY™ component add-on sales at 800-846-2080. Sales Hours: 7am-10pm Weekdays (CT).

\*On-site service is available to most locations in the continental United States, Alaska, Hawaii, Puerto Rico and Canada after you and your Gateway technician determine an on-site visit is necessary. On-site service is provided by PC Technology Services, Inc. On-site is not available for any monitor, mouse, keyboard, or portable system. Write or call for a free copy of the on-site service agreement.



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## UPGRADES

(Sold only with the purchase of a system.)

### Desktop Upgrades

- Altec™ Lansing ACS-251 Subwoofer \$75
- Altec Lansing ACS-410 Dolby® Surround Sound Speaker System w/ ACS-251 Subwoofer \$120  
(upgrade from PCs that include Altec ACS-41 speakers)
- CD-Recordable Drive \$429  
4X read/2X write recordable CD drive with SCSI controller, CD Creator 2 for MS Windows® and three media disks.
- Iomega® Ditto™ 3200 Internal Tape Backup Unit \$199  
3200MB with compression, nominal 1600MB
- Iomega Internal Zip™ 100MB Drive \$139  
(includes three 100MB cartridges)
- Iomega External Zip 100MB Drive \$199  
(before \$50 manufacturers rebate)
- Iomega Jaz® 1GB Drive \$429  
(includes SCSI controller and 1GB cartridge)
- MS Windows NT® 4.0 Upgrade \$99  
(upgrade from PCs that include MS Windows 95)

### Portable PC Upgrades

- Gateway Solo™ Mini Docking Bar \$199
- 28.8 PCMCIA Data/14.4 Fax Modem \$200
- Gateway Solo 2100 upgrade from an 11.3" Dual Scan to an 12.1" Active Matrix SVGA color display \$530

### Destination™ Big Screen PC Upgrades

- harman/kardon® High-Fidelity Sound System  
Seven-piece Dolby Pro Logic® Surround Sound speaker system including AVR-10 audio/video receiver with remote, subwoofer, center channel, and four satellites for the ultimate multimedia audio experience. \$699

The Dakota Keykeeper is Gateway 2000 Security Guard, Ed Redenius. Thanks for freezing your "key-ster" off for us during this photo shoot, Ed.



610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526 • International FaxBack Access 605-232-2561  
Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-5pm Saturdays & Sundays (CT)

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\*Financing available on approved credit issued and administered by MBNA America® Bank, N.A. Payments based on 36-month term at 14.9% Annual Percentage Rate. †Leasing arranged by independent leasing companies to qualified commercial customers. Lease payments based on 36-month term. Lease terms subject to change without notice or obligation.



# Performance. Art.

Introducing Studioworks, the new generation of computer displays from

*Studioworks*

GoldStar. On the performance

side, Studioworks delivers a clearer, sharper

image and more accurate color, edge to

edge. Plug and play compatibility with Windows® 95

sets optimal image characteristics automatically\*. A compact

design fits more screen into less space. And new digital on-

screen controls make precise, custom adjustment simpler.

For the artist in you, Studioworks displays the fine details and

the subtle tones and textures, to give your vision that added

brilliance. The new Studioworks series from GoldStar.

They're more than monitors, they're

masterpieces. Ask for them at your

local computer retailer.



## S T U D I O W O R K S

MODEL	SCREEN	PITCH	MAX. FLICKER-FREE RESOLUTION
20i	20" (18.76" VIS)	.28mm dot	1280x1024 @ 76 Hz NI
78i/78m†	17" FST (15.7" VIS)	.26mm dot	1280x1024 @ 76 Hz NI
76i/76m†	17" FST (15.7" VIS)	.28mm dot	1024x768 @ 80 Hz NI
56i	15" FST (13.6" VIS)	.28mm dot	1024x768 @ 80 Hz NI
56m†	15" FST (13.6" VIS)	.28mm dot	1024x768 @ 80 Hz NI

† Built-in stereo amplifier and speakers. \* Requires DDC compatible video card. Microsoft and Windows 95 are registered trademarks of Microsoft Corporation.

Designed for  
  
 Microsoft  
 Windows 95

**GoldStar**

 LG Electronics

LG Electronics U.S.A., Inc.  
 1000 Sylvan Avenue, Englewood Cliffs, NJ 07632 (201) 816-2000

PHOTO-LINK-CRT  
  
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 YEAR LIMITED  
 WARRANTY

Circle 96 on reader service card

## Software on the cheap ♦ My printer won't let me upgrade ♦ Cheated by sound card

## YOU CAN RECYCLE SOFTWARE?

I WAS IN THE MARKET for a new word processor but hesitated to pay the \$229 list price for the latest version of WordPerfect. It occurred to me that I could save some money by buying used software, but I wasn't sure that was legal. When I saw an ad in *PC World* for a company called Recycled Software in Las Vegas, though, I gained confidence. I placed an order for WordPerfect 6.1, paid \$179, and received the product in two days. I had some trouble with the installation and called the company for help. A technician patiently walked me through the process. A few days later, I had another problem—which turned out to be unrelated to WordPerfect—and received the same patient guidance. I'm very pleased with this company.

*Edwin Gillmore, Blossburg, Pennsylvania*

**Editor's response:** According to Sandy Conway, co-owner of Recycled Software Inc., it is legal to sell used software—though the process isn't simple. Conway told us most software license agreements allow you to transfer the license provided you surrender the complete product and remove all traces of it from your hard drive. When somebody sells used software to Recycled Software, they must sign a transfer agreement and

surrender the complete package. "If we find that there is a disk or manual missing, we send the package right back," Conway says. You can reach Recycled Software at 800/851-2425.



## LEFT BEHIND BY WINDOWS 95

I PAID \$2900 for an Okidata Doc-It multifunction device in October 1993. I'm very fond of this combination printer, fax machine, copier, and scanner. When Windows 95 first came out, Okidata promised a Windows 95 version of the software that operates Doc-It. But last summer, I got a letter from Okidata saying that Doc-It

simply doesn't work in the Windows 95 environment. At first I didn't worry about it, but now I want to buy a new PC and, naturally, it will come with Windows 95. That leaves me unable to use my beloved (and expensive) Doc-It. I'm furious.

*Stephen Kligerman, Rockaway, New Jersey*

**Editor's response:** We spoke to Gene Grunza, senior marketing manager at Okidata. He explained that the company ran into technical difficulties that it was unable to resolve in developing the Windows 95 version of the Doc-It software. Rather than leave Kligerman an unhappy victim of the fast pace of change, however, Grunza offered to exchange Kliger-

man's Doc-It for a new printer. Kligerman says he's impressed with Okidata's response to his situation. "They offered me a choice of two new machines, either of which can do everything Doc-It can, apart from scanning." Grunza assured us that Okidata will look at every Doc-It owner's situation on a case-by-case basis. You can contact Okidata's Doc-It technical support at 800/654-0018.

## THE UPGRADE MYTH

I BOUGHT A Dell Dimension P133c in October 1995. When I placed my order, I confirmed with the representative that I would be able to upgrade the Sound Blaster AWE32 sound card that came with it. I was happy with the system until I recently decided to upgrade the card. On the board I expected to find standard SIMMs that I could simply replace, but there weren't any. I called Dell for help and a representative told me my system came with a low-end "value edition" of the AWE32. That board can't be upgraded. I feel ripped off.

*Kiran Shenoy, Dix Hills, New York*

**Editor's response:** Dan Taylor of Dell's executive services department apologized to Shenoy and authorized a full refund on his AWE32 card—even though its warranty had expired. "We cannot confirm what actually happened," explains Taylor. "We concluded that there was a misunderstanding between Mr. Shenoy and the sales representative when the order was placed." Dell currently ships only the full edition of the card with its Dimension and OptiPlex systems. At press time, Shenoy had declined Dell's offer of a refund, preferring to hold off his upgrade and buy a new card at a later date. Our advice? If you want particular components in your new computer, be as specific as possible when you place the order: Use part names and version numbers whenever possible—and get the configuration in writing before you pay.

Think you've gotten a raw deal—or a great one? PCW Advocate wants to hear the details at [advocate@pcworld.com](mailto:advocate@pcworld.com). We'll investigate complaints and publish items of the broadest interest. Aoife McEvoy is a staff editor for PC World.

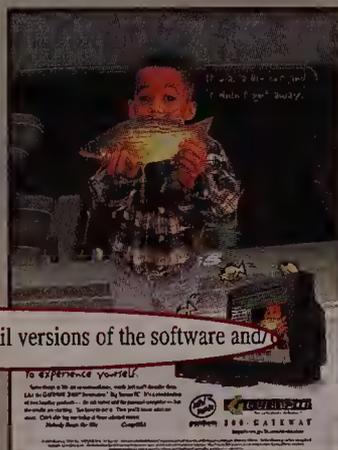
## THE FINE PRINT

## IS BUNDLED SOFTWARE AS GOOD AS RETAIL?

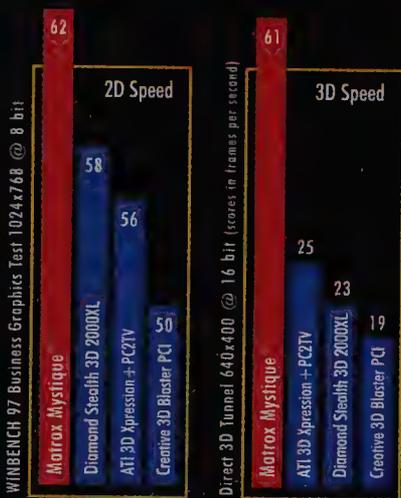


DON'T ASSUME the software that comes with your new PC is identical to what you'd buy off the shelf. The fine print on this Gateway ad says the bundled software may be different from the retail version. How so?

1. For starters, there's no printed manual. You'll get the software with its on-screen help on CD-ROMs. If you want printed manuals, be prepared to pay extra.
2. The biggest difference is with technical support. Support on Microsoft Office is free from Microsoft if you buy the retail version. Gateway provides support if you buy the software preinstalled. And as it happens, Gateway provides free support for most bundled Microsoft titles. But some companies charge for software support, so it's important to ask about this before you buy.



# Speed Versatility Upgradeability



New high performance drivers



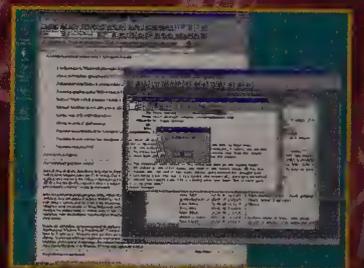
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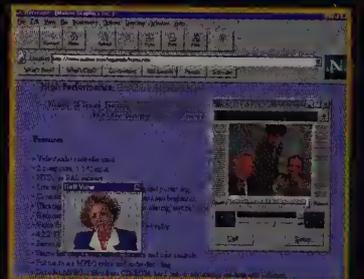
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\*Estimated street price for 2 MB. \*\*Game bundle available with retail version only. All performance tests conducted by Matrox Graphics Inc. on a Dell Dimension P200 V configured with Intel P5-200 MHz, 16 MB of SDRAM and 256K cache. Matrox Mystique, Diamond Stealth 3D 2000 XL and ATI 3D Xpression + PC2TV were configured with 2 MB of memory for the PCI bus using driver release 3.30, 4.03.00.2105 and 3.0 respectively for Windows 95. Creative 3D Blaster PCI was configured with 4 MB of memory for the PCI bus using driver release 1.01 for Windows 95. Winbench 97 business test conducted at 1024 x 768 resolution with 8-bit color at 75-HZ refresh using small fonts under Windows 95. Microsoft Tunnel test run at full screen 640 x 400 resolution with 16-bit color at default manufacturer refresh rate based on Gouraud shading, perspective correct textures, point sampled and z-buffer.

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This companion card for the Matrox Mystique accelerator lets you create and edit high quality movies just like a pro with full resolution Motion JPEG (MJPEG) technology. It's fast, easy and fun. Just capture video from your camcorder, edit in Hollywood style special effects and then save your masterpiece to VHS tape or send it over the Net.

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Rainbow Runner Studio	✓	✓	✓	✓	\$249
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Miro DC20	✓				\$669
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\* Estimated street price. \*\* Software bundle available only with retail product. Rainbow Runner products can only be used in conjunction with Matrox Mystique. 1. Watching TV on the PC requires Matrox Rainbow Runner TV (sold separately) or a VCR in addition to Matrox Rainbow Runner Studio. 2. Video conferencing software included. 3. Price quoted is for 4 MB version. All prices accurate at time of printing. VDOnet is a registered trademark of the VDOnet corporation.

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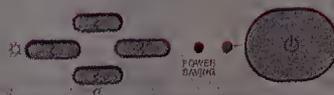
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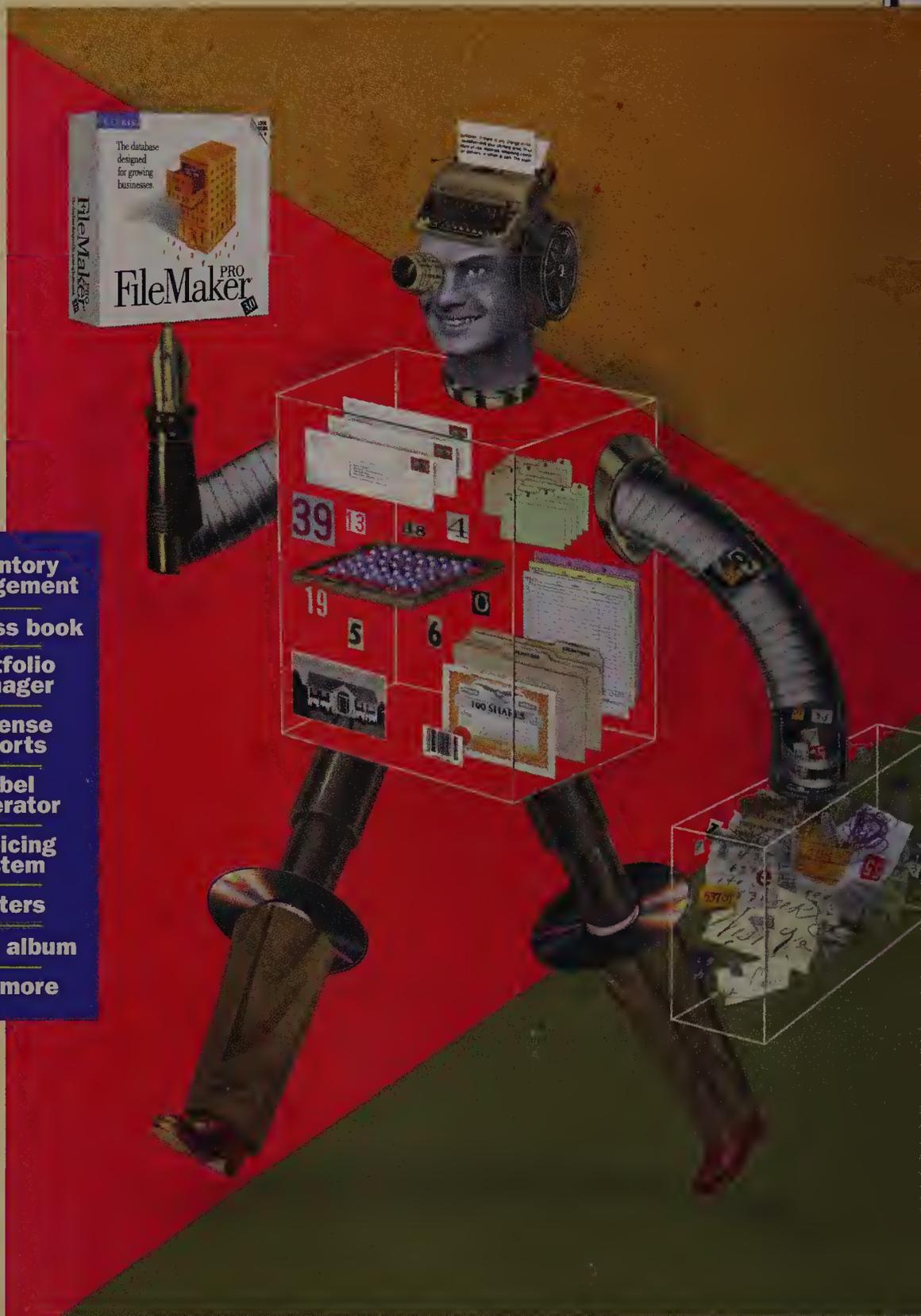
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# Working Overtime at a Dead-end Job

*How do you find a new job when your current one keeps you so busy you don't have time to search? Kristina Klein used the Internet to find the perfect employer.*



**THE PROBLEM** IT'S AN ALL-TOO-TYPICAL situation. Your job is unfulfilling; you're not paid what you deserve; and your boss doesn't appreciate your contributions. At the same time, you're too busy to undertake the intensive job search that would land you the job you've been dreaming about. This month, Kristina Klein, a marketing communications manager for a Northern California technology start-up company, tells how she escaped a dead-end job, and found an ideal one—using the Internet. —*Editor*

TAKE A PERSON who thrives on working proactively, put them in a job where there's no time to be anything but reactive, and you've got a serious case of burnout. That's the situation I found myself in at my last job. As the trade show specialist for a small technology company, I was in charge of coordinating and supervising the company's participation in 35 trade shows each year. It was a huge amount of work: planning the trade show schedule; handling all the paperwork; coordinating with other vendors; and designing, setting up, and running the booths.

I enjoyed the excitement, but I didn't appreciate that my company gave me little support. It usually takes eight weeks to coordinate participation in a trade show. But in most cases I had less than four weeks. Because I had so little time, I worked long hours in panic mode. On top of that, my marketing, public relations, and database design skills weren't being employed to their fullest. To make matters worse, I was underpaid and my job title didn't reflect the work I was doing. Clearly, I had to get out.

## THE SOLUTION: USE THE WEB TO FIND THE PERFECT JOB

JOB HUNTING IS time-consuming and hard to manage when you're working long hours and don't want your employer to know you're looking. But something had to give, so I started my search for a better job. Initially, I spent several hours a week hunting the traditional way: scanning newspaper classifieds and reading job listings in a professional organization's newsletter. Then I went online. At first I spent about four hours a week on the Internet, sorting through the jobs listed at various corporate Web sites. But soon I found a much more efficient way. I took out a subscription to the *San Jose Mercury News* Web site, Mercury Center (<http://www.sjmercury.com>), which includes the newspaper's classified ads. Using its search engine, I was able to quickly find job listings in my field.

It's a much faster and more complete way to sort through the ads. For instance, a lot of companies place one big ad in the Sunday classifieds. Even though a variety of jobs might be listed—marketing as well as engineering positions, say—that ad might be in the Engineering section, where I could easily miss it. But Mercury Center cross-references all job listings. As long as I used “marketing” or “trade show coordinator” as keywords, I'd see all the relevant listings, no matter how they were categorized. ►

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NT 4.0 patches ♦ Hurricane gets more wind ♦ OS/2 bug fix ♦ LapLink and WebEx updates

# More Patches for Windows NT 4.0

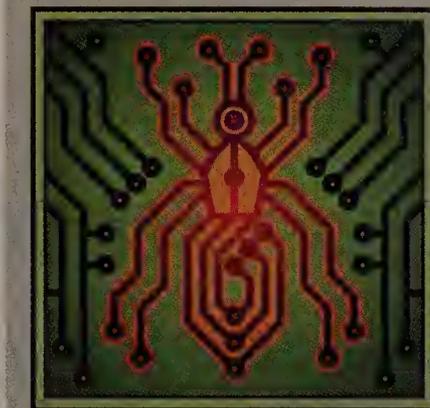
MICROSOFT CONTINUES TO find and fix problems with Windows NT 4.0. In fact, the company has released nearly a dozen more patches since we last wrote about NT (*Bugs and Fixes*, February). These fix an assortment of problems, including CD-ROM read errors, Microchannel bus snarls, incompatibilities with PC Card devices and dongles (hardware copy-protection devices required for programs like AutoCAD), and flaws that can restart or crash multiprocessor systems running the OEM version of NT.

Each fix is located in its own directory on Microsoft's FTP server (<ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/hotfixes-postSP1>), which you can access with any browser. To locate, download, and install a fix, go to the FTP site and select a directory with a promising name; for instance, go to `cdfs-fix/` for the patch for the CD-ROM problem. For a description of the problem and the fix, look for and open the .txt file beginning with the letter q, such as `q142687.txt`. For installation instructions, open the `readme.txt` file.

By the time you read this, Microsoft may have been rolled all of these fixes into a collection of patches called Service Pack 2. If the service pack is available, you'll be able to pick it up at <ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/nt40/ussp1/i386>. You'll also find Service Pack 1 there, if you haven't downloaded it yet.

## HELP FOR HELIX HURRICANE 2.0

IF YOU USE Helix Software's Hurricane 2.0 Windows memory manager, and you've experienced problems printing or playing .avi movies (or if you're getting error messages with any programs that was problem-free before you installed Hurricane or that works fine when Hurricane is disabled), Helix may have a patch for you. Since the program debuted last year, the company has posted three updates—versions 2.01, 2.02, and 2.03—on its Web site (<http://www.helixsoftware.com/techsupp.html>) in succession. Windows 3.1 and 95 versions of all three upgrades are available. You can also download the files from Helix's FTP server (<ftp://ftp.helixsoftware.com/pub/support.html#Hurricane>).



## I N B R I E F

### LapLink for Windows and WebEx Upgrades

TRAVELING SOFTWARE HAS added some tweaks to LapLink for Windows 7.5. The new version 7.5b patch supports Matrox Millennium video boards, fixes a modem call-back glitch under Windows 95 OEM Service Release 2, and prevents a file transfer error that may cause data loss with high-speed connections. You can find the patch file at <http://www.travsoft.com/download/techdownload.htm>. While you're there, you may want to update your version of WebEx, the company's offline Web browser, to 1.02. The upgrade improves access to subscription services, such as the online versions of the *Wall Street Journal*. You can go directly to this 1.2MB upgrade at <http://www.travsoft.com/products/webex/upgr102.htm>.

Keep in mind, though, that the patches are cumulative. If you currently have version 2.01, you'll need to download and apply the 2.02 patch before applying the 2.03 patch. To find out which version you've got, look in the Hurricane Control Panel (the program's main configuration window).

The patch process itself is automated: Just download the self-extracting, self-applying patch file and accept its default settings. Once it's installed, however, you may still need help from Helix tech support (718/392-3735) to make it work, especially if you're uncomfortable with delicate chores like adding commands to .ini files. If you're an intrepid Hurricane survivor willing to go it alone, check the `readme.txt` file in your computer's \hurrican directory for instructions.

## B U G O F T H E M O N T H

### Warp CHKDSK Error Fixed

**BUG** OS/2 Warp 4's CHKDSK utility always reports a 'MINOR SYSTEM ERROR' when it scans a hard drive that's been partitioned with OS/2's High Performance File System. CHKDSK then attempts to fix the problem but fails, so you get the same error message each time you run the program. The problem lies with the 'start' entry in the partition's root directory, which is hidden for better compatibility with older FAT-file-system programs (it wasn't hidden before version 4.0). Unfortunately, IBM neglected to change CHKDSK to look for a hidden 'start'; hence the error.

**FIX** IBM has posted an updated `uhpfs.dll` that fixes the problem. You'll find the patch at <ftp://service.boulder.ibm.com/ps/products/os2/fixes/v4warp/english-us/jr09427/jr09427.zip>. To install it, unzip the compressed file to a temporary directory, boot from your OS/2 installation floppies, press <F3> for a command prompt, and then move `uhpfs.dll` from the temporary directory into the boot drive's `OS2\DLL` directory. ■

## B U G G E D ?

IF YOU FIND a hardware or software bug, post your report on PC World Online, or send us e-mail at [bugs@pcworld.com](mailto:bugs@pcworld.com).

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**“THE PIERCING GAZE OF SCRUTINY”**

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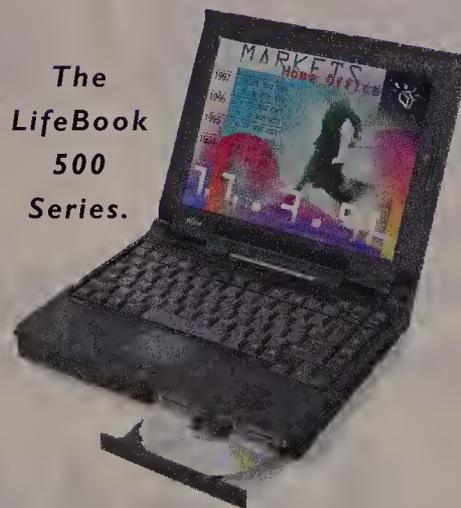
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# TOP OF THE NEWS

## Browser Battle Lines

Communicator and Internet Explorer 4 attack the Web from different directions.



### B E T A

FOR A BRIEF moment in time during the great 1995 and 1996 Internet gold rush, the industry and users alike felt like true pioneers, exploring uncharted territories, expanding their universe. Programs with poetic names reminiscent of legendary Spanish and Portuguese globe-trotters promised the thrill of new worlds. But *Internet* has since become a household term, and Navigator and Internet Explorer are everyday tools not unlike word processors. As Netscape and Microsoft have discovered, Web browsing is

just one aspect of what people need to be productive.

Accordingly, the two software publishers have revamped their Web browsers in an effort to address different productivity needs. Netscape Communicator, which includes Navigator and other applications, is a fairly complete communications suite with plenty of tools for staying in touch, interacting with peers, and keeping informed. Internet Explorer 4, on the other hand, presents a new desktop and file management model, making files on your system and those on a remote Internet site appear and be-

have the same. It's a classic Microsoft approach: Integrate applications and Windows 95 homogeneously to create one-stop computing.

Despite their different approaches to providing what users need and want, the com-

panies offer similar bottom lines—packages that create the conditions for doing much of your computing within the browser environment. I took a look at an early beta release of Communicator and had a brief hands-on encounter with the pre-beta version of Internet Explorer 4—both of which



are expected to ship during the second quarter of this year.

### COMMUNICATOR

NETSCAPE DESCRIBES Communicator, which will sell for \$49.95, as an open e-mail, groupware, and browser suite. Simply put, this package will run on every major platform and relies on open standards such as POP3, SMTP, and IMAP4 for e-mail and H.323 for Internet phone. This openness means cross-platform

operability for users of UNIX, Macintosh, and Windows 95, 3.1, and NT, and an independence from proprietary products such as Lotus Notes or cc:Mail. It even supports ActiveX, originally developed by Microsoft. This well-integrated suite is made up of a variety of components:

■ **Collabra** The groupware collaboration tool is a souped-up news reader. It accommodates discussion forums—public or private areas on an intranet or on the Internet—that let users interact with colleagues via message boards.

■ **Composer** This fairly rudi-

mentary HTML authoring applet includes all the standard Rich Text fare (fonts, alignment, color, and so forth), a non-WYSIWYG but easy-to-use table tool, a spelling checker, and a publishing feature that enables you to upload your file to a Web server.

■ **Conference** The successor to Navigator 3's CoolTalk, Conference includes point-to-point chat, Internet phone, and a whiteboard. Like the rest of Communicator, Conference supports the Lightweight Directory Access Protocol standard, so you can click on a name in an Internet directory such as Four11 and initiate a session just as easily as from within the corporate address book.

■ **Messenger** This e-mail client also relies on LDAP for its address book, and it supports encryption. You compose a message with Composer, so HTML-based e-mail can have a Rich Text Format with images incorporated into the message. Any HTML-aware e-mail client can view these messages exactly as they're intended to be seen. Messenger features custom filters for e-mail and hierarchical folders for organizing incoming and outgoing messages; it supports UUencoding for binary attachments.

■ **Navigator** Even if you love your existing Navigator to pieces, you must admit that its minimalist design and lack of customizability are major shortcomings. The new Navigator looks elegant and contemporary, and it's easily customized. Drag a URL from the address box to the custom toolbar, and you're just one click away ▶



### Vendor Shakeout

SEVERAL SMALL and midsize PC vendors have departed the market. Canon Computer Systems is halting desktop and notebook PC operations. Canon says it will continue to support its systems. Blackship Computer, a small Silicon Valley manufacturer, stopped answering its phones late last year. *PC World* has not been able to reach company officials. Austin Computer/IPC Technologies, a PC maker in Austin, Texas, has been purchased and will be under new management, according to sources. Analysts foresee trouble for midsize vendors as large players gather up market share.

### More Problems at America Online

IN ONE OF SEVERAL recent legal actions against AOL, frustrated customers filed a class action suit alleging that the online service promised unlimited use under its flat-rate program but couldn't meet the surge in demand. Citing recurring network failures, plaintiffs are seeking millions of dollars in punitive damages. AOL says it expects to prevail in the lawsuit and announced steps to improve service and better meet demand. This is the latest round of problems for the nation's largest online service following its introduction of ▶

INTERNET  
 GET UP-TO-THE-MINUTE NEWS, including RealAudio daily news summaries, hot game demos, and productivity shareware, at PC World Online. Just point your browser to <http://www.pcworld.com/news.html>.

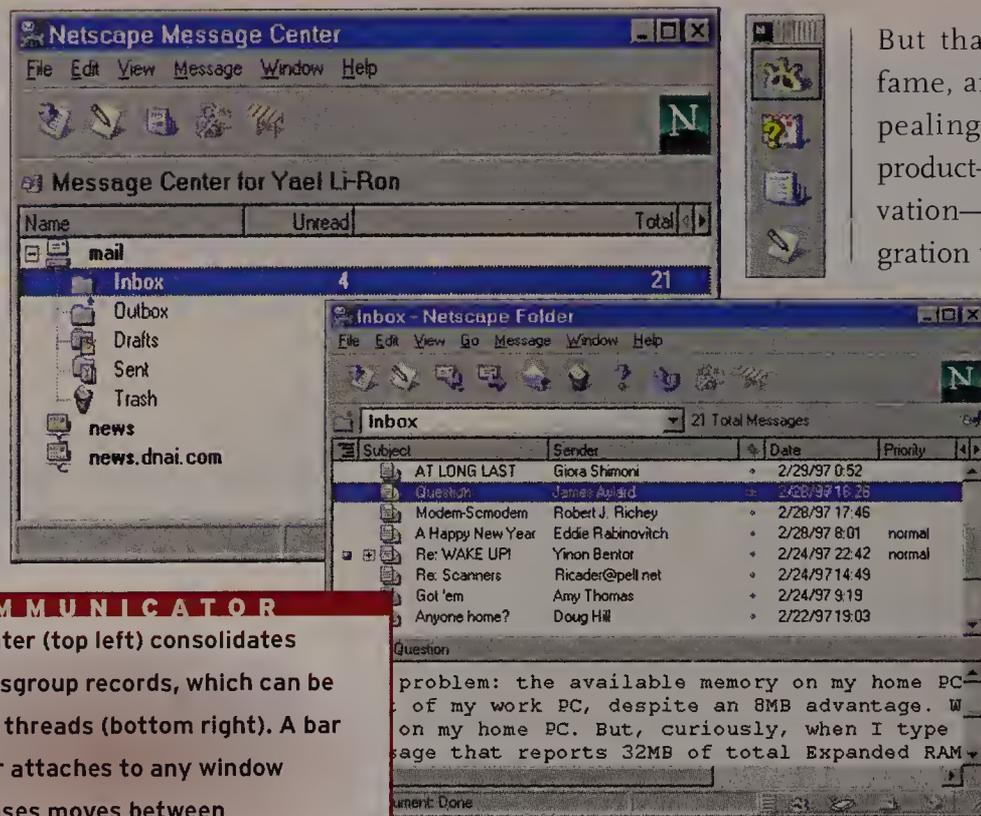
EDITED BY  
 Charles Piller and Randy Ross

from a favorite site, because that site is now available as an icon on the toolbar. Navigator supports HTML 3.2, but some proprietary HTML tags that were presented by Netscape to the World Wide Web Consortium for approval were implemented before the W3C had time to consider them. So much for open standards—but Microsoft is doing the exact same thing with its own proposed extensions to HTML.

The most interesting new tag is <LAYER>, which allows designers to place elements in specific screen coordinates and provides superb overlapping. This feature brings unprecedented DTP-like capabilities to HTML design.

Netscape also will add Constellation, its push technology offering (see "Web Performance Enhancers," page 66). Finally, Communicator simplifies and automates the installation of plug-ins.

A tiny four-button toolbar lets you switch between these components. It can be anchored to the status bar of each Communicator program or detached and set to float. A pro-



**COMMUNICATOR**  
 Message Center (top left) consolidates mail and newsgroup records, which can be organized by threads (bottom right). A bar that floats or attaches to any window (top right) eases moves between Communicator's components.

fessional edition of Communicator will also include a calendar tool for the scheduling of people and resources, and an IS manager's program to permit centralized management of all the aspects of the suite.

**INTERNET EXPLORER 4**

IE 4 WAS not yet available in beta as we went to press. A Microsoft representative said the beta would likely be released by the end of March and would be available free from the company's Web site. Much of what I'm describing here isn't set in stone, as the prod-

uct is evolving rapidly. But it's not far-fetched to assume that Microsoft is currently dissecting Communicator to molecular level, figuring out where and how to one-up the competition. In order to have a genuine apples-to-apples comparison, one would need to assemble several Microsoft products in addition to IE 4.

But that's not its claim to fame, anyway. The most appealing aspect of this new product—and its crucial innovation—is its complete integration with the Windows 95 and NT 4.0 environments (more accurately, with the shell, or interface) so it can function as the desktop and file manager. In other words, the user can opt to replace the existing Explorer shell, which is the Windows 95 and NT 4.0 interface, with IE 4. Browsing and managing files on your local system or local area network will be identical to browsing on the Web.

The interface is entirely HTML-aware, so all URLs you place on the desktop are "hot," and your pointer will become the familiar pointing hand when you move over them. You can use a wizard to design an HTML template that controls the way folders look, complete with textured background, logos, Rich Text, ta-

Communicator brings unprecedented DTP-like capabilities to HTML design.

■ **A Web/desktop hybrid** As a Web browser, IE 4 doesn't seem to offer much beyond evolutionary tweaks to IE 3.

**Communicator Versus Explorer—New Approaches**

PRODUCTS	Overall approach	Groupware	HTML editing	Conferencing	E-mail	Web browsing	Content delivery
<b>Communicator 4,</b> \$49.95 <a href="http://www.netscape.com">http://www.netscape.com</a>	Cross-platform, integrated communications suite for work groups and individuals.	Collabra: Discussion forums enabled by news reader; calendar tool available in Professional Edition.	Composer: Simple HTML editor.	Conference: Internet phone, chat, and whiteboard.	Messenger: Supports encryption, Internet directories, and HTML-based Rich Text Format.	Navigator: Customizable, interface supports ActiveX and DTP-like layouts.	Constellation: Netscape's push technology, soon to be integrated into Communicator.
<b>Internet Explorer 4,</b> free <a href="http://www.microsoft.com/ie">http://www.microsoft.com/ie</a>	Integrates Windows 95 and NT 4.0 desktops with the Web, creating an HTML-aware system and letting applications run within the browser.	Outlook 97: Free adjunct product offers group scheduling and more. Internet News: Add-on, standard news reader.	FrontPad: Simple HTML editor; included.	NetMeeting 2: Free adjunct product includes Internet phone, chat, whiteboard, and video-conferencing.	Internet Mail: Free adjunct e-mail client.	Internet Explorer: The old browser, with few changes so far.	Active Desktop: Uses dynamic HTML to deliver information interactively; included.

bles, movie and audio clips, and other elements that make a folder look and behave like a Web page.

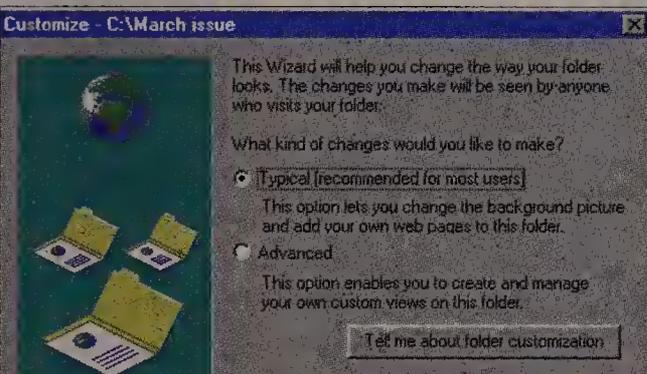
The template is saved in a hidden folder within the folder to which it applies, and it may be edited directly at any time by the HTML-savvy user or through the simple wizard. The pre-beta version of IE 4 doesn't let users establish a master template for a consistent look throughout the system, but Microsoft reports that

## Netscape faces the formidable challenge of Microsoft's integration of IE 4 with the world's dominant OS.

a videoconferencing session with any H.323-compliant program from any vendor.

### ■ Internet Mail and Internet

**News** New versions of Microsoft's e-mail client and its news reader—add-on products—were not available for assessment.



### INTERNET EXPLORER 4

Explorer 4's wizards help change the look of folders (top), while Microsoft's overall approach can make all your files look and behave like Web links. The image below is from a file on the local system's hard drive.

feature will be implemented in the final release.

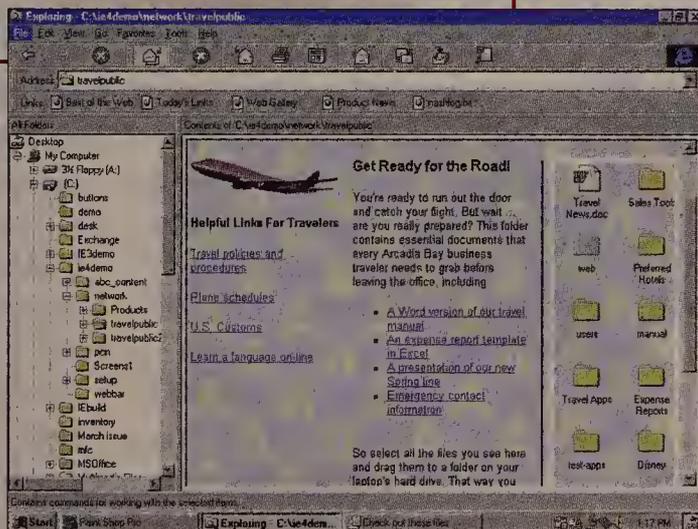
### ■ Outlook 97

Outlook 97, the groupware solution from Office 97, will be a strong selling point when integrated with IE 4. Judging by reaction from early Office 97 adopters, Outlook 97 is sure to give Netscape's Collabra a run for its money.

### ■ FrontPad Micro-

soft says the forthcoming HTML editor will be bundled with Internet Explorer 4; it should be roughly equivalent to Netscape's Composer editing tool.

■ **NetMeeting 2** Currently in beta, NetMeeting 2 offers chat, a whiteboard, Internet telephone, and even videoconferencing. It's designed to enable



Mail will support encryption, Microsoft says, and both products will support LDAP.

■ **Active Desktop** A client-side tool lets users receive push broadcasts from content providers such as PointCast. Interactivity in Active Desktop is based on Microsoft's new Dynamic HTML technology, which allows system admin-

istrators to create interactive elements without the need for programming. Dynamic HTML has been presented to W3C for consideration.

Separate products aren't scheduled to be offered as an integrated package—at least not at this point—but they all work together smoothly, based on what I've seen in IE 3 and Outlook. Integration often proves to be primarily a matter of semantics.

### WHICH APPROACH WILL WIN?

ONLY TIME will tell whether corporate partners and IS managers buy into Netscape's vision of open standards and abandon the established, if proprietary, e-mail and collaboration products they've standardized on. Corel's recent decision to license Communicator—and integrate it into Corel productivity suites—bodes well for Netscape. If IS managers also sign on, you

can look forward to using Communicator as your communications mainstay. But Netscape faces the formidable challenge of Microsoft's integration of IE 4 with the world's dominant operating system.

The real winner, then, will emerge in the interoperability battlefield: Will Microsoft's operating systems prevail, or will platform independence change the way that we do things? The rest of the computer industry currently finds itself grappling with the very same question.

—Yael Li-Ron ►



### Notebooks With Mongo Screens

AMS, NEC, and Toshiba have announced notebooks with 13.3-inch active-matrix displays, the largest screens currently available. The displays offer a viewable area that matches or exceeds that of 15-inch CRT monitors. NEC's \$6399 Versa 6200 series includes a Pentium MMX-166 CPU, a 2.1GB hard drive, a 10X CD-ROM drive, and 32MB of RAM. Toshiba's similarly equipped Tecra 740CDT will run about \$6499. AMS's Travel-Pro 2000CX will include a P-150 processor and cost \$4695. These behemoths have a couple of drawbacks worth noting: The products will initially be scarce, and their oversize screens may make them too unwieldy to use in an airplane seat.

### Another Delay for DVD-ROM

A NEW SNAG will prevent DVD-ROM drives from shipping before April. Last December DVD-ROM drive makers pledged to ship the first drives to PC manufacturers in late January. (Drives were originally scheduled to ship last fall.) But the devices are ►

## Browser Accelerators: Mixed Bag of Tricks

**INTERNET**  
HUMANKIND'S never-ending quest for improved Internet performance has given rise to a new breed of software: the browser accelerator. Unlike offline browsers and push technologies, which automatically retrieve and send Web information while you're busy doing other things, an accelerator employs software tricks so it can goose the performance of your browser while you surf.

We examined two early contenders in the accelerator race—DataLytics' \$50 Blaze Web Performance Pack, and Peak Technologies' \$30 Net.Jet. Blaze and Net.Jet work transparently through your browser, using *read-ahead browsing* technology: While you're reading a Web page, the accelerators download links from that page, along with updated versions of other pages you visit frequently. The products work best for people who visit the same Web sites regularly. In informal tests, we found mixed results.

### BLAZING A TRAIL

BLAZE'S READ-AHEAD browsing wasn't functioning in the beta version we examined, but we were able to evaluate its impressive xSpeed acceleration technology. Most Web pages have multiple types of files—basic HTML, graphics, and Java applets, for example. Using xSpeed, Blaze packs several files into one or two

bundles, reducing the number of trips your browser has to make to each page—greatly speeding up performance.

However, your system and the Web server from which you download pages must both incorporate xSpeed technology. Our informal testing with xSpeed-compliant sites pro-

vided by DataLytics yielded remarkable results. A graphics-intensive page loaded in approximately 50 seconds when we used Internet Explorer 3.0 and a 28.8-kbps mo-

dem; but when we added Blaze, the load times averaged only half as long. Blaze's usefulness depends on the adoption of xSpeed server technologies, which DataLytics provides free of charge. But skepticism runs high. Anything that requires universal adoption probably won't happen, says John Robb, a senior analyst with Forrester Research in Cambridge, Mass-

achusetts. At press time, DataLytics had not disclosed the number of xSpeed-compliant Web sites.

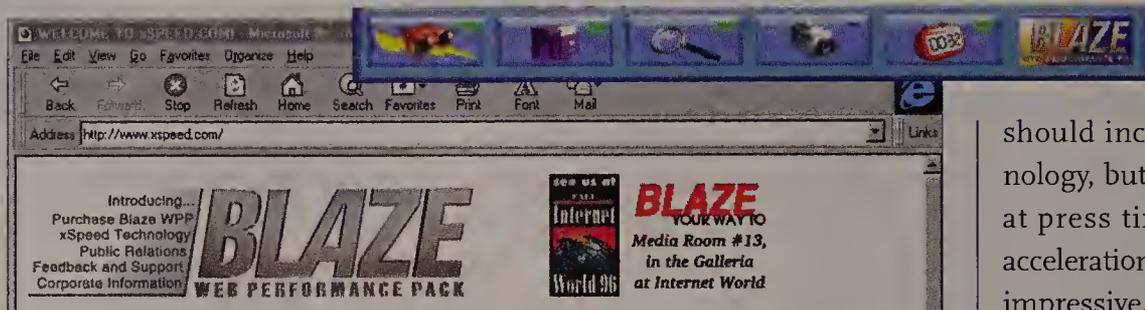
Blaze also boasts read-ahead caching features designed for different types of browsing. For example, you can set Blaze to preload all pages that are one level away from a home

erator to work with Netscape Navigator 3.01 required a call to the vendor. While Net.Jet speeded up the loading of pages that were mostly text, we saw no noticeable improvement on Web pages with lots of graphics. (For another take on Net.Jet, see *Home Office*.)

Despite limitations, both accelerators show promise. Net.Jet can enhance Web performance, particularly if you turn graphics off while you browse. Blaze

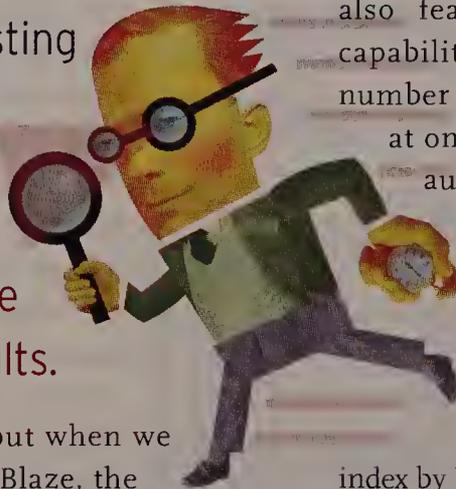
should include similar technology, but we couldn't test it at press time. Blaze's other acceleration feature, xSpeed, is impressive, but it's too early to tell how many Web sites will support it. If you tend to visit the same Web sites regularly, offline browsers may be better for you.

—Glenn McDonald



**BLAZE SPEEDS** your browsing of sites designed for it, and the toolbar (upper right) includes search and indexing tools.

Informal testing with xSpeed-compliant sites yielded remarkable results.



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Blaze's usefulness depends on the adoption of xSpeed server technologies, which DataLytics provides free of charge. But skepticism runs high. Anything that requires universal adoption probably won't happen, says John Robb, a senior analyst with Forrester Research in Cambridge, Mass-

page. This tactic can help when you want to move quickly among a site's first-level pages—as you do with most news sites—but won't be following deeper links. Blaze also features metasearch capabilities for using a number of search engines at once, and it's able to automatically create searchable indexes of cached sites through a familiar Windows Explorer-type interface.

You can search your index by URL, by title, or even by keyword—a handy solution for locating the information that you forgot to bookmark.

### NET.JET TURBULENCE

WHILE NET.JET produced some performance improvements, we ran into some significant problems with the shipping version. Installation on Internet Explorer 3.0 was simple, but getting the accel-

### Blaze Web Performance Pack

**PRO:** Superb performance.

**CON:** Fully functional only on compliant Web sites; pricey.

**VALUE:** If popular Web sites adopt this technology, product could become a winner.

DataLytics

937/226-7700

<http://www.xspeed.com>

Street price: \$50 (introductory; may rise to \$90)

READER SERVICE NO. 810

### Net.Jet

**PRO:** Can accelerate browsing of text-intensive pages.

**CON:** Improvement inconsistent.

**VALUE:** May boost performance in certain situations.

Peak Technologies

800/453-5322

<http://www.peak-media.com/>

Street price: \$30

READER SERVICE NO. 811

# New Intel Packaging Should Mean Easier, Faster Upgrades

## FIRST LOOK

INTEL PLANS TO give its desktop and notebook CPUs a face-lift. To keep pace with the increasing speed and density of PC processors, the company will mount its CPUs on processor cards that it says will permit higher performance and should make CPU upgrades easier for end users. The new designs should also help PC makers deal with issues such as heat dissipation and electromagnetic emissions, potentially cutting the time required for new models to come to market.



## BUILT FOR KLAMATH

THE NEW Intel scheme will appear first in the next version of the Pentium Pro—the so-called Klamath processor—expected by June. The company will package the Klamath and successive processors inside a single-edge contact cartridge, called the SEC, which plugs into a motherboard slot in much the way add-in cards do. (Currently, CPUs attach via a pin grid that is tricky to insert.)

Most important, the cartridge design positions P6-generation processors, such as Klamath, for the mainstream. The current Pentium Pro design puts the CPU and the 256K secondary cache into the same pin-grid-array pack-

aging. This arrangement provides high-speed cache performance, but any flaw in the cache renders the entire CPU worthless. The result: lower yields that drive consumer costs higher.

SEC places Klamath's secondary cache outside the processor but on the same CPU board, a setup that lets Intel increase clock speed beyond 200 MHz while improving manufacturing yields. This solution addresses the current Pentium Pro's 200-MHz ceiling.

For PC users, the SEC cartridge should make upgrading a CPU as easy as swapping a CPU as easy as swapping add-in cards, since there will be no pesky pins to break, and no confusion about which way to orient the CPU when placing it in the socket. Of course,

we won't be seeing upgrades to Klamath-level CPUs until at least 1998. PC vendors may also need to redesign their systems to ensure proper ventilation and to make room for the SEC cartridge. Intel competitors AMD and Cyrix have no current plans to provide processors that accommodate the new Intel design. But both of these companies plan to introduce x86-compatible CPUs for existing Pentium sockets.

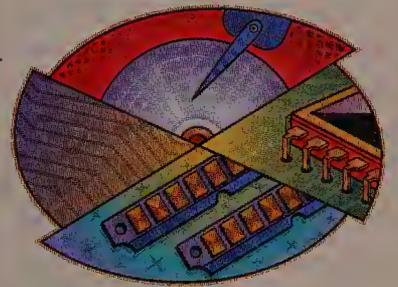
## MOBILE MODULES FOR LAPTOPS

INTEL HAS ALSO launched a similar initiative on the notebook front, albeit with different motives. In the fall, the manufacturer expects to introduce mobile modules that place the CPU, secondary cache, and system chip set on a daughtercard. The design should let notebook makers adopt new CPUs without the expensive process of redesigning existing motherboards, which can delay product introduction and add cost.

While notebook vendors like Dell and NEC welcome Intel's mobile module design, Toshiba executives are concerned that the daughtercard could make notebooks thicker and reduce heat-management options. But Nathan Brookwood, principal analyst for microprocessors at research firm Dataquest, calls the mobile module design "a very nifty strategy for moving notebooks from Pentium to Pentium Pro."

—Michael Desmond ►

being held up due to a last-minute squabble over copy protection issues, says Ken Jones, director of DVD marketing for Toshiba America Information Systems. On the software front, few DVD-ROM titles are expected this spring. Also, Microsoft hasn't finished the requisite Windows 95 DVD-ROM device drivers, which are expected sometime in 1997.



## TidBytes

**P-166 ALTERNATIVE:** Advanced Micro Devices' new AMD-K5-PR166 will perform like a 166-MHz Intel Pentium, AMD claims. Expect to see PCs sporting the chip by May. The systems will likely cost less than computers powered by Intel P-166s. **Digital Camera for Notebooks:** Toshiba's \$500 PDR-2A 24-bit color digital camera connects to a notebook via a built-in PC Card connector. The PDR-2A stores images in JPEG format and works with any OLE 2.0-compliant application, letting you drag and drop images into your documents. **Real PC, Surreal Price:** The Packard Bell C115 system includes a Pentium-120 processor, 16MB of RAM, a 1.2GB hard drive, an 8X CD-ROM drive, a 33.6-kbps modem, a 14-inch monitor, MPEG-1 video playback, a 16-bit sound card, and stereo speakers—for a street price under \$1000. This is the latest (and likely not the last) entrant in this class of low-price, full-featured products. At press time, rumors were circulating that top-tier vendors such as IBM plan to offer systems in this price range.

# Web Performance Enhancers: Don't Let Them Push You Around



DR. DOOLITTLE'S Push-Me-Pull-You, a llama with two heads pointing in opposite directions, had a hard time making decisions. The poor animal had problems getting anywhere at all. You may empathize with this beast as you face the dozen or so new products sporting "push" and "pull" technologies that promise to reduce the time you spend downloading Web pages.

Push products, like the PointCast Network from industry leader PointCast, automatically send personalized Web content to your PC as soon as you connect to the Net. You choose from "channels" that specialize in news, sports, stock prices, weather, and so on. Many of the new push products are long on concept but short on usefulness. With few exceptions, the ones that we tested are difficult to install, offer content of limited interest to businesses, and require extensive hardware and Internet resources.

Pull products, sometimes called offline browsers, let you search the Web and retrieve information from favorite sites at predetermined times. Instead of waiting for Web pages to download, you might set one of these utilities to work while you sleep. When you get up, the latest info

**NEWSCATCHER** uses hardware and a wireless network to bring news to your desktop.



from your chosen sites is on your PC. We looked at the latest versions of these products and found them very useful.

## THE PUSH CONCEPT: CONTENT IS KING

PUSH PRODUCTS are free to PC users; advertisers pay for the right to display their mes-

sages along with any content. The free software, which you can download from the vendors' Web sites, includes a viewer application that installs on your PC. Push products also include *agent* programs that work automatically in the

background to gather personalized information while you're connected

to the Web. After the agents gather content, you

can view it immediately without

having to connect to the Internet. Most

products wait until your PC is idle and

then notify you by presenting a screen saver with a menu of information or by scrolling a ticker tape of choices across your screen. You click an icon to view information.

Be sure to choose the push product whose content most

closely matches your interests and needs. Each service has its own focus, and some of them are better at delivering timely data (see chart).

Unfortunately, push products are resource hogs, so you may want to pass if you have an older computer. Although companies claim a 486-based system is all you need, I saw noticeable slowdowns if I used anything less than a Pentium-133. And performance worsens if your Internet connection is slower than 28.8 kilobits per second. As a result, push products are best for offices that have a local area network and a dedicated Internet connection. Even if you have a high-end PC and a fast Net connection, you'll need to choose carefully—you won't be able to use more than one product at a time. When I tried using more than one, my system locked up completely.

PointCast popularized the push concept, but other products are nipping at its heels. FreeLoader 2.0's unique approach lets you create a personal set of channels based on your preferences. During installation you are asked to provide demographic information—location, age, ►

PHOTOGRAPH: JOHN GREENLEIGH

## INFORMATION PUSHERS

PRODUCTS	Content	Notification	Comments	Reader service number
BackWeb, BackWeb Technologies 800/863-0100 <a href="http://www.backweb.com">http://www.backweb.com</a>	business, lifestyle, shopping, technology, weather	screen saver, scrolling banner, wallpaper	<b>PRO:</b> Best choice for online shopping; free. <b>CON:</b> Slows PC when background agent is working.	796
Communicator, InterMind 800/814-4134 <a href="http://www.intermind.com">http://www.intermind.com</a>	business, health, news, politics, science, technology	on-screen message	<b>PRO:</b> Wide range of content, best choice for businesses; free. <b>CON:</b> Slows PC when background agent is working.	797
FreeLoader 2.0, FreeLoader, Inc. 415/626-8500 <a href="http://www.freeloader.com">http://www.freeloader.com</a>	entertainment, home	screen saver	<b>PRO:</b> Easiest to set up, new multimedia features; free. <b>CON:</b> Most intrusive advertisements.	798
NewsCatcher, Global Village Communication 408/523-1000 <a href="http://www.globalvillage.com">http://www.globalvillage.com</a>	basic: news, sports, weather; expanded: basic plus stocks	sound, toolbar icons	<b>PRO:</b> Unaffected by Net traffic, uses minimal system resources. <b>CON:</b> Costs \$149; basic service free; expanded \$5.95 monthly; expanded with e-mail notification \$9.95 monthly.	799
PointCast Network, PointCast 408/253-0894 <a href="http://www.pointcast.com">http://www.pointcast.com</a>	business, news, stocks, technology, weather	screen saver	<b>PRO:</b> Industry leader, established technology; free. <b>CON:</b> Internet bandwidth hog.	800

All products: 915



# When it comes to scanners, not all 800 pound gorillas are what they're cracked up to be.



If you need a scanner that combines high performance and maximum value, may we suggest a little head-to-head competition. UMAX vs HP? Unfair comparison? Maybe for them. UMAX has a reputation for offering advanced, award-winning scanners at prices that make good business sense. Plus, our software bundles are unmatched, even by the big boys. So why monkey around? Compare the UMAX Vista S-12 with the HP ScanJet 4c and decide for yourself.

Compare	UMAX Vista S-12	HP ScanJet 4c
Image editor software	✓ Adobe Photoshop Full	Photopaint
Presentation software	✓ ASAP Word Power	None
Maximum DPI	✓ 9600	2400
Bit depth	✓ 33-bit <sup>1</sup>	30-bit
Scanning speed (5" x 7" color photo)	✓ 18 sec.	42 sec.
Lamp	✓ Cold cathode - lasts longer	Fluorescent
Tech support	✓ Toll free	No 800 number
Price	✓ \$699 <sup>2</sup>	\$ 938 <sup>3</sup>

UMAX Vista S-12



HP ScanJet 4c



toll free **800-859-2728**

<http://www.umax.com>

<sup>1</sup> 33-bit equivalent with the analog gamma correction. <sup>2</sup> Estimated street price after \$50 mail-in rebate. <sup>3</sup> Average street price from sampled advertisements in Computer Shopper Sept. 1996. © Copyright 1996-1997 UMAX Technologies, Inc. HP and HP ScanJet 4c are registered trademarks of Hewlett Packard, Inc. Adobe Photoshop is a registered trademark of Adobe, Inc. ASAP Word Power is a registered trademark of Software Publishing Corp. All other trademarks are the property of their respective owners.

**Circle 250 on reader service card**



## SURE, A MONITOR SHOULD BUT IT'S WHAT'S ON THE

At Compaq, we haven't forgotten what you look for in monitors. Still, we think there should be more to them than just sharp, crisp images (not that there's anything wrong with that). Which brings us to our new line of monitors.

The first thing you'll notice is their sleek new design and advanced on-screen controls for easy and precise adjustments. Of course, upon closer inspection, you'll see

they've been engineered through and through to the same high standards that have made our PCs among the best on the planet. Which is why the line features a complete range of innovative monitors. Everything from a value series — including our V50 15" (13.77" viewable) — to high-performance models like our QVision 210 21" (19.5" viewable).

Of course, there's also our P70, a 17" (15.68" viewable)



The Compaq V70 monitor won both the PC Magazine Editors' Choice award and the Windows Magazine Best award in October 1996. The Compaq QVision 210 monitor won the PC World Best Buy award in January and November 1996. \*When used with Compaq CPUs which feature Intelligent Manageability. ©1996 Compaq Computer Corporation. All rights reserved. Compaq registered U.S. Patent and Trademark Office. QVision 210 is a trademark of Compaq Computer Corporation. Other products mentioned may be trademarks or registered trademarks of their respective companies.



## D BE NICE TO LOOK AT. INSIDE THAT COUNTS.

Trinitron tube monitor that delivers an impressive 85Hz at a resolution of 1280 x 1024. You'll find it's perfect for graphic-intensive applications as well as Windows 95 and Windows NT.

Speaking of features, all monitors provide the very things you've asked for. Like best-of-class refresh rates at superior resolutions. There's also anti-glare technology for reduced eye strain. Even Intelligent Manageability capabilities that let

you track inventory and manage problems across a network.\*

In other words, the line embodies everything you've come to expect from Compaq. Substance. Quality. And, yes, even good looks. To learn more, visit us at [www.compaq.com](http://www.compaq.com) or call 1-800-869-6865.

**COMPAQ**

Has It Changed Your Life Yet?

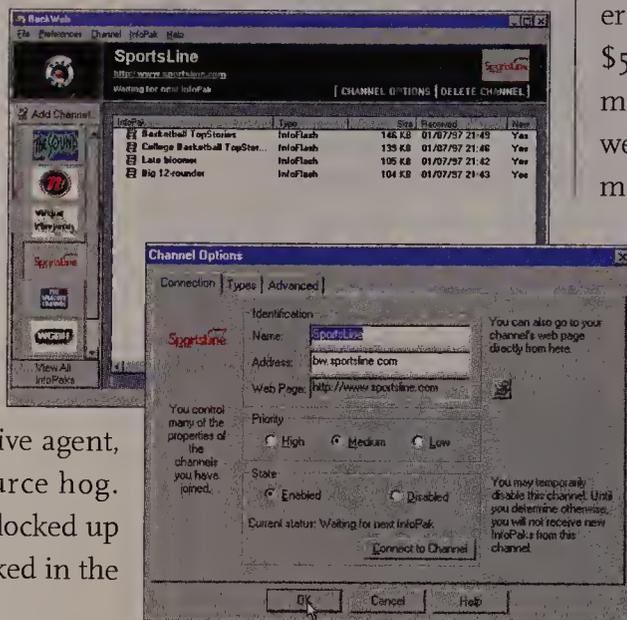
profession, and income. You can also create your own set of channels at any time. Content is focused mainly for home users. FreeLoader lets you control the frequency of channel updates and notifies you of new content via a screen saver.

BackWeb has a consumer-oriented list of channels, including astrology, dating and singles information, music, PBS, and the Weather Channel, plus some technical and business channels. Plus, BackWeb is the only product reviewed here that gives you a choice of notification methods: You can use alerts that flash on screen, a full screen saver, or wallpaper. Its intrusive agent, however, is a resource hog. Even a Pentium-133 locked up while BackWeb worked in the background.

Intermind's Communicator lets you choose from business, health, news, politics, science, and technology. The product was one of the easiest to

install, and its agent slowed my system down the least.

A viable alternative to sys-



tem-hogging Internet agents is Global Village's unique \$149 NewsCatcher, which uses AirMedia's nationwide wireless data broadcasting

service to receive and display data on your computer screen. Basic news, sports, and weather service are free, and an extra \$5.95 per month gets you more-detailed information, as well as stock prices; \$9.95 per month buys all of the above

#### SPECIAL DELIVERY:

BackWeb sends a variety of Web channels to your PC, including news and sports (top). It includes a variety of features that allow you to customize the way channels are delivered (left).

plus personal e-mail notification, with a message sent to the NewsCatcher when e-mail arrives in your Internet in-box.

## OFFLINE BROWSERS

PRODUCTS	List price	Unique feature	Comments	Reader service number
Netriever 2.0, Metz Software 800/447-1712 <a href="http://www.metz.com">http://www.metz.com</a>	\$39	creates slide shows of downloaded sites	<b>PRO:</b> Doesn't require external browser. <b>CON:</b> Limited control over downloads.	801
WebWhacker 2.0, The ForeFront Group 800/653-4933 <a href="http://www.ffg.com">http://www.ffg.com</a>	\$49.95	now searches downloaded sites	<b>PRO:</b> Extensive control over downloads. <b>CON:</b> Time-consuming setup.	802
WebEx 2.0, Traveling Software 800/343-8080 <a href="http://www.travsoft.com">http://www.travsoft.com</a>	\$49.95	logs in and retrieves automatically	<b>PRO:</b> Easiest to use, improved interface. <b>CON:</b> Lacks some advanced features.	803

#### DON'T PUSH, PULL

UNLIKE PUSH products, which have limited content, offline browsers let you choose any sites you're interested in, then download as much of the site as you want. You can browse sites at your leisure without being connected to the Web. The latest pull products are inexpensive, work with your existing browser, and include useful new features. For example, Netriever 2.0 doesn't require a separate browser, and it can create slide shows of Web sites for you to use as wallpaper or screen savers. This feature allows you to scroll quickly through a Web site offline.

WebWhacker 2.0 lets you determine how much of a

## EXPLOSION OF PUSH PRODUCTS CROWDS MARKET

### Push to the Future

AT PRESS TIME, at least a dozen companies were hyping products based on push technology, with industry observers predicting this number to double within the next few months. But these products are still unproven and will not operate with each other, so a shakeout is inevitable. Here are some developments to watch:

**PointCast** signed an agreement with Microsoft. Under the agreement, PointCast will become an integral part of Microsoft's browser, and con-

tent from MSNBC will be available as a PointCast channel.

Netscape is touting **Constellation**, its own push technology. Later this year, Constellation is scheduled to be integrated into Netscape's Communicator Internet suite. Last fall, Netscape CEO Jim Barksdale said that Constellation would incorporate Castanet push technology from Marimba. Castanet (which has been in beta since last summer) holds promise because its Java-based technology doesn't require as many

PC resources as competing push products.

Online services are also joining the push. American Online's **Driveway** should be in beta by the time you read this. Initially, Driveway will automatically deliver selected news, weather, sports, and Web sites, and a spokesperson says that all AOL content will eventually become available for delivery.

Vendors are also addressing bandwidth concerns and a lack of standards. Tibco, a company that provides information to

banks and stockbrokers, has teamed with Cisco Systems, a leading provider of networking and intranet hardware, and several other companies to propose a standard—called **Publish and Subscribe**—for push data. The group claims a widespread standard would "fix the plumbing" of the Internet and vastly reduce Net traffic, extending the life of the current infrastructure. It's too early to say whether the new standard would make discrete push products compatible.

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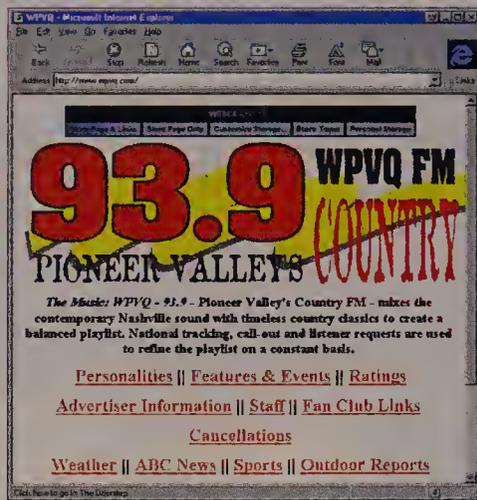
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Web site you want to retrieve. For example, you can download title pages only, just linked pages, or the entire site. The product now has powerful bookmarking features. But what sets WebWhacker apart is a powerful search engine that lets you perform Boolean searches on data you've downloaded.

WebEx 2.0 is one of the easiest offline browsers to use, unique for automated sessions that can grab Web sites at scheduled intervals.



**GRAB THAT SITE:** WebEx adds a small toolbar that lets you retrieve Web sites for offline viewing, or schedule downloads.

## HAVE IT YOUR WAY

ALTHOUGH THIS brand-new generation of push products has become a prime focus of Internet industry attention (not to mention hype), the products are still in their infancy.

Your arsenal of Web tools should also include standard browsers and pull products. The majority of today's users will still find that they need to search the Internet frequently for

information that cannot be planned or predicted.

If you hit the same Web sites repeatedly and download the same types of information on a regular basis, pull products are effective and easy to use, saving money and online time. Push products have the potential for making major changes in the way you use the Internet, but until they become more sophisticated and less resource intensive, we can't recommend them.

—Stan Miastkowski

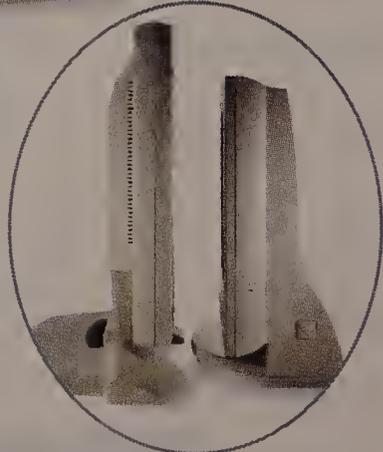
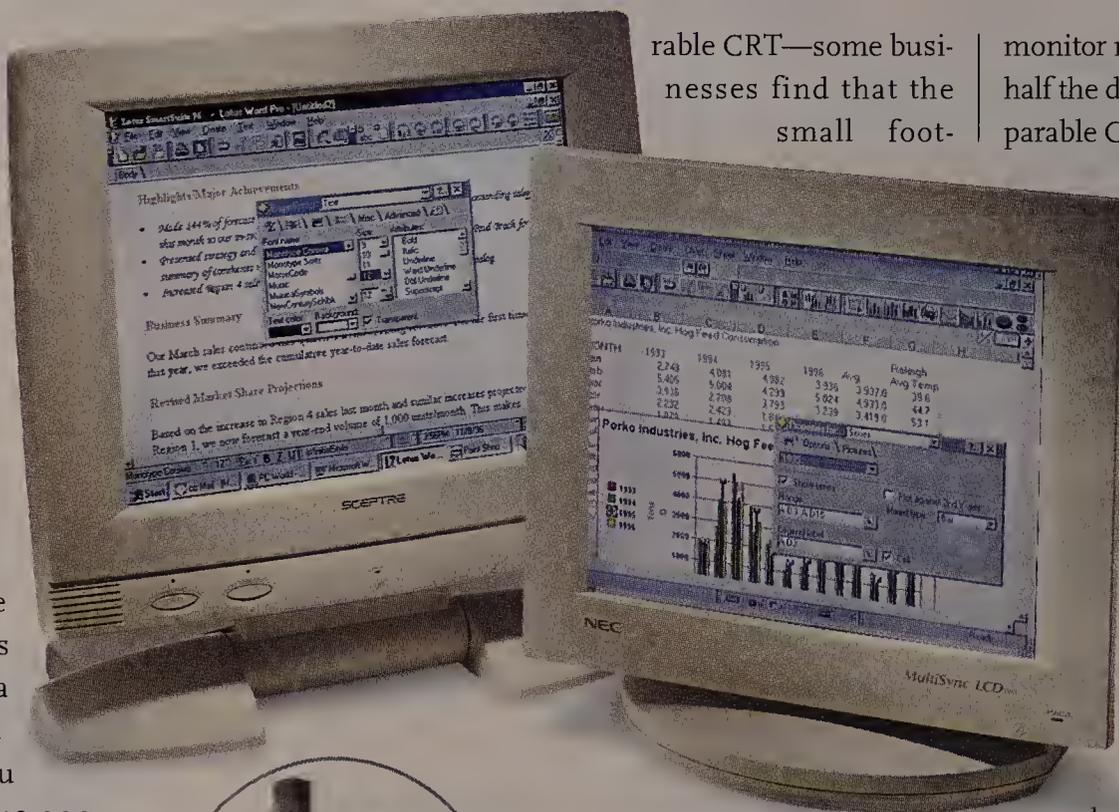
## Is an LCD Monitor in Your Future? Prices Are Shrinking, Screens Growing



WITH monitors, as in fashion, thin is in. For sheer good looks it's hard to beat the slim profile and bright, virtually distortion-free image of a flat-panel LCD monitor—especially as the screen sizes increase and prices decrease. We tested some of the newest LCD monitors and found them on a par with CRT displays.

Two years ago, you could pay more than \$10,000 for a 12.1-inch LCD desktop monitor, and larger models were simply unavailable. Today you can get a 12.1-inch active-matrix display for less than \$2000; larger units are available for as little as \$2500. (A 12.1-inch LCD offers the same viewable screen area as a 14-inch CRT monitor.)

Though most PC users will



blanch when they see these prices—about three or four times more than for a compa-

table CRT—some businesses find that the small foot-

monitor may take up less than half the desk space that a comparable CRT requires.) Hospitals prefer LCDs, because they don't emit the electromagnetic waves that could interfere with sensitive medical equipment. Graphic designers appreciate the image quality that LCDs provide: Straight lines don't look bowed the way they sometimes do on CRT screens.

Lower heat emission, combined with power savings of up to 40 percent over comparable CRT consumption, appeals to just about everybody. LCDs also weigh about half as much as CRTs.

**ROOM TO VIEW:** LCD monitors, like the Sceptre (left) and NEC, measure up to CRT displays in most respects, and the LCDs require a lot less desk space.

print and other unique features make LCDs worth the added expense.

Smaller monitors can be real space savers. (An LCD

### SHOPPING LIST

LCDs DIFFER from CRT monitors in several ways. First, screen sizes for compara- ►

Solid engineering.  
High performance.  
Broad acceptance.

5

4

1

3

That's our drive.

6

2

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\*Actual speed may vary according to application used

## LCD MONITORS

MONITORS	Street price	Screen diagonal (inches)/type	Maximum resolution	Weight (pounds)	Connects to standard video card	Full-motion video support	Mounts on wall	Availability	Reader service number
CTX Opto PanoView 600 888/289-6786	\$2400	12.1/active	1024 x 768	8.6	●	○ <sup>1</sup>	●	now	804
NEC MultiSync LCD300 800/632-4636	\$5000	13/active	1280 x 1024	8	●	●	○	now	805
Portrait PageView <sup>2</sup> 800/858-7744	\$1500	15/passive	1024 x 768	8	○	○ <sup>1</sup>	●	May	806
Sceptre CD-1215T <sup>2</sup> 800/788-2878	\$3000	15/active	1024 x 768	16	○	●	●	now	807
ViewSonic VP140 Flat Panel 800/888-8583	\$2499	14/active	1024 x 768	12.1	●	○	●	now	808
Wysevision WY-9307 800/438-9973	\$1545	12.1/active	800 x 600	13	●	●	●	April	809

Yes    No   <sup>1</sup> Optional card available later this year.   <sup>2</sup> Not tested.   All products: 916

ble LCDs are smaller because they reflect true viewing area, while CRT dimensions are inflated by the tube's curved surface and include the surrounding bezel. A 15-inch LCD monitor's viewing area is roughly equivalent to that of a 17-inch CRT monitor, while a 13-inch or 14-inch LCD is able to display as much as a 15-inch CRT.

Another consideration is screen type. As with notebooks, which use the same technology as the LCD monitors, the more-expensive active-matrix screens generally look brighter than passive LCD screens.

While most of the newer LCD models connect to stan-

dard video cards, a few require their own graphics adapters, which usually are included with the product.

Because of their relatively slow response time, some LCD monitors can't support full-motion 30-frame-per-second video adequately. This limitation doesn't affect the quality of games like Doom and Quake, which generally run at 10 to 15 frames per second. But if you want to view movies from a forthcoming DVD drive, you'll be best off choosing a display that has a response time of 100 milliseconds or less. Some monitors that don't yet support full-motion video will support it by the end of the year, using optional graphics adapters.

You will also want to consider an LCD monitor's viewing angle. If you have ever tried to peer over somebody's shoulder in order to view a notebook screen,

you may have noticed that the colors fade depending on where you stand—particularly with passive LCD screens.

### A LOOK AT THE MONITORS

THE PC WORLD Test Center examined three active-matrix LCD monitors that you might want to consider as an alternative to a 14- or 15-inch CRT. We tested preproduction units of ViewSonic's \$2499 VP140 Flat Panel and Wysevision's \$1545 WY-9307, as well as the shipping model of NEC's \$5000 MultiSync LCD300.

In screen distortion tests, the LCD monitors measured well below the 2 percent distortion level considered acceptable for CRT displays. In subjective ratings by panels of users, the results were similarly impressive. The reviewers found that LCDs were comparable to midrange 15-inch CRTs for both text and graphics. Among the LCD models we tested, the Wysevision received the highest subjective ratings for graphics and overall image quality—the unit was compa-

rable to the best 15-inch CRTs that we've tested.

However, we had some notable problems with these LCD monitors. We could not get the Wysevision, ViewSonic, or NEC units to work with a popular video card, the Matrox Millennium. In addition, we had to struggle to get CTX Opto's PanoView 600 LCD monitor to work properly, and could not include it in testing.

Though we didn't test them, some larger LCDs are available. Fifteen-inch displays include Portrait's \$1500 PageView and Sceptre's \$3000 CD-1215T.

### LCD SNAPSHOT

IF YOU WANT LCD technology but can't afford it, be patient: By 1999, prices on most 14- and 15-inch LCDs will drop to the \$1600-to-\$1800 range, according to Stanford Resources, a market research firm that tracks displays.

For now, larger LCD monitors are finally available for anyone whose job requires more desk space and distortion-free graphics.

—Yardena Arar ■

### LCDs: Room With a Good View

LCD monitors meet or beat 15-inch CRTs.

MONITORS	Graphics rating	Text rating
NEC MultiSync LCD300	6.0	5.6
ViewSonic VP140 Flat Panel	7.5	6.5
Wysevision WY-9307	7.8	7.9
Average of three LCDs	7.1	6.7
Average of six 15-inch CRTs	6.6	6.6

**HOW WE TEST** Four judges used a point system to rate each monitor's text and graphics quality in displaying business letters, spreadsheets, Web pages, and scanned images. Higher ratings are better—10 is best.



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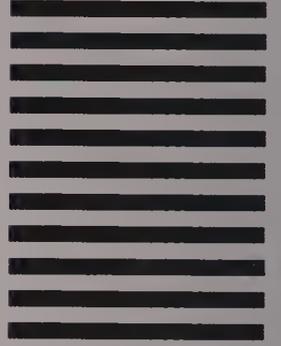
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– PC WORLD, December, 1996 –

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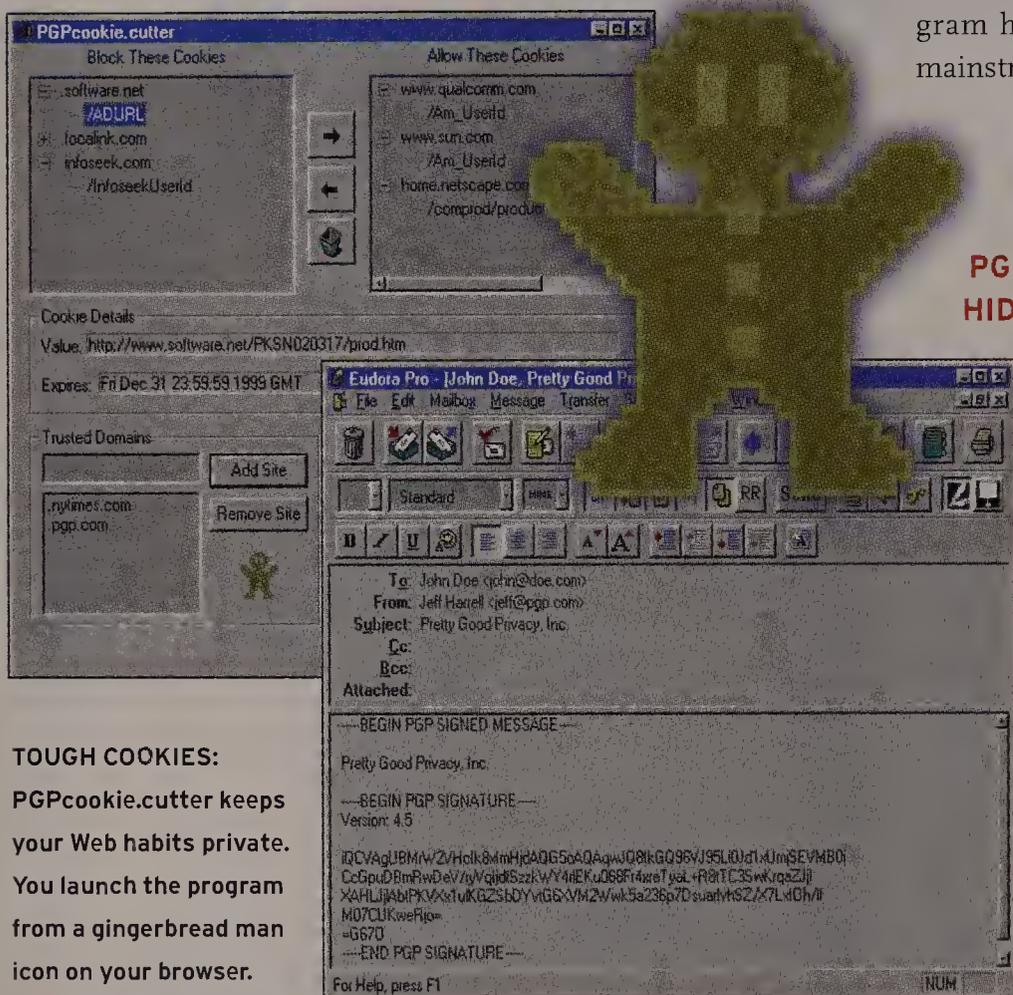
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# NEW PRODUCTS

## PGP Products Protect You Against Internet Snoops



**TOUGH COOKIES:**  
PGPcookie.cutter keeps your Web habits private. You launch the program from a gingerbread man icon on your browser.

### SECURITY

TWO OF THE most common Internet tasks—Web browsing and sending e-mail—induce the most paranoia, so Pretty Good Privacy, Inc. is tackling the security issues with two new products. **PGPcookie.cutter**, a \$19.95 utility, prevents vendors or anyone with a Web server from viewing your browsing habits. **PGPmail 4.5**, list-priced at \$149, lets you encrypt e-mail easily. The pre-production versions I used

suggest that PGPcookie.cutter is a clear winner. PGPmail is pricey and so far supports only two popular e-mail clients—but if you need this kind of security, it can be priceless.

The company's founder, Phil Zimmerman, is already well known for his venerable and modestly named Pretty Good Privacy, a downloadable, free tool that encrypts e-mail using a 128-bit algorithm. But due to its intimidating command-line interface, the pro-

gram hasn't made it to the mainstream. Fortunately, the two latest products aren't tricky for users to learn or work with.

### PGPCOOKIE.CUTTER HIDES WEB TRACKS

IF YOU HAVE a Web browser, you've probably heard of the privacy infringement risk associated with *cookies*—text files that Web servers write to your PC's hard disk and that subsequently can be viewed by other Web servers. Cookie files maintain a record of your identity, some demographic information, and your browsing habits, including the names of specific sites you've visited. PGPcookie.cutter, for Windows 95, Windows NT, and the Mac OS, is the first "cookie-blocker" tool on the market.

Judging from the preproduction version I examined, PGPcookie.cutter is effective and easy to use. The program, which can work with either Microsoft Internet Explorer or Netscape Navigator, adds a tiny icon that looks like a gin-

gerbread man to the title bar of your Web browser. Click this icon, and a simple drop-down menu displays everything you need—four options in all. Once you have configured the program to prevent Web servers from peeking at your cookie file, you won't have to do anything else.

A common misunderstanding arises from the notion that preventing the cookie file information from being written to your PC's hard disk actually prevents servers from peeking at the information. In fact, servers can still look at the information, which is stored in RAM, while your browser is open.

PGPcookie.cutter doesn't prevent information from being written to the cookie file on your computer. Instead, the program lets you control who

### PGPcookie.cutter

**PRO:** Keeps your browsing habits private.

**CON:** None, at first glance.

**VALUE:** Excellent, affordable, and easy to use.

### PGPmail 4.5

**PRO:** Adds a tight layer of security to your e-mail.

**CON:** Pricey, currently works only with Netscape Mail and Eudora Pro.

**VALUE:** Worthwhile for sending confidential messages.

**Pretty Good Privacy, Inc.**

415/572-0430

<http://www.pgp.com>

List price: PGPcookie.cutter \$19.95,

PGPmail 4.5 \$149

READER SERVICE NO. 736

can read the cookie information from your PC's RAM or hard drive: You simply type in the URLs of particular sites you'd like to grant such access to—for example, personalized Web pages and service sites that deliver custom information based on your tastes and past viewing habits.

### ENCRYPTING E-MAIL

PGPMAIL 4.5, a Windows 95 version of the old DOS-based PGP program, offers several powerful options for protecting your sensitive e-mail from prying eyes. To let you know whether anyone has read or tampered with your messages, PGPmail's signing feature verifies the authenticity of the original message by comparing the checksum, a file that should be identical in both the sent and received messages. PGPmail's RSA encryption uses up to a 1024-bit algorithm to encode files.

Unfortunately, the program currently works only with Netscape Mail (the e-mail software that comes with the Netscape Navigator browser) and with Qualcomm's Eudora Pro. Support for other major e-mail programs should be available later this year.

In order to read the messages you send, your recipient needs a free, downloadable PGP program.

PGPmail adds five new buttons to your e-mail software's toolbar. During installation, you create two keys (unique strings of random characters)—a private key for yourself and a public key for your e-mail correspondents. These keys establish a unique and

virtually indecipherable encryption formula.

When you send someone your public key, PGPmail adds the key to the recipient's Keyring—a database of public keys. From then on, sending and receiving encrypted messages is an almost automatic

process, requiring one button click at each end.

Our primary reservation about PGPmail 4.5 relates to its high list price (\$149). The company says that a free trial version may be available by the time you read this.

—Yael Li-Ron

## Philips's Velo 1: A Better Handheld Computer

### HANDHELD PC

IF NOTHING ELSE, Philips's **Velo 1** demonstrates that Windows CE, Microsoft's compact version of Windows 95 for handheld computers, leaves much to be desired. Based on my experience with a preproduction unit, the Velo 1 is the best of the breed so far. But such CE devices aren't for all: They're too large to be pocket-size, keyboards are tiny, and you have to use a stylus (instead of a mouse) to point and click.

Weighing only 14.2 ounces without batteries, the sleek charcoal-gray Velo 1 can generate documents and spreadsheets, handle faxes, surf the Web, take voice memos, and interface seamlessly with your desktop PC via a serial connection. Like other Windows CE devices, the Velo 1 has a small QWERTY keyboard and a 480-by-240 monochrome touch-screen LCD. Its backlighting capability is useful

given the unit's rather dim display. The stylus—calibrated to your touch during start-up—conveniently slides into a slot at the keyboard's upper right when not in use.

The \$599 basic model ships with a docking station (an



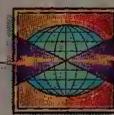
**THE SWIFT VELO 1 has Windows CE plus lots of bells and whistles.**

option that some of its competitors offer, too); a built-in 19.2-kbps fax-modem that comes with an RJ-11 jack; and a built-in voice memo recorder (not complete in my preproduction unit). In addition to the special skinny versions of Microsoft Word and Excel that are included in Windows CE, Pocket Quicken, fax software, and interfaces for Lotus cc:Mail and Microsoft Mail are also available. For another \$100, you can upgrade from 2MB of RAM to 4MB. The Velo 1 comes with an AC adapter and also runs on two AA batteries that should last 12 to 15 hours.

The Velo 1 is a lot bulkier

- 78 PGPcookie.cutter, PGPmail 4.5 Web security software
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- 94 Olympus D-300L digital camera
- 99 Micrografx FlowCharter 7
- 99 Policies Now 5.0 human resources software
- 101 SamePage 2.0 groupware
- 103 GrabIt, Snappy video capture products

### INTERNET



FOR MORE PRODUCT news and the latest announcements, check out the PC World Daily News Service at <http://www.pcworld.com/news.html>.

than a bare-bones personal organizer, and typing on it isn't much fun. But if a Windows CE device seems like the answer to your mobile computing problems, the Velo 1's features and price make this handheld PC an attractive buy.

—Yardena Arar ▶

### Velo 1

**PRO:** Lightweight and full featured, nice price.

**CON:** Small keyboard.

**VALUE:** Excellent choice if you like Windows CE.

**Philips Electronics**

888/367-8356

<http://www.velo1.com>

Street price: \$599

READER SERVICE NO. 737

EDITED BY

Yardena Arar and  
Laurianne McLaughlin

## MaxiSound 64 Puts a Sound Studio in Your PC

### MULTIMEDIA

THESE DAYS, you need a good sound card to run everything from multimedia presentations to Internet software. Ubi Soft Entertainment provides a pair of intriguing options with its **MaxiSound Home Studio 64** and **MaxiSound Home Theater 64** sound cards. Both boards provide rich, 64-note wavetable MIDI voice polyphony for playing back orchestral MIDI audio scores, plus full-duplex audio for communication software and interactive gaming. In addition, both cards support quadrasonic sound, with four-speaker output.

With its unique real-time effects and multitrack support, the \$299 Home Studio 64 takes aim at audiophiles. You can apply echo, reverb, filter, and pitch transformations to incoming audio in real time (to make your voice echo during a speech, for example). You can even alter the sound of your favorite games and save the customized settings for replays. The board supports four tracks of audio (expandable to eight) and includes Quartz Audio Master

S.E. software for mixing complex compositions. The board also bundles the Cakewalk Express MIDI sequencer and an Internet phone application. Home Theater 64 costs about \$50 less but lacks the real-time effects handling and Quartz Audio Master S.E. software.

The real-time effects capability of Home Studio 64 certainly

grabbed my attention, and I liked the graphical controls for setting the equalizer and customizing 3-D audio positions. The quality of wavetable MIDI playback was very good. But the bundled software would not record above 8-bit fidelity, and I struggled with interface quirks, such as contending volume controls on separate

applications. Even worse, both my Home Studio 64 samples produced an audible whine and higher-than-average noise levels in *PC World* audio fidelity benchmark tests.

If you don't need cutting-edge fidelity, the unique features of these boards make either of them a good buy. Aspiring professionals, however, will find the boards' shortcomings troublesome.

—Michael Desmond

## Panasonic's Fast, Cheap CD-ROM Changer

### MULTIMEDIA

ARE YOU AN avid game player, a user of multidisc multimedia reference titles, or (fess up) a music lover who spends way too much time swapping audio CDs in and out of the

ventional CD-ROM drive it will most likely replace—but you must know your way around the inside of a desktop PC. This model uses an IDE connection; a SCSI version should be out by press time.



**FIVE DISCS, 10X:** For a street price of less than \$250, Panasonic's speedy new CD-ROM changer ends the CD shuffle.

drive? Then you've probably had your eye on a CD-ROM changer. Until now, though, such devices have been clunky and slow—typically providing only 4X speed. Panasonic's new 10X **Big 5 SQ-TC510N** answers a CD-ROM juggler's prayer—for less than \$250.

I tested a shipping unit. Fitting snugly into a half-height bay (horizontal mounting only), this changer is no more difficult to install than the con-

Don't count on the manual for much help, though: It's the weakest part of the package.

But after installation, operating the Big 5 is simple. To load discs, you press a numbered button on the front of the device; the appropriate tray slides out. Slip in a disc and push the door gently to slide it shut—no caddies or magazines to mess with. (You can't load or eject a disc when earphones are plugged in, though).

You can manage CDs using the Panasonic Disc Director program for Windows 3.x or Win 95. Select a disc by double-clicking an on-screen button and choosing the appropriate command. Or click the SmartCD icon on Windows 95's Taskbar to generate a pop-up menu from which you can select and play discs.

Another nifty feature is that the audio CD player lets you program tracks from multiple discs just as you would on your home stereo changer. For heavy multimedia users who are tired of the CD-ROM shuffle, there's nothing remotely comparable at the price.

—Yardena Arar ▶

### MaxiSound Home Studio 64, MaxiSound Home Theater 64

**PRO:** Home Studio offers unique real-time effects.

**CON:** A few usability quirks.

**VALUE:** Great for presenters and audiophiles.

Ubi Soft Entertainment

800/824-7638, 415/547-4000

<http://www.ubisoft.com>

Street price: Home Studio 64 \$299,

Home Theater 64 \$249

READER SERVICE NO. 738

### Big 5 SQ-TC510N

**PRO:** Fast, easy to use, reasonable price.

**CON:** Skippy manual, installation can be tricky.

**VALUE:** Excellent feature set and performance.

Panasonic

800/742-8086

<http://www.panasonic.com>

Street price: \$249

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## Look, No Hands: IBM's \$99 Dictation Program

### SPEECH RECOGNITION

ARE YOU ON speaking terms with your computer? IBM's **VoiceType Simply Speaking** software lets you dictate to your PC. List-priced at \$99, it's one of the first low-cost products in a category that formerly required an investment of \$300 to \$500. I tested a shipping copy of this Windows 95 application, which comes with

#### VoiceType Simply Speaking

**PRO:** Attractive price.

**CON:** Needs Pentium-100 or better.

**VALUE:** Affordable, but requires training time.

IBM Speech Systems

800/825-5263

<http://www.voicetype.ibm.com>

List price: \$99

an easy-to-use microphone headset. Unfortunately, you'll need at least a Pentium-100 machine with 16MB of RAM to use the program—no small drawback for many people.

IBM says you can start using the program right away, with no training exercises. To do this, however, you have to choose the "discrete" speech option—meaning that you pause briefly after you say each word, which is not convenient even for quick messages or memos. So we recommend that you complete the "enrollment" option: You spend about half an hour reading 50 to 283 sentences aloud to familiarize the system with your speech patterns.

In my own case, VoiceType

Simply Speaking proved to be stenographically challenged. But I gave it a particularly hard test: It didn't know what to make of my Irish accent on words such as *and*, *hand*, *than*, and *that*. If you have a strong regional accent, your experience may be similar. Completing the first 60 sentences took me just over an hour—and when I started using the program, it translated only about half of my spoken words.

VoiceType Simply Speaking will appeal especially to people with injuries that limit their typing ability. Nonetheless, the program's high-end system requirement means that it's unlikely to bring voice recognition to the masses.

—Aoife McEvoy

### Mighty MouseMan

Nice shape, no cord, smart software, and fair price: Logitech's **Cordless Radio MouseMan** has all the makings of a mighty input device. This radio-controlled mouse communicates with your PC through a receiver that connects to your system's PS/2 or serial port. The MouseMan works within a three-dimensional range of 25 to 30 feet, and—unlike infrared devices—it does not require a clear line of sight to the receiver. Its innovative, tilted profile is comfortable for your wrist. For a reasonable street price of \$79.95, this cordless mouse reduces desktop cable tangle, wrist discomfort, and mousing mileage. It could also come in handy for small group presentations. Logitech Inc., 800/231-7717; <http://www.logitech.com>.

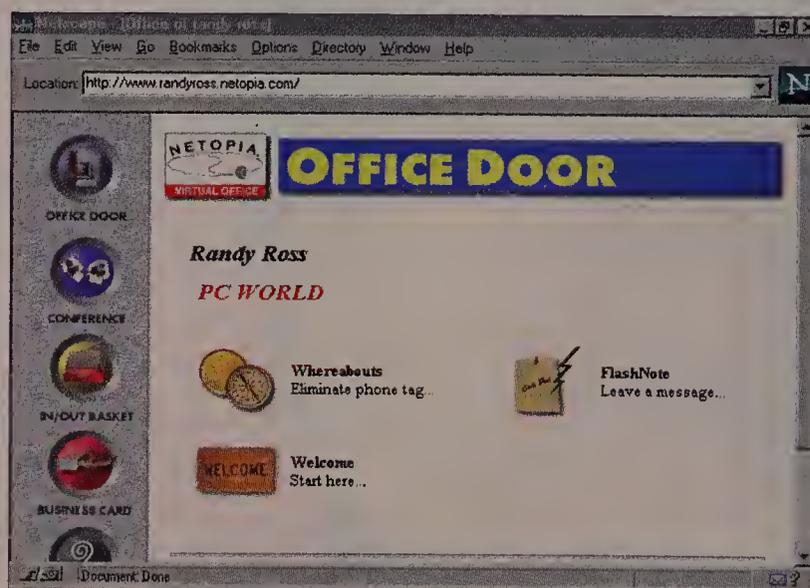
READER SERVICE NO. 740

## Centralize Communications With Netopia

### COMMUNICATIONS

FARALLON'S **Netopia Virtual Office** combines a handful of popular communications technologies into an unusual and worthwhile product. Virtual Office helps you create a personal Web site that becomes your communications center, complete with collaboration, remote access, and messaging features. I examined a beta version; the finished product is expected to sell for \$70 (or \$49.95 as a download).

Setup is a snap. To create a Web site with Virtual Office, you complete a series of templates—a process that took me about 10 minutes to complete. The site consists of multiple parts. The first page, or Office



**KNOCK, KNOCK:** Virtual Office tells visitors whether you're available.

Door, lets you leave a "note" telling site visitors whether you're in or out of the office. If you're in, they can send a message, or move to another page and click an icon that sends a

knocking sound to your PC, inviting you to chat.

A Conference page offers online chat, Internet phone capabilities for making calls, and collaboration features

such as application sharing.

Visitors can leave or retrieve files while you're away from your PC. You can dial in to your site from the road and retrieve files or run applications from a browser—all for the price of a local call.

A demonstration of the product is available at <http://www.demo.netopia.com>.

—Randy Ross ►

#### Netopia Virtual Office

**PRO:** Handles communications chores uniquely and effectively.

**CON:** Beginners could be overwhelmed by the program's many features.

**VALUE:** An affordable time-saver.

Farallon Communications, Inc.

510/814-5000

<http://www.farallon.com>

Street price: \$70, download \$49.95

READER SERVICE NO. 741

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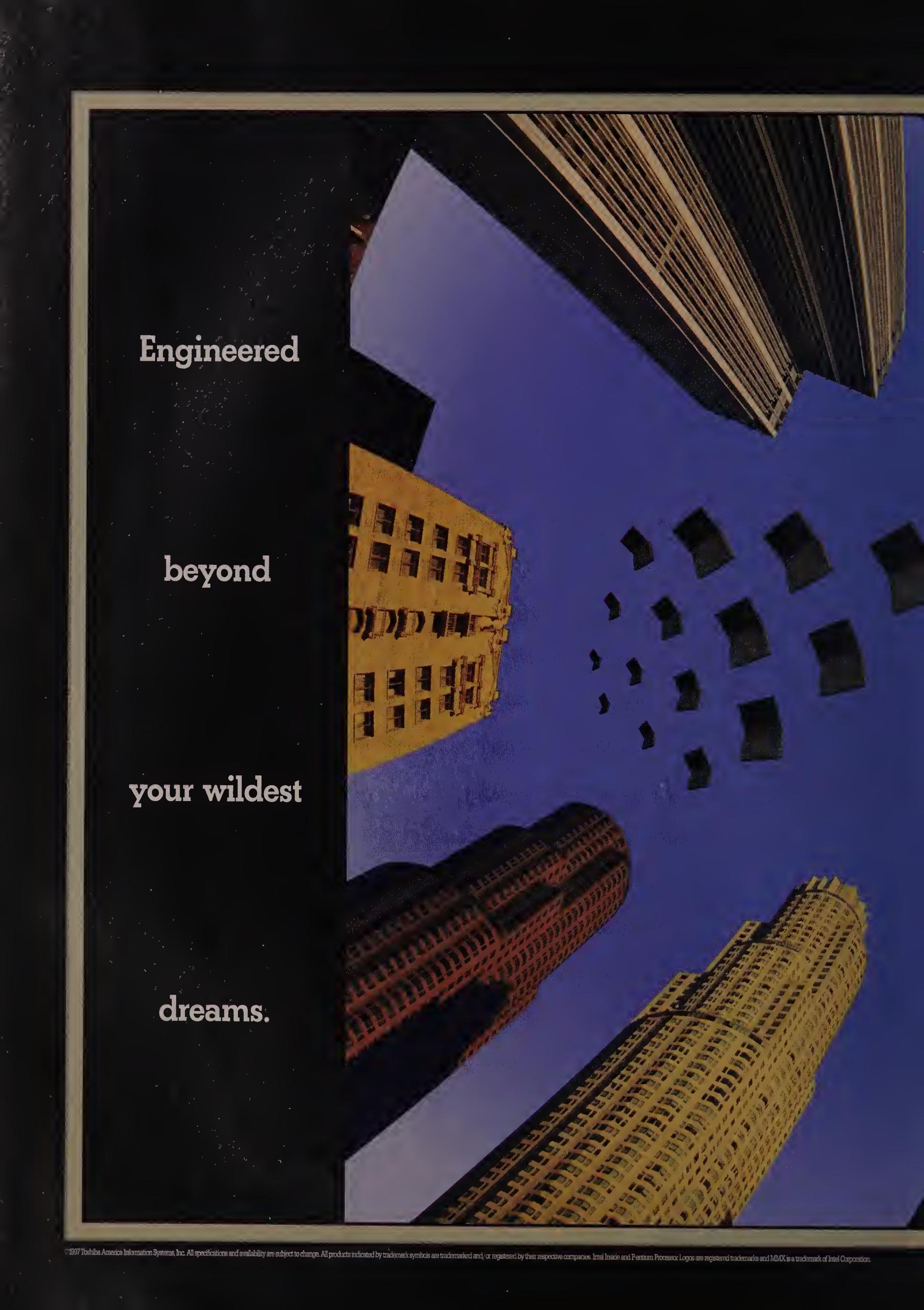
[ DICTIONARY OF THE FUTURE, PAGE 531 ]

**lost** (lôst) *adj.* [archaic]  
**1.** unable to locate one's position, as in, "Help. I am lost."  
**2.** having no sense of direction at all  
**n.b.** became obsolete in 1996 with the introduction of Street Atlas USA 4.0 and Tripmate.



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## Magic Cap Puts a Friendly Face on Your E-Mail

### E - M A I L

THOUGH IT WAS originally a graphical operating system, **Magic Cap** has reinvented itself as a communications and organization tool built around Windows message functions and America Online.

Magic Cap's intuitive interface is a virtual office, complete with a writing desk, filing cabinet, and storeroom. You can use America Online, Microsoft Exchange, or Microsoft Internet Explorer with this Windows 95 product. (Magic Cap includes AOL and IE.) After configuring the software for your Internet connection, you're ready to send and receive e-mail and faxes.

With Magic Cap, you mimic the steps involved in composing a real letter: Pull out an envelope, select a recipient from your address book, write your message, and then put it on the desk or in the out-box. You can also add stamps like Urgent or Reply Needed.

The program makes it easy for you to set customized rules for incoming and outgoing messages by using drop-down dialog boxes. You can sort and



**COMMUNICATIONS WIZARD:** Magic Cap lets you assign rules and sort your e-mail easily. It also handles faxing and some PIM chores.

store messages from individuals or groups, or by priority. It won't replace a full-blown contact manager, but Magic Cap

also includes a tidy organizer that tracks meetings and tasks, and logs phone calls.

—Peter Scisco

## Microsoft Network, Take Two

### ONLINE SERVICE

THE SECOND-LARGEST commercial online service, **Microsoft Network**, is going through a major face-lift and attitude adjustment. The newest version features innovative multimedia content, which makes MSN worth checking out, even though it still has less content overall than America Online. Its pricing is comparable to AOL's, at \$19.95 per month for MSN content and unlimited Internet access.

Current Microsoft Network members—1.6 million people, according to Microsoft—will have received CD-ROMs with new client software by the time you read this. Like Prodigy, MSN is a Web-based service. Why should you need new software? Because Micro-

soft wants you to use *its* Web browser. Though you can look at the new version of MSN with any browser, a specially enhanced version of Internet Explorer 3 has been created for Microsoft Network users, featuring a slick new design and nice navigational tools. In addition, the multimedia-rich MSN stores some files on your PC, which means that less information has to travel through the wires.

The latest MSN boasts tons of new content, available in an Essentials area (a reincarnation of the old versions' special-interest areas) and in six interactive multimedia "channels" that focus on different topics and audiences. Channel 3, for example, is an area for thought-provoking documen-

taries and news analysis, while Channel 6 is dedicated to teenagers and preadolescents. The original material—about 35 programs so far—comes from third-party content providers. You can also access some of the content (with the exception of the special programs) via the Web without becoming an MSN member, for \$6.95 per month.

Microsoft Network retains its useful Expedia travel service, Car Point car shopping service, and an online version of Microsoft Encarta.

On the downside, the new MSN continues to rely on the sluggish Microsoft Exchange system for sending and receiving e-mail. Earlier announcements from Redmond had promised a transition to the POP3 Internet e-mail standard, which would have let members use lighter e-mail clients such as Eudora or even Microsoft's own Internet Mail. A company spokesperson says the conversion to POP3 won't take place until sometime later this year. In addition, Microsoft no longer supports international MSN users.

The company is offering a free 30-day unlimited trial period, which makes it easy to judge MSN for yourself.

—Yael Li-Ron ▶

### Magic Cap for Windows 95

**PRO:** Easy-to-use, rule-based e-mail and faxing.

**CON:** Doesn't replace a full-featured contact manager.

**VALUE:** Top-notch e-mail package lets you concentrate on the message, not the medium.

#### General Magic

888/239-4824

<http://www.genmagic.com/mcw/>  
Street price: \$49; free 30-day trial available from Web site

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### Microsoft Network

**PRO:** Tons of new content, good looks.

**CON:** Slow e-mail handling, less content overall than AOL.

**VALUE:** Worth signing up for free trial period.

#### Microsoft

800/373-3676

<http://www.msn.com>

Pricing: \$19.95 per month

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*PC World, 10/96*

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## Active-Office Spruces Up Documents

### GRAPHICS

THESE DAYS, a report or spreadsheet must be more than clear and effective. If you're presenting your ideas to other people, looks matter. Software Publishing Corp.'s new **Active-Office for Windows 95** helps you easily create slick visuals from scratch, or add graphics and special effects to documents done in Microsoft Office 97 and other Windows 95 applications that support

#### Active-Office for Windows 95

**PRO:** Creates visuals and graphic effects in minutes.

**CON:** Not easy to undo some effects.

**VALUE:** An affordable, smart choice.

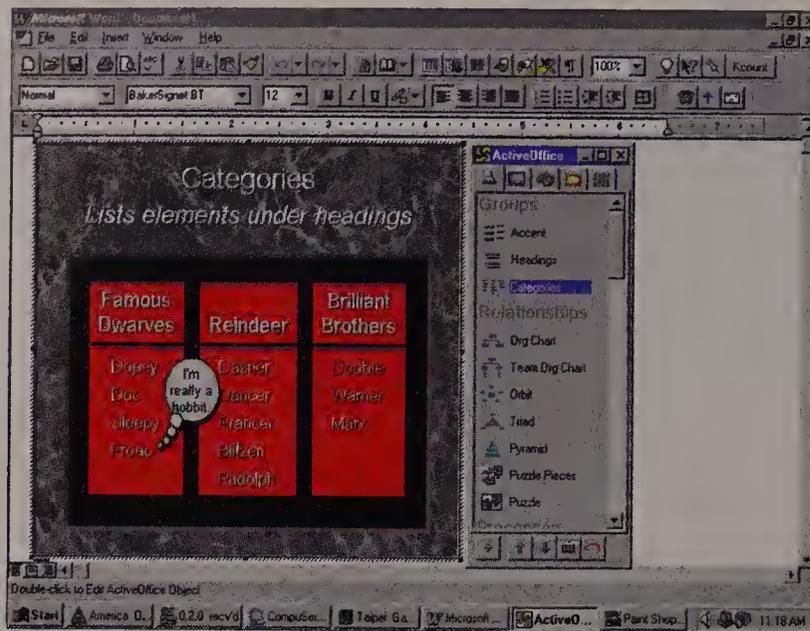
Software Publishing Corp.

800/336-8360

<http://www.spc.com>

Street price: \$50

READER SERVICE NO. 744



**PRESENTATION PIZZAZZ:** Active-Office lets you add graphics and special effects to reports and other documents in minutes.

OLE 2.0. I was very impressed with the preproduction version of Active-Office supplied for this review.

The product works inside your application: If you use Office 97, for example, an Active-Office button is automatically added to the Office toolbar. (When you're using

other applications, the Active-Office icon appears in the Windows 95 Taskbar.) Click the button, and a floating "gallery" of presentation styles pops up, including Groups, Charts, Tables, Scheduling, and others. You can use these to spruce up your existing text, charts, or graphics, or to create

new effects. To add further interest to your visuals, you can change color palettes and even introduce different textures and backgrounds—all through a very quick process of pointing and clicking.

Customizing styles and objects may require a bit of trial-and-error experimentation, so you'll probably want to make copies of your files before modifying them. Case in point: While Active-Office does a great job of converting text into an OLE object, the only way you can convert an Active-Office object back into text is through the Undo command in your Office application. This means that to make further changes to your document you may have to manually recreate text that had been converted into an Active-Office graphic.

Active-Office isn't nearly as intuitive as I would have liked, but it produces impressive results quickly and easily.

—Gordon Meyer

## Partition Magic: Finder of the Lost Megabytes

### UTILITY

ARE YOU REALLY getting all the storage you paid for? With a 1GB to 2GB hard drive, you may typically be wasting 10 to 20 percent of its space, due to a design shortcoming in DOS that dramatically increases the size of clusters in which files are stored as your hard drive partitions get bigger. (Yes, this problem affects most Windows 95 users as well.)

PowerQuest's **Partition Magic 3.0** is a good solution to this problem, judging from the shipping copy I looked at.

This powerful utility—which works under DOS, Windows 3.x, Win 95, Win NT, and OS/2—lets you add, delete, and resize your disk partitions, as well as change their cluster size (something you can't do in DOS without first erasing the disk completely and then starting over from scratch).

Once you've learned Partition Magic, it's very easy to use. But you'll need to read the manual: The program can be complex to master, and the package comes without any

tutorial to walk you through the procedures.

The program's graphical display uses buttons to show the relative sizes of existing partitions on your hard drive. You simply click a partition's button, then choose Resize. The window that follows lets you change the partition size either by sliding a bar or typing in the exact size you want.

I tested Partition Magic 3.0 on a Windows 95 system with a single-partition 1.2GB hard drive. By breaking the disk down into two partitions of

850MB and 350MB—and reducing cluster size—I recovered more than 200MB of usable space. The bigger your hard drive, the more you'll benefit from this program.

—Gordon Meyer

#### Partition Magic 3.0

**PRO:** Does a good job of recovering hard drive space.

**CON:** Not intuitive, lacks on-screen tutorial.

**VALUE:** Worth the price and time spent reading the manual.

PowerQuest

800/379-2566

<http://www.powerquest.com>

List price: \$69

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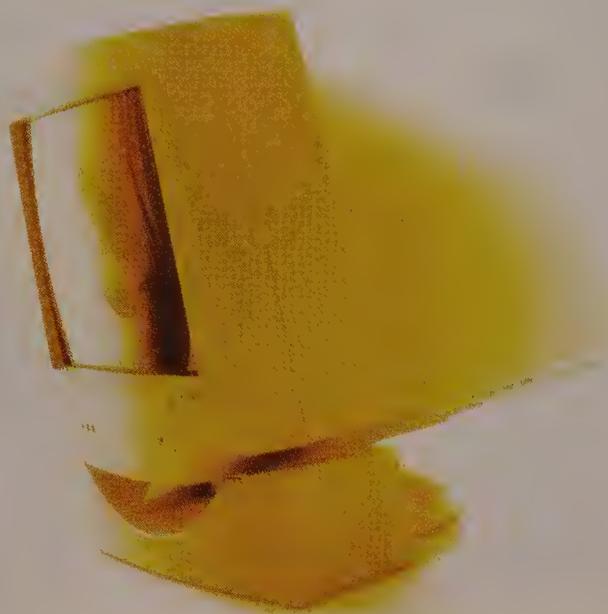
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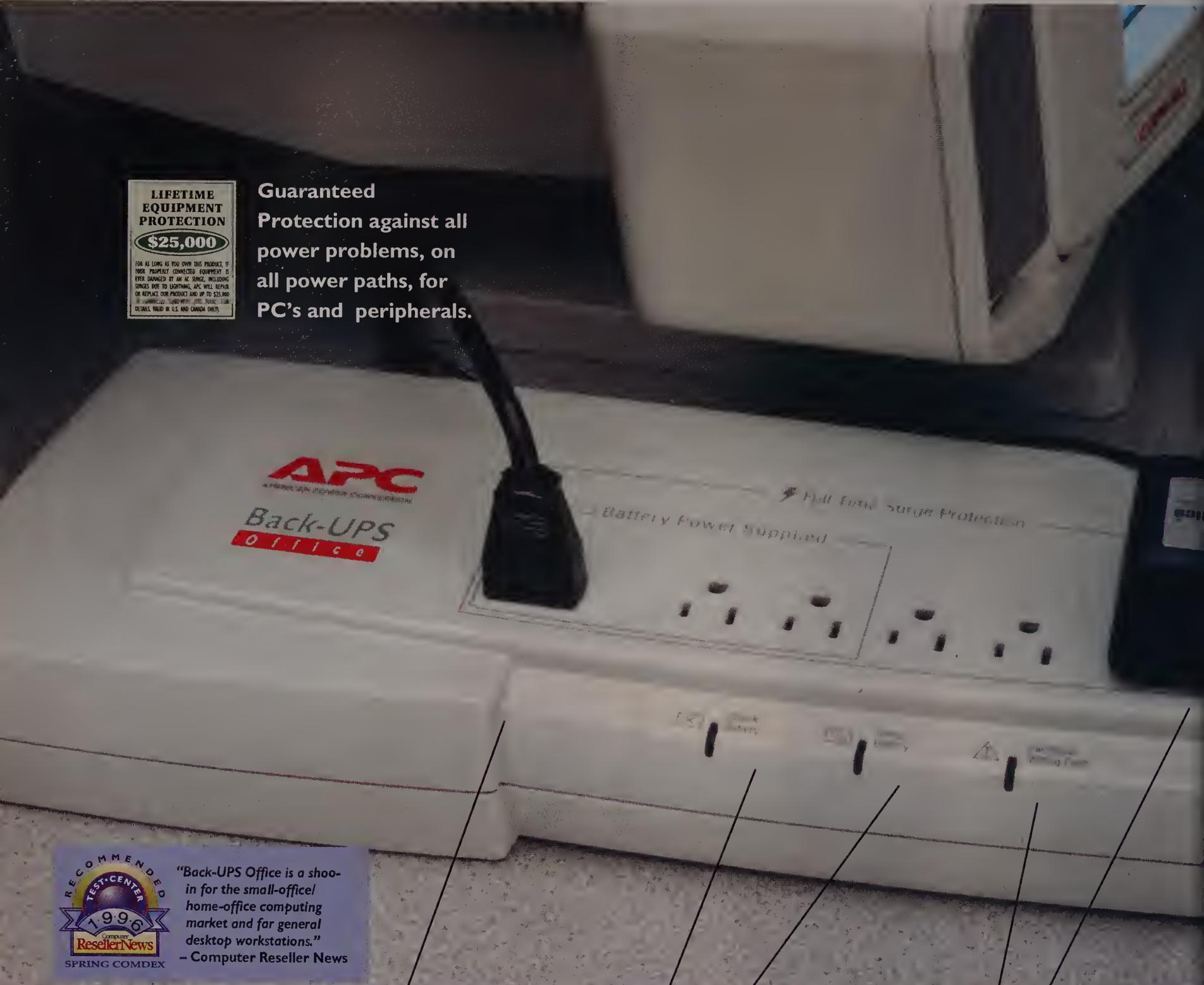


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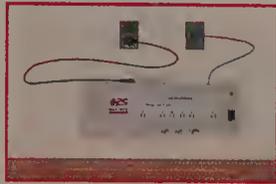
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*APC products have won more awards for reliability than all other UPS vendors combined.*



**Space-saving design**  
 Back-UPS Office's compact design installs easily on desktop, floor, or mounts to wall. Its ninety-degree plug fits flush against the wall.

**User-replaceable Batteries**  
 Cells can be easily swapped out, saving time and expense: no need to return to the factory for service. Batteries last 3-6 years under normal usage.

**Battery Replacement Warning Prevents Downtime**  
 An LED signals when the Back-UPS Office's internal self-test finds the battery near the end of its life. Users have 6-8 weeks warning.

**Convenient BlockSafe™ Outlet Spacing**  
 Back-UPS Office's outlets are spaced to accommodate all size plugs, including large transformer blocks. No need to sacrifice the use of any outlets to accommodate large block plugs.

**Integrates the Security of a Surge Suppressor with the Power of a UPS**  
 Back-UPS Office provides enough outlets to protect your entire system. Six outlets guard your hardware with full time surge protection. Three of the six provide instantaneous battery backup to keep your system from crashing in the event of a brownout or blackout.

**Site-Wiring Fault Indicator**  
 Without a proper ground, most surge protection is useless. Back-UPS Office alerts you to wiring problems such as missing ground and reversed polarity, two common wiring mistakes which otherwise would require an electrician's visit to diagnose.

# FREE 60-page handbook



What are the myths and musts of PC protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your PC? Get your FREE copy and find out!



- YES!** I'm interested in the new Back-UPS Office.  
Please send me more information.
- NO,** I'm not interested in the Back-UPS Office at this time,  
but I would like a FREE Solutions '97 catalog

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Back-UPS<sup>®</sup> Office  
from APC

Name: ..... Title: .....

Company: .....

Address: .....

City: ..... State: ..... Zip: .....

Phone: ..... Fax: .....

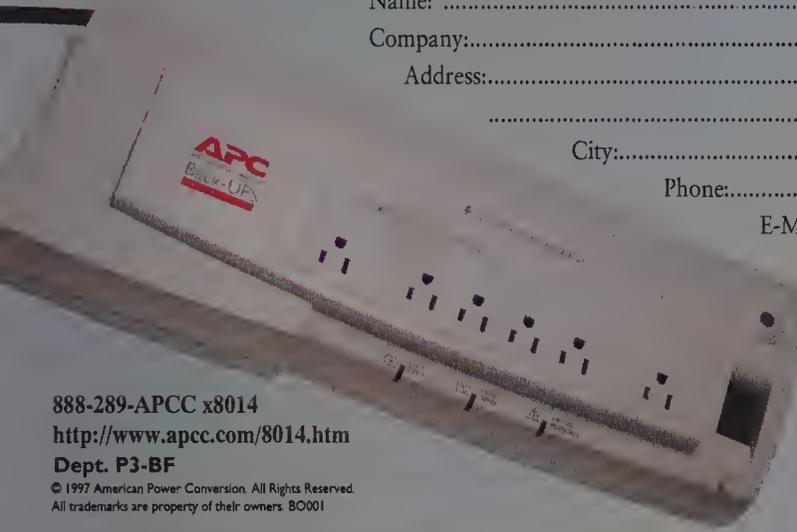
E-Mail: .....

Brands of UPS used: .....

# servers/PCs to be protected: .....

End User    Reseller

Is this your first contact with APC?  Yes    No



888-289-APCC x8014  
<http://www.apcc.com/8014.htm>  
Dept. P3-BF

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# Multipath Back-UPS<sup>®</sup> Office<sup>™</sup> – then the lights went out<sup>™</sup>



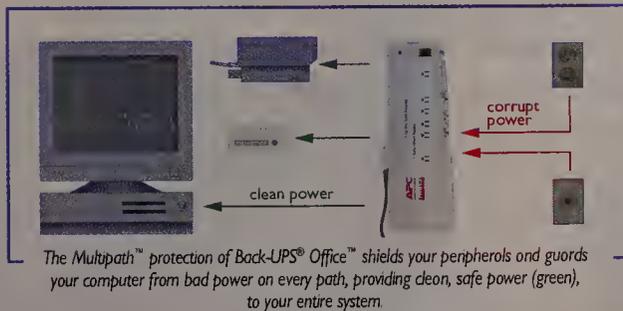
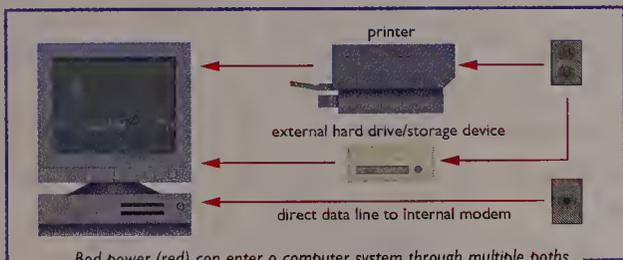
Today's high performance PC's, with operating systems like Windows<sup>®</sup> 95 and Windows<sup>®</sup> NT, need more than just a surge suppressor. Because the data on a new PC becomes more valuable than the hardware in a matter of weeks, battery backup power is mandatory. After all, you have a better chance of winning the lottery than of escaping power problems. In fact, they're the largest single cause of computer data loss and hardware damage.

Back-UPS Office Uninterruptible Power Supplies provide reliable power for your entire system. Instantaneous battery backup ensures uninterrupted operation of your CPU, monitor and an external storage device. Full-time surge suppression and site-wiring fault protection spreads a true Multipath safety net under any remaining integrated peripherals, like modems, printers, fax machines and phone systems. Back-UPS Office also provides convenient BlockSafe<sup>™</sup> outlet spacing to handle all size plugs – even large transformer blocks.

**Unique Multipath protection keeps your PC and data safe**

Plugging a phone line into your computer doubles your vulnerability to power problems; add any peripheral, and it triples. Even if your AC power-line

**MULTIPATH<sup>™</sup> MEANS TOTAL POWER PROTECTION**



**Circuit breaker**  
Provides protection in the event of an overload or short circuit; no fuse, no hassle.

**Recessed Master On/Off Switch**  
Prevents accidental shut-offs and conveniently controls power to the entire connected system.

**Internet Ready Fax/Modem Protection**  
Back-UPS Office's built-in phone line/I/O Base-T network cable surge protection prevents data line surges from damaging internal and external modems, motherboards, input/output cards, and other system components.

is shielded, when a surge hits an unprotected peripheral, it can blaze down serial and data lines, and toast your expensive PC.

**Back-UPS Office protects your entire system**

Until now, protection for your entire system required several devices. But multi-device protection can leave you vulnerable to line noise and unwanted data glitches created by the voltage differential between outlets. Those glitches are prevented with the Back-UPS Office common voltage reference.

**Only Back-UPS Office provides single device Multipath protection for all your equipment**

THE MULTIPATH POWER PROTECTION ADVANTAGE	TRADITIONAL SURGE PROTECTOR	TRADITIONAL UPS	BACK-UPS OFFICE <sup>™</sup>
<b>Protected Paths</b>			
AC	•	•	•
Data			•
Phone			•
<b>Total Outlets</b>	7	2	6
<b>Number of Block Outlets</b>			2
<b>Protection from</b>			
Surges	•	•	•
Spikes	•	•	•
Blackouts		•	•
Brownouts		•	•
Overtages			•
<b>Typical Runtime in Minutes</b>			
with Pentium 100 w/15" monitor		10	10
<b>Battery backup for</b>			
PC		•	•
Monitor		•	•
Storage Devices/Zip Drives		•	•
<b>Full-time surge protection for</b>			
Fax/Modem	•		•
Laser Printer	•		•
Speakers	•		•
<b>Dataline protection for</b>			
Internet or Network			•

Traditionally, protecting all your peripherals meant having to buy a surge suppressor and a UPS. Even then, only the AC line was protected. Back-UPS Office protects all paths: Bulletproof Multipath protection.

Back-UPS Office means true Multipath protection, clean, safe power to every peripheral, and instant battery backup to keep your cutting edge system and O/S from crashing. It means protection for less by integrating the power of a UPS with the security of a surge suppressor, guaranteed up to \$25,000 (see policy for details).



Ask for APC award-winning power protection wherever top-quality computer products are sold.

Protect yourself before you kick yourself. Get your new Back-UPS Office today, or call APC for a FREE 60-page catalog!



Dept. P3-BF



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Circle 45 on reader service card

## Spring Yields Fresh Printer Crop

### PRINTER

AFTER A LENGTHY printer famine, we're facing anew the rustle of curled cellulose and the scent of laser-printer toner. Two new Fujitsu laser printers (the company's first in several years) target the small-office market, and a Xerox system in the same category features a built-in duplexer for double-sided printing—a big bonus not offered by any comparable product. We haven't yet tested these new printers.

The **Xerox DocuPrint 4512** and **4512N** (the latter includes a network adapter) use a 600-by-600-dot-per-inch monochrome engine that Xerox rates at 12 pages per minute.

#### Fujitsu PrintPartner 10V, 14AV

**PRO:** Rated faster than comparable printers.

**CON:** A lot of add-ons to buy, especially for the 10V.

**VALUE:** A good deal if you don't need extra paper trays or a network connection.

Fujitsu Computer Products of America

800/626-4686

<http://www.fcpa.com>

Street price: 10V \$720, 14AV \$1100

READER SERVICE NO. 747

#### Xerox DocuPrint 4512, 4512N

**PRO:** Integrated duplexer saves paper, hassle.

**CON:** PostScript costs extra.

**VALUE:** A great deal for a duplexing printer.

Xerox

800/349-3769

<http://www.xerox.com>

Street price: 4512 \$1270, 4512N \$1530

READER SERVICE NO. 748



**TWO PRINTS IN ONE:** Xerox's DocuPrint 4512 and 4512N offer double-sided laser printing at small-office prices.

The duplexer slows things down somewhat, to a rated speed of 8 ppm—4 double-sided sheets per minute.

But besides cutting paper consumption in half for many jobs, a duplexer eliminates those maddening experiments with manually flipped pages. It's no fun to discover you've printed all the even-numbered pages of an important document upside down.

Estimated street prices are \$1270 for the 4512 and \$1530 for the 4512N. That compares with IBM's \$1250 Network Printer 12, the monochrome Best Buy in this month's Top 10 Workgroup Printers review. We love the IBM Network Printer 12, but if these new Xeroxes come anywhere near the IBM's print quality and 8.9-ppm real-world text printing speed, the duplexer will make the 4512 and 4512N terrific bargains.

Non-Adobe PostScript costs an extra \$175. And to expand beyond the dual 250-sheet

paper trays, you can add a 1000-sheet tray for \$288.

Fujitsu rates its **PrintPartner 10V** at 10 ppm and its **PrintPartner 14AV** at (drum roll, please) 14 ppm. Both monochrome lasers are based on a 600-by-600-dpi engine that interpolates to 1200 dpi.

The 14AV unit includes a 500-sheet tray, a 100-sheet multipurpose tray, and non-Adobe PostScript. Street price is about \$1100.

The PrintPartner 10V, with a



**FAST FUJITSUS:** The PrintPartner 10V and 14AV are rated at 10 and 14 pages per minute, but network interfaces aren't cheap.

### NEC's Affordable Laser

If you've ever been late to a meeting after waiting for a slow ink jet printer to churn out a long document, you know that speed counts. Thankfully, prices for fast personal laser printers keep dropping. At \$349, NEC's new **SuperScript 660plus** sports one of the lowest street prices in its class, especially considering it comes with a parallel cable—an unusual bonus worth \$20 to \$25. Rated by NEC at 6 pages per minute, this compact 600-dot-per-inch laser printer comes equipped with 256K of RAM and a 150-sheet paper tray; an additional 250-sheet tray is optional. NEC also throws in a two-year warranty and a useful CD-ROM that has a helpful on-screen user guide and templates for typical business documents. NEC, 800/632-4636, <http://www.nec.com>.

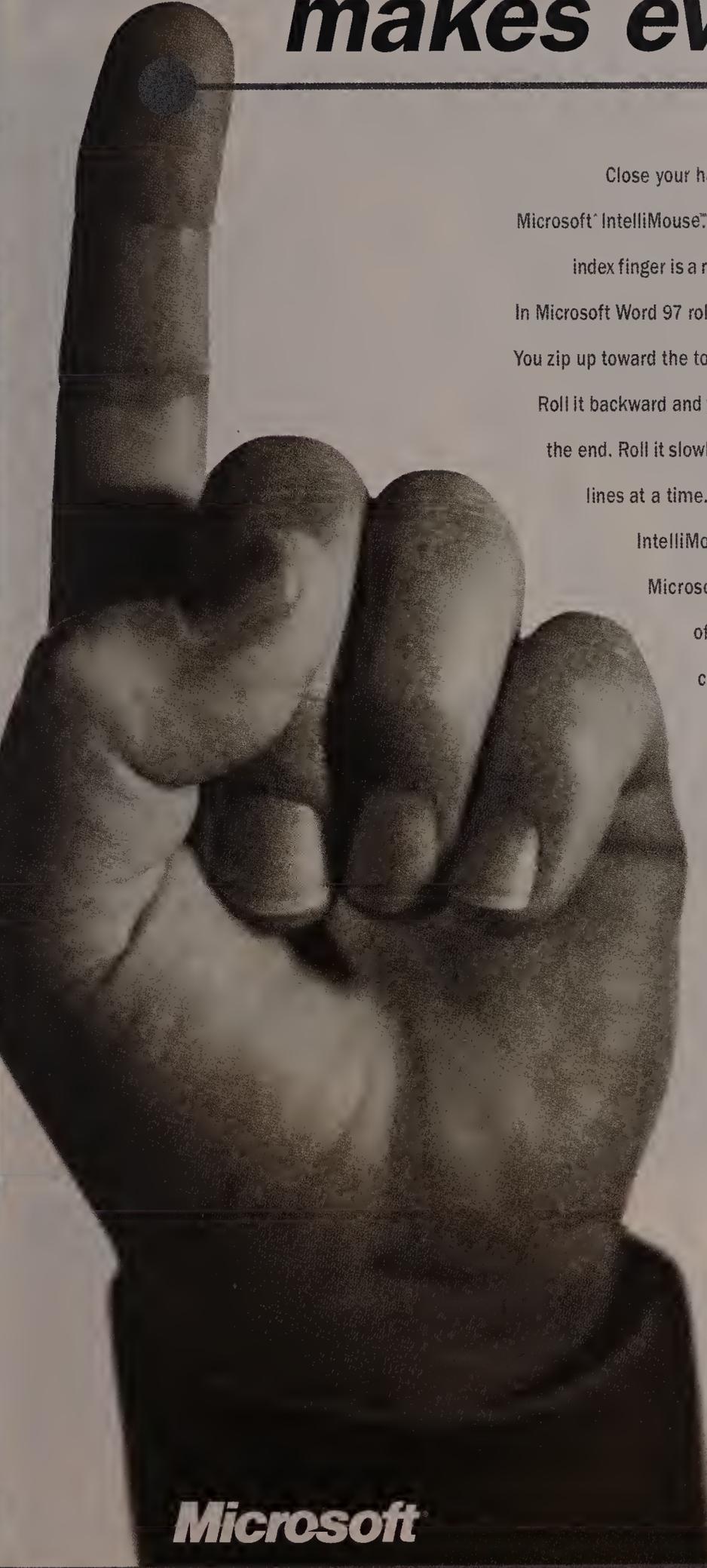
READER SERVICE NO. 746

250-sheet tray, costs about \$720. For either model, a network interface runs a very steep \$450 extra.

Fujitsu is also touting its new toner-cartridge design that ensures all toner in a cartridge gets used.

—Dan Littman ►

# A simple touch makes everything easier.

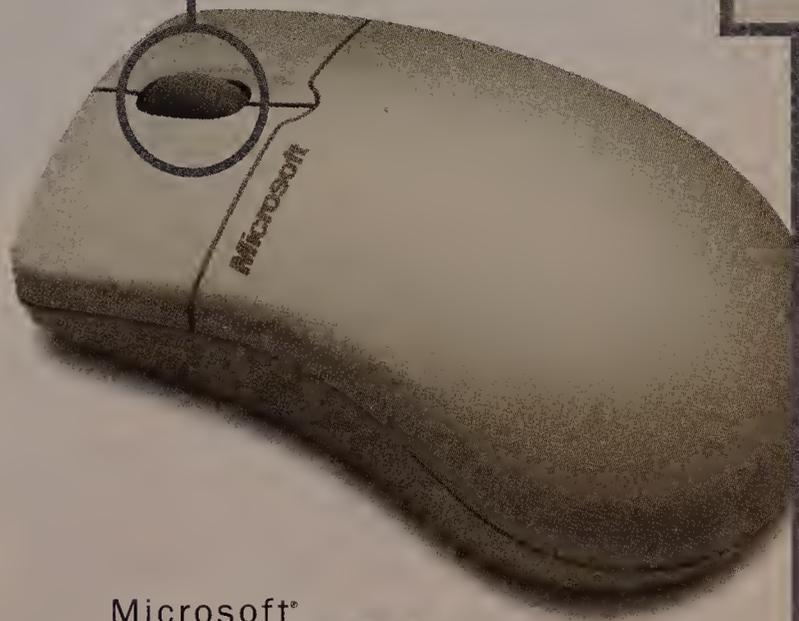


Close your hand around the new Microsoft® IntelliMouse™. Right beneath your index finger is a raised rubber Wheel. In Microsoft Word 97 roll the Wheel forward. You zip up toward the top of your document. Roll it backward and you zip back toward the end. Roll it slowly to move just a few lines at a time. This is how the new IntelliMouse works with new Microsoft Office 97 and lots of other IntelliMouse-compatible programs to make getting your work done easier.

Go to Microsoft Excel 97. Press the CTRL key and push the Wheel forward or backward. You zoom in closer or zoom out farther. See how manageable even a massive spreadsheet becomes.

A final touch.

To scroll through Web pages with Microsoft Internet Explorer, press the Wheel once and move the mouse downward. Your computer goes into AutoScroll mode. Automatically, rolling line by line through your entire document. Without even lifting a finger.



**Microsoft**

Microsoft®  
**IntelliMouse™**

## Cardinal Voyager: Interim High-Speed Solution

### MODEM

WHILE manufacturers squabble over competing standards for next-generation high-speed modems, Cardinal's software-upgradable **Voyager** offers to bridge the technology gap.

New 56-kilobit-per-second modems will break the supposed 33.6-kbps barrier by adopting new technologies. Several chip and modem companies have been developing slightly different implementations of 56-kbps units. U.S. Robotics' upgrades and modems should be available by the time you read this, while modems based on Lucent,

Rockwell, and 3Com technologies probably will ship in April. But the International Telecommunications Union (the international standards body) is unlikely to settle on a 56-kbps standard until 1998. The standard is important because it must be supported by Internet service providers in order for the modems to function at full speed.

The Voyager—available in \$149 internal, \$169 external, and \$199 PC card versions—is shipping as a 33.6-kbps fax-modem. But a \$79 upgrade package permits conversion to 128-kbps ISDN right away. A

56-kbps software upgrade to the U.S. Robotics implementation (the Voyager is based on USR's x2 technology)—and possibly to the eventual ITU standard—will come later. This should appeal to people who have standard analog phone service but want the option to switch to ISDN or 56 kbps down the line. No other product offers such flexibility.

Voyager modems and the \$79 ISDN upgrade (which includes a cable) are slated to ship this spring. The price of the 56-kbps upgrade has not been announced, but Cardinal says it will be \$100 or less. No

pricing on competitors' 56-kbps modems was available at press time (U.S. Robotics' 56-kbps upgrade for its higher-priced Courier modems costs \$95), but the Voyager looks like a low-cost interim option.

—Jeff Sengstack

### Cardinal Voyager

**PRO:** Easy and cheap to upgrade.

**CON:** No voice capabilities, 56-kbps standard still unsettled.

**VALUE:** If you want a fax-modem right now, this makes sense.

### Cardinal Technologies

800/775-0899 ext. 2401

<http://www.cardtech.com>

Street price: \$149 to \$199, ISDN upgrade \$79. Price of 56-kbps upgrade not announced.

READER SERVICE NO. 749

## Resolution Revelation From Olympus

### DIGITAL CAMERA

IF YOU'RE SERIOUS about digital cameras and want the best picture quality available, look no farther than the \$900 **Olympus D-300L**. Our unit arrived too late to be included in our review of digital cameras (see "Cheap Shots" in this issue), but the D-300L combines easy point-and-shoot operation with picture quality superior to our Best Buys.

Like its \$599 cousin, the Olympus D-200L, the D-300L boasts a lightweight and compact design, automatic flash with red-eye reduction, a close-up mode that allows you to shoot from as close as 8 inches, and a built-in 1.8-inch color LCD screen where you can play back or preview shots as you would on a video monitor.

What distinguishes the D-300L, however, is its ground-



**PIXEL PERFECT:** Olympus's D-300L (seen from the front and back) is the first under-\$1000 digital camera to capture 1024 by 768 images.

breaking 1024 by 768 resolution—the highest to date in a camera priced below \$1000. The D-300L's 6MB of internal memory can store up to 30 high-resolution pictures, or as many as 120 shots at a lower 512 by 384 resolution. Working at the higher resolution, you can substantially enlarge

your digital photos—even the cropped ones—and get fine results without losing detail or sharpness.

Unfortunately, you'll need a Ponderosa-size hard disk to corral all those high-resolution pictures. Each image I saved in Adobe Photoshop PSD format occupied a whopping

2.25MB of disk space.

Impressive as it is, the D-300L would be even better if it accepted PC Cards for extra storage so you could use it indefinitely in the field. Instead, you have to download images to a PC (via a supplied cable that plugs into a standard serial port) when the memory is full.

For fast, professional-quality photos to use in presentations, publications, or Web pages, the D-300L is a great choice.

—Richard Jantz ▶

### Olympus D-300L

**PRO:** Superior digital pictures; easy point-and-shoot camera.

**CON:** No removable storage capability.

**VALUE:** Best digital camera for under \$1000.

### Olympus America, Inc.

800/347-4027

<http://www.olympus.com/digital>

Street price: \$900

READER SERVICE NO. 750

# Why settle for HP or Lexmark?

# Now you can afford the best.



## The QMS® 2425 Print System NOW only \$4,199.



Features	QMS 2425 Print System	QMS 2425 EX Print System	HP® 5Si MX	Lexmark Optra N Model 245
Resolution - Std. / Max.	600 / 1200 dpi	600 / 1200 dpi	600 / 600 dpi	600 / 1200 dpi
Duplexing*	yes	yes	yes	yes
Processor Speed	100 MHz	100 MHz	40 MHz	50 MHz
Internal Hard Drive	no	yes	no	no
RAM - Std. / Max.	8 / 128 MB	24 / 128 MB	12 / 76 MB	16 / 64 MB
Printing Speed	24 ppm	24 ppm	24 ppm	24 ppm
Forms-Enabled*	yes	yes	no	no
Image-Enabled*	yes	yes	no	no
Price	\$4,199	\$5,499	\$4,899	\$4,199



**Winner PC Magazine's Editor's Choice Award**  
"The QMS 2425 EX completed the test in almost half the time as the competing HP 5Si MX." PC Magazine 6/11/96



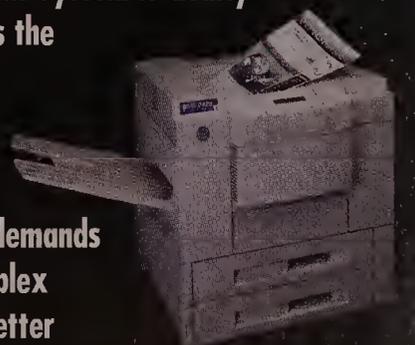
**Best Over All & ★★★★★ from PC Computing**

"...the QMS 2425 EX Print System is clearly the top performer and has the best output quality..."  
PC Computing 11/96



**PC Week says —**

"... Workgroups whose demands include printing more complex documents...will find a better performance in the QMS 2425 EX..."  
PC Week 7/1/96



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**<http://www.qms.com/>**

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TO UNLEASH THAT MAD,  
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encompassing list of features includes a LCD screen for instant review, wireless\*

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transfer of images, and of course, Sony's leading CCD technology for outstanding image quality. Making it the crème de la crème of digital cameras.

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PERSONAL PREFERENCES WITH  
PICTURE-PERFECT MEMORY!



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## FlowCharter Update

### PRODUCTIVITY

IF YOU RELY on flowcharts to visualize complex procedures, but run into problems when clients or colleagues want changes, **Micrografx Flow-**

#### Micrografx FlowCharter 7

**PRO:** Collaborative, multiple templates; good tutorials.

**CON:** Too powerful and expensive for basic flowcharting needs.

**VALUE:** An excellent tool for professionals who analyze processes in depth.

#### Micrografx

800/676-3110

<http://www.micrografx.com>

List price: \$299.95, competitive upgrade \$129.95

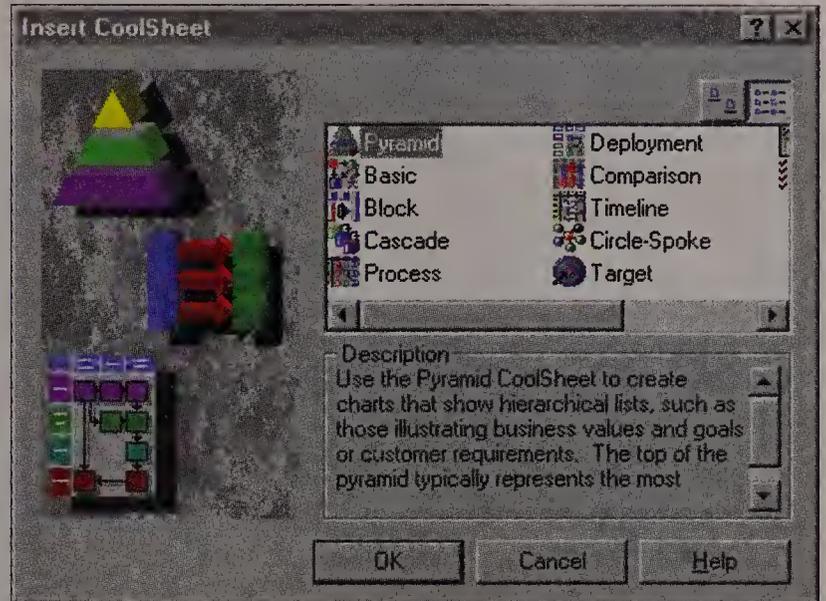
READER SERVICE NO. 751

**Charter 7** may be able to help. We saw a beta version.

This renamed upgrade of ABC FlowCharter 6 is Windows 95-compatible and includes a collaborative Living FlowCharts feature that lets users alter chart shapes to accommodate new functions.

Micrografx has also added drawing tools that put FlowCharter on a par with Corel's Corel Flow, a major competitor. A file converter for Visio Corporation's Visio is due in March as part of an upgrade that will add full Microsoft Office 97 compatibility.

Other improvements are a collection of templates, called CoolSheets, that cover such



**GOING WITH THE FLOW:** Micrografx's upgrade of the former ABC FlowCharter includes CoolSheets—templates that make design easier.

functions as organization charts, statistical process controls, and time lines—each with its own set of diagramming tools. FlowCharter 7 will ship with its earlier Win 3.1 version included.

Novices may find it too expensive and complex, but FlowCharter 7 meets virtually all diagramming needs for advanced technical and business flowcharting.

—Jeff Sengstack ►

## HR for PCs: Policies Now

### HUMAN RESOURCES

WORK FOR A company that's not quite big enough to hire a personnel manager? **Policies Now 5.0 for Windows** is a major step forward from the DOS version of this employee-handbook generator. We saw a shipping copy.

The process starts with an interactive interview about

#### Policies Now 5.0 for Windows

**PRO:** Easily develops complete policy handbook for any size company.

**CON:** None.

**VALUE:** Excellent and inexpensive tool for a very specific job.

#### Knowledge Point

707/762-0333

<http://www.knowledgepoint.com>

Street price: \$99

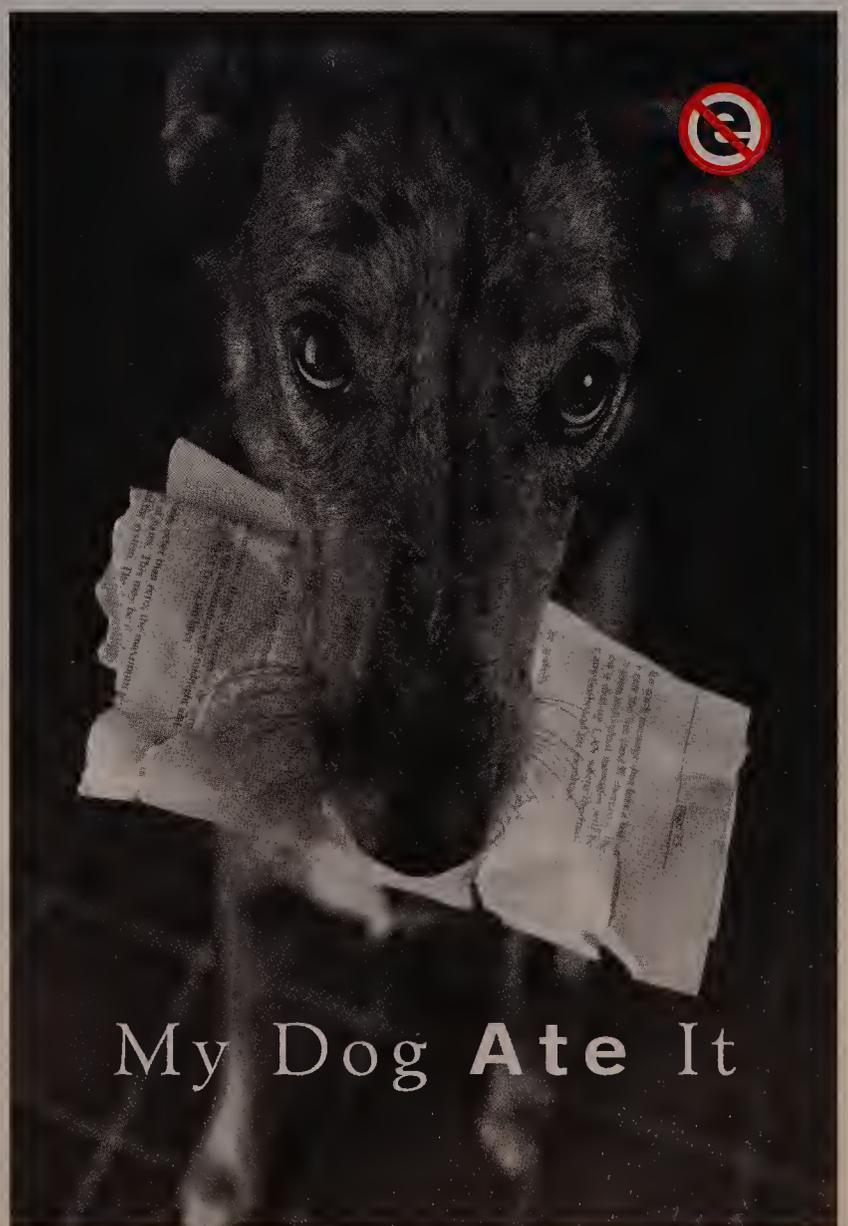
READER SERVICE NO. 752

personnel policies. After you have answered the 2 to 15 questions per subject, Policies Now generates a professionally worded policy statement and corresponding entries in a table of contents and index.

You can edit the text of the handbook or modify the terms going into the index. The book can be printed from within the application, exported to a word processor or graphics program, or automatically tagged with HTML code for publication on an intranet.

The program also suggests a number of Web sites with employment policy content. Policies Now is a good personnel tool for a new company, and the \$99 street price is hard to beat.

—Theresa W. Carey



My Dog Ate It

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Pro 150S*

**Echos Pro Notebook Standard Features:**

Pentium® processor, PCI Bus, 256K L2 cache, 16MB RAM expandable to 128MB, 28.8K internal modem, 2 PC Card slots with PC Card Bus and Zoomed Video, Win 95 keyboard, Li-Ion battery, Multi-function bay: 8X CD-ROM (std.), modular FDD (std.) and second HDD (opt.)

**Echos Pro 150S**

150MHz Pentium® processor, 12.1" SVGA TFT display, 2.1GB Removable HDD



**\$4,999\***

**Echos Pro 133S**

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**Echos Pro 133D**

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**\$3,499\***



The optional Echos™ Pro Docking System offers full port replication, Multi-function bay, drive bay, 2 PCI Card slots, plus much more. It's the perfect solution for desktop replacement.



*Echos  
P133S*

**Echos Notebook Standard Features:**

Pentium® processor, PCI Bus, 256K L2 cache, 1.3GB removable HDD, Multi-function bay, 6X CD-ROM (std.), modular FDD (std.) and second battery (opt.)

**Echos P133S**

133MHz Pentium® processor, 16MB RAM expandable to 40MB, 11.8" SVGA TFT display

**\$2,999\***

**Echos P120E**

120MHz Pentium® processor, 8MB RAM expandable to 40MB, 11.3" SVGA TFT display

**\$2,499\***

**Echos P100E**

100MHz Pentium® processor, 8MB RAM expandable to 40MB, 10.4" SVGA TFT display

**\$2,199\***

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100MHz Pentium® processor, 8MB RAM expandable to 40MB, 11.3" SVGA DSTN display

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Circle 162 on reader service card

## SamePage Keeps Your Office Connected

### WORKGROUPS

IT'S THE AGE-OLD dilemma: You need your coworkers' input on an important project, but you don't have time to track them down.

Groupware such as Lotus Notes is one way to go; however, it requires expensive hardware and software—plus the costs of training and development. **SamePage 2.0** from WebFlow Corporation is a cheaper, intranet-based alternative; it lets users collaborate simultaneously on HTML or text documents, via any Web browser. We saw a beta version.

When registering a document with SamePage, you indicate whether it should be made available to a group of users or to individuals who are assigned specific editing rights. SamePage then copies the document to the server and breaks it down into separate "objects," each of which is indicated by a blue paragraph symbol. (SamePage does not support automatic image registration, so you must move graphic images onto the server manually.)

#### SamePage 2.0

**PRO:** Intranet groupware needs only a Web browser.

**CON:** Lacks functionality of conventional groupware.

**VALUE:** Cost-effective tool for document-based collaboration on an existing intranet.

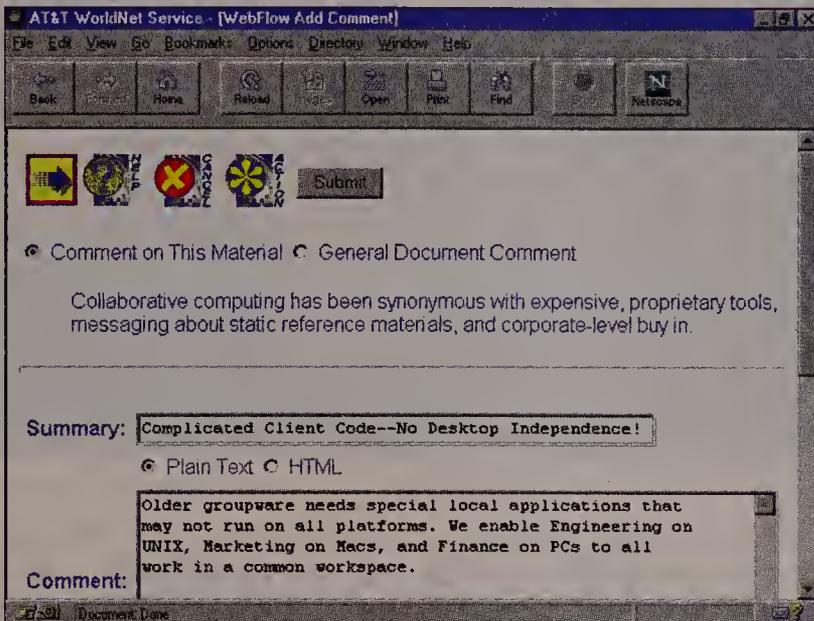
**WebFlow Corp.**

408/235-1417

<http://www.webflow.com>

List price: \$1999 per server with 10 users for SamePage or TakeAction, \$3500 for suite that includes both.

READER SERVICE NO. 753



**WORKING ON THE WEB:** WebFlow's SamePage lets workers on an intranet collaborate on documents using any Web browser.

You can then view documents with a Web browser. To add comments to a section, simply click the blue paragraph symbol and enter your remarks. The comments are embedded directly below the text, allowing subsequent reviewers to see what others have said.

At the end of the review cycle, the document can be edited and either republished in SamePage or exported back to the originating application.

One crucial issue in workgroup applications is security. SamePage answers this need by providing several different levels of user access, including some that black out certain users' comments when others view the document.

You can link SamePage to several popular e-mail systems, so users can be notified of changes to a document and can respond as necessary, regardless of their access to the Web server.

A SamePage application suite includes the TakeAction

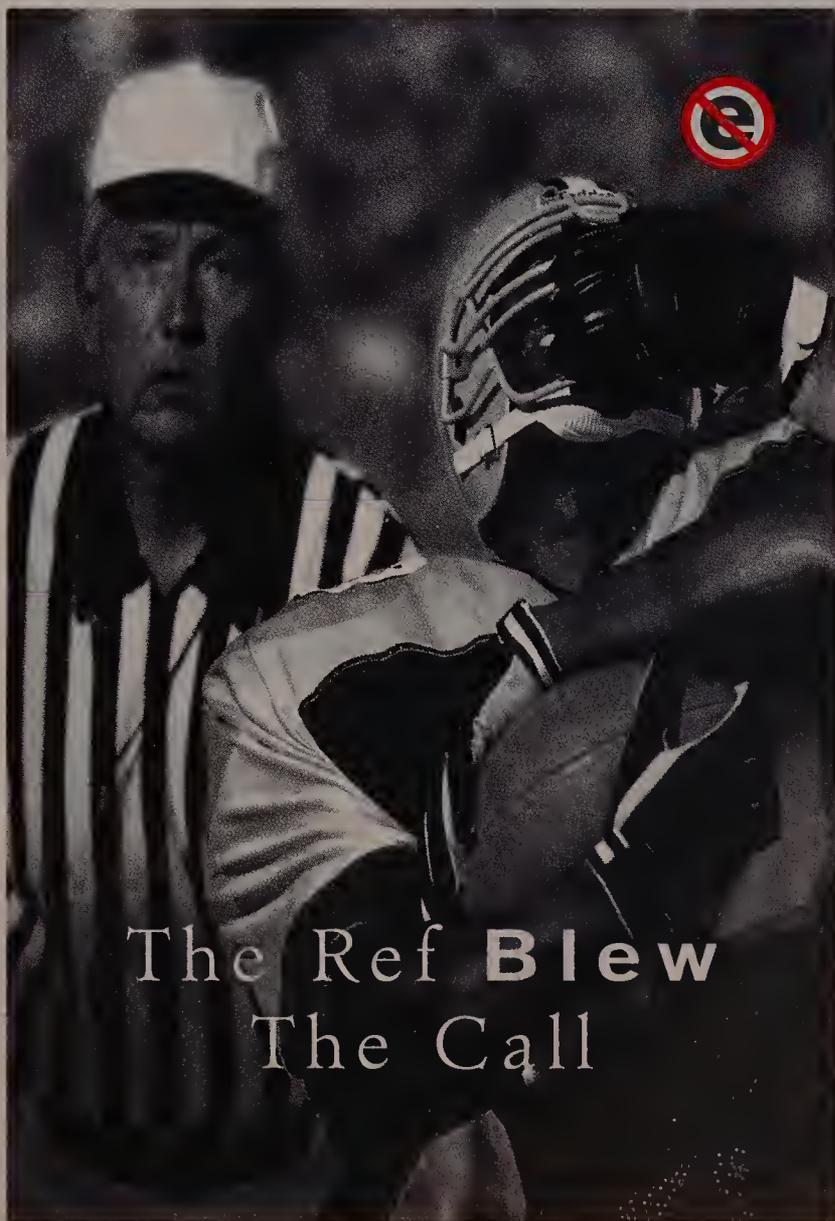
program, which lets you assign and manage tasks and projects from within Same-

Page. Again, you can use e-mail messages to direct participants to a URL where you've posted their assignment.

Of course, more elaborate groupware applications offer features that are not available on browser-based collaboration tools—additional security, offline operation, and full-blown programming capabilities. If you require such a sophisticated environment, SamePage and TakeAction aren't for you.

But if your workgroup collaboration mainly involves document editing, assigning tasks, and basic project management—and you've got an intranet up and running—SamePage provides all the tools you'll need.

—Cathy Kenny ▶



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## Easy Photos From Video

### VIDEO CAPTURE

LOOKING FOR A low-cost way to get photographs into a PC? Consider Play Inc.'s \$200 **Snappy Video Snapshot 2.0** and Aims Lab's \$150 **GrabIt**, two bargain-basement hardware products that permit fast and easy entry into the art of digital photography.

Both perform the same basic trick: They capture still frames from a video source such as a VCR, camcorder, TV, or videodisc player. Both are also painless to install. Attach a small gadget to your PC's parallel port, connect it to a video source via standard input-output cables (included), and then control the device using the bundled software.

I used a Super-VHS high-quality camcorder and a VHS videotape in my tests, and found both Snappy and GrabIt capable of capturing reasonably good images at adequate resolution. But while I admired GrabIt's S-VHS support and multiple-frame color preview (Snappy's is single-frame and black-and-white), I preferred Snappy overall.

Snappy's interface, picture quality, and resolution options—up to 1500 by 1125, compared to GrabIt's 720 by 480—are better, and the device comes with more software tools. For example, only Snappy supplies Adobe PhotoDeluxe SE, which includes more sophisticated image-

editing tools for making further enhancements.

Morphing software comes with both products, but Snappy also throws in Kai's Power Goo image editor.

If you want to convert video into still images for documents or Web pages, you can

get good results with either of these products. It doesn't get much easier than this.

—Richard Jantz

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

### GrabIt

**PRO:** Least expensive product on the market, full-color preview, S-VHS support.

**CON:** Lacks image-editing software.

**VALUE:** Cheap, easy video grabber gets the job done.

### Aims Lab

510/661-2525

<http://www.aimslab.com>

Street price: \$150

READER SERVICE NO. 754

### Snappy Video Snapshot 2.0

**PRO:** High-resolution images, cool interface, useful software.

**CON:** Lacks color preview and S-VHS support.

**VALUE:** The best bang for your buck on the video-grabber market.

### Play Inc.

800/306-7529

<http://www.play.com>

Street price: \$200

READER SERVICE NO. 755



**BEST OF THE VIDEO CAPTURES:** Play Inc.'s \$200 Snappy Video Snapshot 2.0 features superior picture quality and software.



**CAPTURE A WAVE:** Multiple-frame color preview—a feature of Aims Lab's \$150 GrabIt—makes it easy to choose the right digital image.



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Maximum Resolution	1280x1024	1280x1024	1280x1024
Dot Pitch	0.26mm	0.27mm	0.26mm
Plug & Play, Vesa DDC 1/2B	Yes	Yes	Yes
MPR II	Yes	Yes	Yes
Estimated Price	<del>\$639.00</del>	\$649.00	\$689.00



Aurora Vision 14"  
14"/13.2 viewable  
0.28mm dot pitch  
**MSRP: \$231**



AV2 585F  
15"/13.75 viewable  
0.28mm dot pitch  
**MSRP: \$339**



AV2 585FS  
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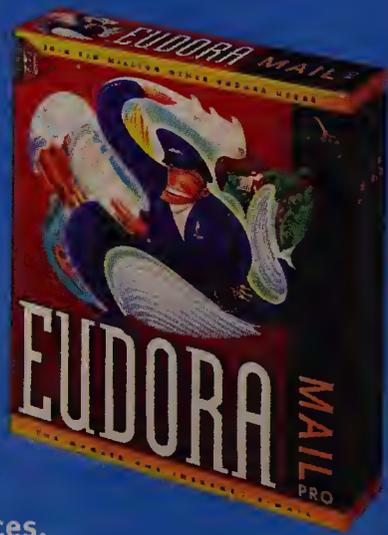
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# The Pros Take Over

Pentium Pro-based machines bring extra power and features to network servers.

## TOP TEN SERVERS

ALMOST A YEAR after they debuted, Pentium Pro-based network servers are pushing older models out of the spotlight, claiming Best Buys for both workgroup and enterprise servers. Hewlett-Packard sweeps these awards again, although Compaq and Digital are hard on its heels. Also note that even inexpensive workgroup models are adding server management tools, Web server software, and high-reliability options. ▶

HEWLETT-PACKARD  
TAKES BOTH BEST BUYS  
AGAIN with its NetServer  
LX Pro enterprise server  
(above) and NetServer LH  
Pro workgroup server.

### 109 Build Your Own Secret Intranet

*Want an intranet, but  
your information  
systems group doesn't  
care? Do it yourself!*

EDITED BY  
Eric Bender

BY DAVE KEARNS AND WILLIAM L. RINKO-GAY

## Workgroup Servers

### 1 HP NETSERVER LH PRO

**PRO:** Top performance, strong software tools

**CON:** Premium price



Featuring a Pentium Pro-200 CPU (upgradable to dual processors), this is the fastest workgroup server we've tested. Credit much of this speed to the two integrated Adaptec SCSI adapters and four hot-swappable Seagate 1GB drives. The inside is nicely organized and plenty expandable. The \$8527 model we tested had four PCI, one PCI-EISA, and three EISA slots open, plus three externally accessible drive bays, as well as HP's excellent server installation and management software.

### 2 DIGITAL PRIORIS ZX 5166

**PRO:** Strong performance, reliability features

**CON:** High price, slow NetWare file service

At \$9100, this is the most expensive server in our current bunch of workgroup machines, but it offers very strong perfor-

mance, support, management tools, and fault tolerance options. The ZX features a Pentium-166 processor with 1MB of dedicated secondary cache; you can expand to four Pentium-166 processors with 1MB of secondary cache each. The model we tested came with two integrated Adaptec controllers and two 2.1GB Seagate hot-swappable drives (with room to add five more). Two PCI, two PCI-EISA, and four EISA slots were open.

This machine scored first in the NT Oracle test and second in all other tests except NetWare file service, where it did surprisingly poorly.

### 3 COMPAQ PROLIANT 1500 5/133 MODEL 2100

**PRO:** Good software tools, hot-swappable drives

**CON:** Mediocre speed on Oracle and Notes tests

This very competitive machine performs on a par with the number two Prioris. It's got good expandability, clean design, hot-swappable drives, and Compaq's leading-edge installation and management tools.

And at \$7399, it's also attractively priced. The model we tested came equipped with a Pentium-133 (upgradable to two CPUs) and two hot-swappable 2.1GB Seagate Barracuda hard drives. The ProLiant 1500 is a large server, and it provides easy access to all components.

### 4 DIGITAL PRIORIS XL SERVER 5133

**PRO:** Good price/performance, clean design

**CON:** Limited expandability

Digital Equipment's Prioris XL Server 5133 is well engineered, fast, bundled with solid server-management software, and backed by Digital's veteran worldwide support organization. It's a very good value at \$5650. The Prioris runs sixth overall in performance. The model we tested came with a Pentium-133 (upgradable to dual CPUs), an Adaptec controller, and two 2.1GB Seagate Barracuda drives. Although it's fairly big, the minitower doesn't provide as much expansion space as some other workgroup servers.

PC WORLD

# TOP 10 SERVERS

	WORKGROUP SERVERS	Overall rating	Street price	CPU/ RAM (MB)	Hard drives/ individual capacity (GB)	Comments	Reader service number
1	HP NetServer LH Pro 800/322-4772 <a href="http://www.hp.com">http://www.hp.com</a>	91	\$8527	PPro-200/32	4/1	Fastest performance, clean design, strong software tools.	601
2	Digital Prioris ZX 5166 800/722-9332 <a href="http://www.digital.com">http://www.digital.com</a>	90	\$9100	P-166/32	2/2.1	Excellent performance, high-reliability features; pricey.	602
3	Compaq ProLiant 1500 5/133 2100 800/345-1518 <a href="http://www.compaq.com">http://www.compaq.com</a>	90	\$7399	P-133/32	2/2.1	Good software tools; mediocre application performance.	603
4	Digital Prioris XL 5133 800/722-9332 <a href="http://www.digital.com">http://www.digital.com</a>	89	\$5650	P-133/32	2/2.1	Good price/performance; limited upgradability.	604
5	Digital Prioris HX 5166 800/722-9332 <a href="http://www.digital.com">http://www.digital.com</a>	87	\$7462	P-166/32	2/2.1	High reliability, good file-service performance.	605
<b>ENTERPRISE SERVERS</b>							
1	HP NetServer LX Pro 6/200 800/322-4772 <a href="http://www.hp.com">http://www.hp.com</a>	92	\$30,205	4 PPro-200/128	6/2.1	Top file performance, good design, strong software tools.	606
2	Digital Prioris ZX 6200 MP/2 800/722-9332 <a href="http://www.digital.com">http://www.digital.com</a>	91	\$23,874	2 PPro-200/128	7/2.1	Top price/performance, reliability features, easy maintenance.	607
3	Compaq ProLiant 5000 6/200 800/345-1518 <a href="http://www.compaq.com">http://www.compaq.com</a>	90	\$30,899	4 PPro-200/128	4/2.1	Excellent tools; mediocre overall price/performance.	608
4	Land-5 HPS 550 888/225-2635 <a href="http://www.land-5.com">http://www.land-5.com</a>	89	\$38,529	4 P-133/128	6/2.1	Rack-mounted server with strong high-reliability features.	609
5	Acer AcerAltos 19000 800/733-2237 <a href="http://www.acer.com">http://www.acer.com</a>	88	\$16,450	2 PPro-200/128	8/2.2	Highly expandable storage; slow.	610



Best Buy


<http://www.pcworld.com/networking/servers>

All products: 901

## 5 DIGITAL PRIORIS HX 5166

**PRO:** Good file-service speed, reliability features

**CON:** Slow application performance

The \$7462 HX is very similar to the Prioris XL in design and overall performance, but the machine we tested came with a Pentium-166 CPU (upgradable to dual Pentium-200s) and a host of high-reliability features. The HX showed good file-service speed but lagged behind its peers in overall application performance.

## Enterprise Servers

### 1 HP NETSERVER LX PRO 6/200 SMP

**PRO:** Top file performance, good design

**CON:** Mediocre database price/performance



The LX's strong performance, high reliability, and expandability, plus HP's management software and excellent service and support, make it a good choice for any enterprise.

This \$30,205 machine offers outstanding performance overall and as a file server, second in each case only to that of the DG Aviion 4900-200. Database performance is less than stellar, however—11 percent behind that of the Compaq ProLiant 5000 6/200.

The large chassis can hold 12 hot-pluggable drives and six other storage units. Our test machine came with four Pentium Pro-200 CPUs, six 2.1GB Seagate drives, two open PCI slots, and three hot-pluggable power supplies.

### 2 DIGITAL PRIORIS ZX 6200 MP/2

**PRO:** Great price, solid management tools

**CON:** Moderate performance

Although capable of supporting four Pentium Pro-200 processors, the ZX came configured with only two (each with 512K of secondary cache). Performance was creditable, in the middle of the pack of four-processor machines—18 percent below the NetServer LX Pro on file service, and only 7 percent below on the Oracle test. That's quite an achievement at a price of \$23,874.

Other features are competitive as well. The small chassis takes only two standard and seven hot-pluggable devices, but Dig-

## Get Full Results on the Web



Check out <http://www.pcworld.com/networking/servers/> for more detailed product reviews and results of performance testing with the new PC WorldBench for Servers 2.0 benchmark. We also post reviews of Best of the Rest servers, which did not make the Top 10 Servers chart:

**WORKGROUP:** Acer AcerAltos 900, AST Manhattan S6200, and Tangent Alcazar II.

**ENTERPRISE:** Austin Affinity XE, Data General Aviion 4900-200, and Tangent Carthage.

ital expects you to add storage capacity in an external chassis. The machine we tested came loaded with seven hot-pluggable 2.1GB Seagate drives, an Adaptec RAID controller, two redundant power supplies and redundant cooling fans. The system is easily serviced and comes with Digital's well-regarded software tools.

### 3 COMPAQ PROLIANT 5000 6/200

**PRO:** Great database speed and software tools

**CON:** Mediocre performance for the price

The ProLiant 5000 we tested came with four Pentium Pro-200 CPUs (each with 512K of on-chip secondary cache) at a street price of \$30,899. It also featured 128MB of memory (expandable to 4GB), ultrahigh-speed processor and memory buses, dual PCI buses, four hot-pluggable 2.1GB Seagate Barracuda drives (expandable to 17.2GB internally), Compaq's Smart-2 Array Controller, and many other bells and whistles.

But the ProLiant is not a performance giant. Overall speed is mediocre, although it posted best times for our Oracle NT test.

Compaq's management tools are first-class, offering everything from customized installation of selected operating systems and applications to easy downloading of drivers over the Internet.

There are five hot-pluggable drive bays; our unit had three slots (two PCI) open.

### 4 LAND-5 HPS 550

**PRO:** Industrial-strength reliability and features

**CON:** Price, mediocre performance

Land-5 sent us a server that wins no price/performance prizes but aims instead to offer excellent uptime and upgrades. We tested the machine as both a \$38,529 quad Pentium-133 system and a \$43,999 quad Pentium Pro-200 system. Oddly, performance was essentially the same—in the middle of the pack, 6 percent below the NetServer LX Pro overall.

This rack-mounted server is intended for a heavy-duty industrial installation, with the hard drives in a second chassis. It includes dual power supplies in both CPU and drive chassis, an Adaptec RAID controller, hot-swappable drives, redundant hot-swappable power supplies, and modems for remote management.

You can go up to eight processors with Windows NT. The six Seagate Barracuda drives in the model we tested gave 13.2GB of storage. You can go all the way to 18 terabytes with additional storage units.

### 5 ACER ACERALTOS 19000

**PRO:** Expandable, reasonable price

**CON:** Slow

If bigger were always better, the \$16,450 Acer AcerAltos 19000 would be the best server we've seen. This behemoth has room inside for 14 hot-pluggable drives, four more standard drive bays, and a lot of extra space. However, there are only eight expansion slots: five PCI, two EISA, and one combo. The model we tested had a Mylex adapter with a 16MB cache and no less than eight 2.2GB IBM drives.

The 19000 offers up to two Pentium Pro-200 processors, and we tested such a model. It lagged behind quad-processor machines: It was three-quarters as fast as the NetServer LX Pro on Oracle service, two-thirds as fast on file service, and half as fast on our Lotus Notes test.

You can access all components easily, and Acer bundles server installation and management software.

*Dave Kearns is a network consultant and writer in Austin, Texas. William L. Rinko-Gay directs the Network World-PC World Network Test Center.*

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Circle 10 on reader service card



# Build Your Own Intranet

# Secret

BY MARK GIBBS

WELCOME TO THE GIBBS SCHOOL of Secret Intranetworking. Please relax and drop your disguises—no one knows you are here.

You are managers, right? You run your groups well.

But you know you could do better, and you know what's holding you up—the failure to communicate! You want members of your group to share information better, to avoid having items drop through the cracks, to hear news quickly, and to easily find key documents and other crucial information.

To do, in short, the same kinds of things with your colleagues that you all do on the Internet. ►

Your group is already surfing the Web but you all still work the same old way? Launch your own private intranet—for cheap!

ILLUSTRATIONS BY MARK MATCHO

You suspect, in fact, that you could use exactly those Internet tools to get some serious help at work—if only you could get the right systems in place. Does your company's information systems group care? Sometimes, if you're lucky. But if what you want to do on the company network isn't something that counts as a corporate strategic issue, you might as well forget it. The IS folks have their own problems, and yours are just not interesting.

That's it. No way around it, no light at the end of the tunnel, just doom, despair, and the sound of IRS auditors rummaging through your bookkeeping late into the night...except...well, actually there is one thing. One way out. One option that could change everything:

*Your group's own private intranet.*

Yes, you in the back waving your hand

frantically, that's right. An intranet is just an internal Internet that lets everyone share any information they like with software that's already on their PCs: their Web browsers.

Now, I know what you're going to say: "The information systems people are building our corporate intranet and we'll only get what they choose to give us when they get around to it."

But I say "nonsense!" Stand up and be counted! Beg, borrow, or steal an intranet server! If you can't get away with that, build one, and create your own intranet.

### WHAT CAN WE START DOING RIGHT AWAY ON OUR INTRANET?

FORGET ALL THAT cool stuff you see on the big commercial World Wide Web sites. Sure, you'd like to be on the cutting

edge, but your first priority is sharing data in your group. For that, you don't need anything fancy. You just need space on an intranet (Web) server. Beg some space on an existing server from the IS folks, or get really subversive and do it all yourself (see "An Intranet Server Recipe").

Once you've got that server for your intranet, you can do a surprising amount without using server-based software or specialized browser functions. It's easy to put valuable documents, presentations or just about any kind of material you please on an intranet server.

For example, if you bought your desktop suite in the past year or so, you can use its word processor to crank out a version of a document, such as a project proposal, in HTML format (the lingua franca of the World Wide Web) and plop it ►

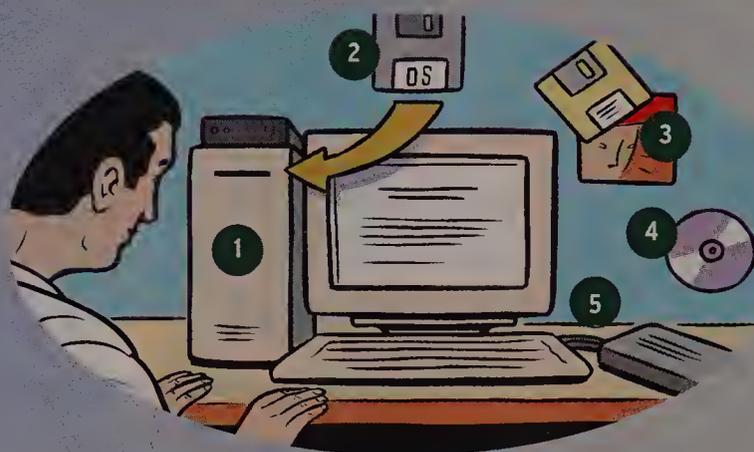
## An Intranet Server Recipe

ARE YOU ON a tight budget and can't get the information systems folks to share their toys? Here's how to get started on a departmental intranet anyway.

First, take one PC that has a fast 486 CPU or better, a network adapter and some cabling, at least 16MB of memory, and a 500MB or larger hard drive. For a Macintosh-based system you'll need something like a PowerMac 6150/50 with 16MB of memory. Yes, you will need a blessing from the information systems troops to add a machine to the network.

Note that you can also share someone's existing computer, although you'll probably have to add memory—32MB is about the minimum you'll need in a shared system. And make sure that person's PC is fast (a Pentium-90 is the absolute minimum). Otherwise, the server will stop serving every time it recalculates a spreadsheet.

Second, install an appro-



**MINIMUM INTRANET SERVER REQUIREMENTS**—components and their costs—include: **1** Fast 486 CPU, 16MB of memory, 500MB hard drive PC: \$2000 and up **2** Operating system: \$0 to \$1000 **3** Low-end Web server software: \$0 to \$1000 **4** Intranet software tools: \$0 to \$500 **5** Network adapter and cabling: \$100 to \$200

propriate operating system such as Windows 95 or Windows NT, NetWare OS/2, MacOS, or UNIX, depending on whatever's comfortable for you.

Third, add Web server software. You have a legion of choices, but start with the simplest and cheapest. Here's a sampling of what's available:

■ **Apache** (<http://www.apache.org>) works on OS/2 and UNIX

platforms. This is the most popular choice for Web servers on the Internet by a long shot. It is rich in features and has good (if rather technical) documentation. It is free, but there's no support.

■ **Microsoft Internet Information Server** (<http://www.microsoft.com>) is now bundled with Windows NT 4.0. This is a credible intranet server, handy if you're happy with NT, and you

can get support. Note also that Microsoft FrontPage comes with its own Web server for both Windows 95 and NT.

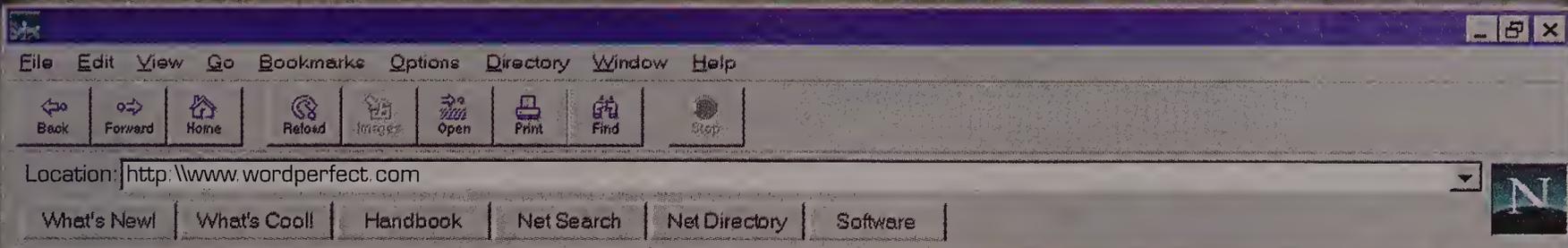
■ **Novell's NetWare Web Server** (<http://www.novell.com>) costs \$995 and is awesomely fast but not terribly easy to set up.

■ **Netscape's FastTrack server** (<http://www.netscape.com>) is priced at \$295; there are versions for Windows 95, NT, and various flavors of UNIX. Designed for easy installation and use, it actually is quick to get up and running and offers some nice features.

■ **Building Your Own WebSite for Windows 95 and NT**, from O'Reilly and Associates (<http://www.ora.com>), comes on CD-ROM with some of the best documentation around for \$59.

■ **WebStar for Macintosh**, which is from Quarterdeck (<http://www.quarterdeck.com>), is an effective solution for Macintosh servers, with many advanced features; it costs \$895.

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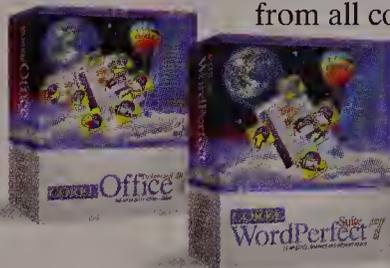
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†Source: WordPerfect For Windows Magazine, November 1996, p. 21

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onto an intranet server. Ditto for a presentation. In fact, you can drop plain old text documents onto the server if you want—they can be read by your browser as easily as an HTML document. And if you've got search software running on the server, you can find the document even if nothing is linked to it.

Why, you ask, would you want to do any of this? Because by storing, searching for, and retrieving documents from an intranet server you can save a lot of time in making key documents available to everyone—regardless of what machine they are on or where they are.

If there's a mistake in something published to the server, you just correct it and inform the workgroup that the document has changed. You don't have to send everyone another piece of dead tree smeared with ink, or point them to a file with a complicated path name that requires software half the recipients don't have. Instead, you just send a link to the



**Just send them a link to the document—one click and they've got it.**

document—one click and they have it.

Encourage your group to drop everything really useful into the intranet server. Give someone the job of scanning your intranet to see what's posted and have them generate an e-mail message once a week to tell everyone what's new.

For example, when Chris in the development group posts the latest project specs on the intranet server, make sure everyone involved in the project knows how to find it. Then encourage them to

send Chris their thoughts and ideas.

You might even invest in a personal document scanner so that group members can add any hard-copy document to the intranet file set.

Good point, you in the Eddie Bauer jacket. Doing this in a more structured way is indeed quite helpful. For example, you can post a staff directory, which can be useful for larger groups and situations in which group members either telecommute or travel a lot. Within the directory, every group member creates a personal home page listing what their job is, who they report to, what they are working on, their telephone number, and their planned schedule.

It's even better, of course, to add server-based software to organize what you post. If you can store customer service records in an online database rather than in a series of discrete documents, you will have a more manageable system.

But don't let the potential confusion of thousands of documents put you off. There are times when even a mess of useful documents is better than no documents at all. Once you can demonstrate how practical this approach is, it's easier to get funding for adding higher-powered server applications.

### WHAT ELSE CAN WE DO?

IF YOU INVEST a little money in software and can afford the time to get it up and running, you can do plenty. And if you're willing to dabble in a little light programming, or have a co-worker who can do it, the information world opens up. Here are some of the possibilities:

**1 Publish existing company data such as product and client databases.** There are now plenty of tools that allow you to take existing databases and drop them into intranet servers.

(Doing this can sometimes be tricky.)

**2 Improve customer service.** You can buy some fancy and expensive applications to really nail the problem of resolving ►

## Intranet Tools for the Rest of Us

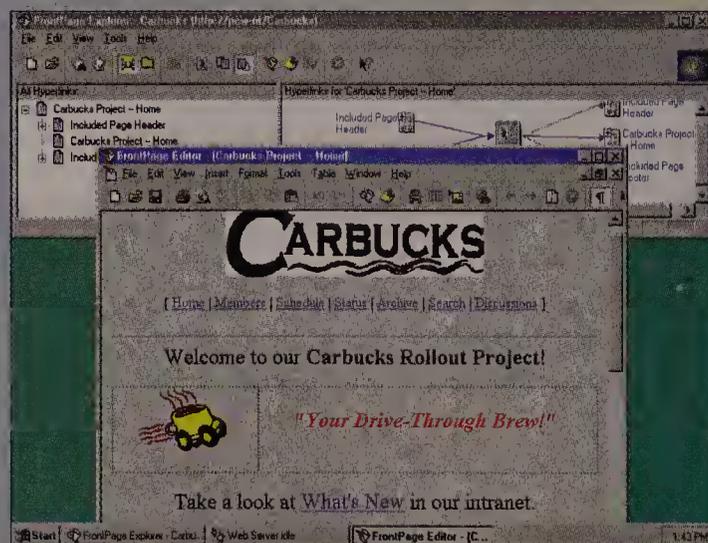


YOU COULD TELL each story in the naked city with a different Web tool. Here are a few of our favorite page editors and database packages for intranet use (see "An Intranet Server Recipe" for URLs not listed here):

**WEB PAGE EDITORS:** FutureTense's \$495 **Texture Designer** (<http://www.futuretense.com>) is an excellent editor for slick content presentation. It's been described as "Page-Maker for the Web." Microsoft's \$149 **FrontPage** is another first-class editor with a slick graphical interface and lots of templates, wizards, and clip art to get you started. **Word for Windows 95 with Internet Assistant for Word** is a tolerable basic editing system; **Word for Windows 97** is much better. Netscape's \$79 **Navigator Gold** is a reasonable entry-level editor, and you may already know the interface. SoftQuad's \$159 **HotMetal Pro** (<http://www.softquad.com>) is a great choice for the technically inclined.

**WEB DATABASE PRODUCTS:** Allaire's \$495 **Cold Fusion** (<http://www.allaire.com>) is a

well-rounded Web development tool. Alpha Software's \$995 **WebFiler** (<http://www.alphasoftware.com>) lets normal folks build intranet databases. Corel's \$100 **Web.Data** (<http://www.corel.com>) is good for translating existing databases for intranet uses. So is Borland's \$500 **IntraBuilder Professional** (<http://www.borland.com>), but this package is at a more advanced level.



**TOOLS LIKE MICROSOFT FRONTPAGE 2.0** make it cheap, easy and (shh!) actually fun to create a working intranet site.

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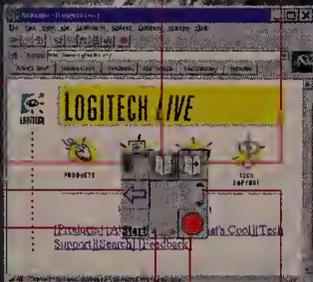
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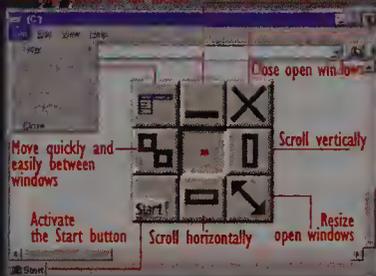
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## Top 5 Intranet Do's and Don'ts

# WIRED FIRED

**1 Do put useful material on your intranet.** The more relevance your intranet has to people's work, the more they'll use it.



**2 Do start simple.** Intranet technologies aren't that difficult, compared with other PC technologies, but unless you start small, you'll die from overwork.

**3 Do keep costs down.** Once you've got it all working, you may well be able to get more funds.

**4 Do get everyone involved.** The key to a successful intranet is having the entire group contribute.

**5 Do make it look nice.** At the least, put some attractive graphics and an image on your intranet's home page.



**1 Don't get buried in technicalities.** It's easy to get caught up in lots of flashy Web tricks, but that's a great way to burn a

huge amount of your time.

**2 Don't force your people to use the intranet.** Get them involved by encouragement, not threats.

**3 Don't restrict what your people can put on the intranet,** aside from what common sense and standard company policies dictate.

**4 Don't worry about minimizing graphics.** Your internal net won't slow down much unless you hurl around 10MB images.

**5 Don't tell the information systems folks too soon.**

specific customer issues. If that's not possible, try just logging calls and solutions to your intranet server and ensuring that these documents can be searched. This alone will provide an invaluable resource for planning, projects, and sales.

**3 Record and track project information.** Create for each project a page for posting status and task information, and link relevant documents to it. This helps to make your intranet the equivalent of a knowledge base for past, present, and future work. Again, you can buy all sorts of sophisticated intranet project applications if you have the bucks.

**4 Create a sales reporting system.** Store all sales reports, call reports, and customer information on your intranet. In some cases, you may even want to link this material to news stories, customer service records, and support information.

**5 Replace internal paper forms.** A plethora of products is available to let you build simple forms that capture data and fun-

nel it into e-mail or databases—all without having to do programming.

**6 Talk about it.** Group discussion tools are moving to the Internet, and to intranets, in a big way. They can be surprisingly useful for small groups that are dispersed.

**7 Deliver the news.** You can let everyone who has time wander around the Web and the intranet to scope out news. Or (much better) you can put some software on your server that systematically collects data from the most likely sources and pushes it out to all concerned.

### BACK TO BASICS: HOW DO WE GET THAT INTRANET SERVER?

WELL NOW, that depends on your organization's political environment, doesn't it? If your IS group has an intranet server up and running, try to get them to help you. If they're hesitant, tell them that you won't need any support—that you only need some space and access for your group.

If you can't get help from the IS folks,

you'll have to get creative and build that stealth intranet server yourself.

This is really not as hard as you might think. You can even run the server software on somebody's desktop system as long as they have a powerful enough processor and enough memory. If you can get a dedicated PC on the network, that's better, and a pensioned-off 486 is a fine start. After that, it's a question of operating system and server software (see "An Intranet Server Recipe").

Now you just need to get the system up and running, add any applications you need, tweak it for your group, and start putting some actual content on it. And if you want to be able to call into it from out of the office, give it a modem, put it on a phone line, and enforce some passwords.

### IS IT REALLY THAT EASY?

IT REALLY IS that easy to get started with an intranet. And it happens all the time.

The IS department of one of my clients, a Fortune 100 manufacturer, was planning to build a corporate intranet. I suggested that we see how many intranet servers were already up and running. "Oh, no," they said. "Don't bother. There aren't any. Ours is the first."

But I persuaded them to check anyway. Guess what? There were already seven servers running. Why was this? The IS department was too slow, and it was so easy for these other departments to solve the problem themselves, they just did it. And these were major departments, including sales and accounting. They had put schedules, notes, project plans, and a whole range of, well, *stuff* online.

If your IS group does make it over the hill with great new tools for all, so much the better.

In the meantime, you now know what you can do. Good luck with your secret intranet. Please leave through the back door. We'll e-mail your diploma if you contact us via an anonymous remailer. Oh, and hail the revolution!

Mark Gibbs is an independent consultant and a contributing editor to *Network World*. He can be contacted at [mgibbs@gibbs.com](mailto:mgibbs@gibbs.com).



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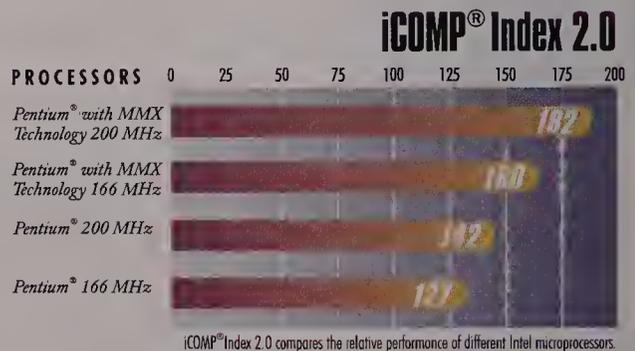
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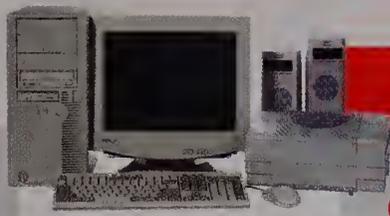
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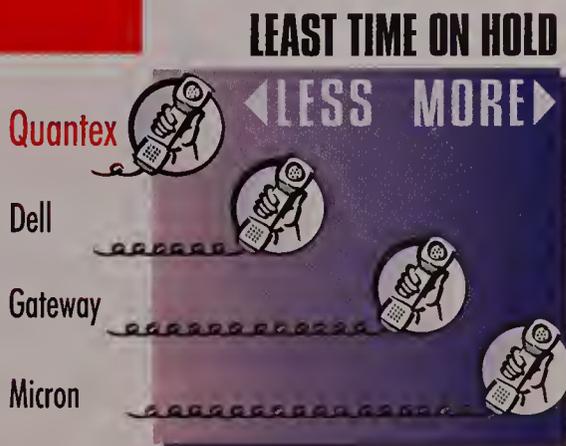
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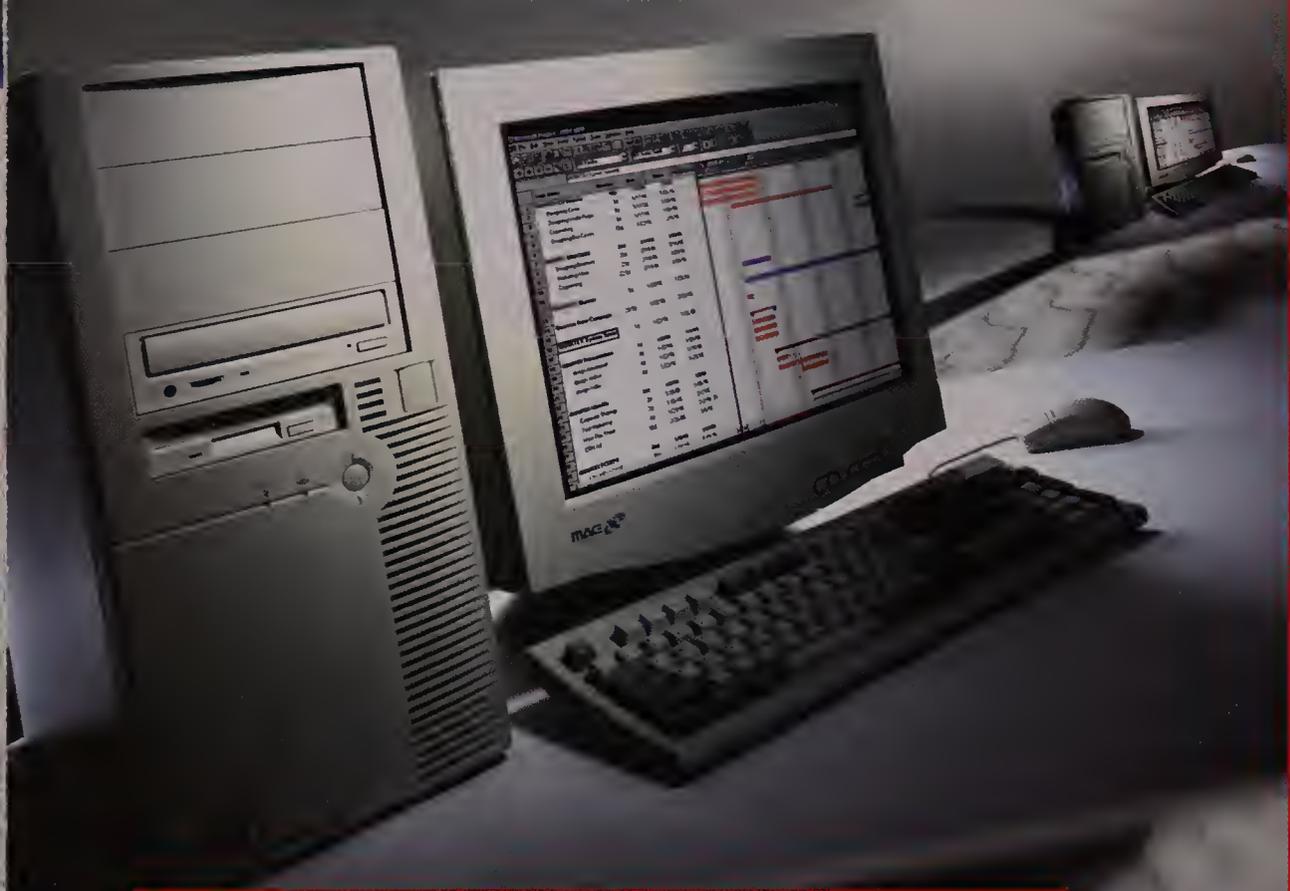
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# UNDOCUMENTED SECRETS

COVER STORY

## 101 Tips for Windows 95, NT, and 3.x

BY VALERIE MURRAY RYAN AND BEN MILLER

HOW SATISFIED ARE YOU WITH YOUR VERSION OF WINDOWS? DOES IT DO EVERYTHING IT SHOULD? IS IT ENTIRELY CRASH-FREE? ARE YOU SECURE IN THE KNOWLEDGE THAT AN EVIL OR IGNORANT COWORKER WON'T TRASH YOUR SYSTEM? CAN YOU ALWAYS FIND YOUR FILES?

WE DIDN'T THINK SO. Whether you use the currently popular Windows 95, the old workhorse Windows 3.1, or the super-secure, cutting-edge Windows NT 4.0, you've got an imperfect operating system on your hands. And no, upgrading to the next version—whenever it comes out—won't solve your problems.

We've compiled this collection of tips to help you turn your version of Windows into an easier-to-use, more reliable operat-



ing system—without an upgrade. We'll show you how to make Windows warn you when you accidentally press <Caps Lock>, what you can do to keep Windows from crashing, the best ways to free up disk space, and where on the Windows 95 CD-ROM you can find hidden treasures that Microsoft hasn't told you about. Because with all its faults, there's one very nice constant about Windows: You can always find a way to improve it. ▶

ILLUSTRATIONS BY MICHAEL KLEIN

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# Make Windows Your Own

**1** **3\*** **Sticky Window Settings.** When you customize Program Manager or File Manager, you must save your new settings to make them stick. First, make sure that *Options•Save Settings on Exit* is not selected. Then hold down **<Shift>** as you double-click the Control box  in the upper left corner of either window. The next time you start Program Manager or File Manager, they'll look the way you want them to.

**2** **3\*** **Icons, Come Back to Me.** If you've accidentally deleted some Program Manager icons, select *File•Run*, type **setup /p** on the command line, and click **OK** to restore all of Program Manager's original icons. You'll then have to delete some duplicates, but it's easier than re-creating them from scratch.

**3** **95 NT** **Quick Access for Favorite Files.** Save yourself time by creating a Shortcut to any document you load regularly. Simply right-drag the file onto your desktop and select *Shortcut*.

**4** **3\*** **95 NT** **Minimized StartUp.** You can make Windows automatically minimize the applications you have it start up when it loads. In **Windows 3.1**, open the Properties dialog box for the icon, select *Run minimized*, and click **OK**. In **Windows 95** or **NT**, right-click the icon, select *Properties*, click *Shortcut*, and for the *Run* drop-down list box select *Minimized*.

**5** **95 NT** **Desktop Floppy Access.** For quicker access to your floppy drive, place a Shortcut on the desktop. In Explorer, My Computer, or any folder window, right-click the drive, drag it to the desktop, and when you let go, select *Create Shortcut(s) Here*.

**6** **95 NT** **Easy Move to Floppies.** The *Send To* menu, which you can access by right-clicking a file and selecting *Send To*, lets you copy the file to drive A:. To move files there easily, use Notepad to create a text file called "Floppy move.bat," with the line **@ move %1 a:**, in the `c:\windows\sendto` folder.

**7** **3\*** **95** **No-Load StartUps.** Want to get to work a little faster? You can prevent the applications in your StartUp folder (StartUp group in Windows 3.x) from loading when Windows starts by holding down **<Shift>** as Windows loads.

**8** **95 NT** **Name That Tune.** If your old CD-ROM drive doesn't play audio CDs automatically, you can at least make it play them semiautomatically. Right-click the desktop and select *New•Shortcut*. Enter the command line `c:\windows\cdplayer.exe /play`. Click *Next*, name the Shortcut, and click *Finished*. Now all you need to do is pop in a CD and double-click the Shortcut.

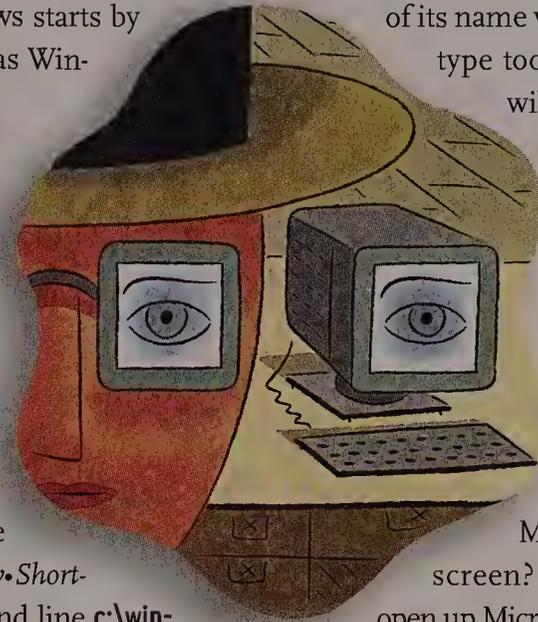
**9** **95 NT** **Making a Good Pointer.** Want to have some fun with your mouse cursors? Select *Start•Control Panel*, double-click *Mouse*, and go to the *Pointers* page. Highlight the pointer you'd like to change, click *Browse*, and double-click a

pointer you want to change to. Select *Apply* or *OK* to make your change stick.

**10** **95 NT** **Folder Jumping.** Would you rather type than click? In Explorer, you can jump to any folder or file by typing the first few letters of its name very quickly. Just don't type too slowly, or Windows will jump to a file whose name begins with the second letter you type.

**11** **3\*** **95 NT** **Print Screen From Paint.** Want to get a print-out from the File Manager or Explorer screen? Press **<PrtSc>**. Then open up Microsoft Paint (Paintbrush in Windows 3.1), select *Edit•Paste*, and print your screen.

**12** **95 NT** **Does <Caps Lock> Ring a Bell?** Have you ever hit the **<Caps Lock>**, **<Scroll Lock>**, or **<Num Lock>** key by mistake? To make those keys sound a warning tone when they're tapped, go to Control Panel, double-click *Accessibility Options*, select *Use ToggleKeys*, and click **OK**.



## Windows 95 in Ten Easy Lessons

FEELING LIKE AN ALIEN because you're using a Windows version you're not used to? Here's a quick translation guide for the fastest ways to perform common Windows tasks.

WINDOWS TASK	Windows 3.x	Windows 95 or NT
[13] Minimize your window	Click 	Click 
[14] Maximize your window	Click 	Click 
[15] Toggle between Full Screen Window and See Borders	Click 	Click 
[16] Close open window	Double-click 	Click 
[17] Cycle through open applications	Press <b>&lt;Alt&gt;-&lt;Tab&gt;</b> , or <b>&lt;Alt&gt;-&lt;Shift&gt;-&lt;Tab&gt;</b> to go backward	Press <b>&lt;Alt&gt;-&lt;Tab&gt;</b> , or <b>&lt;Alt&gt;-&lt;Shift&gt;-&lt;Tab&gt;</b> to go backward; or click the <i>Taskbar</i> button
[18] Launch an application	Go to File Manager, select the file, and press <b>&lt;Enter&gt;</b>	Press <b>&lt;Ctrl&gt;-&lt;Esc&gt;</b> and use the arrow keys to select your app
[19] Delete a file	In File Manager, select the file and press <b>&lt;Alt&gt;-D-F</b>	Drag the file to Recycle Bin
[20] View two drives at once	In File Manager, select <i>Window•New Window</i> and select a drive	Launch a second copy of Explorer
[21] Exit windows	In Program Manager, press <b>&lt;Alt&gt;-&lt;F4&gt;</b>	Press <b>&lt;Alt&gt;-&lt;F4&gt;</b> , making sure you're not working in an open app
[22] Reboot your system	Press <b>&lt;Ctrl&gt;-&lt;Alt&gt;-&lt;Del&gt;</b>	Press <b>&lt;Ctrl&gt;-&lt;Alt&gt;-&lt;Del&gt;</b> twice

## Twelve Tips for Customizing Windows 95

By making some basic adjustments to the Windows 95 interface, you can make it more pleasant to look at and easier to use.

**[23]** If you tend to work with windows that are taller than they are wide, move the Taskbar to the side of the screen.

**[24]** Make the Start menu more manageable by displaying small icons. Right-click the *Taskbar*, select *Properties*, and check *Show small icons* in the Start menu.

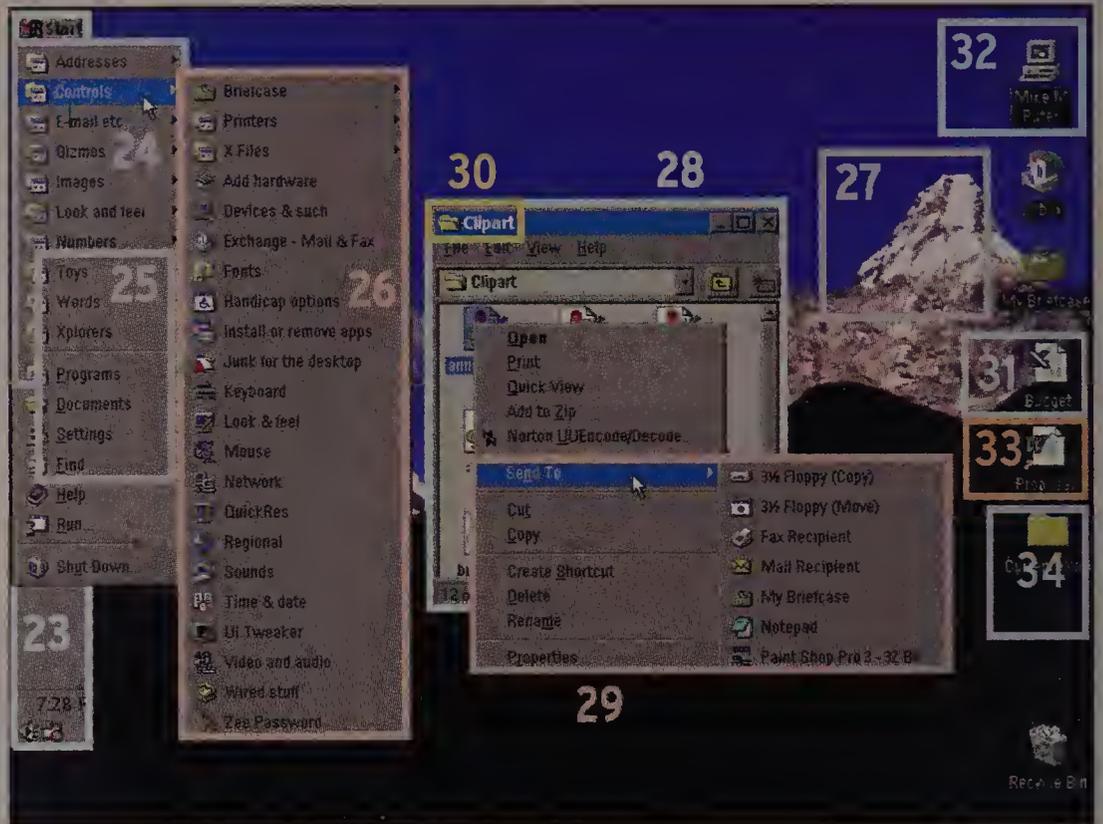
**[25]** Move your most-used programs and menus out of the Programs menu and onto the Start menu.

**[26]** For the fastest keyboard access to menus, rename your menu Shortcuts so that each starts with a unique letter.

**[27]** Find an attractive picture and turn it into wallpaper. Convert it into a .bmp file and save it in c:\windows. Click the desktop, select *Properties*, click the *Background* tab, and make your selection.

**[28]** Are Microsoft's default colors hard on your eyes? Right-click the desktop, choose *Properties*, click the *Appearance* tab, and pick something you like. Muted colors are easier to look at.

**[29]** Add your most common destinations for files to the *Send To* menu.



**[30]** Don't like the on-screen font? Right-click the desktop, choose *Properties*, click the *Appearance* tab, select something from the *Item list*, and adjust the font and type size to your taste.

**[31]** Position Shortcuts and other desktop icons along the edge of the screen, where you can see them and get to them even when you have an application open.

**[32]** Think 'My Computer' is a silly name? Change it as you would any other file name.

**[33]** For quick access, limit Shortcuts to high-priority documents on your desktop.

**[34]** Reduce clutter by storing lower-priority documents in a folder on the desktop.

BY SCOTT DUNN

**35** **95 NT** **Finders, Keepers.** If you use Windows Find to search for the same set of files regularly—for instance, to locate all the files in c:\data saved in the last month—you can save your search criteria for later use. After you've clicked *Find Now* and you have your results, select *File•Save Search*. Windows will create on the desktop a Shortcut to that exact find.

**36** **95 NT** **Explorer View, Please.** Switching an open folder to an Explorer view is an easy and efficient way to browse from folder to folder. To open an Explorer view, right-click the icon in the upper left corner of the window and choose *Explore*.

**37** **3x 95 NT** **The Captain's Log.** You can use Notepad to create a time-stamped log file—a handy tool for logging your voice mail or creating a to-do list. Simply type **.LOG** as the



**WANT TO SEE MORE** of your folders? Right-click the icon in the upper left corner and click *Explore*.

only text in the first line of a Notepad file. Then make your entries, save the file, and close it. Next time you open the file, you'll see that Notepad has added a time-and-date stamp beneath each entry.

**38** **3x** **Dual Boots.** If you're using Windows 95 and NT on the same system, none of the programs you installed under Win 95 will work under NT. The quickest way to fix this is to add your Windows 95 system folder to your NT path. In NT, right-click *My Computer*, choose *Properties*, and click the *Environment* tab. In the *System Variables* list box, click *Path*. In the *Value* text box at the bottom of the window, after the last '%' that's already there, add the path to your Windows 95 system folder. Click *OK* to save your changes.

## Avoid Disasters

**39** **95** **No More Crashing, Part 1.** Is your Windows 95 system performing poorly? Your hard disk swap file may not have enough room to do its thing. It needs free disk space equal to at least twice your system's RAM. For example, a system with 16MB of RAM needs 32MB of free disk space.

**40** **3x 95** **No More Crashing, Part 2.** Rid your system of old .tmp files. In **Windows 3.1's** File Manager, locate all .tmp files by selecting *File•Search* and typing in .tmp. In **Windows 95**, use *Find*. Sort the files by date, and then delete those without today's date.

**41** **95** **No More Crashing, Part 3.** If your system crashes when you open My Computer, Exchange, Control Panel, or Recycle Bin, it could be because you have these three conditions: Your icon spacing is set to a large number or to 0, your video resolution is set to 640 by 480, and you've placed your Taskbar along the right or left edge of the screen and made it larger than the default size.

**42** **3x 95 NT** **Reboot After a Crash.** No matter what version of Windows you use, always reboot your system after an error crashes an application.

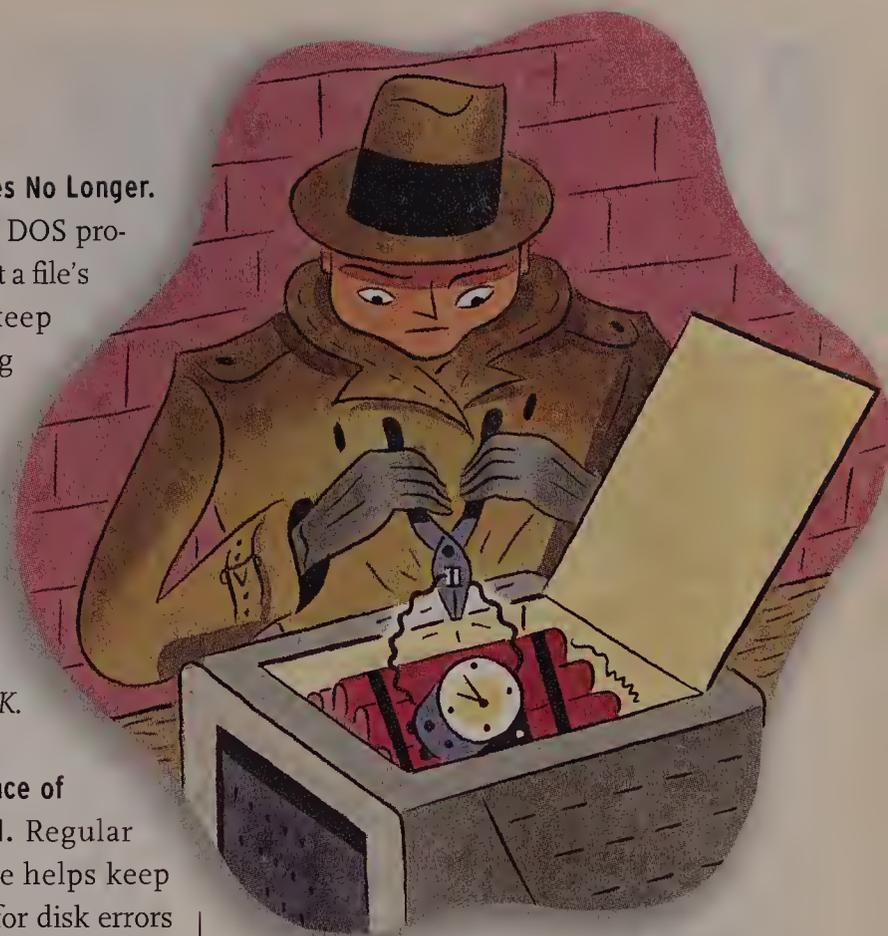
**43** **3x 95 NT** **Sure You Wanna Delete Me?** Deleting a directory (also called a folder) is not something you should do casually. To protect yourself against mistakes, in File Manager or Explorer select *Options•Confirmation* and make sure 'Directory Delete' is selected. If you want to take extra precautions, also select *File Delete* and *File Replace*.

**44** **95** **Long File Name Compatibility.** Windows 3.x applications generally work fine with Win 95's long file names; not so with utilities, which can truncate long names. If the documentation doesn't explicitly say the utility is compatible with Windows 95, don't use it.

**45** **95** **Long File Names No Longer.** Some old, obscure DOS programs can wipe out a file's long name. If you must keep such a program, disable long file names. Right-click *My Computer* and select *Properties*, then *Performance*. Click the *File System* button and select the *Troubleshooting* tab. Check *Disable long name preservation for old programs* and click *OK*.

**46** **3x 95 NT** **An Ounce of Prevention, Part 1.** Regular disk maintenance helps keep your system stable. Check for disk errors at least once a month. In **Windows 3.1**, exit Windows and type `chkdsk /f` at the DOS prompt. (This won't work in a Windows DOS window.) In **Windows 95**, select *Start•Programs•Accessories•System Tools•ScanDisk*. For **NT**, right-click *My Computer*, then highlight and right-click a drive. Choose *Properties*, click *Tools*, and then click *Now*.

**47** **3x 95 NT** **An Ounce of Prevention, Part 2.** You're more likely to lose files when your hard drive is fragmented, so you should defragment your drive at least once a month. In **Windows 3.1**, exit Windows and type `defrag` from a DOS prompt. In **Windows 95**, you'll find the Disk Defragmenter under ▶



## Windows 95 Wanna-bes

NOT PLANNING TO UPGRADE to Windows 95? Don't fret: You can use these utilities to get nifty features similar to Win 95's.

**[48] Dashboard 3.0.** Win 95's Taskbar sits at the bottom edge of the screen, supplying a button for each active program and open folder. To get the same effect in Windows 3.x, use Dashboard 3.0. Dashboard attaches itself to any edge of your screen, hides when not in use, and pops up when your mouse cursor comes near—just like Win 95's Taskbar. You can also switch between printers, view virtual screens, launch apps, and more. Dashboard 3.0, \$19.95 list; Starfish Software; 888/782-7347, 800/503-3847 (fax-back); <http://www.starfishsoftware.com>

READER SERVICE NO. 640

**[49] Better Alt-Tab.** Win 95's <Alt>-<Tab> shows you all the applications you have loaded, so you can move quickly from one to the next. Windows 3.x users can do the same thing with Better Alt-

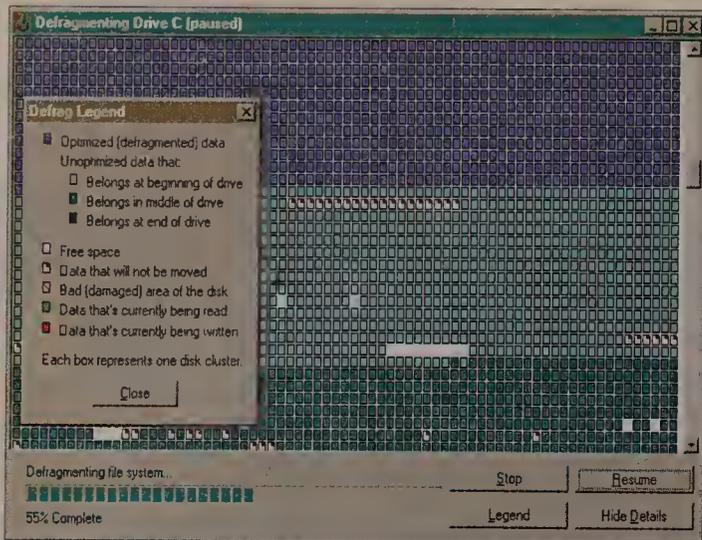
Tab. It lets you see your loaded apps in a frame by just pressing <Alt>-<Tab>; then click their icons or press <Alt>-<Tab> again to switch between them. You can download a copy from PC World Online as `batsetup.exe`. Better Alt-Tab, \$19.95 registration; Toggle Boolean; 800/242-4775, 713/524-6394; <http://www.toggle.com>

READER SERVICE NO. 641

**[50] Silver Wolf Desktop.** Are you hungry for long file names, Shortcuts, and folders? Silver Wolf Desktop—a pretty thorough replacement for Program Manager and File Manager—gives you all these features. You can create folders and desktop shortcuts, and assign file names up to 128 characters long. Not to worry, though: The files still have the traditional DOS 8.3 names—it's just the aliases that are long. Silver Wolf Desktop, \$39 registration; Silver Wolf Software; [mailbox@silverwolf.com](mailto:mailbox@silverwolf.com); <http://www.silverwolf.com/>

READER SERVICE NO. 642

—Steve Bass



**DEFRAG OR DIE:** Defragment your hard disk at least once a month. Windows will run faster and you'll lose fewer files.

*Start*•*Programs*•*Accessories*•*System Tools*. Windows NT doesn't include its own defragmenter, so you'll have to obtain a third-party NT-specific disk utility that has one.

**51** **3\*** **DOS Boots.** You should always keep a system disk close at hand. If your hard drive has serious problems, you can use the disk to boot your system and hopefully fix the problem. To create one, from File Manager insert a blank floppy into your A: drive, select *Disk*•*Format*, check *Make System Disk*, and click *OK*.

**52** **95** **Emergency Startups.** If you can't boot your hard drive, you'll be glad you have a start-up floppy disk handy. To create one, from Control Panel double-click *Add/Remove Programs*. Insert your disk, select the *Startup Disk* tab, and click *Create Disk*.

**53** **3\*** **Create an NT Repair Disk.** You can create an emergency repair disk by going to the System32 folder in your NT folder from Explorer: double-click the *rdisk* icon or type *rdisk.exe* at the Run prompt. This will start the Repair Disk utility, which allows you to either create a new repair disk or update an old one.

**54** **3\*** **Weird NT Behavior.** If you have just made a change to your Windows NT environment and it starts behaving erratically, restart your computer. When you get the message 'Press the Space Bar to use Last Known Good Installation', do so. Your PC will

boot to the configuration made before your last change to the NT environment.

**55** **95** **FAT32 and Defrag Don'ts.** Don't defragment a FAT32 partition with anything but a defragmenter that supports FAT32. The one that came with your computer, which you'll find at *Start*•*Programs*•*Accessories*•*System Tools*•*Disk Defragmenter*, will do fine. See "75: What File System Is This?" to see if your computer

has a FAT32 partition.

**56** **3\*** **NT Won't Boot for Me.** If Windows NT won't boot properly and you know what file or driver may be causing the problem, you can boot your computer using a DOS system disk.

**58** **3\*** **95** **NT Screen-Saver Lockouts.** Password-protecting Windows' screen saver will give you some protection from nosy coworkers. True, in Windows 3.1 or 95, all someone has to do to access your hard drive is reboot your system, but at least they won't be able to log on to the network as if they were you. Since NT requires a password even to boot, a screen saver offers full protection.

In Windows 3.1's Control Panel, double-click *Desktop*, select a screen saver other than (None) or Blank Screen, and click *Setup* to set your password. In 95 or NT, right-click your desktop, select *Properties*, click the *Screen Saver* tab, and select a screen saver. Then check *Password protected* and click *Change* to enter a password.

**59** **95** **Display for Yourself.** Don't want other folks messing with your wallpaper or screen resolution? The Windows 95 System Policy Editor is great for restricting access to your Display Properties dialog box (see "87:

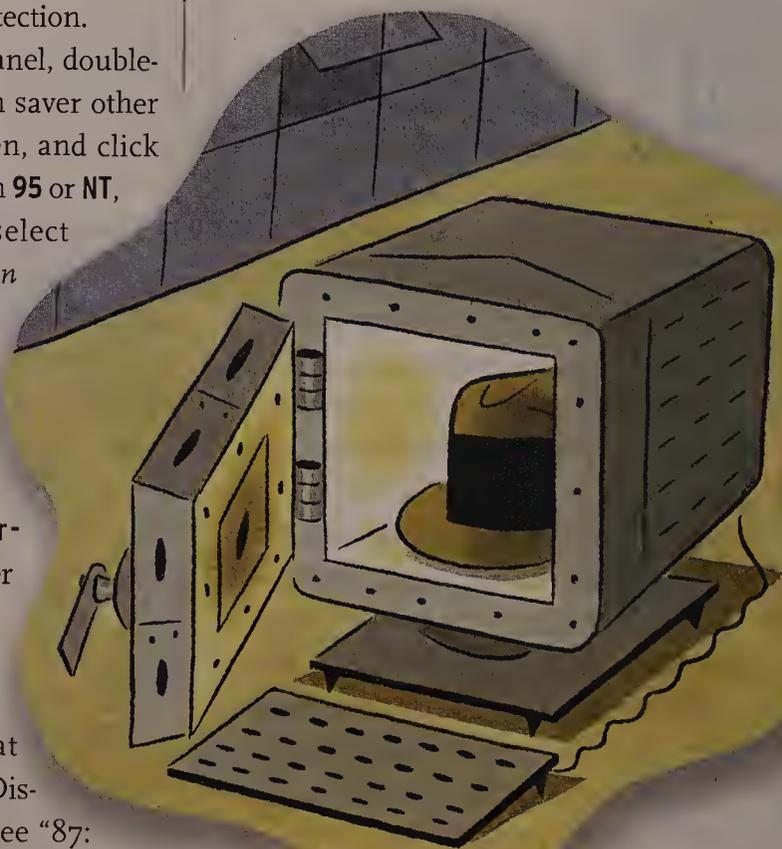
Your computer will boot to a DOS prompt, and as long as you're not using NTFS, you can remove the offending file manually. To find out if you're using NTFS, see "75: What File System Is This?"

**57** **95** **How Hard Is Your CPU Working?** If you've changed your system's configuration, you can use System Monitor to see the effect of those changes on performance. You can measure the difference in performance between two hard drives to determine if the upgrade was worth it. From the Start menu, select *Programs*•*Accessories*•*System Tools*•*System Monitor*.

If System Monitor isn't there, you'll need to install it. Put your Windows 95 disc in your CD-ROM drive. When the blue Windows 95 window comes up, click *Add/Remove Programs*. Click the *Windows Setup* tab, double-click *Accessories*, check *System Monitor*, and click *OK* twice.

## Protect Yourself From Others

Keep Policy Editor Off Your Hard Drive"). Select *File*•*Open Registry*, double-click the *Local User* icon, double-click *Control Panel*, and then open the *Display* book. Select *Restrict Display Control Panel* and take your pick of options at the bottom of the dialog box—for example, use *Disable Display Control Panel* to keep people out altogether. Save your changes and exit.



# Seven Better Ways to Do Windows 95

WINDOWS 95 HAS tasty features, but some are only half-baked. These utilities can really cook.

**[60] PowerDesk 2.0.** Explorer-Plus, part of PowerDesk Utilities 2.0, lets you open multiple windows, create PKZip-compatible archives, and find files fast. There's also a lickety-split file viewer. PowerDesk Utilities 2.0, \$39.95 list; Mijenix; 800/645-3649; <http://www.mijenix.com>

READER SERVICE NO. 643

**[61] EMail Connection.** Tired of Exchange? EMail Connection can handle over 13 online and paging services, including America Online, cc:Mail, and the Internet. One negative—it's a 16-bit program in a 32-bit world. EMail Connection, \$49.95 list; ConnectSoft; 800/889-3499; <http://www.connectsoft.com>

READER SERVICE NO. 644

**[62] DUNCE.** Want to automatically redial your Internet provider after a busy signal? Forget Windows' Dial-Up Networking; download the Dial-Up Networking Connection Enhancement from PC World Online (dunce2\_4.zip). DUNCE, free; Vector Development; [vecdev@vecdev.com](mailto:vecdev@vecdev.com); <http://www.vecdev.com>

**[63] Cheyenne Backup for Windows 95.** Cheyenne offers the power, ease, and safety that Microsoft Backup lacks. And it supports a lot more tape drives, too. Cheyenne Backup, \$70 street; Computer Associates; 800/243-9462; [sales@cheyenne.com](mailto:sales@cheyenne.com); <http://www.cheyenne.com>

READER SERVICE NO. 645

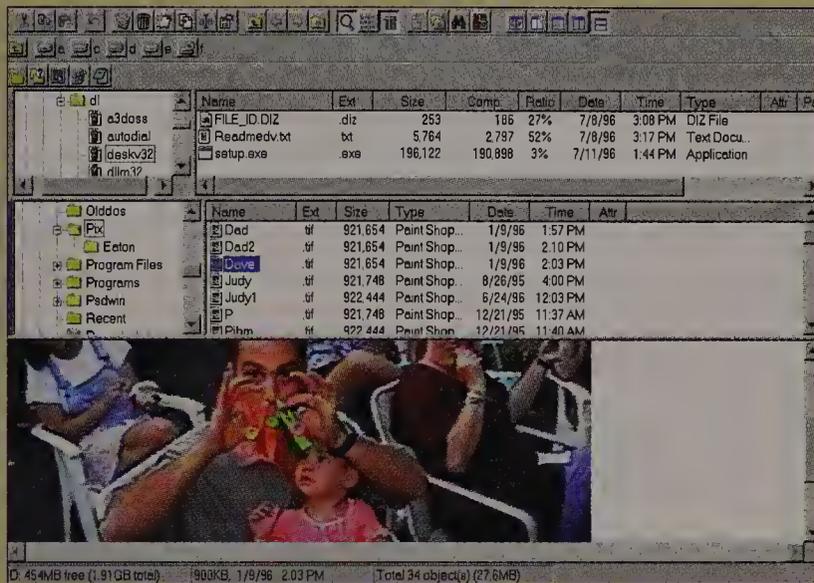
**[64] Paint Shop Pro.** Here's a major improvement on Windows' Paint. Browse images, retouch photos, and more. Paint Shop Pro, \$69 registration; JASC; 800/622-2793; <http://www.jasc.com>

READER SERVICE NO. 646

**[65] Hide-It.** Want to keep a program running but get it off the Taskbar? Hide-It conceals the app until you need it. Hide-It, free; German Salvador; [german@bitmailer.net](mailto:german@bitmailer.net); <http://usuarios.bitmailer.com/german/hideit.htm>

**[66] Power Toys.** Microsoft's own collection of cool stuff lets you right-click a folder for a menu of its contents, change color depth on the fly, and make new Shortcuts stop saying 'Shortcut to'. Windows 95 Power Toys, free; Microsoft; <http://www.microsoft.com/windows/software.htm>

—S. B.



POWERDESK'S EXPLORER replacement, ExplorerPlus, lets you display multiple folders and easily peek inside your files.

**67** **95** **Get Your Hands Off My Registry.** Playing with the Registry is an invitation to disaster, and the Windows 95 System Policy Editor can keep people out of it (see "87: Keep Policy Editor Off Your Hard Drive"). To lock people out of your Registry, select *File • Open Registry*, double-click the *Local User* icon, and double-click *System* and then *Restrictions*. Select *Disable Registry Editing Tools*. Save your changes and exit.

**68** **95 NT** **Conceal Your Selected Past, Part 1.** The Start menu's Documents option gives anyone walking by a list of your most recently used documents. For a little more privacy, you could, for example, remove all references to files with names that begin with 'pri'. You can do this by selecting *Start • Run* and then entering the command `move c:\windows\recent\pri*. * c:\recycled`.

Note: This trick works only with file names, not extensions. Since the Start menu's folder contains only Shortcuts

that have the .lnk extension, you can't remove all files with .doc extensions from the folder, for instance.

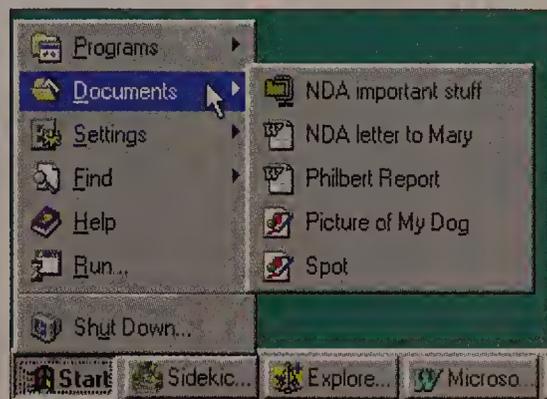
**69** **95 NT** **Conceal Your Selected Past, Part 2.** If you regularly want to remove files with names that begin with, say, 'pri' from the Start menu's Documents list, create the following two-line batch file (a plain text file with the extension .bat) and save it on your desktop or in the Start menu so you can easily run it to cover up your past.

```
move c:\windows\recent\pri*. * c:\recycled
@cls
```

The path may vary if your Windows folder isn't in c:\windows.

**70** **95 NT** **Conceal Your Entire Past.** To erase the Start menu's Documents list entirely, at least until you next create or save a file, right-click an empty spot on the Taskbar, select *Properties*, click the *Start Menu Programs* tab, click *Clear*, and then click *OK*.

**71** **3x** **Lock Those Files.** By default, Windows NT gives full access to anyone who can log on to your computer. But if you're using NTFS (see "75: What File System Is This?"), you can prevent other people from accessing files and folders that you created yourself—and if you're logged on as the administrator, you don't even need to be their creator. Right-click the file or folder that you want to set access privileges for and choose *Properties*. Click the *Security* tab and ▶



**DON'T WANT TO SHOW** which files you've been working on? Hide this list by deleting the file names from your Documents menu.

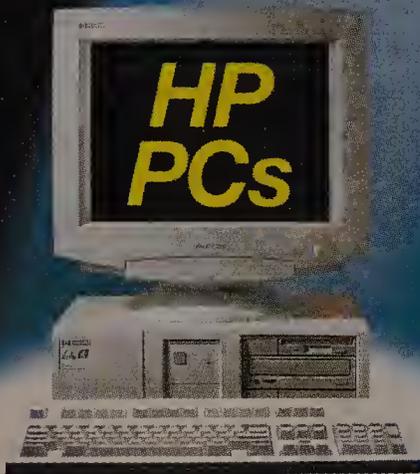


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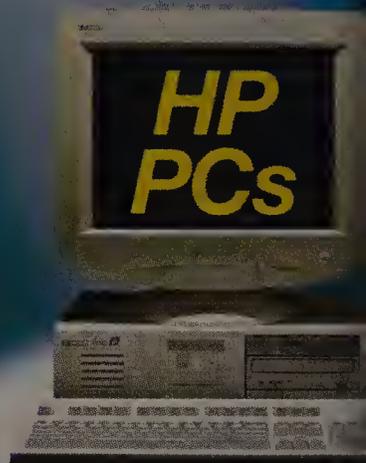
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then click *Permissions*. To remove a user, select a name and click *Remove*. To add groups of users (for example, by department), click *Add* and select from the list provided.

**72** **3x** **Select Your Coworkers.** By default, when you select users to give them access to your files (see “71: Lock Those Files”), NT will show you only groups of users. To add individual names, in the Add Users and Groups dialog box select a group and click *Show Users*. The names of everyone in that group will appear at the bottom of the Names list. Double-click a name to put it on the Add list.

**73** **3x** **What Kind of Access?** It's not just a matter of granting people access to your files—there are also different *degrees* of access (full, read-only, and so on). In the Permissions dialog box, click a user or group of users, then select a new access level from the Type of Access menu.

**74** **3x** **Who's Been Playing With My Files?** If you're going out of town and someone else will be using your computer, you may want to know which files they go through. If you can log on to your PC as the administrator, you can set up an audit trail for actions like deleting, executing, reading, writing, and changing access privileges. Right-click the file or folder you want to audit and choose *Properties*. Click *Auditing*, then click *Add*, and select the names of the people who will be accessing your PC. Choose the actions to audit from the list provided, and indicate whether you want to monitor success and/or failure for each event.

## Fine Tune Your Hard Drive

**75** **95 NT** **What File System Is This?** Both NT and newer versions of Windows 95 provide modern file systems in addition to the more antiquated DOS-based FAT, which both of them also support. NT has been offering the NT File System (NTFS) for years, while many new Windows 95 computers come with FAT32. Each file system has incompatibility issues, and it's a good idea to know which one your PC uses.

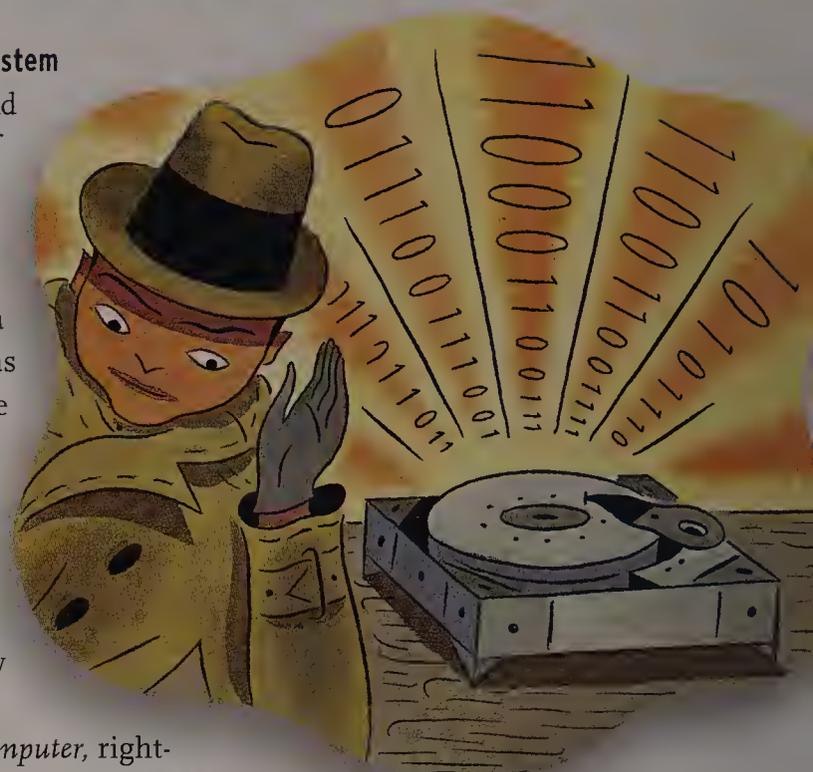
To find out, open *My Computer*, right-click *C:*, and select *Properties*. If you see the words ‘Type: Local Disk (FAT32)’ or ‘File system: NTFS’, your hard drive has been formatted with a modern file system.

**76** **3x** **Think Before You Convert.** NTFS is a robust and secure disk operating environment. But no operating system other than NT can read an NTFS partition, and once you've converted a FAT or FAT32 partition to NTFS, there's no going back. So think hard before you convert. If your system has only one hard disk partition and you want to dual-boot, stay with the old FAT system.

**77** **3x** **Conversion and Translation.** When you convert a hard drive partition to NTFS, you may encounter some problems translating unusual 8.3 file names—such as those with a tilde (~)—from FAT to NTFS. To counter this, enter the command **convert drive:**

**/fs:ntfs/nametable:convert.log** at a DOS prompt. This will automatically create a name-translation table in the boot sector of the drive or partition before you convert. NTFS will use this translation table to resolve any difficulties it has translating file names.

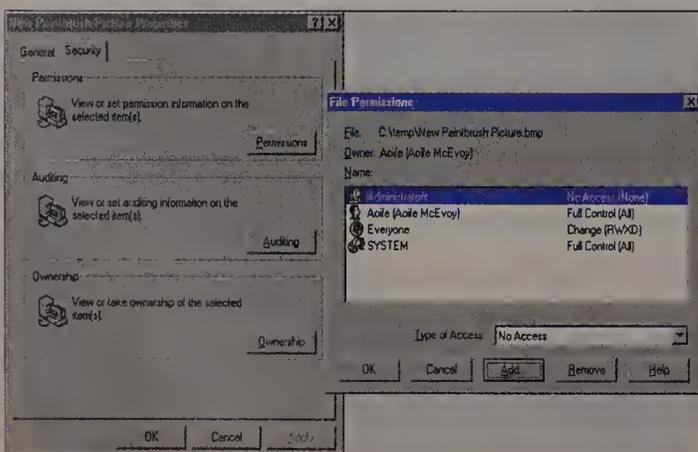
**78** **95** **Longest Battery Life.** You can conserve battery power on a notebook PC by setting Windows 95 to do a



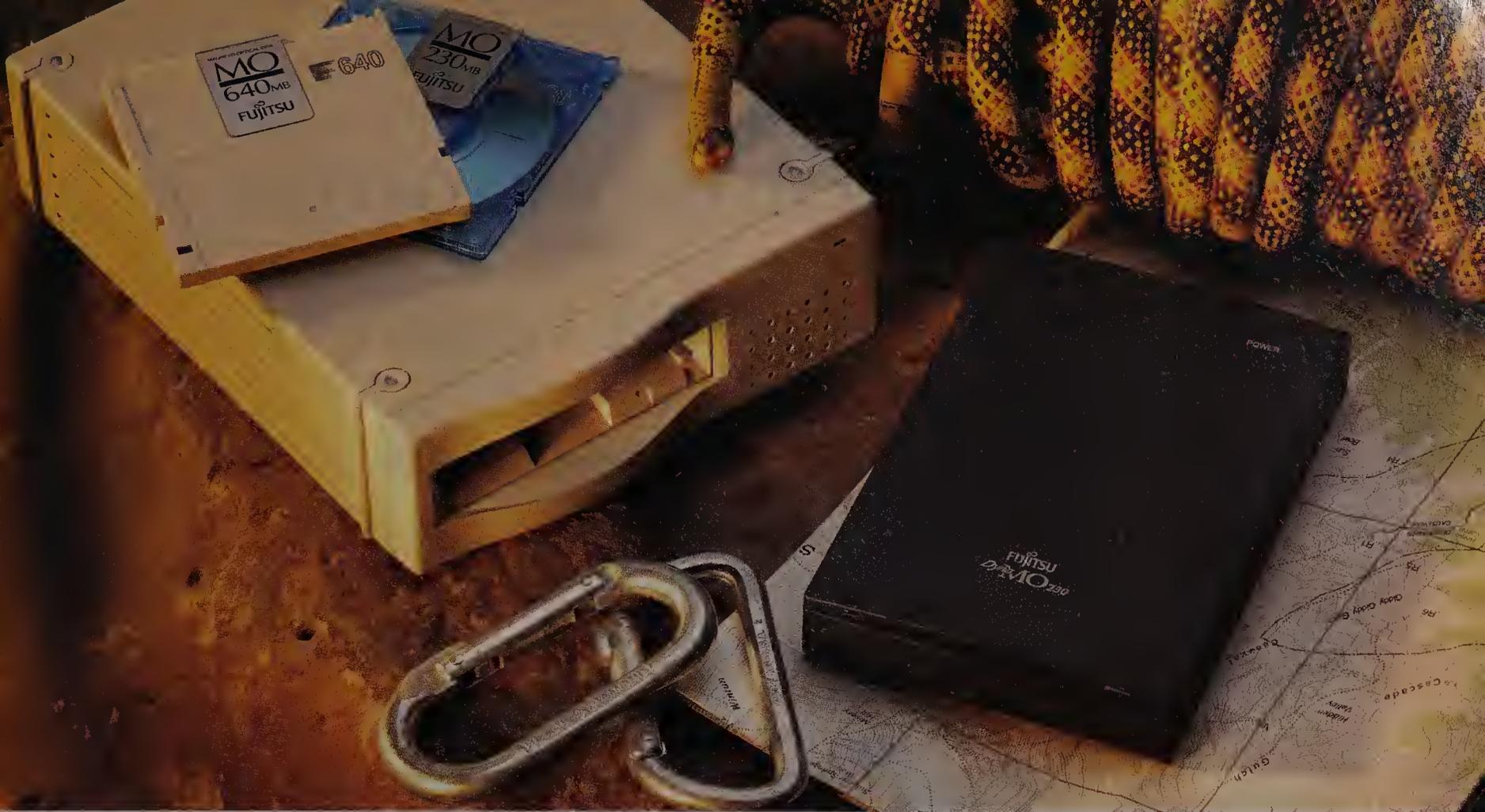
minimal amount of disk caching. Right-click *My Computer* and select *Properties*. From the *Performance* tab, click *File System*. On the *Hard Disk* tab, make sure *Mobile or docking system* is selected under ‘Typical role of this machine’. Your system won't be as fast as it was before, but it will last longer on a battery charge.

**79** **3x 95 NT** **Data Central, Part 1.** For easy backups, keep all of your data files in a single directory (folder). To organize your data, put it in subdirectories within that directory, by project or whatever other division makes sense to you.

**80** **3x 95 NT** **Data Central, Part 2.** Once you're keeping your data in a single directory (folder), tell your applications that's the default location where they should save new files. How you do this varies from application to application, and it may take a bit of looking to figure it out. For instance, in Microsoft Word for Windows, select *Tools•Options*, click the *File Locations* tab, and modify the *Documents* option. In Excel, it's again *Tools•Options*, but you click the *General* tab and enter the correct path into the Default File Location field. In Lotus Approach, you select *File•User Setup•Approach Preferences*, click the *General* tab, click *Default Directories*, and fill in the information. ▶



**THANKS FOR SHARING:** Windows NT lets you control who can and cannot access your files across a network.



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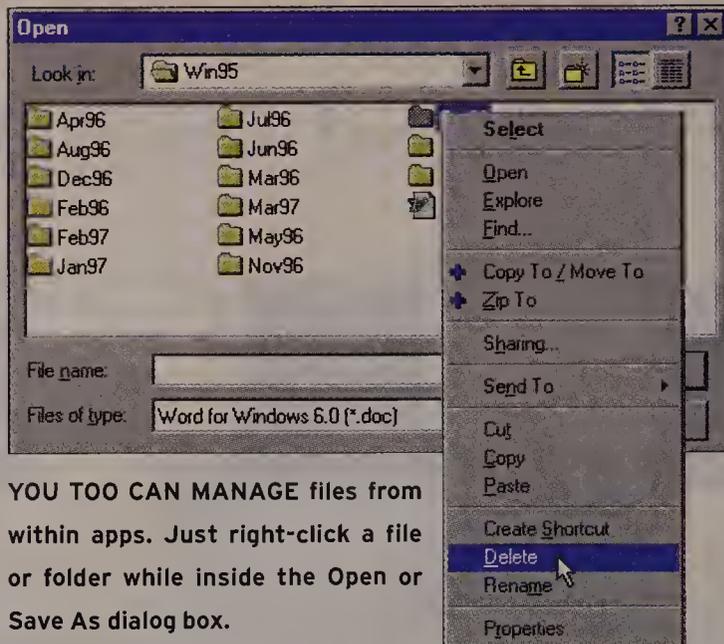


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**81** **3.1** **95 NT** **Data Central, Part 3.** If an application doesn't offer a way to change its working directory (folder), try telling Windows to open it where you want it to save files. In **Windows 3.1**, switch to Program Manager, select the application, and press **<Alt>-<Enter>**. Type in a new working directory, such as **c:\data**, and click **OK**.

In **Windows 95** or **NT**, right-click the *Start* button and select *Explorer*, then find the Shortcut to the application—if the Shortcut is on the desktop, you don't have to open Explorer. Right-click the Shortcut, select *Properties*, go to the *Shortcut* tab, and type the desired working folder in the 'Start in' field.



**YOU TOO CAN MANAGE** files from within apps. Just right-click a file or folder while inside the **Open** or **Save As** dialog box.

**82** **95 NT** **Explorerless File Management.** You can manage files right inside your applications. The **Save As** and **Open** dialog boxes of Windows 95-savvy applications offer full drag-and-drop capabilities and the same right-

click menu you get in Explorer or a standard folder window.

**83** **95** **Seven Megabytes Richer.** Looking to free up some disk space? Check your **Windows\Help** folder for AVI files—you could have as much as 7MB of them left over from Windows' tutorial. Unless you're using Windows 95 for the first time, you don't need them.

**84** **95 NT** **Eliminate Confusion With Quotes.** When using a long file name at the DOS prompt, where it could be confused with a string of parameters, surround the name in quotes, as in copy "**Letter to Garcia About Smith**" a:

## Find Windows 95's Hidden Treasures

**85** **95** **Good Storage With ClipBook.** There's some amazing, little-known stuff on the Windows 95 CD-ROM—for instance, a better version of Clipboard. When you copy or cut something to the usual Clipboard, you lose the last thing that was there. Few people know it, but Windows 95 also has a *ClipBook* where you can save clippings and reuse them. To install it, insert the Windows 95 CD-ROM, and in the resulting window select *Add/Remove Software*. Go to the *Windows Setup* tab, click *Have Disk*, click *Browse*, and navigate your way to *d:\Other\Clipbook* (where *d* is your CD-ROM drive letter). With the *clipbook.inf* file the only thing in the file name box, click **OK** twice. Check *ClipBook Viewer*, then click *Install*. You'll now be able to open the program by selecting *Start•Programs•Accessories•ClipBook Viewer*.

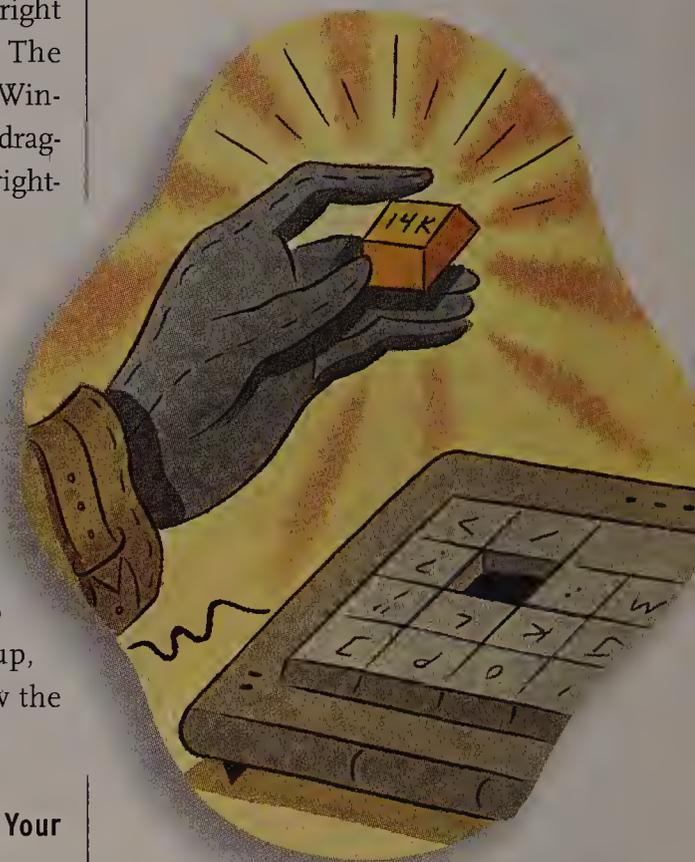
**86** **95** **Back Up Your Registry.** All sorts of installation programs mess with the Windows Registry, so it's a good idea to make regular backup copies of the two files, *user.dat* and *system.dat*. Unfortunately, you can't use Explorer or DOS to copy these files.

Buried on the Windows 95 installation

CD-ROM is a program that lets you make up to nine backups of your Registry. Just copy *Cfgback.exe* from the CD-ROM's *\Other\Misc\Cfgback* folder to *c:\windows*, and then copy the *Cfgback.hlp* file to *c:\windows\help*. To make a backup, double-click *Cfgback.exe* and follow the detailed instructions.

**87** **95** **Keep Policy Editor Off Your Hard Drive.** Don't want someone else changing your Windows environment? Use the System Policy Editor, located on the Win 95 installation CD-ROM. Don't put the Policy Editor on your own hard drive or you'll make it too easy for others to change your configuration. When you need it, pop in the CD-ROM, select *Start•Run*, and run the command *d:\admin\apptools\poledit\poledit.exe*, where *d* is your CD-ROM drive. See "59: Display for Yourself" and "67: Get Your Hands Off My Registry" for examples of how to use this tool.

**88** **95** **Emergency Recovery Utility, Part 1.** There's a hidden program on the Windows 95 CD-ROM for creating an emergency boot disk that can



restore your system to the way you've configured it. Before running the program, format a floppy, making sure to check the *Copy system files* option in the Format dialog box. Then place the CD-ROM in your drive, browse to the *d:\other\misc\eru* folder (where *d* is your CD-ROM drive), and double-click *eru.exe*. Just follow the directions from there. In case of disaster, reboot your system with the ERU-created floppy, and it will automatically restore some of your Windows 95 settings.

**89** **95** **Emergency Recovery Utility, Part 2.** If you use the Emergency Recovery Utility found on the Windows 95 CD-ROM to create an emergency boot disk, be aware that some of ►

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# Windows NT: Ten Easy Ways to Upgrade

## Upgrading From Windows 3.1 or 95

**[90] To Avoid Stress, Decompress.** Windows NT can't read drives compressed with DoubleSpace, DriveSpace, or other utilities. If you need to see those drives when running NT, uncompress them before you install it.

**[91] Home Alone With NTFS.** Don't be in a hurry to upgrade to the NT File System: Neither Windows 3.1 nor 95 can read NTFS drives.

## Upgrading From Windows 3.1

**[92] Install Over Windows 3.1.** NT's installation normally creates a dual-boot system, so you can run either NT or Win 3.1 each time you boot up. To carry over your current Win 3.1 desktop settings, drivers, and apps into NT, you must install NT to your existing Windows 3.1 directory. You must then create a new user account to import your old settings into NT.

**[93] Create a New User Account.** For NT to read your Windows 3.1 settings, you must create a new user account. Go to the Start menu and select *Programs*•*Administrative Tools (Common)*•*User Manager*, then *User*•*New User*. Fill in the data fields, create your password, click *OK*, and then shut down and log back in. After NT has asked you to change your password and confirm some settings, you'll find that your new desktop has some familiar features.

**[94] Keep 3.1 and NT in Sync.** In a dual-boot system, NT won't know about new apps installed in Win 3.1. To import recent changes from 3.1, edit NT's Registry.

Choose *Start*•*Run*, and enter `regedt32` in the Open field. Select the *HKEY\_LOCAL\_MACHINE* window, expand the *Software* branch, select the *Windows 3.1 Migration Status* branch, and press `<Del>`. Repeat the process in the *HKEY\_CURRENT\_USER* window, then exit the editor. Next time you log in to NT, it will import your Windows 3.1 configuration anew.

**[95] Make a Clean Break.** Are you absolutely sure you'll never, ever use DOS or Windows 3.1 again? (Remember, almost 25 percent of Win 3.1-compatible hardware and software won't run under NT.) If so, install NT to a different directory, then delete the Windows 3.1 directory and subdirectories using the command `deltree\windows`.

## Upgrading From Windows 95

### [96] Let the Past Go.

Don't waste one precious minute trying to install Windows NT over Windows 95 or get NT to pick up your old settings. No can do.

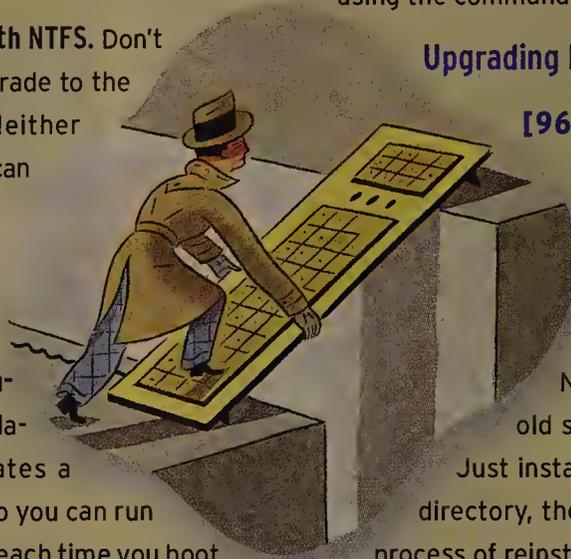
Just install NT to a separate directory, then start the painful process of reinstalling your apps.

**[97] Eschew the FAT32.** If you recently bought a new PC, it's probably using the FAT32 file system (see "75: What File System Is This?"). Unfortunately, NT won't install on or convert FAT32 disk partitions.

Your only remedy: Back up the drive, delete the FAT32 partition, create and format a FAT16 partition in its place, restore the drive, and proceed with the NT installation.

**[98] Beware Odd Partitions.** If you try to install NT and get a message that the target partition type is unknown, Windows 95's fdisk program has probably given you a OE or OF 16-bit FAT partition. Before you install NT, download and install the patch that prevents Win 95 from creating unsupported partition types in the first place; you'll find it at <http://www.microsoft.com/windows/software/dskts.htm>. You then must back up the drive, delete the FAT partition, re-create it, format it, restore the drive, and then proceed with installing NT.

**[99] Good-bye '95.** To get rid of Windows 95 forever, delete the entire Windows 95 directory using the DOS command `deltree\windows`. But you may find that some of your current hardware and software is not supported by NT. —Scott Spanbauer



the configuration files can be huge, making it impossible to fit them all on a floppy (and ERU can't handle multiple floppies). When ERU shows the files it will back up, click *Custom* to see the files it will skip. You can choose to skip other files, or you can make a note of the ones not being copied and back them up manually.

## 100 <sup>95</sup> Windows 95 Resource Kit.

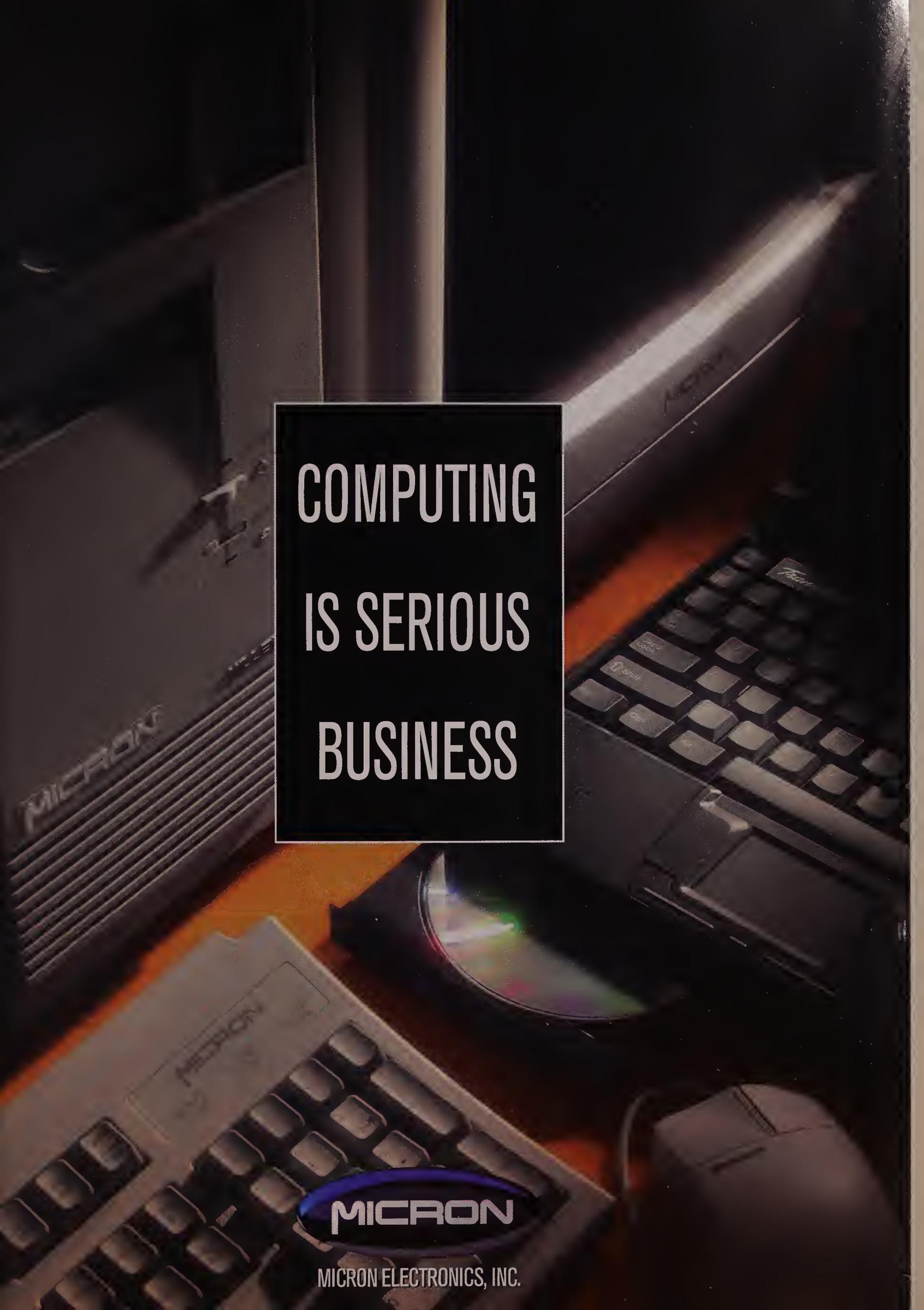
If you need the inside scoop on Win 95's innards, take a look at the Windows 95 Resource Kit, hidden on the installation CD-ROM. There you'll find information on everything from configuring a dial-up server to how device drivers work. To read this help file, place the CD-ROM in your drive, browse to the `d:\admin\reskit\helpfile` folder (where *d* is your CD-ROM drive letter), and double-click `win95rk.hlp`. To make the Resource Kit a permanent part of your hard drive, copy `win95rk.hlp` and `win95rk.cnt` to your `c:\windows\help` folder, then create a Shortcut to `win95rk.hlp`.

## 101 <sup>95</sup> Enhanced Printer Troubleshooter.

Having trouble with your printer? The Windows 95 installation CD-ROM contains a printer troubleshooting program that may be able to help. Place the CD-ROM in your drive, browse to the `d:\other\misc\eps` folder (where *d* is your CD-ROM drive letter), and double-click `eps.exe`. The program will ask you what kind of problem you're having, then continue to ask questions and offer solutions until you solve your problem or give up.



Want access to even more Windows tips? The Internet and online services are full of them, and we've compiled a list of the best online spots for Windows information. Point your browser to <http://www.pcworld.com/mar97/wintips>. There you can also find all the files mentioned in this article. Valerie Murray Ryan is the editor of the Do It With Windows 95 newsletter (IDG Newsletters, 800/807-0771) and the Windows 95 Tip of the Day (<http://www.tipworld.com>). Ben Miller is a writer and musician in San Francisco. Steve Bass, Scott Dunn, and Scott Spanbauer are contributing editors for PC World. ■



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- Microsoft Side Winder game pad.....\$39

## Storage/Media Options

- Adaptec® 2940U Ultra SCSI Fast-20 controller.....\$100  
(upgrade from system with standard Ultra SCSI Fast-20 controller)
- Plextor™ 12PleX 12X 1.8MB/sec SCSI internal CD-ROM drive.....\$200\*\*  
(upgrade from systems with standard 12X EIDE CD-ROM drive)
- Iomega® Jaz™ SCSI drive with 1GB removable cartridge.....\$399\*\*
- Iomega Zip™ IDE drive with 100MB removable cartridge.....\$99
- Iomega 6-pack of 100MB Zip cartridges.....\$99
- Iomega Ditta™ 800 (400/800MB) Travan™ tape backup w/tape.....\$149
- Iomega Ditta 3200 (1.6/3.2GB) Travan tape backup w/tape.....\$199
- Sony® 4/BGB SCSI DDS-2 DAT tape backup w/tape.....\$999\*\*

## Communications Options

- 33.6bd V.34 internal data/fax modem.....\$139\*\*\*
- 33.6bd V.34 internal telephony data/fax modem w/full duplex speakerphone and voice mail.....\$159\*\*\*†

## Networking Options

- 3Com® 3C509 ethernet ISA NIC (BNC, AUI & RJ-45).....\$99
- 3Com 3C595 Fast EtherLink® PCI 10/100 NIC (RJ-45 only).....\$159
- SMC® ISA TokenCard network card.....\$199

## HP® Printer Options

- HP DeskJet® 690c printer—photo-quality color printing for the home, complete with cable.....\$369
- HP LaserJet® 5L-FS printer—affordable B&W printing, complete with cable.....\$449 (with rebate)
- HP LaserJet® 6P printer—full-featured B&W printing, complete with cable.....\$799

Additional DeskJet/LaserJet models available. Please call for details



## Software Options

EdVenture Pak: Sheila Ray the Brave, Putt-Putt® Saves the Zoo™, Reader Rabbit's Reading Development Library™ 1, Freddi Fish™ and the Case of the Missing Kelp Seeds™ and the Thinkin' Things™ Collection 2.....\$69  
(available only on desktop and notebook systems with Windows® 95)

Quicken® Financial Pak: Quicken Deluxe, Quicken Financial Planner™, Quicken Parents' Guide to Money™, Quicken Family Lawyer™ and free TurboTax® 1996 coupon.....\$79  
(available only on desktop and notebook systems with Windows® 95)

## Display/Video Options

- 17" Hitachi® SuperScan® 1711 (15.9" display) .26dp color monitor.....\$150 ††
- 21" Hitachi SuperScan 2111 (20" display) .26dp color monitor.....\$650 ††
- Number Nine® Imagine™ 12B series II video card w/4MB VRAM.....\$500 †††

## TransPort™ Options

- MicronDack™ multimedia port replicator: ethernet 10BT LAN adapter, SCSI-2 port, S-video and NTSC-video output, built-in stereo speakers, infrared port, headphone, microphone, line-in jacks, parallel, serial, VGA and 2 PS/2® parts (with warm dock and built-in game port—available on XPE models only).....\$299
- Micron Executive™ desktop package: matching black 17" monitor (15.8" display), mouse, mousepad and keyboard (can be used with or without MicronDack).....\$699
- Matarala® Mantana 36.6 fax/modem supports regular telephone connections, cellular phones and two-way paging devices.....\$259

## Service Options

- Extended 2-year on-site service coverage for desktop systems.....\$99  
(upgrade from optional 1-year on-site service coverage)
- Extended 3-year on-site service coverage for desktop systems.....\$139  
(upgrade from optional 1-year on-site service coverage)
- Complete on-site PC installation (call Micron Electronics™ for details).....\$159

## Other Options

- APC® Per7T surge suppressor.....\$39
- APC Pra7T surge suppressor.....\$59
- Microsoft Natural Keyboard®.....\$49  
(upgrade from standard keyboard)

\* Upgrade from systems with standard 16-bit stereo sound card

\*\* Requires SCSI host adapter

\*\*\* V.34 modem includes trial memberships to CampuServe®, Pradigy® and America Online®

† Requires sound card

†† Upgrade from systems with standard Micron 17" 17F6x color monitor

††† Upgrade from systems with standard 64-bit 2MB video card

Options and accessories available with system purchase only.

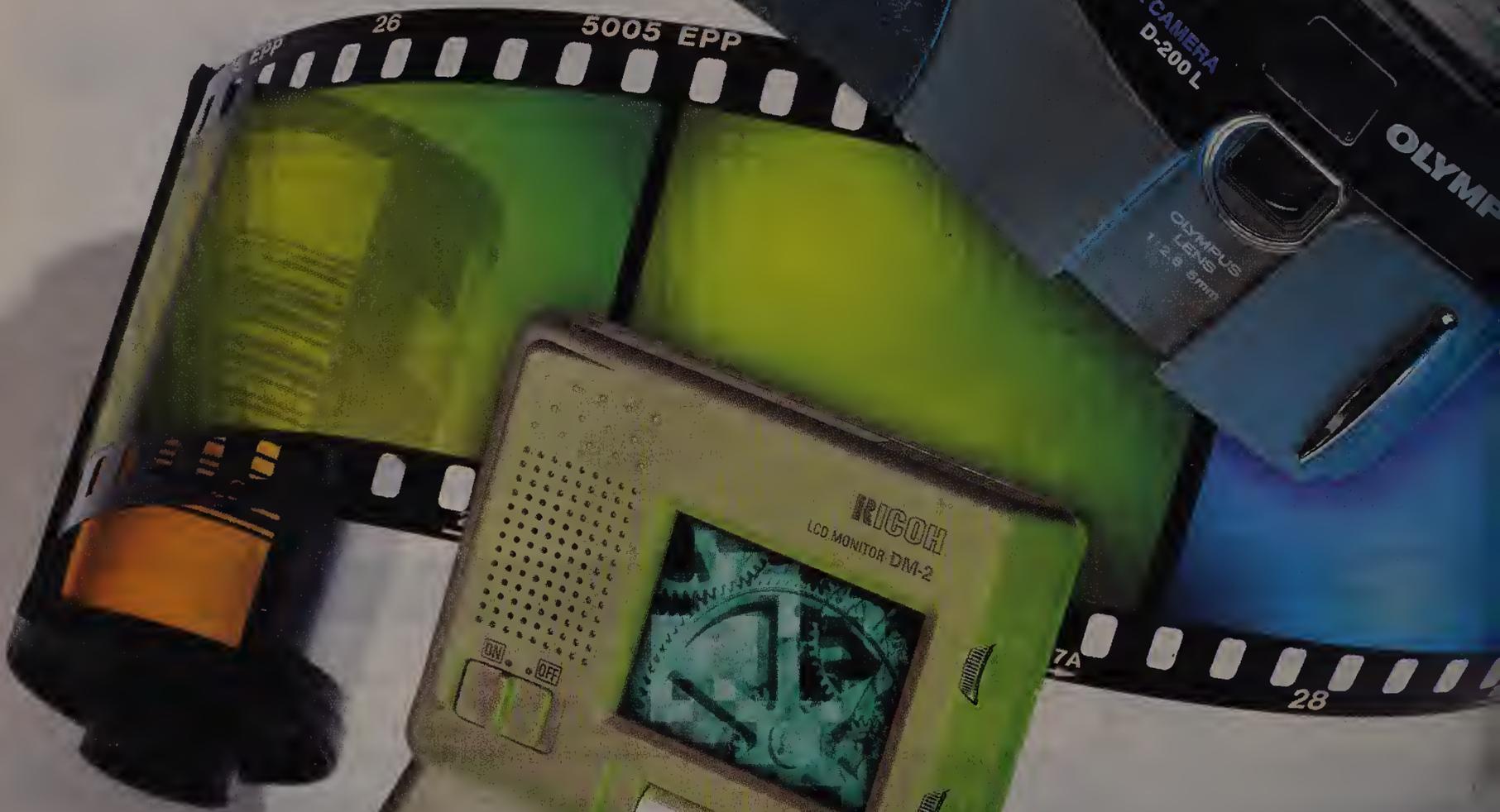


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Digital cameras are finally affordable. We test ten point-and-shoot models priced as low as \$199 that can free you from the hassles of film.



BY RICHARD JANTZ



NOT LONG AGO, instant photography meant pushing a shutter release and waiting 2 minutes to peel apart the Polaroid print. Times change. Now for as little as \$199, you can take a picture, fire up your PC, and within minutes post the shot on a Web page or paste it into a newsletter. Digital cameras have radically simplified the process of getting your pictures into your PC. There are no rolls of film to buy, no prints to develop, no scanning; you simply connect a digital camera to your PC with a cable or PC Card, then pick the images you want to transfer to your hard drive.

Is it time to toss out your 35mm camera? That depends on what kinds of pictures you need. If you're shooting your newest product for a glossy ad campaign or your company's annual report, keep in mind that the digital cameras we looked at don't produce anything close to the image quality of film. But if all you need is a simple photo for a Web site, a presentation, or a database record, an inexpensive digital camera is just fine—with quality almost as pleasing as that from a low-priced desktop scanner. And a digital camera won't cost you an arm and a leg. A year ago, most of them cost over \$1000. For this review, we found ten cameras that range from \$199 to ▶

# cheap shots

\$999. And a bunch more are on the way (see "New Cameras: Digital Evolution").

The entry-level digital cameras we saw are targeted for casual and business use. They are small and light, battery powered, and have image resolutions of 832 by 608 or lower. We took shots indoors and out, compared picture quality, tested battery life, and measured how long it took to download our images into a PC. We also noted how easy it was to use each camera.

**PICKING A CAMERA**

A TYPICAL DIGITAL CAMERA is a lot like a point-and-shoot film camera: It has a viewfinder, a flash, and a control panel that shows the number of shots taken, battery status, and so on.

The ideal digital camera would fit into a pocket; store 50 or more images (at high resolution, of course); sport a zoom lens, optical viewfinder and LCD screen; and cost less than \$500. The latest cameras have some of those features, but none have it all for that price.

The key questions to ask are, how sharp do my images have to be, how much storage do I need, and how much can I pay? The higher the resolution, the sharper the picture quality—but this drives up the camera's price. Another expense is memory. The more the camera has, the more pictures it can store. Using PC Cards is

**BEST BUYS**

**Olympus and Epson**

NEED PICTURES PRONTO? The \$599 Olympus D-200L produces crisp, accurate images, and it's one of the few cameras we looked at that has both an optical viewfinder and color LCD screen built in. Its quality and design make it our Best Buy for both business and play. The \$399 Epson PhotoPC earns our Best Buy for casual users. Of the low-priced cameras we reviewed, the PhotoPC serves up the best features and

performance. Like the Olympus, Epson's camera takes good pictures at 640-by-480 resolution, indoors or out.



the most expensive storage technique, but it's the best way to hold lots of images. Canon's PowerShot 600, for example, can use an optional \$389 PC Card that stores up to 800 high-resolution images.

Next, consider the camera's size and controls. The Casio QV-10Aplus and Kodak DC20 are small enough to fit comfortably in a coat pocket. The Agfa, Epson, and Olympus models all have the same compact look and feel of standard point-and-shoot cameras. Others, such as the

Apple QuickTake 150 and Kodak DC40 and DC50, resemble small video cameras. Some of the more esoteric controls include the Kodak DC50's motorized 3X zoom lens and the Casio and Ricoh's ability to display images on a TV. The Canon and Ricoh cameras can also record sound.

**WHAT'S WRONG WITH THIS PICTURE?**

DIGITAL CAMERAS, like all cameras, live or die on image quality. We took shots

**FEATURES COMPARISON**

DIGITAL CAMERAS	Street price 1/2/97	Camera height x width x depth (inches)	Weight (ounces)	IMAGE CAPTURE		PHOTOGRAPHIC SPECS			
				Resolution (maximum/minimum)	Image capacity (max. res./min. res.)	Standard memory (MB)	Equivalent 35mm lens size (mm)	Aperture	Shutter speed range (second)
Agfa ePhoto 307	\$550	3 x 5.5 x 1.5	13	640 x 480 / 320 x 240	36 / 72	2	43	f/2.8 to f/8	1/30 to 1/10,000
Apple QuickTake 150	\$599	2.2 x 5.3 x 6.1	16	640 x 480 / 640 x 480	16 / 32	1	50	f/2.8 to f/16	1/30 to 1/175
Canon PowerShot 600	\$950	3.6 x 6.2 x 2.3	22	832 x 608 / 320 x 240	4 / 36	1	50	f/2.5 to f/16	1/30 to 1/500
Casio QV-10Aplus	\$399	2.6 x 5.1 x 1.6	7	480 x 240 / 480 x 240	96 / 96	2	60	f/2.8 to f/8	1/8 to 1/4000
Epson PhotoPC*	\$399	3.5 x 6.5 x 1.9	27	640 x 480 / 320 x 240	16 / 32	1	45	f/2.8 to f/8	1/30 to 1/10,000
Kodak DC20	\$199	2.4 x 4 x 1.2	4.2	493 x 373 / 320 x 240	8 / 16	1	47	f/2.8 to f/8	1/30 to 1/4000
Kodak DC40	\$599	2.2 x 6.1 x 5.3	16	756 x 504 / 756 x 504	48 / 99	4	42	f/2.8 to f/16	1/30 to 1/175
Kodak DC50	\$865	2.4 x 4.3 x 5.9	22	756 x 504 / 756 x 504	7 / 22	1	37 to 111	f/2.8 to f/24	1/16 to 1/500
Olympus D-200L*	\$599	5.7 x 2.8 x 1.8	11	640 x 480 / 320 x 240	20 / 80	2	35	f/2.8 to f/16	1/8 to 1/10,000
Ricoh RDC-2	\$999	5.6 x 1.1 x 3	11	768 x 576 / 768 x 576	9 / 38	2	35 or 55	f/2.8 to f/16	1/8 to 1/1000

\*Best Buy ● Yes ○ No

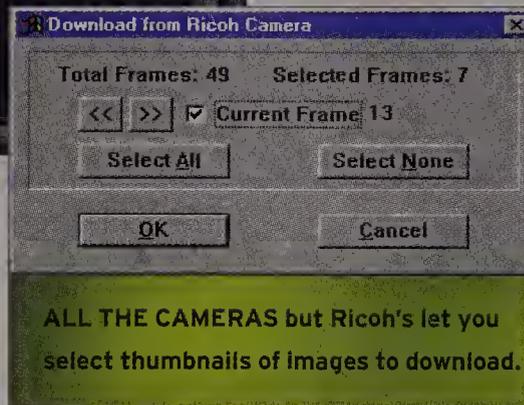
both indoors and out and compared how well each camera was able to shoot a focused picture at the correct exposure. To compare our digital images with scanned color slides, we also used two 35mm film cameras—a Nikon point-and-shoot and a Canon SLR. We viewed the images in Adobe Photoshop and printed each one on a Tektronix Phaser 440 dye-sublimation printer and a Hewlett-Packard DeskJet 683 ink jet printer.

In our picture-quality tests we found that images varied wildly—from true-to-life color and minute details with the Canon PowerShot 600 to washed-out color and chunky pixels with the Casio QV-10Aplus and Kodak DC20 (for a sample of these images, see “Canon: Best Digital Shots”). The Agfa, Epson, and Olympus cameras tended to produce more lively and vibrant colors than did the Kodak and Ricoh. The Canon was the only one that consistently got the colors just about right.

Most digital camera images look pretty good on a monitor. For printing, you'll get the best detail from higher-resolution (756 by 504 or better) cameras such as the Canon, the Kodak DC40 and DC50, and the Ricoh. We made 5-by-7-inch prints that showed little visible image loss compared with what we saw on screen. Print a 640-by-480 image and you'll get a base-

ball card-size printout of decent quality.

We also looked at the software bundled with each camera. All but the Ricoh include a TWAIN driver, which downloads a camera's pictures directly into your favorite image editor or other program



that supports the TWAIN standard. Most TWAIN software shows you a thumbnail gallery of your images. Before you download, simply select the thumbnails of the images you wish to keep.

Generally it doesn't take long to download images from the camera to your PC. The Canon was the only camera to use a parallel cable and so was the quickest—5 seconds per shot. Most took less than 20 seconds. The worst was the Kodak DC20, which took on average 30 seconds to transfer each of its low-resolution images.

## PARTING SHOTS

SOME DIGITAL CAMERAS can really guzzle batteries. We were amazed that the Canon took only 72 shots, lasting just over an hour, before its battery was drained. Fortunately the battery is rechargeable. On the other hand, the Apple lasted 8 hours on three AA lithium batteries, letting us take over 1000 images. Most of the cameras here can use standard AA alkaline batteries, which is handy because you can buy them most anywhere. But if you plan to take lots of photos, invest in a camera that can also use rechargeable batteries.

Finally, don't forget that you'll need to store those digital images. It won't take long for your photos to consume your PC's hard drive. The size of our digital images was up to 1MB each. If you buy

a digital camera, do yourself a favor and buy a removable media drive.

 Images from all the cameras are on PC World Online (<http://www.pcworld.com>). Richard Jantz is a freelance writer in Kensington, California.

For more information about all products in this article, circle reader service no. 914. ▶

					CONTROLS				SUPPORT	
Viewfinder	Closest focus range (inches)	Flash	Batteries	Output	Images deleted	Image protection	Self-timer	Date stamp	Warranty (years)	Weekday/weekend support (hours)
optical	24	●	4 AA alkaline	serial	selected	○	●	●	1	8/0
optical	10	●	3 AA lithium or NiCd	serial	all	○	●	○	1	24/24
optical	4	●	1 proprietary NiCd	parallel, PC Card	selected	○	●	●	1	18/18
1.8-inch color LCD	4	○	4 AA alkaline	serial, TV	selected	●	●	○	1	10/7
optical	8	●	4 AA alkaline	serial	selected	○	●	○	1	12/0
optical	19	○	1 lithium	serial	all	○	○	○	1	11/0
optical	48	●	4 AA alkaline or lithium	serial	selected	○	●	○	1	11/0
optical	19	●	4 AA alkaline or lithium	serial, PC Card	selected	○	●	○	1	11/0
optical, 1.8-inch color LCD	8	●	4 AA alkaline	serial	selected	●	●	●	1	8/0
optical, 1.8-inch color LCD	8	●	4 AA alkaline, NiCd, or NiMH	serial, PC Card, TV	selected	●	●	●	1	8/0

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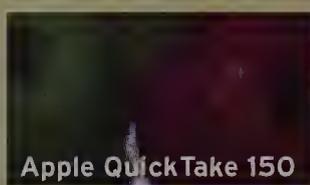


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# Canon Best Digital Shots

Do digital images measure up to conventional film photos? The proof is in the pixels. Of the digital cameras we tested, Canon's produces the best-looking images—close to film quality. Although the colors look a bit flat, Canon's high-resolution 832-by-608 image detail is impressive. Each of its pictures came out razor sharp. We also got good-looking shots from the Agfa, Epson, and Olympus cameras. All three deliver sharp 640-by-480 pictures with accurate colors, minimal pixel patterns, and not too much contrast. Pixel distortion mars the Ricoh's photos, while shots from the Apple QuickTake and all the Kodak cameras come out faded and fuzzy. The worst results are the low-resolution pictures from the Casio and the Kodak DC20.



## AGFA EPHOTO 307

**PRO:** Good picture quality, easy to use, fast download, red-eye reduction

**CON:** Can't upgrade storage capacity, no close-up lens, no LCD screen

The ePhoto 307 is the first digital camera from Agfa aimed at business users. It's an easy-to-use camera that delivers sharp digital images—properly exposed without too much contrast or color shift—but for \$550, we expected more.

The ePhoto 307 works like a point-and-shoot film camera. A sliding panel on the front turns the unit on and off and protects the lens. The control panel is on top, making it easy to change the image resolution, set the flash mode, turn on the self-timer, and erase images. At a glance, you can see how many shots are left or check the battery status. The ePhoto 307's 2MB of memory can hold 36 images at 640 by 480, or 72 at a lower resolution.

Downloading the ePhoto 307's images to a PC through the serial cable took just 6 seconds per image—surpassed only by the Canon PowerShot 600, which downloads larger images through a parallel cable. The ePhoto 307 bundles two programs: Agfa PhotoWise for downloading your shots, and Adobe PhotoDeluxe for manipulating pictures in some cool ways. Agfa Division, Bayer Corp., 800/227-2780, <http://www.agfahome.com>

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## APPLE QUICKTAKE 150

**PRO:** Terrific battery life, 24-hour support

**CON:** Lackluster picture quality, can't upgrade storage capacity, overpriced, no LCD screen

Apple's QuickTake 150 is the oldest digital camera in our roundup, but after almost two years there's still life in it. For starters, it has the longest battery life of all the models we tested—8 hours. The three nonrechargeable AA lithium batteries included allowed us to take over 1000 pictures, but oddly, this camera can't use standard AA alkaline batteries. Unfortunately, the QuickTake 150's images were not nearly as impressive as its battery life. Our test shots lacked contrast, and colors were too pale.

The camera is easy to use. It looks and feels like a camcorder—you simply slip your right hand through a strap and compose the shot through the viewfinder. ►

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A panel in back indicates battery status, flash mode, number of shots taken, and settings for picture quality and the self-timer.

We weren't very pleased when the QuickTake's Erase control zapped all our stored images. Better cameras let you select the images you want to delete. The QuickTake 150's 1MB of internal memory holds only between 16 and 32 pictures at 640 by 480 resolution. And for close-up shots, the QuickTake comes with a plastic lens adapter—it looks like a Cracker Jack prize, but it gets you within 10 inches of your subject.

Downloading images was tedious. The bundled PhotoNow image editor accepts pictures only one at a time instead of in batches. The bottom line: \$599 is too much to pay for Apple's QuickTake 150. *Apple Computer Inc., 800/598-2386, <http://www.apple.com>*

READER SERVICE NO. 780



Agfa ePhoto 307

Apple QuickTake 150

Shot 600—it takes the best pictures of any camera we reviewed. Higher-resolution images were sharp and properly exposed, with colors close to film quality. Unlike the other cameras, Canon lets you pick the resolution *and* compression mode (fine, normal, and economy). At 832 by 608, it captures from 4 to 15 shots; at 640 by 480, you get from 6 to 19 shots; and at 320 by 240, up to 36. For marathon photo sessions you'll need Canon's 170MB PC Card hard drive (\$389), which can hold 800 high-resolution shots or a whopping 5500 at low resolution.

All in all, though, we don't like this expensive camera. For starters, it's too bulky for mobile users. Battery life is short, and image capture is slow. For example, to get a little more than an hour of continuous picture-taking, we had to charge the PowerShot 600's proprietary NiCd battery for at least 12 hours. And in the field, we had to wait up to 5 seconds between shots. Some of the ►

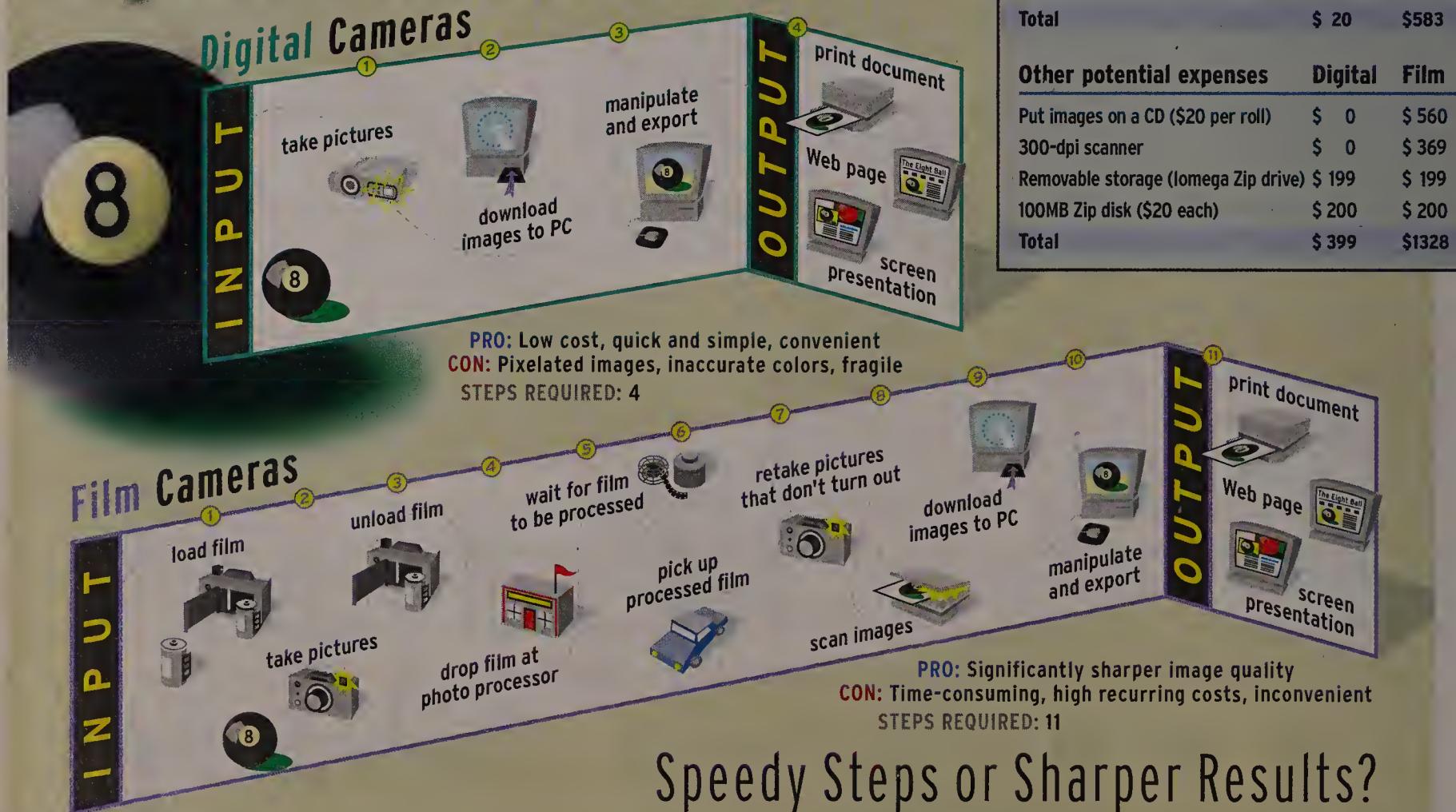
**CANON POWERSHOT 600**

**PRO:** Terrific high-resolution pictures, quick downloads, uses PC Cards, records sound

**CON:** Expensive, bulky, complex to use, short battery life, slow image capture, no LCD screen

If image quality is vital in your line of work, consider the \$950 Canon Power-

# Digital Versus Film



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PowerShot's controls are also irritating. It isn't tricky to add a sound bite to a frame or change flash intensity, but getting the camera to shoot at its highest resolution is like cracking a safe—turn a dial, press two pairs of buttons, then pick an obscure acronym, CWR. We used this camera's manual more than any other's. The close-up mode gets you within 4 inches of objects, but when you look through the viewfinder, you can't determine what's in focus.

We did like Canon's intuitive TWAIN software. After we locked the camera to its download/recharge station and connected a parallel cable to our PC, it poured the images onto the hard disk faster than did any of the other cameras (which all use serial cables). And we also appreciated the full version of Ulead's PhotoImpact 3.0—arguably the most capable image editor bundled with any of these cameras.



Pick this camera only if picture quality is paramount. And if you plan to share the Power-

#### CASIO QV-10APLUS

**PRO:** Color LCD screen, compact design, high storage capacity, video output

**CON:** Poor picture quality, low resolution, no flash, short battery life

The \$399 Casio QV-10Aplus has some cool features; too bad picture quality isn't one of them. Our sample images were blurred by chunky pixels, no doubt due to the camera's low 480 by 240 resolution.

Who should buy the QV-10Aplus? Someone who wants quick, simple snapshots and isn't picky about picture quality. The camera is almost as light as the Kodak DC20 and slips into a coat pocket easily. A handy 1.8-inch color LCD screen on the back lets you compose and review your shots on the spot. You can also display images on a TV or record them with a VCR. The camera's close-up mode lets you photograph objects as near as 4 inches. We also like the way the lens pivots 270 degrees, so you can take a self-portrait or nab a candid moment. Unfortunately, to use the camera you must have the LCD screen turned on. That means you'll need to pop in a lot of AA batteries; we had ►

Shot 600 with your coworkers, they'll need a crash course (or two) on using it. Canon Computer Systems, Inc., 800/848-4123, <http://www.ccsi.canon.com>

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## New Cameras Digital Evolution

AS WE WROTE THIS ARTICLE, eight more pocket-size digital cameras were announced. Here's the skinny on what's coming.

■ The new **Casio QV-100** (\$649) and **QV-300** (\$699) are nearly identical: 4MB of internal RAM should store up to 192 images at 320 by 240, or 64 images at 640 by 480. The QV-300 has a bigger 2.5-inch LCD screen in back; the QV-100's is 1.8 inches. Casio, 800/962-2746, <http://www.casio.com>

READER SERVICE NO. 787

■ At first glance, the \$699 **Fujifilm DS-7 Digital Camera** looks like a miniature version of the Canon PowerShot 600, plus it's got a built-in 1.8-inch LCD screen in back. The DS-7's 2MB of memory should store 30 images at 640 by 480. For \$75 extra, a stamp-size 2MB memory card can double the camera's storage. Fuji Photo Film USA, Inc., 800/378-3854, <http://www.fujifilm.com>

READER SERVICE NO. 788

■ The \$499 **Epson PhotoPC 500** is an inch less wide than our Best Buy Epson, holds 30

images at 640 by 480, and has a port for an optional 1.8-inch color LCD screen (\$199). Epson America, Inc., 800/289-3776, <http://www.epson-usa.com>

■ The \$699 **Kodak DC25** camera sports a 1.6-inch LCD screen in back and a flash, but it can grab only 29 shots at 320 by 240. Eastman Kodak Co., 800/235-6325, <http://www.kodak.com>

READER SERVICE NO. 789

■ The **Minolta Dimâge V** fits in your palm, sports a 1.8-inch LCD screen on the back, and has a 2.7X zoom lens. A 3-foot cable detaches the lens from the camera body, so you can grab images in tight spaces (up to 40 at 640 by 480).

Pricing should be under \$1000. Minolta Corp., 201/825-4000, <http://www.minoltausa.com>

READER SERVICE NO. 790

■ The \$899 **Olympus D-300L** looks identical to the D-200L, our Best Buy, but this version grabs shots at 1024 by 768 (see *New Products* in this issue for a review). Olympus America, Inc., 800/622-6372, <http://www.olympus.com>

READER SERVICE NO. 791

■ We spent some time using a beta version of the \$849 **Sony DSC-F1**. The Walkman-size camera sports a 1.8-inch color LCD screen, wireless infrared port, flash, pivoting 35mm lens, and rechargeable lithium ion battery. Its 4MB of memory holds up to 108 images at 640 by 480, and in Time-machine mode the camera records continuously—touch the button and you can retrieve an image captured from a full second beforehand. It's a fun camera, but the menus are cumbersome. Sony Electronics, 800/352-7669, <http://www.sony.com/image>

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### EPSON PHOTOPC

**PRO:** Colorful pictures, inexpensive, easy to use, add-on lenses

**CON:** Low storage capacity, slow downloads, expensive memory upgrade, heavy, no LCD screen



Good picture quality, simple design, and a low price earn the \$399

Epson PhotoPC our budget Best Buy. It's an affordable choice for any home or office that needs good digital photos. The shots we took had close to the same vibrant color quality as those from the more expensive Agfa and Olympus models.

The PhotoPC has the same shape and feel as a point-and-shoot film camera. The control panel on top is much like the Agfa ePhoto 307's and provides a quick overview of the camera's settings and status levels. The PhotoPC is one of the few cameras we reviewed with a lens that lets

you attach accessories such as filters or a wide-angle lens.

With only 1MB of internal memory, the PhotoPC doesn't hold many shots—16 at 640 by 480, or 32 if you go down to 320 by 240. If you need to shoot lots of pictures, you can capture between 40 and 80 images by upgrading the storage capacity with 2MB (\$199) or 4MB (\$299) memory modules. Travelers should note that the

PhotoPC weighs a hefty 27 ounces, and it is nearly as big as Canon's camera. At an average of 20 seconds per shot, getting the PhotoPC's images onto our PC's hard drive was not very fast. But the Storm Technology EasyPhoto software makes the process easy and has plenty of tools for editing digital snapshots.

Pick the Epson if cost is more important to you than picture quality and capacity. It doesn't have the built-in color LCD screen that the Best Buy Olympus has, but it costs \$200 less. *Epson America, Inc.*, 800/289-3776, <http://www.epson-usa.com>

### KODAK DC20

**PRO:** Lowest price in review, compact, easy to use, battery life nearly 8 hours

**CON:** Low-quality images, inaccurate color, no control panel, slow downloads, no LCD screen

Kodak's DC20 is a low-end, inexpensive camera that's about the size of a deck of cards and weighs only 4.2 ounces. At \$199, it's by far the lowest-priced camera we reviewed. But other than small size and long battery life, there's not much to recommend it. It holds only eight images at its peak resolution of just 493 by 373, and our sample shots suffered from overexposure, poor focus, and serious color shifts. You can take 16 shots at a lower resolution (320 by 240), but the image quality is even worse.

Instead of a control panel, the DC20 has three lights to indicate whether the power is on, the camera is busy, or the memory is full. Its Erase button is precariously close to the on/off button. If you accidentally press the wrong button when switching off the camera, you'll lose all your shots. Downloading images was painfully slow—30 seconds per image on average. We suggest you look elsewhere. *Eastman Kodak Co.*, 800/235-6325, <http://www.kodak.com>

READER SERVICE NO. 783

## TEST REPORT

# Apple Lives Longest, Shoots Most

DIGITAL CAMERAS	Shorter	Battery life	Longer	Pictures taken	Avg. download time (seconds per image)	Battery type
Agfa ePhoto 307	0	2.5	3	252	6	alkaline
Apple QuickTake 150	0	8	9	1136	14	lithium
Canon PowerShot 600	0	1.5	2	72	5 <sup>1</sup>	NiCd
Casio QV-10Aplus	0	2	3	158	10 <sup>2</sup>	alkaline
Epson PhotoPC*	0	4	5	538	20	alkaline
Kodak DC20	0	8	9	762	30 <sup>3</sup>	lithium
Kodak DC40	0	3	4	192	13 <sup>4</sup>	alkaline
Kodak DC50	0	2.5	3.5	238	29 <sup>4</sup>	alkaline
Olympus D-200L*	0	3	4	280	19	alkaline
Ricoh RDC-2	0	4	5	351	23	alkaline

\* Best Buy

<sup>1</sup>At 832 by 608. <sup>2</sup>At 480 by 240. <sup>3</sup>At 493 by 373. <sup>4</sup>At 756 by 504.

**HOW WE TEST** Battery life: We used regular AA alkaline batteries, unless the camera operates only with its own proprietary battery. Under controlled lighting conditions, we took ten flash pictures, then ten without flash, and repeated these steps until the batteries were exhausted. Pictures taken: We tallied the images during a single battery life. Average download time: We calculated the average time per image for downloading six images at 640 by 480 resolution (or closest) to a Pentium-133 PC with 16MB of RAM. Kodak's DC20 time is based on its five-image limit. We did not time image download from PC Cards.

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**KODAK DC40 AND DC50**

**PRO:** High-resolution images, DC40 downloads images quickly, DC50 has auto-focus zoom lens and accepts PC Cards

**CON:** No LCD screen, DC50 has poor battery life and slow downloads, user manual only on CD  
The Kodak DC40 (\$599) and DC50 (\$865) are suitable for mobile workers—real estate agents or insurance adjusters, for example—who routinely take lots of pictures in the field. If you've ever handled a video camera, you'll have no trouble using the DC40 or DC50. Using the control panel on the back, it's easy to change flash intensity and exposure. It's also easy to erase images, check the battery status, and see how many shots are left. Two buttons on top of the DC50 let you adjust its built-in wide-angle and 3X zoom lenses; the DC50's control panel shows information on the lenses and PC Card.

Although both the DC40 and the DC50 take decent pictures at 756 by 504, the colors look flat, and the flash is sometimes too in-

tense. The DC50 gives you the option to compress images as good, better, and best. On the other hand, the DC50 holds only up to 22 shots, compared to 99 with the DC40. The DC50 can use an optional 4MB PC Card (\$230) along with its 1MB of internal memory; this lets you take up to 100 photos at its highest image quality.

Both Canon cameras use PhotoEnhancer for downloading and editing images. While the DC40 was fairly quick at transferring images to our PC—just 13 seconds per shot—the DC50 took a sluggish 29 seconds per image. Of course, if you have a notebook you can simply pop in the DC50's optional PC Card and open the images.

We also noticed that the DC50's auto-focus zoom lens takes a toll on battery life—it lasted a little over 2 hours, compared to almost 3 hours for the DC40. What's missing from both cameras is an LCD screen, which would help you see

which exposures from a photo session work best. *Eastman Kodak Co.*, 800/235-6325, <http://www.kodak.com>

READER SERVICE NO. 784

**OLYMPUS D-200L**

**PRO:** Good picture quality, sleek design, color LCD screen, red-eye flash reduction

**CON:** Can't upgrade storage capacity, bundled image editor opens only one shot at a time



Overall, the \$599 Olympus D-200L is our favorite digital camera. Its intuitive design, integrated features, and the crisp, attractive color images it produces earn it a Best Buy. At first glance, it's easy to mistake it for a film camera. It looks and feels like that trusty point-and-shoot you pull out for family photos. Just peer through the viewfinder and press the shutter button.



The Olympus D-200L's impressive design includes a 1.8-inch color LCD screen, which lets you compose and review shots. Unlike the Casio, this camera works with

its LCD screen turned off, and this conserves battery life—you can use the optical viewfinder to compose shots. With four AA alkaline batteries, the D-200L can take pictures for about 2.5 hours—that's still a bit short.

The D-200L consistently produces fine pictures that have a nice blend of sharpness, contrast, and brightness. Its



2MB of internal memory stores 20 high-quality shots (640 by 480) or 80 standard-quality shots (320 by 240). Downloading images took 19 seconds per shot on average. One disappointment is that the bundled Adobe PhotoDeluxe opens only one shot at a time.

Unless you need high-resolution images, the Olympus D-200L is a reliable camera for nearly any digital photo task. Its 640-by-480 shots are good looking. Add to that a smart design with an LCD screen, and this Best Buy makes it easy to capture digital shots, pronto. *Olympus America, Inc.*, 800/622-6372, <http://www.olympus.com/digital>

READER SERVICE NO. 785

**RICOH RDC-2**

**PRO:** High-resolution images, color LCD screen, dual lens position, records sound, accepts PC Cards for extra storage

**CON:** Flawed picture quality, no TWAIN driver, expensive, slow downloads

We had high hopes while using the \$999 Ricoh RDC-2, but we were disappointed when we downloaded the results. Pictures were sharp and properly exposed, but we noticed faint pixel distortion across each image and thin white lines along two edges of each shot. We tested a second RDC-2 and the pixels were less distracting, but the white lines were there.

Downloading images was slow (23 seconds per image), and the camera works only with its ArtSoft image editor, which doesn't support the TWAIN standard. All in all, the RDC-2 is solidly built, simple to use, and relatively light (11 ounces). Its 2MB of memory stores from 9 to 38 high-resolution (768 by 576) pictures, depending on which compression level you choose. You can send images to video, stamp dates on pictures, and even record sound bites. The camera's detachable 1.8-inch color LCD screen sports a built-in speaker and lets you capture sound bites, so you can hear comments you've recorded about an image.

Ricoh also offers add-ons: a \$20 remote control and a \$309 10MB PC Card that holds 52 to 210 shots. If Ricoh can solve its image-quality problem, we think the RDC-2 would be a nice camera. *Ricoh*, 800/225-1899, <http://www.ricohcpg.com>

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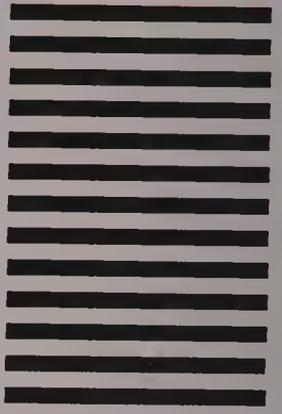
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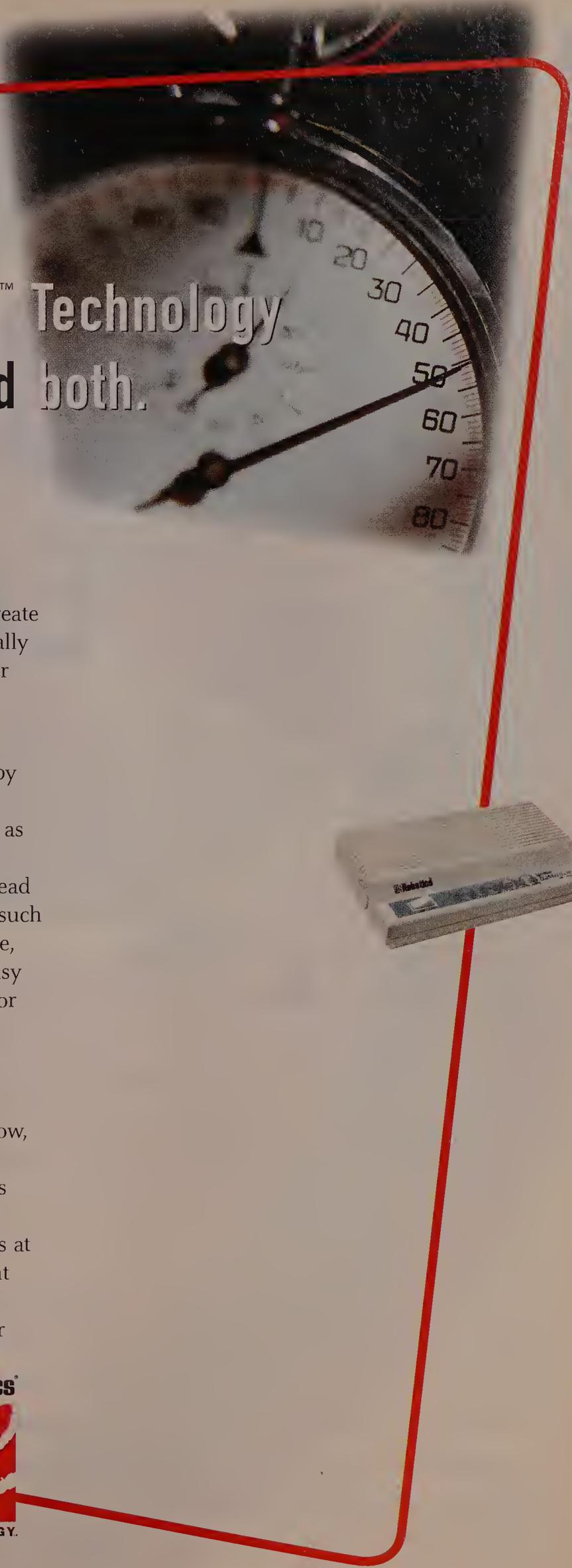
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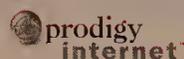
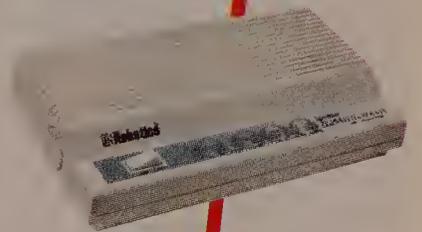
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# Now Smart Enough?

**W**ITH SMARTSUITE 96, you had to ask yourself the question: Is the glass half empty or half full? While a partial upgrade to Windows 95 is better than none, Lotus's decision to leave 1-2-3 and Organizer in their Windows 3.1 versions made SmartSuite 96 unnecessarily hard to learn and use. To make matters worse, it was poky. Word Pro, an otherwise promising new application, took three times longer to perform some tasks than Microsoft Word. In our last look at SmartSuite in May 1996, we recommended that users go with Microsoft's Office 95.

SmartSuite 97 overcomes most of the suite's initial growing pains. With 1-2-3 and Organizer now in the Windows 95 fold, gone is the confusing mix of interfaces. Although we didn't have a shipping version to test formally for this review, SmartSuite 97 also seems much faster than before. For SmartSuite diehards, the suite's complete conversion to Windows 95 is alone worth the price of the \$149 upgrade.

But is it worth switching to SmartSuite 97 from Office? When our reviewers had finished banging on the final beta, we had our answer: Office is still the better suite. In our review of the beta version of Office 97 last month, we found that it continues to have overall the best major business applications, particularly Word and Excel. That said, if SmartSuite 97 comes with your new PC or if you're a current SmartSuite user, there's no reason to throw it out and start over with a suite you don't know. SmartSuite 97 is not only an important upgrade in many respects for current users, it makes a good showing in features, speed, and special tools for Internet access. ►

EDITED BY JOANNE ROBB

At long last, with a 32-bit version of 1-2-3, SmartSuite is completely Windows 95 savvy. Our first take on the new version? It's a strong second to Office 97.



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Any of the three major suites on the market today—the \$399 SmartSuite 97, the \$499 Office 97, and Corel's \$395 WordPerfect Suite 7—are good buys. In one box you get just about all the applications you should ever need to run a small business or home office. The number and quality of programs you get for your money is pretty amazing, considering that only a few years ago just one major app might cost as much as a suite does now.

### TIME TO UPGRADE

USERS OF 1-2-3 and Freelance Graphics—SmartSuite's spreadsheet and presentation graphics programs—will be most impressed with this upgraded suite. The new 1-2-3 benefits enormously from the addition of Lotus's InfoBox, which is already present in other SmartSuite applications. A floating, interactive dialog box, the 1-2-3 InfoBox turns the most arcane spreadsheet tasks into clear, easy-to-apply choices. 1-2-3 is now easier to use than Excel and nearly as powerful. The Windows 95 upgrade of Freelance isn't as dramatic, but it's still the best presentation graphics package available and the only SmartSuite application that tops its Microsoft counterpart, hands down.

SmartSuite also remains the teamwork expert. By incorporating group editing into 1-2-3 and working tightly with Lotus Notes, SmartSuite is the best suite for people who need to work together on documents, spreadsheets, and presentations.

### LIVE FEEDS FROM THE INTERNET

FOR PUBLISHING TO and accessing the Internet, we'd say SmartSuite—which incorporates some unique tools—now ranks as the second best, after Office. For

example, SmartCenter, SmartSuite's desktop management utility, organizes URLs for quick access to favorite Internet sites.

SmartSuite is fairly easy to learn, but Office is easier, especially for higher-end tasks. For instance, Office's Access has a Table Analyzer Wizard that suggests how to divide a large table into a group of smaller ones. Typical of SmartSuite, however, when you divide tables in Approach, you have to rely on the on-screen help and your own intuition. Of all Lotus's applications, only Freelance Graphics handles difficult jobs better.

SmartSuite could make it a little easier to accomplish the simpler stuff, too. For instance, you can't just create a global style in a Word Pro document; you first have to set up a document, then create and save the style. And call us picky, but the SmartSuite thesaurus could use some consciousness raising: When you type in "man," it gives you several synonyms. When you type in "woman," you get an error message. Sometimes it's just the little irritations that set the suites apart.

### NO SHAME IN SECOND BEST

NOW THAT IT HAS acceptable speed and all its applications are compatible with Windows 95, SmartSuite has a real chance of success. We had trouble getting a few of the features in the beta version to work properly, but Lotus said these problems would be fixed in the final product.

Once we've received and checked out a shipping version of SmartSuite 97, we'll post the results of our timed speed tests on our Web site. You can find them at <http://www.pcworld.com/mar97/suite>. Look for our review of version 8 of Corel's WordPerfect Suite in an upcoming issue.



## WORD PRO 97

### Better Performance and the Best Workgroup Tools

By George Campbell

#### What's Hot

Improved Web tools; linked frames

#### What's Not

No equivalent to Word's Web wizards; confusing menus

WORD PRO 97 gets a "B" for effort. Lotus has done a nice job of smoothing the kinks out of the latest version of this Ami Pro replacement and adding a few new features. Current users should definitely upgrade. But overall, Word Pro is not dramatically improved. Its workgroup tools are still the best of any word processor, but Word 97 remains the better program.

Some of Word Pro 97's refinements may seem minor, but they make the program much easier to use. While Word Pro 96 was slow and crash-prone, this upgrade is faster and seems to perform better. Document loading times and transitions between the regular and the page sorter view, for instance, were faster. It seemed more stable, too. Word Pro 96 had all kinds of annoying problems: The hourglass was missing so you never knew if the program was responding, and video conflicts often caused crashes. Unlike Word Pro 96, the new version doesn't feel as if it's about to break; it behaves the way a program should.

If you're new to Word Pro, you'll appreciate the tools it provides for easing the transition from Word and WordPerfect. Lotus wasted no time in providing filters for all the latest word processors, so you

### Application for Application: Are They Worth the Upgrade?

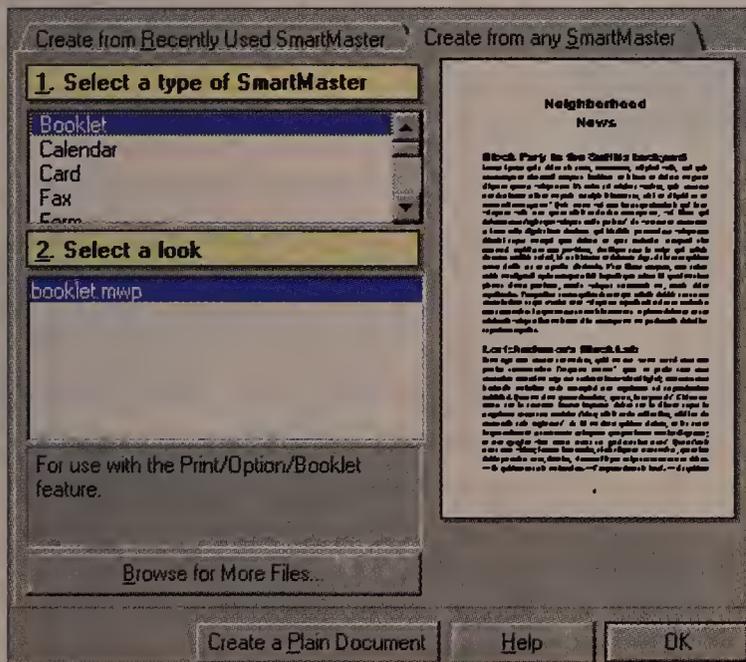
Application/ upgrade price	Is it worth the upgrade?	Is it better than Office 97?	Comments
Word Pro 97 \$105	Yes	No	Word Pro 97 is faster and more stable than the previous version, but it's still not as thoughtfully designed as Word 97.
1-2-3 97 \$105	Definitely!	No	With InfoBoxes, 1-2-3 takes the lead in spreadsheet ease of use, but it still lacks Excel's power.
Freelance Graphics 97 \$105	Probably	Yes	Freelance has always been the best presentation product; if you want to publish to the Web, make the upgrade. Though Microsoft's PowerPoint has some good features, it still can't compete.
Approach 97 \$105	Probably not	No	This is a minor upgrade, geared mainly to people who create Approach databases. If you're buying for the first time, Access's tools are still more powerful.
Organizer 97 \$49	Yes	It depends	Though Outlook is best if you want very tight integration into the suite, Organizer is the best stand-alone PIM.

can convert dozens of formats to Word Pro 97. To make the transition from another word processor, Word Pro's SwitchKits have also been improved to help you learn Word Pro's menus. However, the SwitchKits still aren't as easy to use as Word's real-time command translation for WordPerfect, which teaches you Word as you simultaneously use WordPerfect commands.

## GOOD NEWS FOR DESKTOP PUBLISHERS

WORD PRO 97 offers some helpful new tools for people who like to use their word processors for publishing projects. The most important improvement is that you can now link frames, which are containers for text and graphics that can be moved or formatted independently. If you're creating a newsletter, for example, linked frames would allow you to automatically flow text from a frame on the first page to a frame on the third page. Word, which calls its frames text boxes, also allows you to flow text, but its frames aren't nearly as flexible. For example, unlike Word Pro, Word doesn't let you put multiple columns in a single frame.

Like WordPerfect, Word Pro now lets you create and print folded booklets. The



**WORD PRO 97 SMARTMASTER** templates help you create almost any type of document, including folded booklets.

template for this task was still clearly in beta code: I had some trouble printing the booklet correctly. Still, I have to give Lotus credit. Word 97 doesn't include any tools for booklet making, and WordPerfect's tools are overly complicated.

## THE WEB AND OTHER GROUP WORK

THE FIRST VERSION of Word Pro had some Web tools; with them, you could open files from the Internet and even convert work into HTML format, but you couldn't easily post documents to a server. This upgrade, though, gives you all the tools you'll need to create and maintain Web pages. It adds Web tools in a SmartIcon toolbar and allows you to create an HTML document rather than just converting existing ones. You can also use Word Pro to fetch documents from the Internet: Just type the address into the HTML toolbar, and the page appears as an editable document in Word Pro. Word Pro also has a small set of well-designed SmartMaster templates that make it easy to create interactive forms for a Web site. However, Word's Web Page Wizard is still the best tool for design, because it leads you through the process of choosing and using the best template.

Setting up a complex workgroup project is still easier in Word Pro than in any other word processor: For instance, you can set access levels and workgroup limitations without help from IS. Tight links to Notes make it easy for Notes users to distribute group documents.

## WHICH WORD PROCESSOR WINS?

WORD PRO STILL lags behind Word 97 in some areas. It doesn't include the same comprehensive automation: For example, Word Pro's grammar checker doesn't work as you type. Worse—it's not installed automatically, so if you want it, you have to run a custom installation.

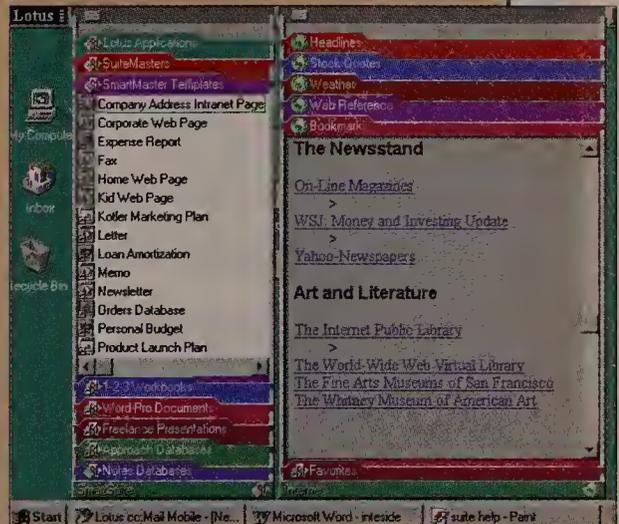
Two groups will benefit from this updated version of Word Pro: current users who want improved performance and workgroup leaders who need project control. For Word and WordPerfect users, though, there is little reason to switch and learn a new program: While Word Pro is a good word processor, only its workgroup tools are standard setters. ▶

# INTERNET TOOLS

## SmartSuite Offers Smart Browsing

By Peter Scisco

THE INTERNET CAN BE a valuable ally, both for finding and disseminating information. Though Office 97 generally has the best tools for using the Internet,



THE SMARTCENTER has single-click access to a host of files, including your favorite Web sites.

SmartSuite has features that earn it honorable mention.

Among suites, SmartSuite takes a unique approach to retrieving and organizing crucial Internet information. The Internet drawer on the SmartCenter toolbar, for instance, stores your Explorer favorites and Navigator bookmarks, gives you access to Internet indexes and directories, and lets you receive updated stock quotes and local weather reports directly on your desktop, using a proprietary minibrowser.

Nifty features aren't confined to the SmartCenter, though. In any SmartSuite document, except in Organizer, you can highlight text—say, the words *PC World*—and click the *Perform Internet Search* icon; SmartSuite launches your browser and does a search on the selected term.

Without a doubt, SmartSuite 97 makes it easier to browse the World Wide Web. With the SmartCenter tools and the ability to search selected text in SmartSuite applications, you have one-click access to information on the Internet that's relevant to your work.



## 1-2-3 97

### A New Interface Makes Spreadsheets Easier

By Richard Scoville

#### What's Hot

InfoBoxes; total function automatically builds sums

#### What's Not

OLE links to Approach are cumbersome; still missing essential features found in Excel and Quattro Pro

A BREAKTHROUGH interface innovation and a host of new features make the first Windows 95 version of Lotus 1-2-3 an attractive upgrade, and perhaps the easiest-to-use spreadsheet. For power spreadsheet users, it's still no match for Excel, but for average users, 1-2-3 97 is a viable alternative. In fact, it now leapfrogs over Quattro Pro into second place.

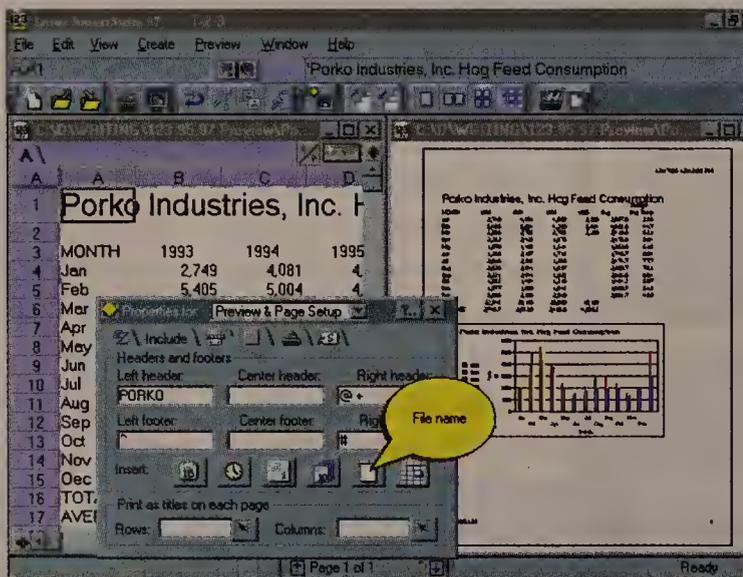
#### INFOBOXES: DIALOGS DONE RIGHT

AN INTERFACE is a funny thing. Small changes can turn an incomprehensible widget into a really cool tool. Remember how no one but UNIX geeks could navigate the Internet before Mosaic came along? For years, designers have come up with tricks to make spreadsheets easier to use, but as programs became festooned with features, even the easiest interfaces became cluttered and confusing. 1-2-3's InfoBoxes may change all that.

Lotus's unique InfoBoxes—which made their appearance in other SmartSuite 96 applications, but are only now part of 1-2-3—are pop-up, context-sensitive, tabbed dialog boxes that let you change properties in real time. Suppose you've just created a new chart. As you click on parts of the graph, the InfoBox shows the name of the selected object and all of its properties. Dialog tabs lead to choices for fonts, colors, tick marks, axis scaling, and so on. And the InfoBox's context sensitivity never gets confusing: You can change only features you're directly working on. Because your selections take effect immediately, you can swiftly adjust the properties of the object until you get the effect you want.

Other pleasing enhancements bring 1-2-3 up to speed with competitors. As you already could in both Excel and Quattro Pro, you can now set worksheet titles with the mouse and edit cells within the titles area. And even easier than an AutoSum feature, you can now create sums for a table of data simply by typing the word **TOTAL** in the next row or column.

For more skilled users, though, many infuriating shortcomings remain: You still can't paste a set of numbers into discontinuous ranges. And when you print a



1-2-3's PRINT PREVIEW FUNCTION IS REALLY UNIQUE: use the InfoBox to adjust the page setting and see the changes immediately in the Preview window.

report using page titles, you have to select a print range that doesn't overlap the column and row you've set for the titles.

#### OLE OR OH, BROTHER?

ALTHOUGH 1-2-3's interface-lift and improved tools make it attractive to ▶

## SMARTSUITE INTEGRATION

### Tighter Across the Board

By Cathy Kenny

SMARTSUITE 96 was something of an embarrassment: Certainly, no other vendor has ever lumped programs based on two different operating systems together in one box and called it an integrated suite. By upgrading 1-2-3 and Organizer to Windows 95, SmartSuite 97 takes care of the old version's biggest integration problem.

All the applications now sport a similar menu structure and similar toolbars. The status bar provides comparable functionality in each application. And all the programs now use InfoBoxes—Lotus's innovative all-in-one formatting tool—as well as the LotusScript programming language. In addition, SmartSuite is the only suite that includes comprehensive desktop management tools: SmartCenter acts as a warehouse for storing documents and applications and as a location where you can easily manage your schedule and address book. It also has a Reference drawer, which provides single-click access to the dictionary and thesaurus and a Suite Help drawer, which provides help on how to use the applications together.

Despite these improvements, though, SmartSuite's integration capabilities trail behind those of Microsoft Office, which includes features like Binder that lets you collect multiple documents in one place. Also, despite SmartCenter's Suite Help, we would like a universal help system, rather than the disparate help systems found in each application. In addition, SmartSuite needs to get up to speed when creating cross-application documents: While Corel's QuickTasks walk you through the process of creating such documents, in SmartSuite you have to fumble through the Suite Help to find the information you need.

Though SmartSuite 97's integration is more tightly knit than before, Lotus still has a few hurdles to overcome before they are truly well integrated.

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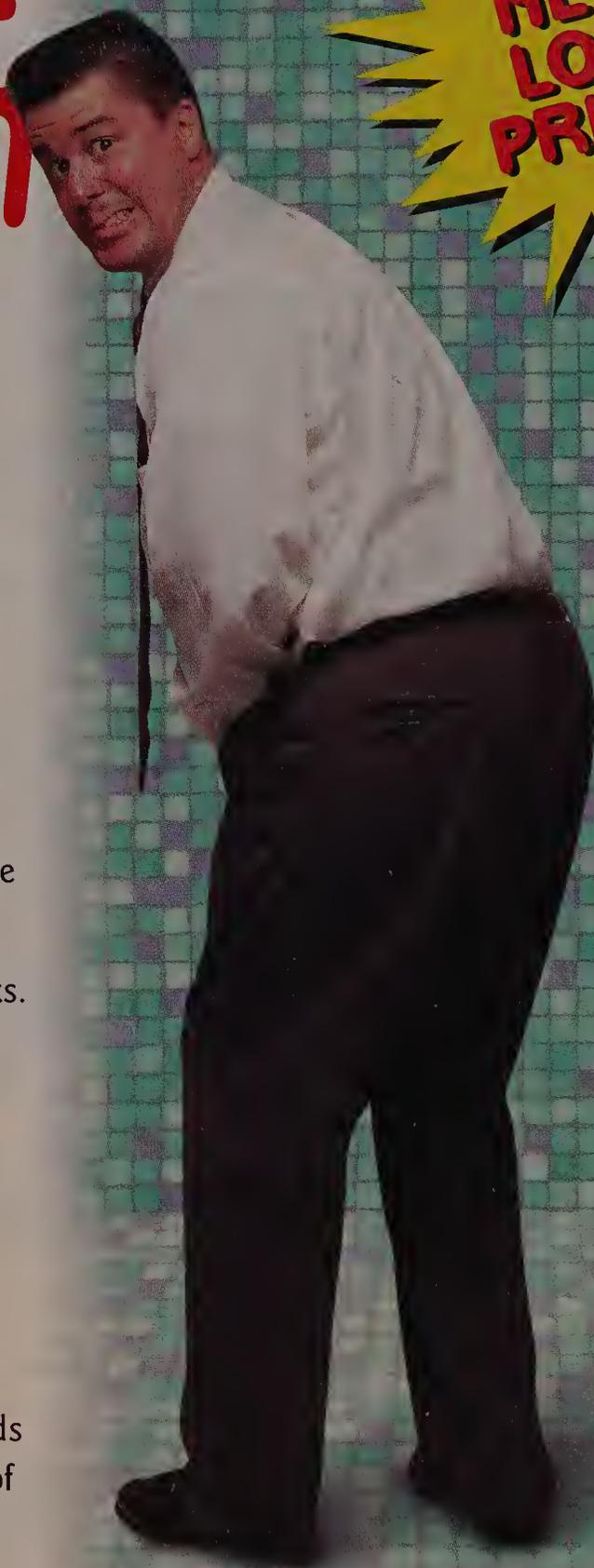
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occasional spreadsheet users and novices, it still trails Excel in power features. For one thing, sharing database data with the spreadsheet actually has become harder. Lotus seems to think that OLE links to Approach are now the best way to bring in database information, which is particularly odd since even Microsoft has passed over OLE in favor of Excel's Autofilter feature. The innovative database query objects that appeared in releases 4 and 5 have been supplanted by a kludgy embedded Approach query view. It's slow, and using the data returned by the query is very cumbersome. What's more, 1-2-3 still relies on an OLE link to Approach for cross-tab reports; with that method, you can't even reference the data in formulas.

Revenue	Q1	Q2	Q3	Q4	Total
Book Publishing	\$116,303	\$116,052	\$123,812	\$119,217	\$475,384
Electronic Pubs	75,510	117,750	80,670	126,330	400,260
<b>Total</b>	<b>\$191,813</b>	<b>\$233,802</b>	<b>\$204,482</b>	<b>\$245,547</b>	<b>\$875,644</b>

**IN 1-2-3, CREATING TOTALS is even easier than an AutoSum button: Just type TOTAL, and the numbers fill in.**

As Excel has shown for several years now, automatic subtotals and outlines are a handy, no-sweat way to prepare summary reports from a spreadsheet database. As a good student of a good product, 1-2-3 now includes an outline feature that lets you collapse rows or columns so you can view or print selected summary data. Unfortunately, this outline tool lacks an automatic subtotal feature like Excel's, making outline setup an awkward, one-group-at-a-time process.

The really big news for advanced users and dedicated Lotus shops is LotusScript, a Visual Basic-like programming language that is comparable to Microsoft's VBA. A special script-editor window features an object browser for looking up object properties and command syntax, a full set of debugging tools, and a separate dialog box editor. Trained programmers will welcome this kind of power, but they will also find that their applications are constrained by the inherent limitations of

1-2-3's object model, which doesn't allow them to identify objects easily.

### SHARING SPREADSHEET DATA

IN KEEPING WITH Lotus's push to sell Notes to the corporate world, the new 1-2-3 sports a host of ways to integrate spreadsheet data into Notes databases. And the workgroup tools allow a Notes shop to interactively share individual workbook pages via a Notes database. Say the group puts expense forms into a database that then feeds into a budget summary sheet; as they input data, the budget summary would be updated dynamically.

Like Quattro Pro and Excel, 1-2-3 now offers a bevy of Web features. You can, for instance, save a workbook to an FTP site.

And you can save a worksheet range as an HTML table without setting up a separate workbook as in either Excel or Quattro Pro—handy for Web site builders.

### UPGRADING GETS THE THUMBS UP

EXCEL STILL leads the pack when it comes to features for intermediate and advanced users. But for ease of use, 1-2-3 97, with its InfoBoxes and other interface improvements, is second to none. And its tight Notes integration makes it a natural for committed Notes organizations. On balance, the new 1-2-3 takes a giant step toward making spreadsheeting easier and more intuitive. For current 1-2-3 users, 1-2-3 97 is a must.



## FREELANCE GRAPHICS 97

### The Best Gets Better

By Cathy Kenny

#### What's Hot

Additional multimedia-enhanced SmartMasters; improved Web publishing tools; ability to run remote presentations in multiple locations

#### What's Not

Setting up screen shows takes work; multimedia special effects more difficult to find than in PowerPoint

DESPITE STEADY improvements in Microsoft's PowerPoint, Freelance Graphics will hang on to its title of best presentation graphics package for a while longer. PowerPoint 97 is getting closer to seriously competing with Freelance, with additions like its animation toolbar and easy screen-show transition effects. But Freelance 97 maintains a healthy lead with enhancements such as useful new SmartMaster templates, better Internet publishing capabilities, and other ►

## ScreenCam 97

### Your Computer Will Be in Movies

By JoAnne Robb

READY! AIM! CLICK! With SmartSuite's nifty little ScreenCam application, you can record minimovies of your cursor cruising through any application you have open. True to the cooperative-computing theme of the suite, ScreenCam 97 now lets you provide these demonstrations over the Internet, your intranet, or even e-mail. If end users don't have ScreenCam, you can save your files as executables so anyone can view them.

But ScreenCam is also fun. You can rearrange segments at will, record your voice with the movie, or—to save space—add captions. Though the copycat Camcorder in Microsoft's Office 97 is similar in look, feel, and functionality to ScreenCam, the original is still the best: While you can save your ScreenCam movies as bulky AVI files, Lotus also has a proprietary format that runs well on lower-end systems. Microsoft—less considerate of your PC's limitations—lets you save your files in AVI format only.

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## Five ways to capture

### High Resolution, Sharpness and Color Accuracy...

That's what you need to capture a quality image with a digital camera. The RDC-2's advanced design supports these requirements, as well as offering exciting features that let you go beyond just taking stills. Now you can bring your images to life by capturing the movements and sounds of your subjects.



**Still Mode** captures high res images in vivid 24-bit color. Exclusive macro capability lets you take pictures as close as 1cm away. **Document Mode** utilizes a sharpening filter to capture razor-sharp images of text and graphics.



**Still with Sound Mode** allows you to take a picture while recording 10 seconds of digital sound. **Sound Mode** uses the RDC-2's built-in microphone to record pure digital sound in 8-bit, 11kHz WAVE file format.



**Continuous Shooting** records the movements of your subject in 1 second intervals. Play back as *QuickTime* or *AVI* files. (Requires use of PC cards to transfer data to your computer.)

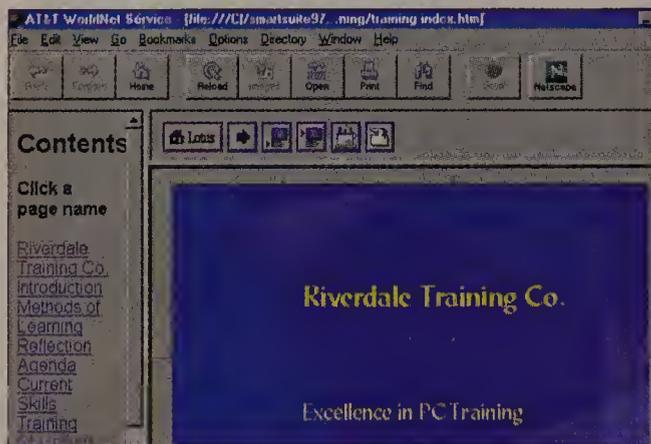
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## BRAND NEW LOOKS

FREELANCE HAS ALWAYS had a wider selection of presentation templates than either PowerPoint or Corel Presentations. This version adds 14 new templates, for a total of 130 different looks. Eleven have built-in multimedia special effects, so you can whip up screen flashes and sound effects. It's still easier to choose a template in PowerPoint, though. Finding the look you want in Freelance can be overwhelming since all the templates are lumped together in a single listing.



**FREELANCE OFFERS SUPPORT** for frames when publishing to the Web. Also, each slide's title appears along the left side of your screen for easier navigation.

As any veteran speaker knows, you can't keep your cool during a presentation unless you have your notes close by. Freelance 97 comes to the rescue—its index card-style speaker notes now hold an unlimited amount of text. Unfortunately, Freelance's speaker notes feature doesn't have an Undo command, so you have to be careful when editing your notes.

The TeamShow feature introduced in Freelance 96 let you run a screen show in one remote location; Freelance 97 provides support for running a screen show at multiple sites, so Human Resources could inform both the Seattle and Boston offices about the new benefits package. Freelance lets you run the show in a number of different ways: over the Internet, via your local area network, or by direct connection. The presenter chooses *Send* and the people watching the show click *Receive*. If the recipients don't have Freelance, they can download the mobile screen-show player from Lotus's site. Although PowerPoint also has remote

presentation abilities, they are more limited. With Freelance, you can have speaker notes appear only on the presenter's machine so the audience can't read them.

## FREELANCE DOES THE WEB

FREELANCE 96 introduced tools for publishing presentations to the Web, but the process required that you search through menus to find the needed tools. In Freelance 97, Web publishing couldn't be easier. You simply select the *Publish to Internet* command and Freelance takes care of the rest. Freelance now supports frames, so when you publish a presentation to the Web, the title of each slide and your speaker notes are displayed on the left side of your screen. If you want to bring the Web to your presentations instead, just attach a URL to any object in your show. To launch the Web site you click on the object. And in keeping with Lotus's workgroup tools, the program is more tightly integrated with Notes, so you can open presentations from and save them to a Notes database.

## WORTH THE UPGRADE

IF YOU'RE A DEVOTED PowerPoint or Corel Presentations user, you're probably better off sticking with what you know. But if you're already using Freelance Graphics 96, upgrading to Freelance 97 is a good idea, especially if you want to make your presentations available on the Web. Freelance is not only the best presentation product on the market, but its single-step Web publishing feature is easier to use than PowerPoint's multiscreen wizards. Buying your first presentation product? Even if you don't care about Web publishing, you should still pick Freelance for its selection of templates and limitless speaker notes, among other good features. As an all-around presentation graphics package, Freelance is still the best.



## APPROACH 97

### Small Changes for Database Designers

By Celeste Robinson

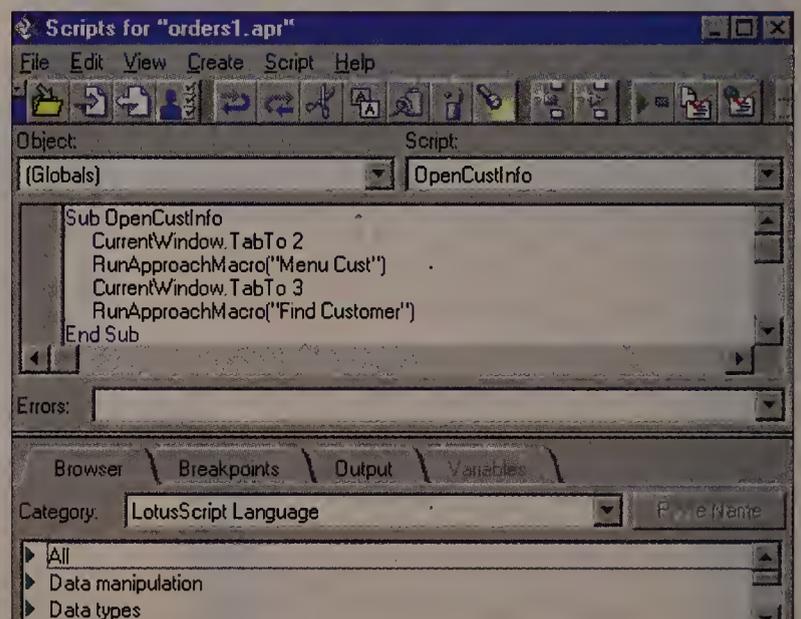
#### What's Hot

New automation tool to record macros; easier to manage custom styles for design objects

#### What's Not

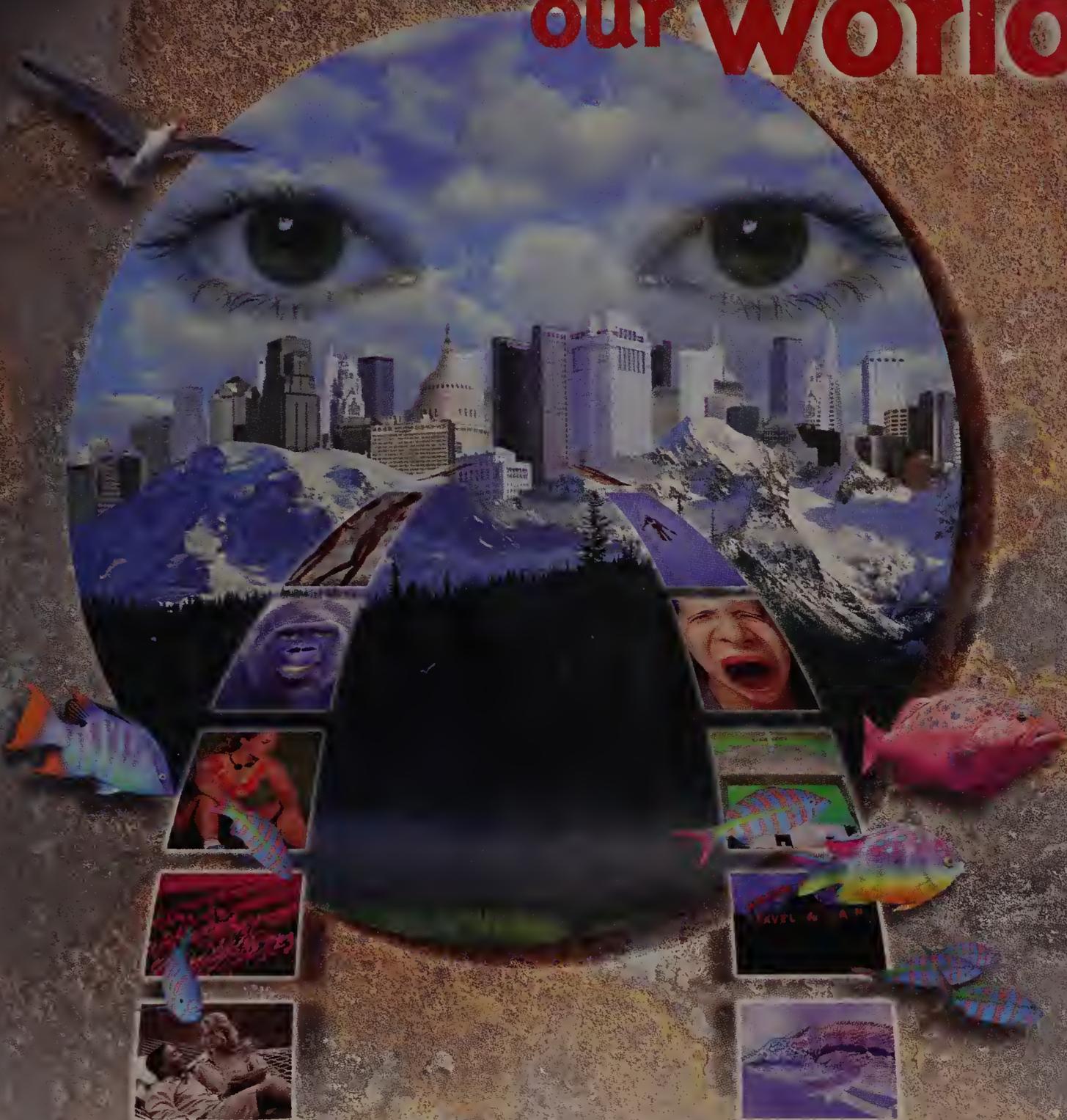
Not as many helpers as Access; new features helpful only for designers, not average users

ALTHOUGH APPROACH has always billed itself as an end-user application, the new features in Approach 97 are really for those who do the down-and-dirty design work. A relatively minor upgrade, this new version lets you publish data to the Internet, record keystrokes to automate tasks, and manage styles for design objects. If you're a database designer, you'll appreciate these additions. But if you're a casual user of Approach or ►



**EASY AS ONE, TWO, THREE:** This script is an example of what you can do with Approach 97's new macro recording feature.

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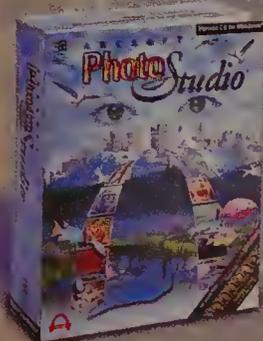
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use Access or Paradox, these new features are not enough to warrant a switch.

I like now being able to record my actions as I perform tasks, especially since neither Access nor Paradox incorporates this capability. With this feature, I created a macro to open my database to the correct form without pointing and clicking through a macro builder or writing code. And the tools were easy: I built my macro without using the help files.

In addition, Approach now includes a tab for Named Styles in the InfoBox. This lets you create and change your styles for design objects easily, instead of digging through menus. Although Approach was the last of the three suite databases to add this feature, it's done the best job of keeping things simple. In Access the location of the Style tools isn't at all obvious, and in Paradox I had to use the help files to do the job properly.

Approach 97 leapfrogs over Paradox and joins ranks with Access 97 by adding an Internet toolbar. You can use it to publish any of the various Approach views—a form, report, or chart—to the Internet, or open or save them as Internet documents. But the Net tools are otherwise disappointing: Unlike Access 97, there is no step-by-step wizard to help create Web publications or ready-made HTML templates for formatting Web pages.

Overall, I'd say Approach 97 is a worthwhile upgrade only for people who create Approach applications, for folks who want to publish Approach data to the Web, or for users who design their own macros.



## ORGANIZER 97

### PIM Gets Up to Windows 95 Speed

By Peter Scisco

#### What's Hot

Ability to edit documents from inside Organizer;  
Web calendar for Internet group scheduling

#### What's Not

No direct Internet access; doesn't share all  
SmartSuite tools

ORGANIZER HAS always been easy to like. Its notebook-planner metaphor is familiar and easy to learn. Ever since SmartSuite 96 shipped with the old Windows 3.1 version of Organizer, I've been eager to see how Lotus would improve this personal information manager.

Some of the biggest changes in Organizer are designed for people who live inside their PIM: For instance, you can link your Organizer file with the SmartCenter Addresses and Calendar drawers for instant access to your schedule. Another

substantial improvement comes in Notepad. With its OLE 2.0 support, you can now embed any OLE-supported objects in the Notepad and edit them without stepping outside of your PIM, which is a convenient way to keep track of documents. Despite OLE support, though, Organizer's automatic tracking tools don't equal those in Outlook 97, Microsoft's Exchange/Schedule+ replacement; Outlook includes tools like Outlook Find, which lets you search for text in any document you've created in Office.

OLE support will let you track

Web sites in the Notepad, but it's a kludgy process. Unlike some PIMs such as Sidekick, the Organizer Notepad doesn't recognize stored URL text as a live link.

Not all of the Internet connections are weak. Using Lotus's free server-based Web Calendar, which comes on the SmartSuite CD, Organizer 97 users can share scheduling information with coworkers. Once Web Calendar is on the company server, employees can access and distribute calendars from within the Windows 95 Internet Explorer 3.0, Navigator 3.0, or over the company intranet.

There are other small but important improvements worth noting: The calendar view now displays appointments as colored blocks. And though Organizer now has the Internet toolbar that all the other SmartSuite applications have, it's missing the tool that allows you to run a Web search on highlighted text.

Organizer 97 is certainly better integrated into the suite. The previous version of the PIM wasn't multithreaded, meaning that it would launch Word Pro whenever you started a letter in Organizer, even if the word processor was already run-

### Where to Buy

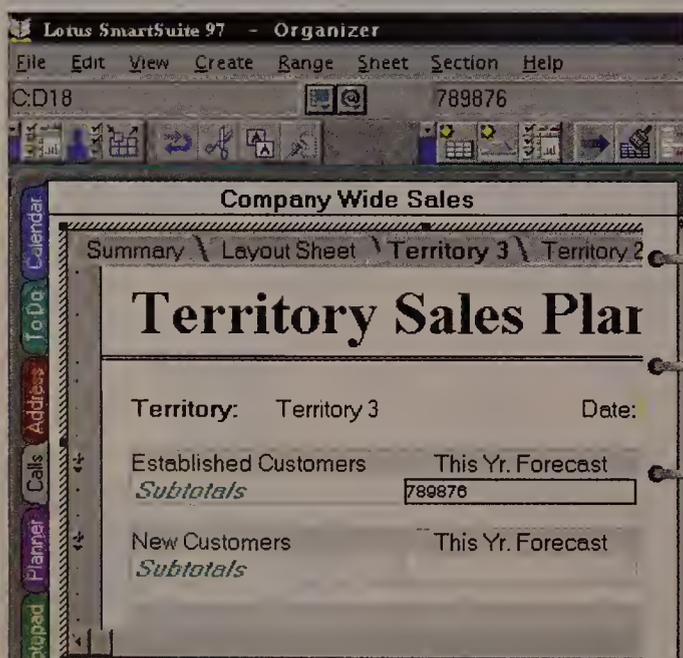
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ning. Though my beta version couldn't recognize open applications, Lotus says this will be fixed in the suite's shipping version.

Overall, Organizer is worth the upgrade. In fact, as a stand-alone PIM, I would definitely choose Organizer over either Sidekick or Outlook. I prefer its notebook metaphor to Sidekick's list-heavy look. Though Outlook is useful if you need tight integration with the other Office applications, in my opinion it's far too rigid and has more features than I need.

*George Campbell, Celeste Robinson, and Richard Scoville are contributing editors to PC World; JoAnne Robb is an associate editor. Freelance writers Cathy Kenny and Peter Scisco are frequent contributors.* ■



OBJECTS IN ORGANIZER 97'S Notepad can be edited because of new support for OLE.

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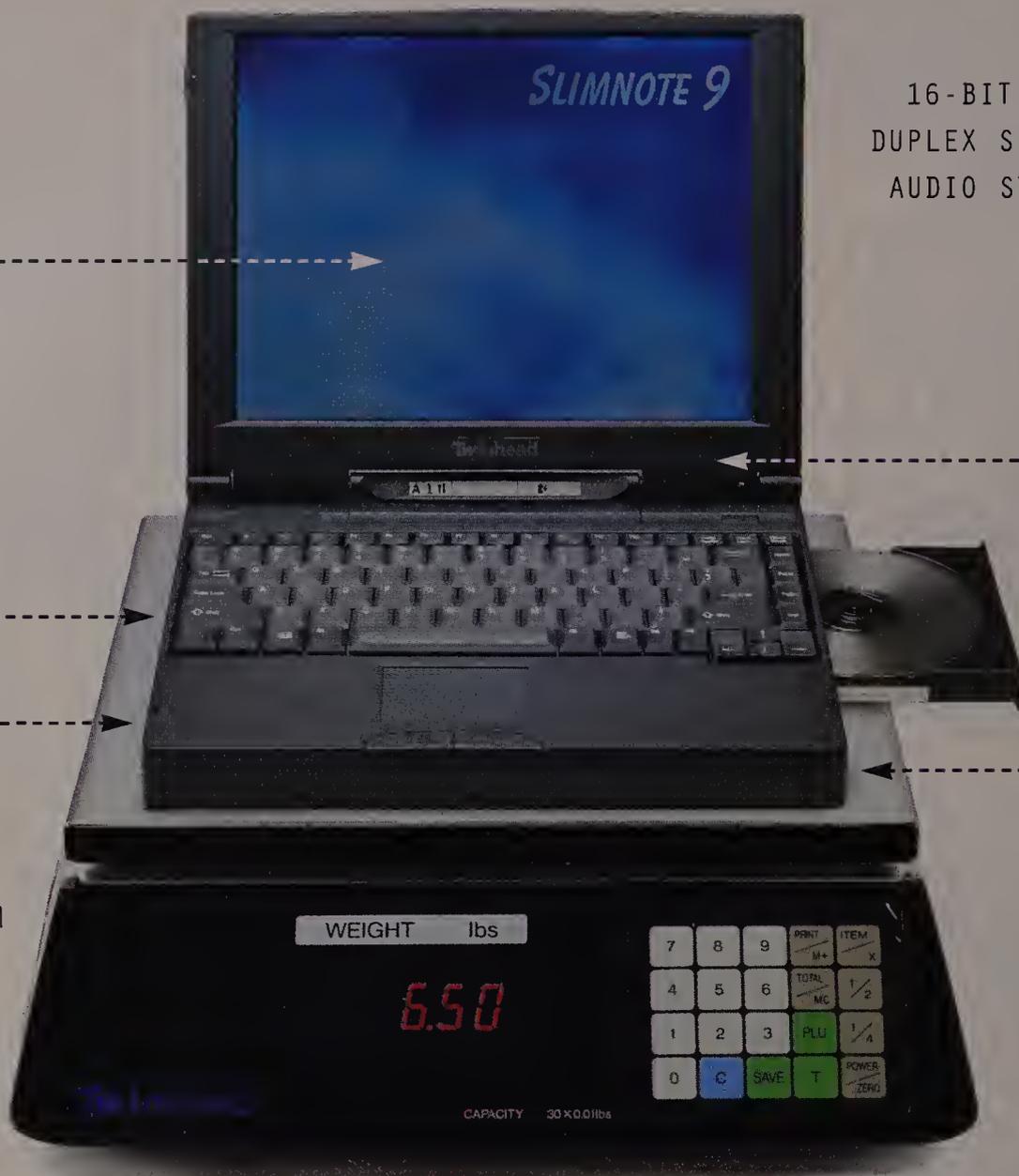
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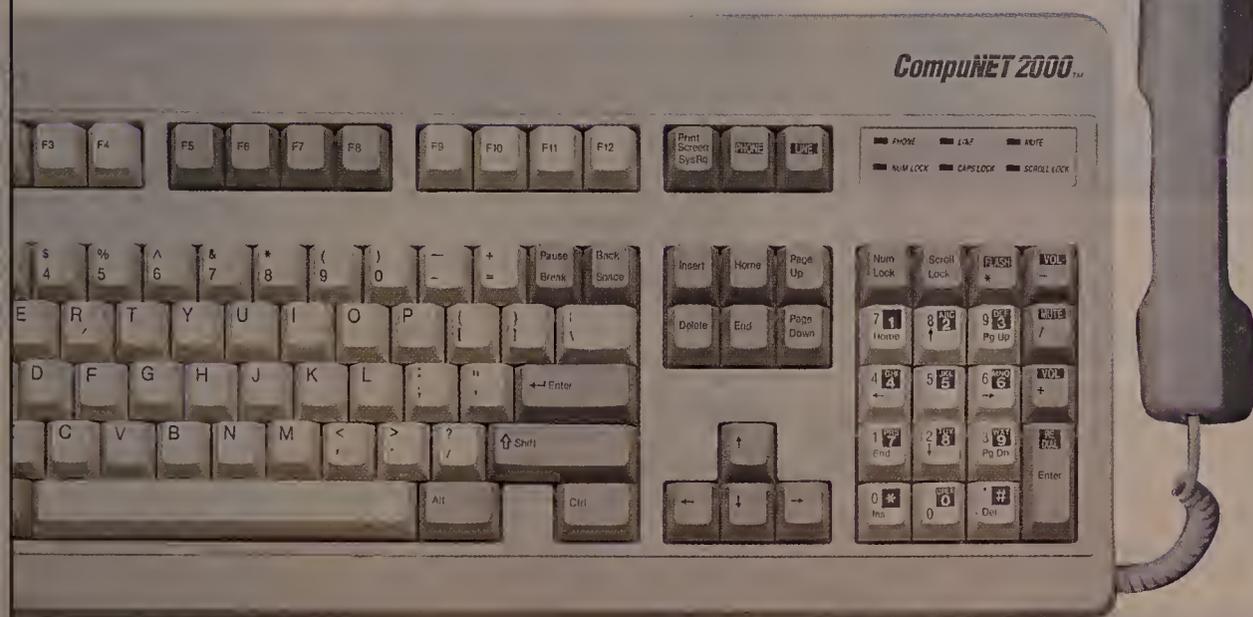
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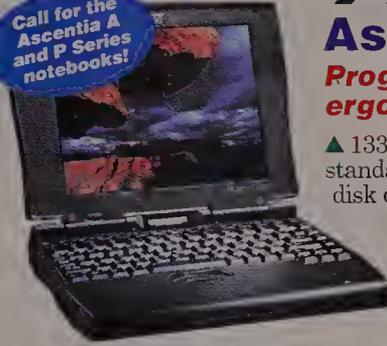
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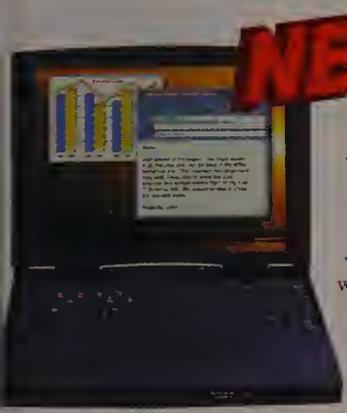


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- 10X CD-ROM drive
- 12.1" active-matrix TFT color display
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- 2GB removable hard drive
- 10X CD-ROM drive
- 13.3" active-matrix TFT color display
- Integrated 28.8K bps (V.34) modem
- Telephony features: full duplex speakerphone, telephone answering machine
- Noteworthy Video Conferencing kit includes color video camera, CardBus Capture Card and Intel ProShare software

**\$6279.76** CDW 80958



### Satellite 200CDS

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- 11.3" dual-scan SVGA color display

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# VIRUS

ANTIVIRUS

COMPUTER VIRUSES ARE COMING SOON TO A PC NEAR YOU.

# KILLERS

DON'T GET PARANOID, GET ANTIVIRUS SOFTWARE.

BY STAN MIASTKOWSKI

SOMETHING'S UP WITH YOUR PC. Something bad. It's raining characters in your word processing document. Or perhaps you just received birthday greetings addressed to someone named Joshi. Or maybe you just noticed that half the contents of a directory seem to be missing. Don't look now, but you've got a virus.

Computer viruses are so overhyped in movies and the news, it's easy to shrug them off as one more of life's little risks. Don't. Computer viruses are real, lethal, and coming soon to a PC near you. Thanks to the widespread use of LANs and the Internet, and the advent of macro viruses that spread through e-mail, it's easier than ever for your computer to pick up a nasty bug (see "It Could Happen to You"). If you're lucky, all you'll lose is the time it takes to find ►

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ILLUSTRATIONS BY JIM LUDTKE

and eradicate it. But if your PC's caught a bad virus, your data could be terminal. Take One Half, for instance. This common and lethal virus gradually and secretly encrypts the contents of your hard disk, decrypting them for you on demand. One day, it stops decrypting files when you attempt to access them—and also makes the drive unbootable. Then it's bye-bye, data. (For other infamous viruses, see "The Virus Hall of Shame.")

The only way to avoid such disasters is to stop the virus before it can do its damage. As with biological viruses, you can take steps to reduce your risk of infection (we list them in "Tips for Self-Protection"). But your best shield is an up-to-date antivirus utility. Antivirus programs have been around practically since the dawn of the PC, and as you might expect, they've evolved. The first DOS-based packages had primitive detection schemes, separate removal modules, and few automated features. Most of today's antivirus packages not only integrate detection and removal utilities, they're also cheap (most are under \$100), unobtrusive, and effective at finding the latest virus strains. In many cases, a program can also remove the virus and get you back to work quickly.

### A GAUNTLET OF VIRUSES

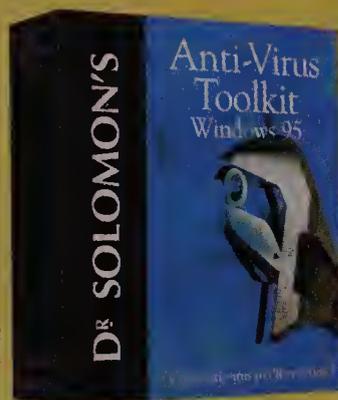
TO FIND OUT WHICH of today's antivirus packages does the best job of detecting and removing viruses, we put seven Windows 95 and two Windows NT antivirus programs through a battery of performance and ease-of-use tests. (Only the Windows 95 programs are fully reviewed here.) *PC World* checked installation, configuration, and general features. To test the programs' virus-catching capabilities, we hired the National Computer Security Association, well-known virus experts.

NCSA tests and certifies commercial antivirus software. All of the programs here, for instance, except ThunderByte Anti-Virus Utilities, are NCSA certified. For our review, NCSA put each program through an unprecedented series of tests even more stringent than its own certification process. Each package went mano a mano with a legion of viruses—2767 in all. Test viruses fell into two main categories: "wild" strains that are known to be actively infecting computers, and "zoo" types that, so far, remain imprisoned in antivirus test labs.

## BEST BUY



DR SOLOMON'S Anti-Virus Toolkit was the clear leader in detecting and removing just about any virus your PC is unlucky enough to catch. Its "Magic Bullet" one-disk emergency solution helps clinch the title. At \$85, Dr Solomon's is a little pricey, but at press time we were told that a \$50 version with a new, simpler interface will arrive soon. This new version has Toolkit's detection technology, but adds online virus updates.



After the last program had sniffed out the last virus, our findings were that most of the packages performed well where it mattered most: Amazingly, they could detect almost every virus. The programs differed most in interface and in virus removal capability.

In the grand scheme of things, virus removal is less important than detection. After all, if a package can't remove a virus, that only means you have to delete the infected file—a relatively small price to pay. Failure to detect, on the other hand, can be deadly, because it allows the virus to plunder unchecked.

Still, it pays to look for a package that does both jobs well and is also easy to set up.

Our Best Buy, Dr Solomon's Anti-Virus Toolkit, for example, provided the best combination of virus detection and removal. Although three other packages had 100 percent detection, they did not match Dr Solomon's virus removal rate of 89 percent. TouchStone's

PC-Cillin II had the next best removal rate—80 percent. We also found that Toolkit was simple to set up and use and more generous with options and automation than any of the others.

Had the shipping version arrived in time for our review, TouchStone's \$50 PC-Cillin II probably would have been our first choice for Best Buy. The beta version we looked at didn't remove as many viruses as Dr Solomon's did, but it performed well overall, and its lively interface made virus detection almost fun. See "PC-Cillin II Is Good Medicine" for our review of the beta.

### WHAT VIRUSES DO

COMPUTER VIRUSES are simply small programs that insert themselves into program files and boot sectors (the area on each floppy or hard disk containing the program

## A WALK ON THE WILD SIDE

WE TESTED the nine anti-virus programs in this review using over 2700 viruses, but most of the big differences between packages lay in how they handled the 131 file viruses known to be "in the wild" (in circulation). Almost all of the packages did a good job of detecting the wild file viruses, but some, like IBM AntiVirus, had a hard time removing them. With the other types of viruses, ThunderByte had the biggest problem: It couldn't remove boot viruses at all.



ANTIVIRUS PROGRAM	Platform	Wild file virus detection (percent)	Wild file virus removal (percent)
Dr Solomon's Anti-Virus Toolkit	Windows 95	100	89
F-Prot Professional	Windows 95	99	78
IBM AntiVirus 2.5	Windows 95	96	32
McAfee VirusScan	Windows 95	93	90
Norton AntiVirus 2.0	Windows 95	100	77
ThunderByte Anti-Virus Utilities	Windows 95	95	60
TouchStone PC-Cillin II	Windows 95	100	80
McAfee VirusScan	Windows NT	92	59
Norton AntiVirus 2.0	Windows NT	100	76

**HOW WE TEST** The National Computer Security Association tested the ability of each package to detect and remove the following: 10 wild boot viruses, 121 wild file viruses (including 13 macro viruses), 2631 "zoo" viruses, and 5 polymorphic viruses that were allowed to cycle through 2000 permutations each. Only wild file virus results are shown here.

# PC-CILLIN II IS GOOD MEDICINE

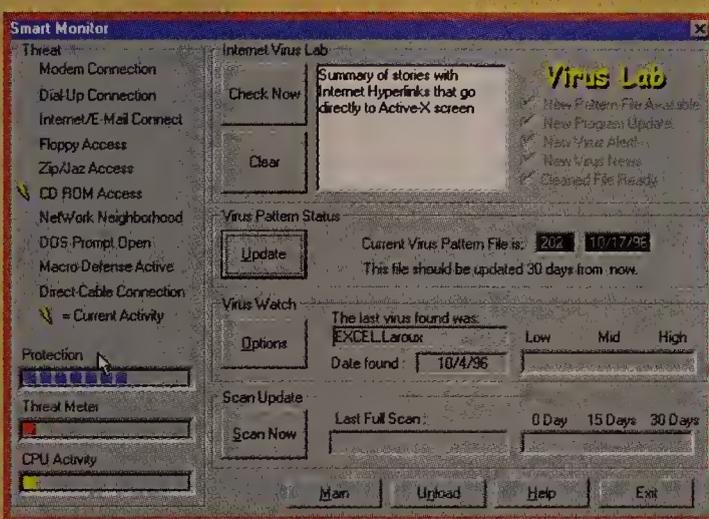
BANG! POW! ZAP!  
TouchStone's PC-Cillin II is a good antivirus package that stands out from the crowd of too-serious competitors with a colorful interface and some unexpected extras.



as F-Prot does, but it works better as an unobtrusive background scanner because it doesn't try to pack everything into one main dialog box. If you

want lots of options, the \$50 PC-Cillin II is a well-designed, low-priced, and effective package. TouchStone Software, 800/531-0450, <http://www.checkit.com>

READER SERVICE NO. 723



**BUSY SCREEN:** PC-Cillin II's Smart Monitor tells how long it's been since your last virus infection or antivirus upgrade; its Threat Meter shows how risky your current PC activity is.

that loads the operating system). Most are activated when you run the infected program or boot from an infected disk, and they immediately start replicating themselves by looking for new files and boot sectors to infect. Like real germs, the most successful and prevalent computer viruses do little except hide, reproduce, and wait for the opportunity to spread to other PCs. Often, the only damage they do is incidental—the result of the author's poor programming.

The computer viruses we fear most—those that destroy files, format hard disks or make them unbootable, or corrupt BIOS settings—are relatively rare. They usually don't spread as rapidly as less lethal bugs because they do such a dandy job of disrupting their host—your hard disk, which you may have to reformat, wiping out the virus in the process.

Antivirus packages typically have a couple of ways to seek their targets. All the programs we tested install a memory-resident Windows 95 virtu-

al device driver (VxD) that loads automatically when you start Windows and works continually in the background to find viruses. Because scanning memory isn't enough (it won't discover viruses in programs you don't run), all the reviewed programs also let you schedule a thorough hard disk scan at a time when you're away from your desk. And most packages offer some additional tricks for finding viruses. All but ThunderByte check inside of compressed files, for instance, and most also track changes in the sizes of executable files, a near-sure sign of infection.

## YOUR SIGNATURE HERE

ALL ANTIVIRUS PROGRAMS refer to a database of virus signatures when checking for infection. So keeping this database current is the surest way to trap new virus strains. All the reviewed programs let you update your signature file, but some make it easier than others. Norton AntiVirus

2.0 and PC-Cillin II do the best job, with free, one-button automated updates via the World Wide Web. With others, you'll need to manually download and install the updates. At press time, only Dr Solomon's hadn't yet jumped on the Web update bandwagon, instead sending disks by mail to subscribers.

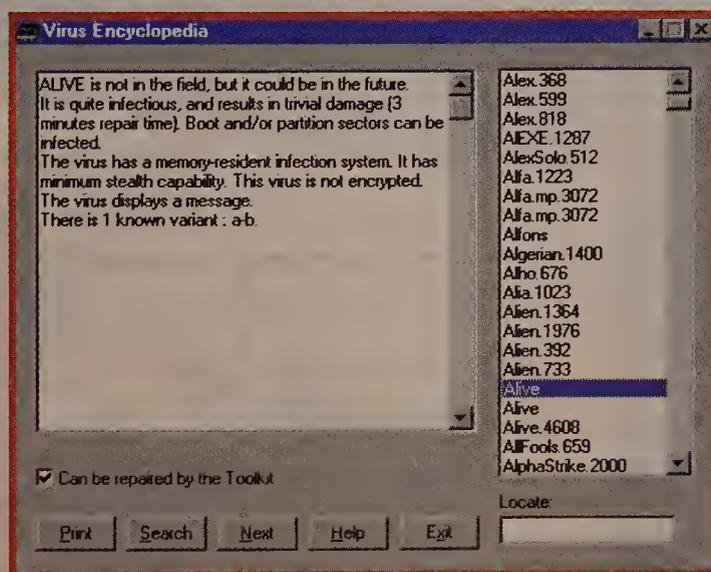
Whichever antivirus program you decide to buy, it's important to choose it soon, to use it regularly, and to keep its virus signatures up to date. Viruses have never been more prevalent, or more lethal, than now. Fortunately, antivirus tools have never been easier to use, or

more potent. The data you protect is your own.

## DR SOLOMON'S ANTI-VIRUS TOOLKIT

**PRO:** Best overall virus detection and removal

**CON:** Fairly expensive; updates available only via subscription disks



DESPITE a somewhat high price, Dr Solomon's \$85 Anti-Virus Toolkit is our Best Buy due to its top-notch performance. Only one other product, McAfee's VirusScan, removed more wild file-infecting viruses in our tests. The program's no-nonsense interface places every antivirus feature you need at your easy disposal, along with a complete on-screen encyclopedia of known viruses and their effects. Roaming virus hunters will appreciate the included "Magic Bullet" bootable floppy disk that lets you quickly seek and destroy a virus on any system.



With the AMD-K5™-PR166 processor,

CyberMax provides its customers a

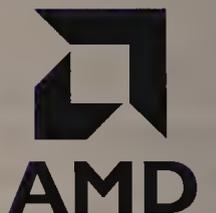
viable alternative: the freedom to choose a Microsoft® Windows® & Pentium-compatible processor solution that offers superior value. The AMD-K5-PR166 processor delivers equivalent performance of a 166-MHz Pentium (chart below), making it the *best* performance value for today's desktop PC users.



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The P-Rating of an AMD-K5 processor is determined in an "apples to apples" system-level comparison. PC system manufacturers utilize this methodology for consistent, objective rates on Pentium-relative performance for Windows applications. And the P-Rating helps end users understand true processor performance equivalences while making their PC buying decisions. For example, if an AMD-K5 processor offers the equivalent performance of a 166-MHz Pentium, it receives a P-Rating of "PR166".

AMD-K5-PR166 CPU (33.5)  
586 at 166 MHz (33.4)



AMD-K5-PR133 CPU (76.8)  
586 at 133 MHz (76.6)



The results are in! The AMD-K5 CPU series outperformed its 586 processor opponents in recent Winstone testing.

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- ◆ 33.6Kbps Fax/Voice/Spkr phone Mdm w/ CyberSpace Pack
- ◆ 17" Princeton Graphics 28dp (16.1"VA) NI Color Monitor
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- ◆ 12x CD-ROM, Ensoniq Wavetable Sound Card
- ◆ Altec Lansing ACS-45 speakers, Microphone
- ◆ The Family Office Multimedia CD Bundle
- ◆ 33.6Kbps Fax/Voice/Spkr phone Mdm w/ CyberSpace Pack
- ◆ 17" Princeton Graphics 28dp (16.1"VA) NI Color Monitor
- ◆ 104-Key keyboard, Microsoft® PS/2 Mouse
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- ◆ 16MB EDO RAM, 512K Pipeline Burst Mode Cache
- ◆ 2.0 Gigabyte HDD, 3.5" High Density Floppy
- ◆ 12x CD-ROM, Ensoniq Wavetable Sound Card
- ◆ Altec Lansing ACS-45 speakers, Microphone
- ◆ The Family Office Multimedia CD Bundle
- ◆ 33.6Kbps Fax/Voice/Spkr phone Mdm w/ CyberSpace Pack
- ◆ 15" Princeton Graphics EO 28dp (13.8" VA) NI Color Monitor
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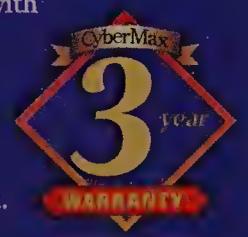
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Circle 74 on reader service card

On the downside, Toolkit doesn't let you download new virus data, and updates are limited to four a year.

As we went to press, the company told us it would soon begin selling the Windows 95 version of Toolkit only as a five-user package for \$349. But starting in mid-March, the company will introduce a new, simpler \$50 version called Dr Solomon's Anti-Virus. Based on a beta we saw, this new package can't scan network drives, but it retains all the features that make Toolkit great for personal use, including the encyclopedia and Magic Bullet disk (renamed SOS). The interface is easier to use, you can do online updates, and monthly updates will cost \$29.95 a year. We haven't run virus tests yet, but the new version has the same detection engine as the Toolkit and should perform as well. We'll test the new version and post the results online. Dr Solomon's Software Ltd., 888/377-6566, <http://www.drsolomon.com>

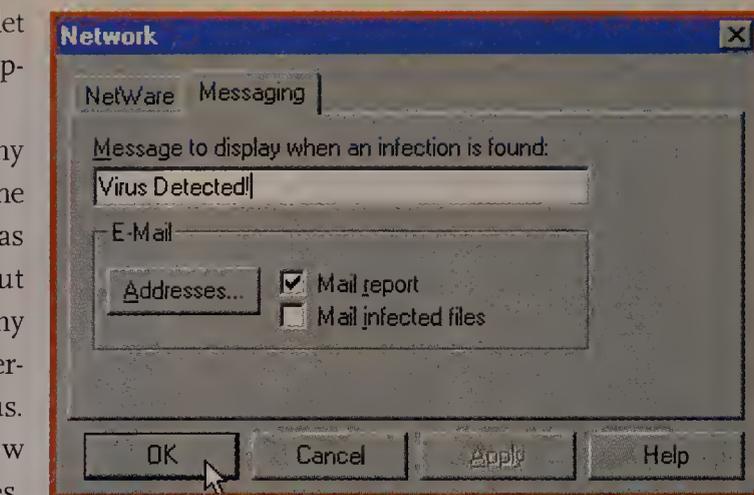
READER SERVICE NO. 724

OF THE 200-ODD computer viruses actually in circulation now, you're likely to encounter only a handful. These are some of the most common:

■ **AntiCMOS** A boot sector virus that spreads when you boot from an infected floppy. This one carries a deadly payload: After the disk it resides on is accessed 256 times, it writes to the computer's CMOS, changing the floppy type and uninstalling the hard disk. Fortunately, recovery is easy if you know what to do—just run the CMOS setup program.

■ **AntiEXE** A trickier boot sector virus that spreads whenever you access a floppy's system area (using the dir command, for example). As far as researchers can tell, it damages only one .exe file. Unfortunately, they haven't yet figured out which file that is.

■ **Concept** The first Word macro virus, now widespread thanks to its ability to circulate through shared documents and e-mail attachments. It doesn't cause damage (a new variation even displays the message



**SEND A MESSAGE:** F-Prot Professional's LAN tools can notify network administrators of viruses as soon as they're detected.

may also want a package that does a better job of virus removal: F-Prot found 99 percent of our file viruses, but it could disinfect only 78 percent of them.

F-Prot's basic feature set is comparable to that of the other reviewed packages. And like ThunderByte and McAfee Virus-Scan, it also allows extensive control over what specific disks, folders, or files to include or

## F-PROT PROFESSIONAL

**PRO:** Near-perfect virus detection; extensive customization options; can send e-mail alert on virus discovery

**CON:** Virus updates require password and reinstallation; mediocre removal capability  
**THOUGH EXPENSIVE** at \$99, F-Prot Professional is an effective and aggressive antivirus utility brimming with options that LAN administrators will love. But if you are using a stand-alone Windows 95 system and want only simple and unobtrusive protection, F-Prot's LAN extras may be too much. You

folders, or files to include or



"Have a nice day!"), but more destructive relatives continue to pop up. For example, Wazzu rearranges words in your document and inserts the word "wazzu" at random; FormatC is a trojan horse macro (it carries a destructive payload but does not replicate itself) that formats your hard disk when you open the infected file.

■ **Form.A** A simple boot sector virus; on the 18th of the month, it marks hard disk sectors as damaged, makes keys beep when you press them, and displays a message we can't reprint in a family magazine.

■ **Junkie** A multipartite virus that doesn't cause major outright damage. It occasionally displays the message "Junkie

Virus—Written in Malmo" and prevents .com files larger than 64K from running.

■ **NYB (New York Boot)** A relatively simple boot sector virus that spreads to other hard drives and floppy disks if you boot with an infected floppy. NYB isn't overtly malicious, but virus experts say it's so badly written that it can inadvertently damage floppy and hard disk boot sectors, preventing your system from starting.

■ **One Half** A multipartite, polymorphic stealth virus (see "Viruses Keep Branching Out") that encrypts hard disk sectors gradually—you don't notice because it decrypts the data when you access infected files. However, when half of your

hard disk is infected, the message "Dis is one half" appears, and decryption ceases along with the ability to boot from the drive. Antivirus software can remove the virus but can't decrypt the data.

■ **Parity Boot** A multipartite virus that doesn't cause any real damage but displays the message "PARITY CHECK" and locks up your PC until you restart it.

■ **Ripper** A malicious boot sector virus that gradually corrupts your hard disk data. Because it happens slowly, you may not notice the corruption until it has already caused serious damage.

■ **Stoned.Empire.Monkey** A boot-sector virus that encrypts hard disk partition tables, making the drive's contents inaccessible. The prognosis sounds grim, and you might assume that you've lost all your data and reformat your hard disk. However, the virus doesn't destroy files. To regain access to the hard disk, you need to run an antivirus program capable of removing the virus.

## IT COULD HAPPEN TO YOU



LEE RICHEIMER DISCOVERED THAT EVEN commercial software is not always free of viruses; with backups, he cleaned up his system.

SOMETIMES, bolting the doors against computer viruses isn't enough. Viruses can find a way around your antivirus moat, and recovery can be difficult.

Lee Richheimer, a dentist in Wells, Maine, discovered that even commercial software isn't safe from viruses. Richheimer's copy of McAfee's free Scan virus detector caught AntiEXE rummaging through his system after he installed a color-matching utility called Colorific for his new NEC monitor. Although Richheimer didn't have a virus-removal program, he's unusually conscientious about doing daily backups, and because the AntiEXE virus generally affects only boot sectors, it didn't damage his program or data files. Richheimer used his

backups to restore a virus-free system. According to NEC, current Colorific floppies are virus-

free, but older copies could still cause problems.

Barrie Shabel, a retired metallurgist, ran into an even nastier problem when his Windows 3.1-based PC suddenly locked

up and refused to boot from the hard disk. After booting from a floppy, Shabel ran McAfee's VirusScan, which showed that his system was infected with KBUG1720, a sophisticated and malicious file virus. Despite VirusScan's above-average virus-removal capabilities, it couldn't get rid of this one.

Shabel took the PC to his dealer, who confirmed the presence of the virus but couldn't remove it even using a different antivirus package. The only solution was a complete reformat of the hard disk and reinstallation of all applications. Because Shabel had backups of all his data files, he was able to get back to work without data loss. But Shabel has no idea where the virus came from, and is now even more vigilant in making backups and keeping VirusScan updated.

### TIPS FOR SELF-PROTECTION

DON'T WIND UP PROFILED in a *PC World* story about senseless virus attacks. The best defense is to make sure viruses can't get to your PC in the first place.

■ **Scan shared floppies.** Boot and file viruses are distressingly common in disks swapped between friends and coworkers.

■ **Set the write-protect tab on floppies** when you're not actively writing to them, and don't leave floppies in the drive. Viruses that spread by infecting the system area of a floppy disk are

the most common, and some even periodically check the floppy drive for an easy victim.

■ **Don't download and run.** Although the major online services are usually careful to check all downloadable files for viruses, the World Wide Web is a wild frontier. Major companies are likely to scan their files before posting them, but you can't be sure. For safety, scan downloads before you run, install, or unzip them.

■ **Back up regularly.** Regular back-

ups are crucial because some viruses cause damage that antivirus programs can't repair. Low-priced tape drives make this easier (see last month's "Better Safe Than Sorry"), but backing up requires discipline.

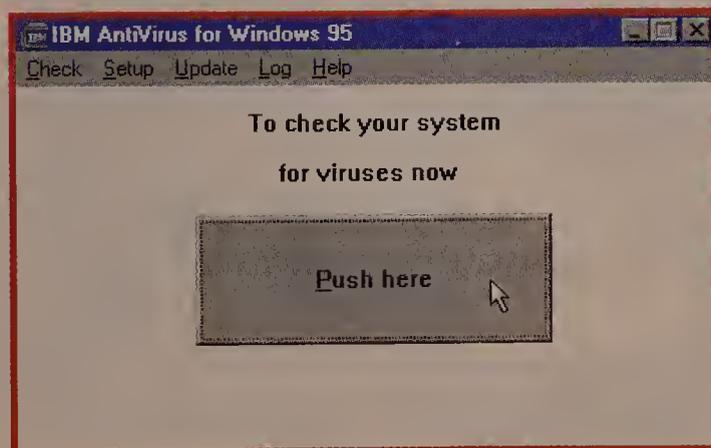
■ **Lock up your PC.** You may practice safe computing, but what about the janitor? Modern PCs let you set a boot password in the BIOS that offers excellent protection, as long as you turn

off your PC when you leave for the day or use a password-protected screen saver.

■ **Keep your antivirus program up-to-date,** and use its memory-resident module. Outdated virus signatures leave you open to attack from new viruses, and without memory-resident scanning, viruses may run amok for days or weeks before you catch them. For highest security, scan the entire hard disk regularly.

exclude from scheduled scans. This can save scan time by ignoring files that you've previously scanned and that you know haven't changed. F-Prot is the only package we tested that can send an e-mail alert through a LAN when it detects a virus, and it can even mail the infected file to a system administrator.

F-Prot's major downfall, though, is in virus signature file updates. Although updates are available over the Web, you must first call for a password, then reinstall the program



SCANNING DOESN'T GET ANY EASIER than IBM AntiVirus's almost ridiculously simple interface. Unfortunately, it's overcautious about removing viruses.

to integrate the update file—annoying steps that none of the other packages require. Command Software Systems, 800/423-9147, <http://www.commandcom.com>

READER SERVICE NO. 725

### IBM ANTIVIRUS VERSION 2.5

**PRO:** Fairly good virus detection; versions for multiple OSes in one box

**CON:** Conservative approach to disinfection hurts ability to remove viruses

ACCORDING TO THE documentation, IBM AntiVirus incorpo- ▶

# FEATURES COMPARISON

ANTIVIRUS

ANTIVIRUS PROGRAM	Street price	INSTALLATION			VIRUS SCANNING		
		Included OS support	Preinstallation scan	Creates emergency boot disk during install	Memory-resident scanner	Detects and removes macro viruses	Scans compressed files
Dr Solomon's Anti-Virus Toolkit*	\$85	Windows 95	○	●	●	●	●
F-Prot Professional	\$99	Windows 95	●	●	●	●	●
IBM AntiVirus 2.5	\$49	Windows 95 and 3.x, DOS, OS/2	○	●	●	●	●
McAfee VirusScan	\$45	Windows 95 and 3.x, NT, DOS, OS/2	●	●	●	●	●
Norton AntiVirus 2.0	\$70	Windows 95	●	●	●	●	●
ThunderByte AntiVirus Utilities	\$100	Windows 95, DOS <sup>2</sup>	●	○	●	●	○
TouchStone PC-Cillin II (beta)	\$50	Windows 95	●	●	●	●	●

\*Best Buy ● Yes ○ No

<sup>1</sup> Registered owners can download one program update in first 90 days; additional updates and phone support \$49 annually.

<sup>2</sup> Removing viruses requires using DOS version.

rates cutting-edge technology that allows it to recognize new types of viruses. This \$49 package did a reasonable job of detecting our wild file-infecting viruses, but it has several problems that make it difficult to recommend.

IBM AntiVirus is the only program we reviewed that won't remove a file virus unless it's sure it can do so without damaging the infected file. If the program finds a virus it can't remove harmlessly, your only option is to delete the file, meaning you'll need to reinstall it from the original disks or a backup. As a result, IBM AntiVirus was able to save only 32 percent of files infected by wild viruses. However, like most of the other programs, it removed 100 percent of the boot viruses.

Besides limited virus removal, other characteristics of the program are off-putting. For example, IBM AntiVirus creates a bootable emergency disk when you first install it, but there's no way to create a new one without going back and using the installation floppies. Other programs make this process easier.

On the plus side, virus updates are available from the IBM Web site, and the main screen offers a convenient menu choice for installing them. And if you keep multiple operating systems on one PC, this program's for you—it comes with versions for Windows 95, Windows 3.1, DOS, and OS/2 in one fairly inexpensive package. (An NT version is included in the program's Enterprise Edition.) IBM, 800/742-2493, <http://www.av.ibm.com>

## MCAFFEE VIRUSSCAN FOR WINDOWS 95

**PRO:** Best removal rate; works with multiple operating systems; least expensive program

**CON:** Worst virus detection; support and guaranteed updates cost extra

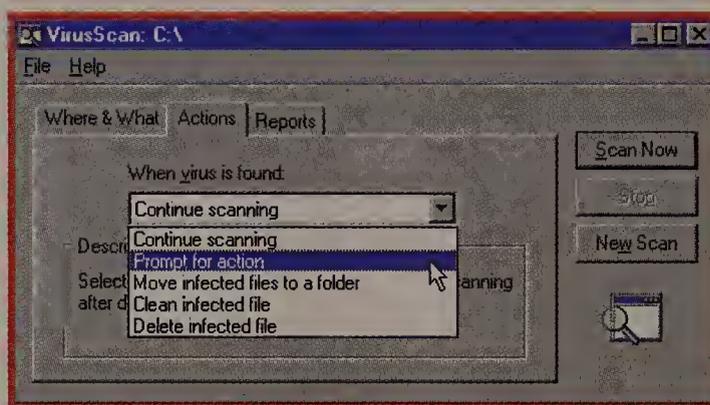
VIRUSSCAN is one of the best-known antivirus packages, thanks to McAfee's venerable freeware DOS products, media grand-standing by founder John McAfee, and the company's feud with Symantec over whether Norton AntiVirus does a better job of

detecting macro viruses. Based on our test results, Symantec can keep its bragging rights, by a slim margin: Its Norton AntiVirus caught all 13 macro viruses, while VirusScan missed one—the fairly rare Imposter. More important, VirusScan fared much worse than any of the other packages at detecting a wide variety of file viruses. It was able to detect only 93 percent, the lowest score of the lot except for the sibling NT version (92 percent).

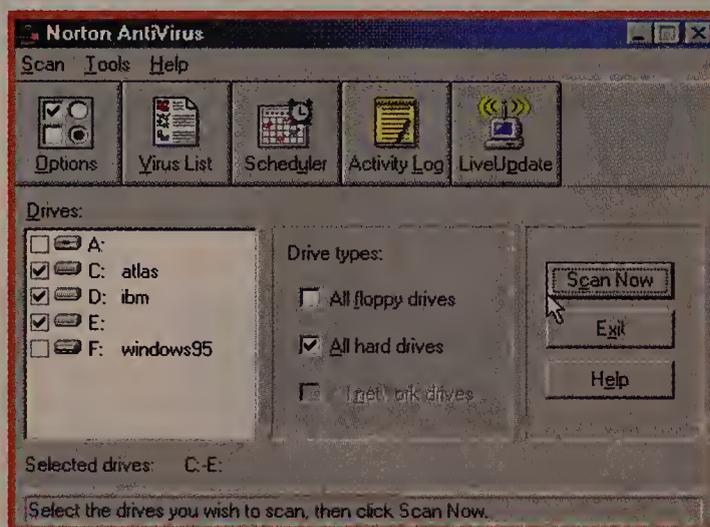
If its performance were better, VirusScan would be an attractive package. It's quick and easy to install using defaults, or you can customize it to your heart's content. You can scan all files or just program files, and include or exclude compressed files from the scan.

VirusScan is also the only program we reviewed that includes versions for every major operating system—Windows 95, 3.x, and NT; DOS; and OS/2—at the low price of \$45.

You'll pay for support instead. Virus database updates are available free over the Web, but according to



**INEXPENSIVE PROTECTION:** Low-cost McAfee VirusScan includes versions for Windows 95/3.x/NT, DOS, and OS/2, but it fared worst at virus detection in our tests.



**QUICK CLICKS:** Norton AntiVirus 2.0 offers fast access to common chores, one-button virus signature updates, and a virus-removal wizard.

AND REMOVAL UPDATES					
Detects file size changes	Checks floppy drive at shutdown	Allows scheduled scans	Online virus updates	Automated virus updates	Online program updates
●	○	○	○	○	○
○	○	○	●	○	●
●	○	○	●	●	●
●	●	●	●	○	●
●	●	●	●	●	●
●	●	●	●	○	●
○	○	○	●	●	●

McAfee's Web page, these updates are not guaranteed to work unless you subscribe to the company's maintenance plan. Registered users get one free program update within the first 90 days. After that, a \$49-per-year maintenance contract entitles you to unlimited free program and virus signature updates, along

with 24-hour phone support. McAfee Associates, 800/332-9966, <http://www.mcafee.com>

READER SERVICE NO. 726

## NORTON ANTIVIRUS 2.0 FOR WINDOWS 95

**PRO:** 100 percent virus detection rate in our tests; great interface; automatic virus updates

**CON:** Removed only 77 percent of wild viruses

SYMANTEC'S \$70 NORTON ANTIVIRUS 2.0 was one of the least successful packages here in virus removal, scoring 77 percent. However, it was one of only four (out of the nine programs we tested) that could detect every single wild virus. Overall, it's a fast, reliable, easy-to-use tool that beginners can install and ignore, and power users can customize.

Norton AntiVirus's interface features LiveUpdate, a one-button method of getting both program and virus signature updates via the Web. Its unique Virus Repair Wizard provides detailed information on the virus detected, plus options to remove it automatically or through a more cautious step-by-step procedure that lets you see every action in the process.

All the essential features—scanning individual drives, directories, or files, or turning memory-resident scanning on or off—are right out front on the main screen for easy access. And ▶

TO BE CONVERSANT in virus-speak, it helps to be familiar with the major types of computer viruses.

*Boot sector viruses* are the most prevalent of all the virus types. All it takes to get one is booting your PC with a floppy disk that has an infected boot sector. Even if you never boot from floppies, eventually you'll forget and leave one in the drive when you start your PC. Fortunately, boot sector viruses are also the easiest to catch. With only one exception—ThunderByte—all of the reviewed programs passed NCSA's boot virus detection and removal tests with flying colors. In addition, three programs—Norton AntiVirus 2.0, VirusScan, and ThunderByte—attack the forgotten-floppy problem head-on: When you shut down Windows 95, they check to see whether a floppy disk is in the drive and then scan it for viruses.

*File viruses* mostly infiltrate your .exe and .com executable files. Well-written file viruses

replicate and carry out their missions without interfering with the host program or otherwise revealing themselves. Some of the most dangerous ones simply replicate until a particular date (Friday the 13th, for example) before destroying files. File viruses are easy to find, but the damage they cause to applications is often so extensive that the only way to remove them is to delete the infected files and reinstall the application.

*Multipartite viruses* are a hybrid of the file and boot sector types. They infect both files and boot sectors, which makes them better at spreading, and also tougher to detect and remove. In the leapfrog game between virus writers and antivirus toolmakers, viruses of all types are becoming more clever at avoiding detection. The latest wrinkle is the *polymorphic* virus, which continually self-mutates to foil scanners that look for specific virus code strings, called signatures. Even



sneakier are *stealth* viruses, which temporarily remove themselves from memory, among other tricks, to elude capture.

Until 1995, you could state with near-certainty that the only type of file that could host a virus was an executable file. That changed when the first Microsoft Word *macro* virus, Concept, started showing up in documents around the world. Though nondestructive, Concept has been followed by other macro viruses that cause more serious problems, including erasing files. And the first Excel macro virus, Laroux, appeared last year, though it's still rare.

Macro viruses spread quickly—all you have to do is open an infected Word or Excel file received on disk or as an e-mail attachment. Currently, only Word and Excel are in danger of macro virus attacks, but it's only a matter of time before other programs also become targets.

In the meantime, there's good news: The latest versions of Word and Excel come with built-in macro virus protection. Even if you're not using Word 97 or Excel 97 yet, all the antivirus packages here detect and remove the most common Word macro viruses, Concept and Wazzu.

# VIROQUIZ: ARE YOU IN DANGER OF INFECTION?

YOU AVOID BOOTING with floppies and download software only from trusted sources. And you've so far managed to avoid computer virus infection, so you must be safe, right? Not necessarily. To calculate your danger quotient, take this little test. —Scott Spanbauer

- You run antivirus software
  - whenever the computer is on.
  - only when you download new files.
  - only when your network administrator makes you.
  - at gunpoint.
- The last time you updated your program's virus signature database was
  - last month.
  - last year.
  - sometime this decade.
  - during the Reagan administration.
- You sometimes let coworkers
  - view your password-protected screen saver.
  - copy data files to and from your computer using floppies.
  - copy data files to and from your hard disk over the network.
  - use your computer when you're out of the office.
- You sometimes run programs you found on
  - a CD-ROM or floppy you just scanned for viruses.
  - America Online, or another commercial online service.
  - the Web, Usenet, or a private BBS.
  - a floppy your cousin Leo gave you.
- You recently viewed
  - a dirty picture from the Internet.
  - an Excel file received as an e-mail attachment.
  - a Word document on a Microsoft promotional CD-ROM.
  - Junior rebooting the family PC with a floppy in the A: drive.

## SCORING

For every **A** answer, score 0 points  
For every **B** answer, score 1 point  
For every **C** answer, score 2 points  
For every **D** answer, score 3 points

### 12-15

Your computer is a Hot Zone. Unplug it and reread this article.

### 8-11

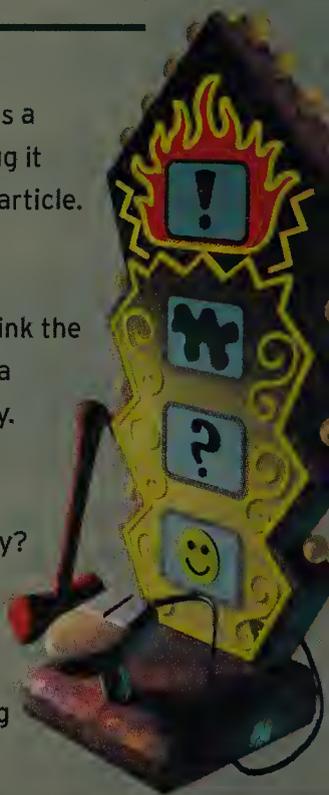
You probably think the nickname "Ebola Tamer" is catchy.

### 4-7

Do you feel lucky?

### 0-3

Breathe easy—you're practicing safe computing.



advanced options—such as detecting changes in file size, automatic scanning, and reporting scanning results—are just a couple of mouse clicks away. Symantec, 800/441-7234, <http://www.symantec.com>

READER SERVICE NO. 727

## THUNDERBYTE ANTI-VIRUS UTILITIES

**PRO:** Fairly good file virus detection; unique scanning conveniences

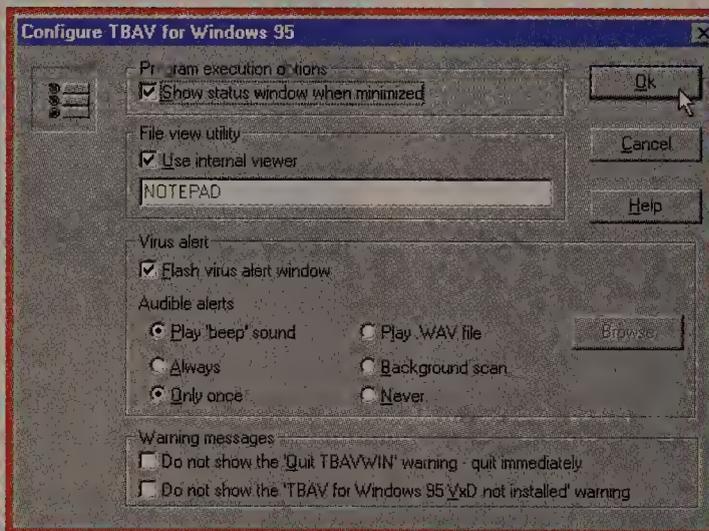
**CON:** Second-worst file removal capabilities of the bunch; removal procedure too difficult for novices

AT FIRST GLANCE, the \$100 ThunderByte Anti-Virus Utilities seems to offer the same tools as its competitors, including easy-to-install virus updates that can be downloaded from the Web. But a closer look reveals that this package has several fairly advanced features—and is missing some others.

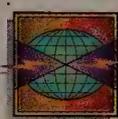
ThunderByte's Explorer-like interface has nice extras you won't find in most packages. You can include or exclude disks, folders, or files from a scan. You can even perform convenient on-the-fly scans of specific files, folders, or disks by right-clicking on them in Explorer or on the desktop. But ThunderByte lacks some features no antivirus program should be without. Most glaring is its inability to remove boot viruses, even though it detected 100 percent of them in our tests. Neither could it scan compressed files, which means that a virus in a zipped file could go undetected.

ThunderByte's ultra-cautious removal process is a sound one for multiple-PC corporate installations where virus removal can be left to system administrators, but it will likely frustrate novice or casual users. To remove file viruses (except macro viruses), you must first create a floppy containing a separate DOS utility, TBCLEAN, and insert the disk into your PC before starting it. Booting from the floppy reduces the chances that a virus will be active in memory during the scan because you're not accessing an infected boot sector or file. (The quick-start guide doesn't cover this key procedure.) Authentix/ThunderByte Corp., 800/667-8228, <http://www.thunderbyte.com>

READER SERVICE NO. 728



**DOING THE TWO-STEP:** ThunderByte Anti-Virus Utilities offers extensive configuration options but makes you boot from a floppy and run a separate program to remove viruses.



For a list of virus-related Web sites, reviews of the NT versions of Norton AntiVirus and McAfee VirusScan, and more, visit PC World Online (<http://www.pcworld.com/Marg7/antivirus>). Contributing Editor Stan Miastkowski is ever vigilant against invading viruses at his fortified cyberbase deep in the New Hampshire woods. Contributing Editor Scott Spanbauer also worked on this article.

For more information about all products in this article, circle reader service number 911.

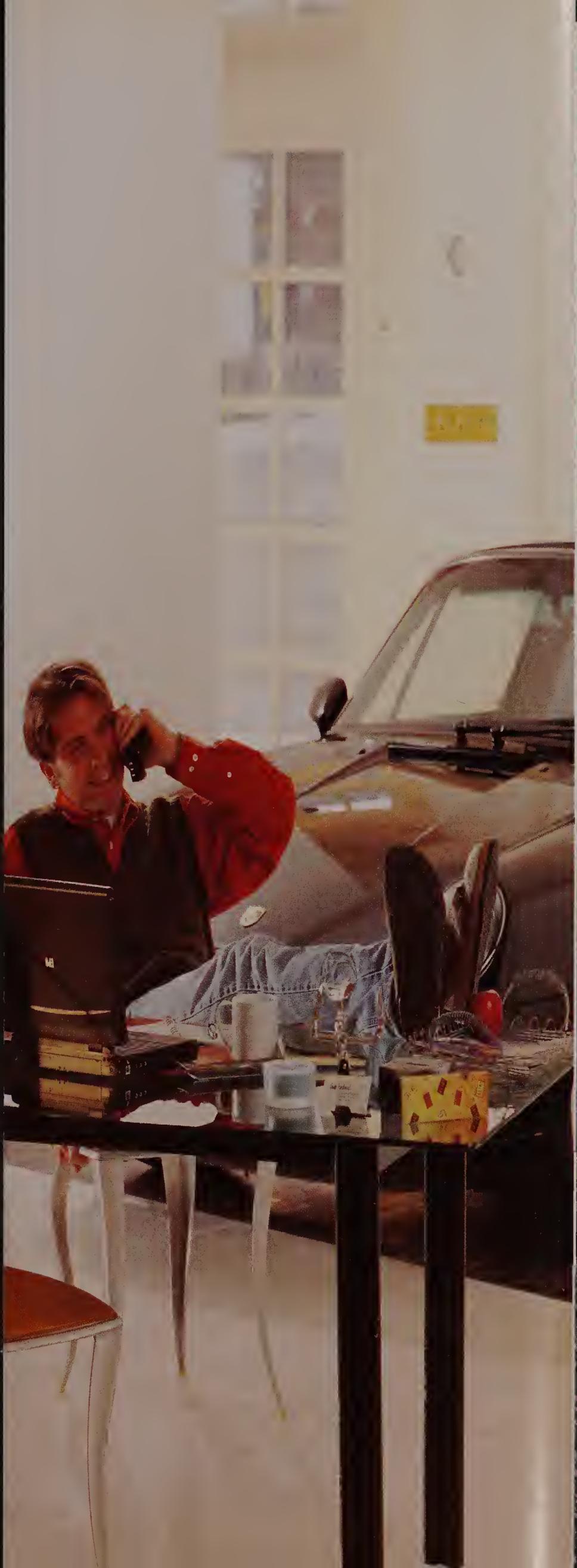
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AGER TO THE DIRECTOR  
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## EPS APEX L-166 **ENTRE XI**

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- 2MB EDO PCI Graphics
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- 1.44MB Floppy Disk Drive
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- 16-Bit Built-in Sound with Speakers
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- Two Type II / One Type III PCMCIA Slot
- Lithium Battery / AC Adapter
- 33.6 PCMCIA Fax Modem
- Mobile Car Adapter
- Microsoft Windows95
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32MB RAM / 1.6GB HARD DRIVE

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## EPS EVOLUTION EV-3 **ENTRE XI**

- 32MB EDO RAM, 512K Pipeline Burst Cache
- 3.2GB EIDE Hard Drive
- 3.5" Floppy Disk Drive
- 3D 4MB EDO PCI 64-Bit Video with Full-Motion Video and Virtual Resolution Support
- 17" N.I. 1600 x 1200 res. (.25 Dot Pitch) MPR II Compliant, Low Radiation
- Wavetable Sound Card with Premium Quality Labtec 3211 Speakers
- 12X EIDE CD-ROM Drive
- Internal 33.6 Fax Modem with Voice Mail, Full Duplex Speaker Phone and Caller ID
- 104 Enhanced Keyboard, MS-Compatible Mouse with Pad
- Microsoft Windows95
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- Three-Year Warranty, 30-Day Money-Back Guarantee, and One-Year On-Site Service

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## EPS EVOLUTION EV-4 CORPORATE XL

- 64MB EDO RAM, 256K Cache
- 3.8GB EIDE Hard Drive
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- Internal 33.6 Fax Modem with Voice Mail, Full Duplex Speaker Phone and Caller ID
- 104 Enhanced Keyboard, MS-Compatible Mouse with Pad
- Microsoft Windows95 or WindowsNT Workstation
- Lotus SmartSuite or Corel Office Professional 7
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## EPS APEX™ XL-166 CORPORATE XL

- 13.3" Active Matrix Display
- 166MHZ Intel Pentium Processor
- 48MB EDO RAM, 256K Pipeline
- 2MB EDO PCI Graphics
- 2.1GB Hard Drive
- 8X CD-ROM Drive (Removable)
- Zoomed Video Port, Video In Jack
- 1.44MB Floppy Disk Drive
- Infrared Interface Support
- 16-Bit Built-in Sound with Speakers
- Integrated Personal Touchpad
- Two Type II / One Type III PCMCIA Slot
- (2) Lithium Batteries and AC Adapter
- EPS Battery QuickCharger
- 33.6 PCMCIA Fax Modem
- Microsoft Windows95
- Microsoft Office Professional with Bookshelf
- Quicken Deluxe
- Lotus Organizer
- Two-Year Warranty
- 30-Day Money-Back Guarantee
- Deluxe Ballistic Nylon Carrying Case

48MB RAM / 2.1GB HARD DRIVE

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AND THREE YEAR WARRANTIES.

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### EPS Apex™ ES-133

- 11.3" Dual Scan or 12.1" Active Matrix
- 133MHZ Intel Pentium Processor
- 16MB RAM, 256K L2 Cache
- 1.0GB Hard Drive
- 8X CD-ROM Drive (Removable)
- 1.44MB Floppy Disk Drive
- Infrared Interface Support
- 16-Bit Built-in Sound with Speakers
- Integrated Personal Touchpad
- Two Type II / One Type III PCMCIA Slot
- Lithium Battery / AC Adapter
- Microsoft Windows95
- Quicken Deluxe
- Lotus SmartSuite or Corel Office Professional 7
- Two-Year Warranty
- Carrying Case
- 30-Day Money-Back Guarantee

16MB RAM / 1.0GB HARD DRIVE

**\$2095**

11.3" dual scan

BUSINESS LEASE  
**\$71/mo.**

**\$2495**

12.1" active matrix

BUSINESS LEASE  
**\$85/mo.**

### EPS Apex™ L-133

- 11.3" Dual Scan or 12.1" Active Matrix
- 133MHZ Intel Pentium Processor
- 24MB RAM, 256K L2 Cache
- 2MB PCI Graphics
- 1.3GB Hard Drive
- 8X CD-ROM Drive (Removable)
- 1.44MB Floppy Disk Drive
- Infrared Interface Support
- 16-Bit Built-in Sound with Speakers
- Integrated Personal Touchpad
- Two Type II / One Type III PCMCIA Slot
- Lithium Battery / AC Adapter
- 33.6 PCMCIA Fax Modem
- Mobile Car Adapter
- Microsoft Windows95
- Quicken Deluxe
- Lotus SmartSuite or Corel Office Professional 7
- Two-Year Warranty
- Carrying Case
- 30-Day Money-Back Guarantee

24MB RAM / 1.3GB HARD DRIVE

**\$2245**

11.3" dual scan

BUSINESS LEASE  
**\$76/mo.**

**\$2795**

12.1" active matrix

BUSINESS LEASE  
**\$95/mo.**

### EPS Apex™ L-166

- 12.1" or 13.3" Active Matrix Display
- 166MHZ Intel Pentium Processor
- 32MB EDO RAM, 256K L2 Cache
- 2MB EDO PCI Graphics
- 1.6GB Hard Drive
- 8X CD-ROM Drive (Removable)
- Zoomed Video Port, Video In Jack
- 1.44MB Floppy Disk Drive
- Infrared Interface Support
- 16-Bit Built-in Sound with Speakers
- Integrated Personal Touchpad
- Two Type II / One Type III PCMCIA Slot
- Lithium Battery / AC Adapter
- 33.6 PCMCIA Fax Modem
- Mobile Car Adapter
- Microsoft Windows95
- Quicken Deluxe
- Lotus SmartSuite or Corel Office Professional 7
- Two-Year Warranty
- 30-Day Money-Back Guarantee
- Deluxe Ballistic Nylon Carrying Case

32MB RAM / 1.6GB HARD DRIVE

**\$3095**

12.1" active matrix

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**\$105/mo.**

**\$3495**

13.3" active matrix

BUSINESS LEASE  
**\$136/mo.**

### EPS Apex™ XL-166

- 13.3" Active Matrix Display
- 166MHZ Intel Pentium Processor
- 48MB EDO RAM, 256K Pipeline
- 2MB EDO PCI Graphics
- 2.1GB Hard Drive
- 8X CD-ROM Drive (Removable)
- Zoomed Video Port, Video In Jack
- 1.44MB Floppy Disk Drive
- Infrared Interface Support
- 16-Bit Built-in Sound with Speakers
- Integrated Personal Touchpad
- Two Type II / One Type III PCMCIA Slot
- (2) Lithium Batteries and AC Adapter
- EPS Battery QuickCharger
- 33.6 PCMCIA Fax Modem
- Microsoft Windows95
- Quicken Deluxe
- Microsoft Office Professional with Bookshelf
- Lotus Organizer
- Two-Year Warranty
- 30-Day Money-Back Guarantee
- Deluxe Ballistic Nylon Carrying Case

48MB RAM / 2.1GB HARD DRIVE

**\$4295**

13.3" active matrix

BUSINESS LEASE  
**\$146/mo.**

eps evolution

### EPS Evolution™ EV-1

- 16MB EDO RAM, 256K Pipeline Burst Cache
- 1.2GB EIDE Hard Drive
- 3.5" Floppy Disk Drive
- 2MB PCI 64-Bit Video, MPEG Full-Motion Video
- 15" Non-Interlaced (.28 Dot Pitch) MPR II Compliant, Low Radiation
- Wavetable Sound Card with Labtec Speakers
- 8X EIDE CD-ROM Drive
- Internal 33.6 Fax Modem with Voice Mail, Full Duplex Speaker Phone and Caller ID
- 104 Enhanced Keyboard, MS-Compatible Mouse with Pad
- Microsoft Windows95
- Quicken Deluxe
- Lotus SmartSuite or Corel Office Professional 7
- Compton's Interactive Encyclopedia, Complete Reference Collection, Compton's Complete Street Guide, Mosby's Medical Encyclopedia
- Three-Year Warranty, 30-Day Money-Back Guarantee, and One-Year On-Site Service

PENTIUM™ 133MHZ

**\$1395**

BUSINESS LEASE  
**\$48/mo.**

PENTIUM™ 166MHZ

**\$1495**

BUSINESS LEASE  
**\$51/mo.**

### EPS Evolution™ EV-2

- 16MB EDO RAM, 512K Pipeline Burst Cache
- 2.5GB EIDE Hard Drive
- 3.5" Floppy Disk Drive
- 3D 2MB EDO PCI 64-Bit Video with Full-Motion Video and Virtual Resolution Support
- 17" Non-Interlaced (.28 Dot Pitch) MPR II Compliant, Low Radiation
- Wavetable Sound Card with Labtec Speakers
- 12X EIDE CD-ROM Drive
- Internal 33.6 Fax Modem with Voice Mail, Full Duplex Speaker Phone and Caller ID
- 104 Enhanced Keyboard, MS-Compatible Mouse with Pad
- Microsoft Windows95
- Quicken Deluxe
- Lotus SmartSuite or Corel Office Professional 7
- Compton's Interactive Encyclopedia, Complete Reference Collection, Compton's Complete Street Guide, Mosby's Medical Encyclopedia
- Three-Year Warranty, 30-Day Money-Back Guarantee, and One-Year On-Site Service

PENTIUM™ 133MHZ

**\$1695**

BUSINESS LEASE  
**\$57/mo.**

PENTIUM™ 166MHZ

**\$1795**

BUSINESS LEASE  
**\$61/mo.**

### EPS Evolution™ EV-3

- 32MB EDO RAM, 512K Pipeline Burst Cache
- 3.2GB EIDE Hard Drive
- 3.5" Floppy Disk Drive
- 3D 4MB EDO PCI 64-Bit Video with Full-Motion Video and Virtual Resolution Support
- 17" N.I. 1600 x 1200 res. (.25 Dot Pitch) MPR II Compliant, Low Radiation
- Wavetable Sound Card with Premium Quality Labtec 3211 Speakers
- 12X EIDE CD-ROM Drive
- Internal 33.6 Fax Modem with Voice Mail, Full Duplex Speaker Phone and Caller ID
- 104 Enhanced Keyboard, MS-Compatible Mouse with Pad
- Microsoft Windows95
- Quicken Deluxe
- Lotus SmartSuite or Corel Office Professional 7
- Three-Year Warranty, 30-Day Money-Back Guarantee, and One-Year On-Site Service

PENTIUM™ 166MHZ

**\$2095**

BUSINESS LEASE  
**\$71/mo.**

PENTIUM™ 200MHZ

**\$2295**

BUSINESS LEASE  
**\$78/mo.**

### EPS Evolution™ EV-4

- 64MB EDO RAM, 256K Cache
- 3.8GB EIDE Hard Drive
- 3.5" Floppy Disk Drive
- 2MB VRAM PCI 64-Bit Video (upgradeable to 4MB VRAM) with Full-Motion Video and Virtual Resolution Support
- 17" Non-Interlaced (.28 Dot Pitch) MPR II Compliant, Low Radiation
- 12X EIDE CD-ROM Drive
- Internal 33.6 Fax Modem with Voice Mail, Full Duplex Speaker Phone and Caller ID
- 104 Enhanced Keyboard, MS-Compatible Mouse with Pad
- Microsoft Windows95 or WindowsNT Workstation
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- Three-Year Warranty, 30-Day Money-Back Guarantee, and One-Year On-Site Service

PENTIUM™ PRO 200MHZ

**\$2495**

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# TOP 100

200 Power Desktops



210 Budget Desktops



218 Notebooks



231 Printers



235 Monitors



237 Graphics Boards



239 Modems



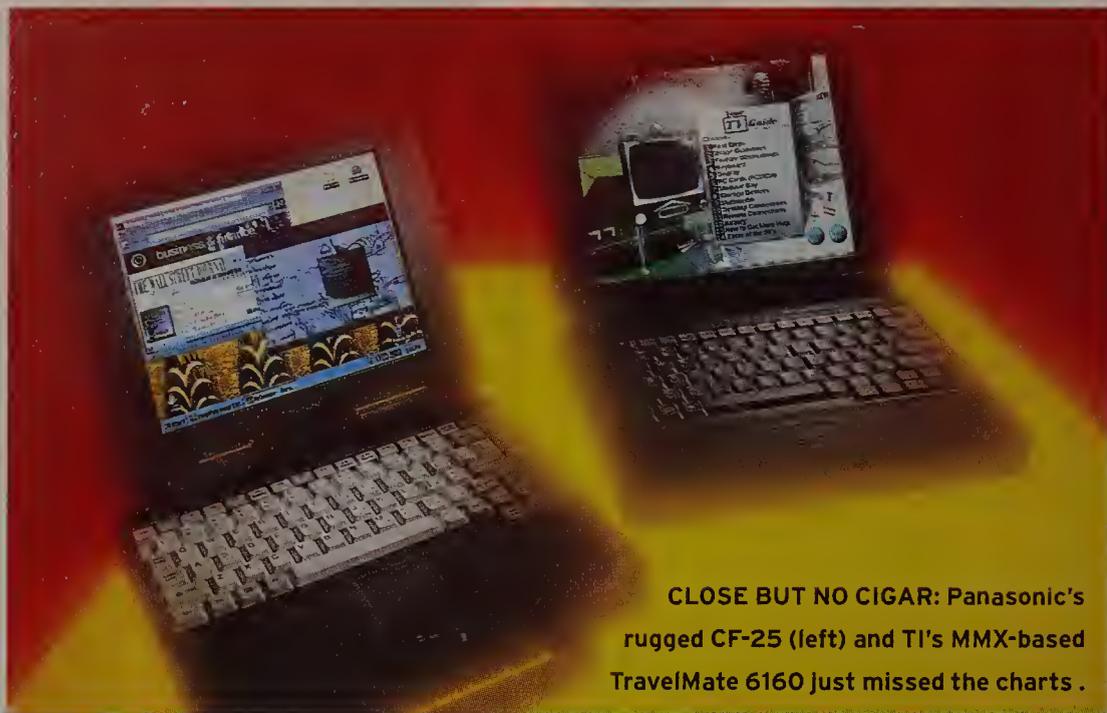
## First MMX Pentiums Arrive

BY BRAD GRIMES



STRAIGHT TO THE TOP  
with a burst of MMX speed:  
the Dimension XPS M200s.

TO GLIMPSE THE FUTURE OF PCS, go straight to the top of this month's Top 20 Power Desktops chart. There you'll find Dell's Pentium-200 Dimension XPS M200s, one of the first available PCs based on Intel's new MMX chip. Not only is the XPS M200s designed to speed up applications written for MMX, such as graphics and video, but it runs everyday business applications faster than ►



**CLOSE BUT NO CIGAR:** Panasonic's rugged CF-25 (left) and TI's MMX-based TravelMate 6160 just missed the charts.

the average Pentium-200. The best part is that you'll hardly notice the price difference. The \$2779 Dell MMX system costs about the same as Dell's comparably equipped non-MMX version, which ranked third last month and is now being replaced by the MMX version. And Quan-

tex's \$2699 QP5/200MMX SM-3, the second of two MMX-based desktop PCs we tested this month, costs only \$100 more than its non-MMX sibling.

We also reviewed one MMX notebook this month, Texas Instruments' \$4899 TravelMate 6160. Unfortunately, TI's low marks for system reliability keep this new notebook off our charts.

All three MMX systems are fast. The Dimension XPS M200s earned a PC WorldBench score of 234, which is slightly higher than the average Pentium Pro-200 we've tested and fully 11 percent higher than the average score for Pentium-200s. The Quantex QP5/200MMX SM-3's PC WorldBench score of 227 is on par with the average PPro-200 score and 8 percent higher than for the average P-200. Although these MMX PCs perform like Pentium Pro-200s, they cost less.

It's too early to say how the MMX will affect notebook speed. The TI TravelMate 6160, which uses a P-166 MMX chip, is the fastest notebook we've tested—but not by much. Its PC WorldBench score of

188 is just 3 points higher than the score of the fastest non-MMX P-150 notebook we've seen—the Sceptre Soundx Series 4000. In marked contrast, several of the preproduction MMX notebooks we tested in February yielded outstanding performance—in some cases better than MMX desktops (see "Big Gain, No Pain: MMX Pentiums," *Top of the News*).

Next month we'll review half a dozen more MMX systems, including a P-200 MMX Dell OptiPlex desktop PC and a P-150 MMX Gateway 2000 notebook.

### NOT MMX YET

IT WILL BE SEVERAL MONTHS before all PC manufacturers switch to the MMX processor. In the meantime, some non-MMX machines debuting this month merit your consideration. On the Power Desktops chart, the \$3337 Micron Home MPC P200 and the \$3148 Hewlett-Packard Pavilion 7280P take different approaches to satisfying families' computing needs. The Micron Home MPC looks like a standard business minitower, but packs cool features such as a Diamond Monster 3D gaming card and a slew of software titles. The HP Pavilion P-166 features a hip, curvy design and a built-in photo scanner. For more on family PCs, see our Top 5 Home PCs chart.

On the Budget Desktops list, the fourth-place Dell OptiPlex GS+ 5200L emerges as the best networkable Dell you can buy for under \$2500. We first tested this \$2454 machine last month, but it was overshadowed by the OptiPlex GXM 5133, which we deemed a better value. Since then, Dell has discontinued its OptiPlex

## MMX: NOW OR LATER?

TIRED OF PULLING YOURSELF ABOARD yet another new-technology bandwagon before shopping for a new PC? MMX isn't hype; it works. If you buy one now, you won't be disappointed. Intel added new instructions to its Pentium CPU, doubled the primary cache to 32K, and jammed 36 percent more transistors into the chip. This overhaul means more raw speed in all applications.

But to take full advantage of MMX, a program must be specially written, and we don't expect to see a large influx of MMX software until later in the year. We've run some early MMX-compliant programs such as Adobe Photoshop and Macromedia Director, and seen 50 percent performance boosts. Programs like PowerPoint that take advantage of Microsoft's DirectX technology can get a boost now because DirectX has been revised to use MMX.

By the time all is said and done, though, MMX will be everywhere. Even AMD and Cyrix will have MMX-compatible chips by mid-1997. As the months pass and more MMX software comes out, your PC will actually be able to do more things instead of fewer—that's a nice change.

### CORRECTIONS & CLARIFICATIONS

IN PREVIOUS Top 20 Budget Desktop charts, we listed an incorrect phone number and Web address for First Computer Systems, ranked 16th this month. The correct information is included this month. *PC World* regrets the errors.



GXM and GXMT lines, leaving this entry-level PC as the OptiPlex of choice. Dell will be refreshing its GXM line with MMX chips in the coming months, and we will test the new systems soon.

More than half the systems on this month's Top 20 Budget Desktops chart are P-133s, the machine to buy if you're looking for an entry-level PC. The \$1695 Vektron Home Office P133, for example, is fast and inexpensive, with some nice extras, including a 12X CD-ROM drive and a 33.6-kilobits-per-second modem. The \$1712 Austin Power Plus 133 is a nonsense business PC. (At press time we learned that Austin was changing ownership. See *Top of the News*.)

### NOTE THE FORM

NOTEBOOK VENDORS continue to make their mark in design. Notebooks like the \$3499 Sharp W100T, our seventh-ranked power notebook, and the \$2499 Compaq Presario 1010, fourth on the budget chart, have innovative designs. The Sharp has an extra wide screen for viewing side-by-side Web pages, while the Compaq has a set of buttons for playing audio CDs in the CD-ROM drive.

Two new notebooks on the power chart emphasize portability. The \$3999 Toshiba Portégé 650CT is the latest Toshiba sub-notebook. It weighs just 6.6 pounds but comes with a brilliant 11.3-inch active-matrix screen, a fast P-133 CPU, and a built-in fax-modem. The \$4370 HP OmniBook 800CT P-133 weighs the same as the Portégé, but it has an external 4X CD-ROM drive module. At the other end of the spectrum is the \$3869 Panasonic CF-25, a bulky but very sturdy notebook that is clad in magnesium alloy. It just missed the chart.

### BUYING A GOOD MODEM

THIS MONTH'S Top 10 Modems chart looks little like last month's. For starters, we have new modems heading both the external and PC card charts. The \$329 Practical Peripherals PC288LCD V.34, our new number one external modem, costs a pretty penny, but it's money well spent. The PC288LCD is rich in features, with Caller ID support, an easy-to-read status

display, and manual volume control. It's also a top performer. Our new Best Buy PC Card modem is the \$240 Motorola Montana 33.6. It's not the most expensive PC Card modem on the chart, but you pay a slight premium for its many features and top-notch speed.

Check out our other Top 10 charts for this month's rankings of the best graphics boards, monitors, and workgroup printers you can buy.

Brad Grimes is a senior associate editor for PC World. Assistant Editor Allyson Bates, Staff Editors John Goddard and Eric Hellweg, Associate Editors Melissa Riofrio and JoAnne Robb, and freelance writers Jon Jacobi, Dan Littman, and Jim Martin contributed to the Top 100. Testing for the Top 100 by Ulrike Diehlmann, Jeffrey Kuta, Kevin Mitchell, Mike Salayko, and Susan Silvius. See page 12 for contact information. ▶

## YOUR GUIDE TO THE TOP 100

**QUESTIONS ABOUT OUR CHARTS?** The following section should answer most of them. If not, ask us; see page 12 for contact information.

 **How do the charts work?** The Top 20 and Top 10 charts are evolving lists of the best PCs, monitors, modems, printers, and graphics boards we've tested. Every month we test the latest products in each category and compare them to the pool of items we've already reviewed. As new products earn places on the charts, those at the bottom drop off. Price cuts also cause chart changes.

 **Where do you get your prices?** We estimate street prices based on vendor information and our own research, including surveys of retail outlets. We recheck all prices every month.

 **What does the overall rating mean?** It's the sum of all our tests—both hands-on evaluations and automated speed tests. The scale is 1 to 100, so a product that scores in the 90s is generally considered exceptional, one in the 80s is among the best, one in the 70s is above average, and one that scores lower usually doesn't place.

 **What does the PC WorldBench score mean?** It's a measure of the speed of a PC in relation to our baseline machine, a Dell P75t configured with 8MB of RAM, a 540MB hard drive, and no secondary cache. A PC that scores 200, for instance, is twice as fast as the baseline unit.

 **Where do the reliability and service and support scores for PCs come from?** The reliability score and the "service" portion of the service and support score come from readers who respond to the Reliability and Service fax-back survey in each

issue of *PC World*. The "support" portion of the service and support score is based on the vendor's support policies (such as length of warranty and support hours).

 **What do all those word scores mean?** Word scores for performance and price are based on a product's rating in relation to other products in its category. For example, a budget PC that is rated "expensive" is high-priced only in relation to other budget PCs. Likewise, a power notebook rated "good" for performance is good only in relation to other power notebooks. Word scores for other categories, such as features, are relative to all desktops or all notebooks.

 **Where can I find the online version of the Top 100?** Go to PC World Online (<http://www.pcworld.com>). There you'll find not only the current issue of *PC World* and reviews for the last 18 months, but some extra features you'll want to check out. For one thing, PC World Online includes reviews you won't find in print. If a product misses a chart and we don't cover it here, you can go directly to an online review by using the URL provided in each Top 100 section.

 **Have you ever wished you could build your own chart based on your buying criteria?** Now you can, with Personal Shopper at our Web site. Personal Shopper combines your criteria with *PC World*'s current data and test results to generate customized Top 20s and Top 10s. For instance, if you want your chart to rank notebooks that have 120-MHz processors and 28.8-kbps modems, Personal Shopper will find and rank all the machines that fit your specifications.

# PC WORLD TOP 20 POWER DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (12/9/96)	CPU	Comments
1	 Dell Dimension XPS M200s 800/388-8542 www.dell.com	-	NEW	\$2779	Pentium-200 MMX	Dell's first MMX-equipped PC is extremely fast and feature-rich.
2	 Dell Dimension XPS Pro200n 800/388-8542 www.dell.com	1	Jan 97	\$3349	Pentium Pro-200	Fast, feature-packed minitower is also a snap to open and upgrade.
3	 Dell OptiPlex GXpro 200 800/388-8542 www.dell.com	2	Aug 96	\$3702	Pentium Pro-200	Speedy corporate PC with modular design, built-in networking.
4	 Micron Millennia Pro2 200 B 888/634-8799 www.micron.com	4	Feb 97	\$2838	Pentium Pro-200	Fast and thoroughly loaded, but Micron's PC reliability is down from best.
5	 Gateway 2000 P5-200 FPC 800/846-2000 www.gw2K.com	7	Sept 96	\$2519	Pentium-200	 Gateway loads up on features while dropping the price \$185.
6	Micron Millennia P166 888/634-8799 www.micron.com	6	Jan 97	\$2538	Pentium-166	Fast P-166 is a better deal than Micron's P-200 version; \$269 price drop.
7	Gateway 2000 G6-200 800/846-2000 www.gw2K.com	8	Dec 96	\$2599	Pentium Pro-200	Fast and expandable, SCSI storage; \$280 price drop. A good workgroup server.
8	Quantex QP6/200 PD-4 800/896-4898 www.quantex.com	10	Feb 97	\$2699	Pentium Pro-200	One of the fastest PCs we've tested; Quantex gets only a fair reliability rating.
9	Micron Home MPC P200 888/634-8799 www.micron.com	-	NEW	\$3337	Pentium-200	 Doesn't look the part, but its software bundle makes it family-friendly.
10	HP Vectra VA 6/200 MT 800/752-0900 www.hp.com	-	NEW	\$3474	Pentium Pro-200	Great corporate PC, but support hours are limited.
11	HP Pavilion 7285 800/724-6631 www.hp.com	9	Jan 97	\$3148	Pentium-200	 Performs well, with large hard disk, voice modem. One-year warranty.
12	Compaq Deskpro 2000 Model 5200/1080 800/345-1518 www.compaq.com	12	Nov 96	\$2699	Pentium-200	Strong corporate performer, high reliability rating, clean design. No sound.
13	IBM PC 350 P200 800/426-2968 www.pc.ibm.com	-	Sept 96	\$3321	Pentium-200	Excellent network PC includes Universal Serial Bus ports; a bit expensive.
14	Quantex QP5/200MMX SM-3 800/896-4898 www.quantex.com	-	NEW	\$2699	Pentium-200 MMX	Great deal for an MMX PC, but Quantex's reliability score hurts overall rating.
15	HP Vectra 500 Model 515MCx 5/166 800/752-0900 www.hp.com	13	July 96	\$2529	Pentium-166	 SOHO system with voice mail; \$225 price cut.
16	Quantex QP5/200 SM-3 800/896-4898 www.quantex.com	14	Feb 97	\$2599	Pentium-200	Minitower is reasonably fast and comes with a lot of extras; \$200 price drop.
17	HP Pavilion 7280P 800/724-6631 www.hp.com	-	NEW	\$3148	Pentium-166	 Slower than higher-ranked Pavilion 7285, but has a photo scanner.
18	HP Vectra VL4 5/200MT Series 4 800/752-0900 www.hp.com	15	Sept 96	\$2849	Pentium-200	Well-built PC, \$334 price drop; limited support hours. P-166 model is also good.
19	Compaq Presario 4716 800/345-1518 www.compaq.com	-	Feb 97	\$2648	Pentium-200	 Sturdy home PC packs decent power, lots of features; \$300 price drop.
20	IBM PC 365 800/426-2968 www.pc.ibm.com	-	NEW	\$5124	Pentium Pro-200	Has everything, including rewritable optical drive. But price is awfully high.



Best Buy

See features chart, page 202; performance chart, page 204.



Recommended as home system

To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews (\$9.95, available February 26).



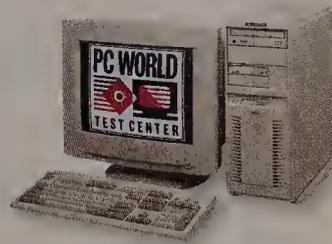
WHILE COMPANIES LIKE DELL AND QUANTEX are pushing the speed envelope with the latest MMX technology, others are humming along with tried-and-true Pentium Pro-200 CPUs.

This month Hewlett-Packard and IBM crack the Top 20 with Pentium Pros of their own. Some other vendors missed the chart: Digital sent us two fast, well-built Pro-200 systems—the \$4315 Celebris GL 6200 and the \$3655 Venturis GL 6200. But high prices and Digital's low rating for PC reliability kept them off the chart. Caliber and CyberMax offer loaded, inexpensive Pro-200s for \$2695 and \$2599, respectively, but their support policies trail the field. For details, visit PC World Online (<http://www.pcworld.com/t20pcsnaps>).

## SCORECARD

★ Overall rating	PC WorldBench score/performance	Vendor's system reliability	Features and design	Price	Vendor's support quality/policies	Fax reprint number <sup>1</sup>	Reader service number
94	234/outstanding	best	outstanding	inexpensive	best/best	3494	647
93	230/very good	best	outstanding	average	best/best	3474	648
91	232/outstanding	best	outstanding	average	best/best	3401	649
90	231/outstanding	good	outstanding	average	best/best	3487	650
89	208/very good	fair	outstanding	inexpensive	best/best	3418	651
89	208/very good	good	outstanding	inexpensive	best/best	3473	652
88	234/outstanding	fair	outstanding	inexpensive	best/best	3458	653
87	235/outstanding	fair	outstanding	inexpensive	good/best	3488	654
87	216/very good	good	outstanding	average	best/best	3495	655
87	229/very good	best	outstanding	average	good/worst	3496	656
87	207/good	best	outstanding	average	good/fair	3475	657
87	218/very good	best	very good	inexpensive	fair/best	3442	658
86	215/very good	good	outstanding	average	good/good	3422	-
86	227/very good	fair	outstanding	inexpensive	good/best	3497	659
85	192/good	best	outstanding	inexpensive	good/poor	3383	660
85	216/very good	fair	outstanding	inexpensive	good/best	3489	661
84	184/good	best	outstanding	average	good/fair	3498	662
84	201/good	best	very good	average	good/worst	3421	663
84	202/good	best	very good	inexpensive	fair/good	3499	664
84	232/outstanding	good	outstanding	very expensive	good/good	3500	-
Scorecard weightings ▶	Performance 25 percent	Reliability 25 percent	Features 20 percent	Price 15 percent	Support 15 percent	All products:	906

fastest PC in our database. Featurewise, the XPS M200s is also intimidating, thanks to its top-speed CD-ROM drive, 33.6-kbps telephony fax-modem, and roomy hard drive. And although the system's 4MB Matrox Millennium graphics card is not as imposing as Dell's workstation-class card,



Dell XPS M200s

Imagine 128 Series 2, it's great for most graphics tasks and costs about \$300 less.

But if you're a serious graphics professional, you'll be the first to note a limitation of the XPS M200s. Like all the other Dimensions that use SDRAM, this unit can accommodate only 64MB of system memory—that's only half of what most other PCs can take. Although 64MB sounds like a lot, users of programs such as Photoshop and other high-end graphics software know you can never have enough memory.

Still, Dell throws in nice extras like Microsoft Office Professional and Altec Lansing ACS 290 speakers with a subwoofer. And everything is wrapped up with Dell's highly rated service and support.

## 2 DELL DIMENSION XPS PRO200N

**PRO:** Very fast, 33.6-kbps modem, top reliability

**CON:** None significant



The XPS Pro200n is a powerful machine, but because it's a tad slower than Dell's top-ranked

Dimension XPS M200s and costs \$570 more, it slips to number two on this month's chart. This fast \$3349 system has the same minitower case style as the "s" series of Dell Dimensions. The CD-ROM drive is located at the top of the front panel, making it easily accessible, and the power and reset buttons lie in the center of the panel, well away from the floppy disk eject button.

While Dell's engineers were at it, they made the case much easier to open. Give a thumbscrew a few turns, and off comes the side panel to reveal an impeccable interior with plenty of free slots and bays. All the cable connectors sit right ▶

## This Month's Best Buys

### 1 DELL DIMENSION XPS M200S

**PRO:** Fast like a Pentium Pro, 33.6-kbps modem

**CON:** Total RAM is limited to 64MB



The XPS M200s is the first Dimension to use Intel's performance-enhancing multimedia extensions (also known as MMX), and it

bullies its way to the top of our Power Desktops chart on the strength of its Pentium Pro-like speed.

But it doesn't cost as much as Dell's Pentium Pro PCs. At \$2779, the Dimension XPS M200s delivers a lot for your money, like an impressive PC WorldBench score of 234—that's a hair faster than the fastest Dell Pentium Pro we've tested, and just a hair slower than the

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension XPS M200s*	Pentium-200 MMX	32	512	3.2	Matrox Millennium	4/WRAM	17/15.8	.28	12X
2	Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	3.2	Number Nine Imagine 128 Series 2	4/VRAM	17/15.6	.28	12X
3	Dell OptiPlex GXpro 200*	Pentium Pro-200	32	256	2.1	Number Nine Imagine 128 Series 2	4/VRAM	17/15.6	.28	8X
4	Micron Millennia Pro2 200 B*	Pentium Pro-200	32	256	2.1	Diamond Stealth 30 2000	4/ORAM	17/16	.26	12X
5	Gateway 2000 P5-200 FPC*	Pentium-200	32	512	3	Matrox Millennium	2/WRAM	17/15.9	.26	12X
6	Micron Millennia P166	Pentium-166	32	512	2.1	Diamond Stealth 3D 2000	4/E00 ORAM	17/15.8	.26	12X
7	Gateway 2000 G6-200	Pentium Pro-200	32	256	2.1	Matrox Millennium	4/WRAM	17/15.9	.25	8X
8	Quantex QP6/200 PD-4	Pentium Pro-200	32	256	3.2	Matrox Millennium	2/ORAM	17/16	.26	12X
9	Micron Home MPC P200	Pentium-200	32	512	3.1	Diamond Stealth 3D/Monster 30	4/E00 ORAM	17/16	.26	12X
10	HP Vectra VA 6/200 MT	Pentium Pro-200	32	256	2.5	Matrox Millennium	2/WRAM	17/15.7	.28	8X
11	HP Pavilion 7285	Pentium-200	32	256	3.2	integrated S3 Virge	2/EDO ORAM	17/15.5	.28	8X
12	Compaq Deskpro 2000 Model 5200	Pentium-200	32	256	1.1	integrated Cirrus Logic 5436	2/E00 ORAM	15/14	.28	8X
13	IBM PC 350 P200	Pentium-200	32	512	1.6	integrated Trio64V+	2/EDO DRAM	17/15.5	.28	6X
14	Quantex QP5/200MMX SM-3	Pentium-200 MMX	32	512	3.2	Matrox Millennium	4/WRAM	17/16	.25	12X
15	HP Vectra 500 Model 515MCx 5/166	Pentium-166	16	256	1.6	integrated Trio64	1/ORAM	15/13.7	.28	8X
16	Quantex QP5/200 SM-3	Pentium-200	32	512	3.2	Matrox Millennium	2/WRAM	17/15.8	.28	12X
17	HP Pavilion 7280P	Pentium-166	16	256	2.5	integrated S3 Virge	2/EDO ORAM	17/15.7	.28	8X
18	HP Vectra VL4 5/200MT Series 4	Pentium-200	16	256	2.5	Matrox Millennium	2/WRAM	15/13.5	.28	8X
19	Compaq Presario 4716	Pentium-200	32	256	2.6	integrated S3 Virge	2/DRAM	15/13.6	.28	8X
20	IBM PC 365	Pentium Pro-200	32	256	2.1	Matrox Millennium	4/WRAM	17/15.7	.28	6X

\* Best Buy

<sup>1</sup> Five years on CPU and main RAM, three years on other parts.<sup>2</sup> Toll call.

below the drive cage, which means you're not faced with the usual maze of ribbon cables obstructing the slots. The interior needs better ventilation, however; the system's heat sink burned our hands when we touched it, despite the presence of a big cooling fan. More air could circulate if the hard drive were mounted farther away from the front grille.

The Dimension XPS Pro200n's system documentation is thorough and easy to understand, and Dell's support policies are superb. The company's system reliability ranks among the best too, according to *PC World* readers. Of doz-

ens of fax-back responses we get from Dell owners each month, few of them complain about system problems.

### 3 DELL OPTIPLEX GXPRO 200

**PRO:** Speedy, great design, built-in networking

**CON:** None significant



The \$3702 OptiPlex GXpro 200 is a very fast, easily upgradable powerhouse designed to work well in a corporate environment. Although the system comes with some multimedia components, including integrated sound and speakers, don't count on it for the ultimate multimedia experience. Dell put most of the muscle behind this Pentium Pro-200 machine into a LAN connection and a terrific interior design that network administrators will love.

With a PC World-Bench score of 232, the OptiPlex GXpro 200 is one of the fastest systems that we've tested. The graphics hardware is top-notch—a Number Nine Imagine 128 Series 2 graphics card with 4MB of VRAM, plus a bright and crisp 17-inch Dell D1728D monitor. The multimedia setup is pretty much standard for power desktops today: You get an integrated Vibra 16 sound chip, Altec Lansing ACS 31 speakers, and an 8X CD-ROM drive. The computer comes ready to plug into your network with an integrated 3Com ethernet adapter.

The OptiPlex GXpro's desktop design is



Dell GXpro 200



Dell XPS Pro200n

## EXPANDABILITY

## CUSTOMER SUPPORT

Modem speed (kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
33.6	integrated Vibra 16	minitower	64	512	1	2/1	3	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Sound Blaster AWE32	minitower	128	512	2	3/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	integrated Vibra 16	desktop	512	256	3	1/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	integrated Sound Blaster 16	minitower	512	512	3	3/0	4	3 1/1	24	Sat., Sun.	CIS, WWW
33.6	Ensoniq Soundscape Vivo	tower	128	512	1	2/6	2	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
28.8	integrated 16-bit	minitower	128	512	2	3/1	5	3 1/1	24	Sat., Sun.	CIS, WWW
-	Sound Blaster 16 PnP	tower	256	256	2	3/6	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Ensoniq Vivo 90	minitower	256	256	2	3/3	4	3/1	15	Sat., Sun.	BBS, Prodigy, WWW
33.6	Sound Blaster AWE32	minitower	128	512	2	3/1	3	3 1/1	24	Sat., Sun.	CIS, WWW
-	Sound Blaster 16 PnP	minitower	192	256	4	2/1	4	3/3	11 <sup>2</sup>	-	AOL, BBS, CIS, WWW
28.8	integrated 16-bit	minitower	128	256	2	2/3	6	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
-	-	compact	128	256	2	2/0	5	3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	-	desktop	192	512	4	1/1	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	Ensoniq Soundscape Vivo	minitower	128	512	2	3/2	4	3/1	15	Sat., Sun.	BBS, Prodigy, WWW
28.8	Sound Blaster 16	minitower	128	256	4	2/1	4	1/1	16	Sat.	AOL, BBS, CIS, WWW
33.6	Ensoniq Soundscape Vivo PnP	minitower	128	512	2	3/2	4	3/1	15	Sat., Sun.	BBS, Prodigy, WWW
33.6	integrated Yamaha OPL3-SA	minitower	128	256	2	1/2	5	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
-	Sound Blaster 16	minitower	128	512	4	2/1	4	3/3	11 <sup>2</sup>	-	AOL, BBS, CIS, WWW
33.6	integrated 16-bit	minitower	128	512	0	2/0	5	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	-	desktop	512	256	3	0/1	3	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW

a vast improvement over that of previous systems, making it one of the easiest to upgrade. The case is simple to remove, and the internal construction is modular. Cards are housed on a vertical riser plane that slides out easily. Even the power supply swings aside for effortless access to the motherboard and drive bays.

The GXpro uses the newer dual in-line memory modules rather than SIMMs. People who service computers love DIMMs because they allow easy memory expansion without forcing you to remove lower-capacity modules to make room. The OptiPlex GXpro has four DIMM sockets instead of the usual two. This leaves three sockets open, so graphics professionals and other users who need lots of RAM can fill 'er up.

#### 4 MICRON MILLENNIA PRO2 200 B

**PRO:** Fast; 33.6-kbps modem; two CPU sockets

**CON:** Occasional long waits for technical support



Micron's Millennium Pro2 200 B is the model for you if you need high-quality components plus an upgrade path to the world of dual processing. This \$2838 minitower comes with a U.S. Robotics Sportster 33.6-kbps internal modem—one of the best, according to recent *PC World* tests. Micron also provides a pair of Advent AV007 speakers and an integrated sound chip to complete the multimedia setup.

The Millennium Pro2 200 B's Intel motherboard includes a second CPU socket for adding another Pentium Pro-200 processor, a rare but useful option for true multitasking. The computer's DIMM sockets

are capable of holding twice as much memory as SIMM sockets.

The Millennium Pro2's PC WorldBench score of 231 makes it one of the fastest machines we've tested. Micron has a very good record for reliability and support, although with recent telephone calls we've been lucky to reach a support person in less than

45 minutes. The service is great once you do get through, however. Micron's warranty covers the

CPU and main RAM for five years and other parts for three. You also get free on-site service, and toll-free technical support 24 hours a day, seven days a week. ▶



**Micron Pro2 200 B**

**5 GATEWAY 2000 P5-200 FPC**

**PRO:** Big hard disk, 12X CD-ROM drive, crisp display, 33.6-kbps fax-modem

**CON:** A bit slow considering its fast SDRAM



Note the name change: Gateway 2000 now sells its P5-200XL as the P5-200 FPC. This family system is impressive, and with its price hovering around \$2500, it's a new Best Buy. The 17-inch Gateway Vivitron monitor has a fine .26mm dot pitch for crisp graphics,

and it supports high refresh rates to help reduce flicker. The monitor is fed by a Matrox Millennium graphics card with 2MB of WRAM. For multimedia aficionados, the P5-200 FPC offers a fast CD-ROM drive, a wave-table sound card, and a set of Altec Lansing speakers with a subwoofer.

The P5-200 FPC's 32MB of SDRAM is on a single

DIMM chip (as it is in several Dell Dimensions we've tested), rather than on the more common two SIMMs. That leaves one other DIMM socket open for upgrading. The good news: If you want to upgrade to 64MB, you need only one memory chip. The bad news: To upgrade again later (up to 128MB), you'll need ▶



Gateway P5-200 FPC

TOP 20 POWER DESKTOPS

PERFORMANCE

SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score	← Faster	Average of tested P-200s	Slower →
1 Dell Dimension XPS M200s*	Pentium-200 (MMX)	32	512	234	[Bar chart showing performance relative to average]		
2 Dell Dimension XPS Pro200n*	Pentium Pro-200	32	256	230	[Bar chart showing performance relative to average]		
3 Dell OptiPlex GXpro 200*	Pentium Pro-200	32	256	232	[Bar chart showing performance relative to average]		
4 Micron Millennia Pro2 200 B*	Pentium Pro-200	32	256	231	[Bar chart showing performance relative to average]		
5 Gateway 2000 P5-200 FPC*	Pentium-200	32	512	208	[Bar chart showing performance relative to average]		
6 Micron Millennia P166	Pentium-166	32	512	208	[Bar chart showing performance relative to average]		
7 Gateway 2000 G6-200	Pentium Pro-200	32	256	234	[Bar chart showing performance relative to average]		
8 Quantex QP6/200 PD-4	Pentium Pro-200	32	256	235	[Bar chart showing performance relative to average]		
9 Micron Home MPC P200	Pentium-200	32	512	216	[Bar chart showing performance relative to average]		
10 HP Vectra VA 6/200 MT	Pentium Pro-200	32	256	229	[Bar chart showing performance relative to average]		
11 HP Pavilion 7285	Pentium-200	32	256	207	[Bar chart showing performance relative to average]		
12 Compaq Deskpro 2000 Model 5200	Pentium-200	32	256	218	[Bar chart showing performance relative to average]		
13 IBM PC 350 P200	Pentium-200	32	512	215	[Bar chart showing performance relative to average]		
14 Quantex QP5/200MMX SM-3	Pentium-200 (MMX)	32	512	227	[Bar chart showing performance relative to average]		
15 HP Vectra 500 Model 515MCx 5/166	Pentium-166	16	256	192	[Bar chart showing performance relative to average]		
16 Quantex QP5/200 SM-3	Pentium-200	32	512	216	[Bar chart showing performance relative to average]		
17 HP Pavilion 7280P	Pentium-166	16	256	184	[Bar chart showing performance relative to average]		
18 HP Vectra VL4 5/200MT Series 4	Pentium-200	16	256	201	[Bar chart showing performance relative to average]		
19 Compaq Presario 4716	Pentium-200	32	256	202	[Bar chart showing performance relative to average]		
20 IBM PC 365	Pentium Pro-200	32	256	232	[Bar chart showing performance relative to average]		

\*Best Buy

Application test times in minutes

0 10 20 30

- Word 7.0 for Windows 95
- Picture Publisher 6.0 for Windows 95
- WordPerfect 6.1 for Windows
- Excel 7.0 for Windows 95
- Paradox 5.0 for Windows
- 1-2-3 release 5 for Windows

**HOW WE TEST** All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (<http://www.pcworld.com>).



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to toss out a 32MB DIMM and replace it with something bigger.

Gateway throws in a lot of software, including Microsoft Office Professional, Money, Publisher, Cinemania, Encarta, and Golf. You also get fax and Internet communications programs to go with the included Gateway Telepath 33.6-kbps voice/data/fax modem. Overall, it's a lot for your money.

## New This Month

The following PCs made our Power Desktops chart for the first time this month. For previously tested PCs on the chart, visit our Web page at <http://www.pcworld.com/t20pcs>.

### 9 MICRON HOME MPC P200

**PRO:** Hot 3-D graphics card, 33.6-kbps modem

**CON:** Expensive for a home PC

The system doesn't look like a lot of today's funky, contoured home PCs, but the latest version of Micron's Home MPC P200 has the goods it takes to light up a home office or family fun center. However, all the cool extras add up—\$3337 is a lot for families to shell out.

The key enhancements for home business users are the system's roomier 3.1GB Western Digital hard drive and the faster 33.6-kbps Supra fax-modem with speakerphone support. Micron also outfitted this PC with 512K of secondary cache (the version we tested in December had 256K), but this failed to significantly improve the system's PC WorldBench score, which is a solid 216. Gamers will appreciate the new Diamond Monster 3D add-in card, which generates the most realistic 3-D graphics we've seen so far in a PC, and the Microsoft game pad for enjoying bundled software like *Monster Truck Madness* and *MechWarrior 2*. Micron even sent us its top-of-the-line speaker set—Advent AV-370s with a subwoofer.

Set the Home MPC P200 next to Micron's business-oriented Millennia machines, and you'd be hard-pressed to find

any differences. The Home MPC's mini-tower design is fairly plain and angular, with drive bays at the top and a vent at the bottom. It's easy to get inside, but with so many boards in there, you'll need to know what you're doing in order to unhitch cables and upgrade components. Amid the confusion are a couple of free memory sockets, three open add-in card slots, and four vacant drive bays.

What makes this Micron a home system is its abundant software. The Home MPC P200 comes with Microsoft Office, Quicken and Microsoft Money (in case you want to try both personal finance packages), Turbo Tax, Microsoft Publisher, and Encarta. There are also a few titles for the kids, including ABC by Dr. Seuss and Earthworm Jim. Internet junkies get Internet Explorer 3.0 and a free month of Net access via SpyNet. Micron backs the Home MPC P200 with an extensive warranty: five years on the CPU and main RAM, three years on other parts. However, the company's PC reliability rating has slipped recently in our fax-back survey.

### 10 HP VECTRA VA 6/200 MT

**PRO:** Easy-to-open latch case, security features, tidy interior

**CON:** Cheap mouse, no weekend tech support

How do you know where you really rank in a relationship? When your significant other gives you the keys to the PC.

This \$3474 system is one of the few we've seen recently with a truly Fort Knox-style chassis lock and security bracket to prevent unwanted guests from getting under the lid of this machine. But once you've got the key, the case is easy to remove. With a latch that's flush to either side of the chassis, the toughest thing about taking the cover off is figuring out that no screws are involved. Inside, the system is as tidy as a house that's been cleaned for company: The cables are neatly tied off so there's nothing cluttering the path to the four available SIMM sockets and four empty card slots. What's more, in keeping with the latched exterior, the motherboard buckles in and out of place, making it easy to upgrade.

But don't think that all this PC has to offer is easy access. A Pentium Pro-200 with 32MB of RAM, a 2.5GB hard drive, an 8X CD-ROM drive, and a 17-inch monitor, the Vectra gives every appearance of a PC in shining armor. However, despite all the Vectra's powerful features, its PC WorldBench score of 229, while impressive, is only average for its class.

Of course, as with any relationship, after you get to know the Vectra better you'll see past its shiny facade. You'll notice that although it has a solid keyboard, the mouse is lightweight. And while

the machine comes with a three-year warranty, the lack of weekend technical support and the slender documentation might irritate you. Still, don't give up on the Vectra too soon; this is one system it's worth having the keys to.

### 14 QUANTEX QP5/200MMX SM-3

**PRO:** Fast, great monitor, 33.6-kbps modem

**CON:** Jumbled interior, reliability rating just fair

It's not as fast as Dell's top-ranked MMX system, but the Quantex QP5/200MMX SM-3 is definitely speedy, with a PC WorldBench score of 227. The best thing about this PC, though, is its price—just \$2699. That's a mere \$100 more than the company's similarly configured Pentium-200 system (ranked number 16). And when you consider all the features that your money buys, the QP5/200MMX SM-3 is a superior value for a power system. The only thing that keeps it from landing higher on the chart is Quantex's mediocre score for system reliability.

If you're eager to use MMX-specific applications, such as graphics programs, the QP5/200MMX SM-3 is ready for you. Its Matrox Millennium graphics card with 4MB of WRAM displays high-resolution, true-color images at steady refresh rates. And you get a 17-inch MAG DX700T monitor that offers some of the crispest, brightest im- ▶

Quantex QP5/200MMX



Micron Home MPC



HP Vectra VA 6/200





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### Windows 95 - what a mess!

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ages of any display we've seen shipped with a system. The PC's other components are also of high quality, including a 12X Toshiba CD-ROM drive, an Ensoniq wavetable sound card, and a set of Altec Lansing 3-D sound speakers with a subwoofer. The system's 33.6-kbps CPI Viva CommCenter fax-modem can handle your voice mail and act as a speakerphone.

The QP5/200MMX's minitower configuration is a little taller than most and contains four free add-in card slots plus five open drive bays—ample for upgrading the PC in the future. However, removing the system's cover is not particularly easy, and once you're inside there's some cable clutter that will block your access to the free memory slots.

The QP5/200MMX SM-3 comes with a big software bundle, including Corel WordPerfect Suite. With the suite you get the Netscape Navigator browser, plus access to AT&T WorldNet Services, a fairly well-respected Internet service provider. Quantex backs the system with a three-year parts and one-year labor warranty, and readers tell us Quantex has improved its support in recent months.

## 17 HP PAVILION 7280P

**PRO:** Built-in PhotoDrive scanner, sleek design, ample hard drive for a home PC

**CON:** Below-average performance for a P-166

Hewlett-Packard's Pavilion 7280P is a solid power system, but it doesn't rank as high as the Pavilion 7285 because it has a slower CPU and less memory. Yet it costs the same as the Pentium-200-based Pavilion 7285. This is because the 7280P comes with a built-in PhotoDrive scanner that accepts color pictures up to 5 by 7 inches. The scanner is incredibly easy to use—just launch the bundled software and slide in a photo—but the quality of the scanned image leaves a little to be desired.

Among the PC's other cool features are a 33.6-kbps fax-modem with phone answering system and full-duplex speakerphone capabilities, wavetable sound, and a pair of Altec Lansing 3D Spa-

tializer speakers that can attach to the 17-inch monitor. There's also a huge software bundle that includes Microsoft Works, Money, and Encarta, plus Quicken, Adobe PhotoDeluxe, and loads of games and edutainment titles.

Although the 7280P is a bit slower than most other P-166 desktop PCs, it's faster relative to its CPU class than previous Pavilion models have been.

This is good news for home PC buyers who are lured to the curvy designs and cool multimedia features of systems like the Pavilion but are wary of unacceptable performance. In this case, the speed hit isn't nearly as noticeable as it is with other home PCs. Part of the reason for the new Pavilions' sprightliness in Windows programs is HP's move to pipeline-burst secondary cache instead of regular cache. In addition, HP has put 2MB of video RAM in its new Pavilions instead of just 1MB. Gamers may notice that new 3-D titles run slower than expected despite the 7280P's S3 Virge 3-D accelerator. This is because the new wave of 3-D requires even more video RAM—a situation PC vendors have only recently begun to address.

HP backs its Pavilion PCs with a one-year warranty and round-the-clock support. Readers responding to our ongoing reliability and service survey say they like the support they get from HP and find the company's systems to be highly reliable.

## 20 IBM PC 365

**PRO:** Combo CD-ROM/optical storage drive, infrared port, USB port, sturdy design

**CON:** Very expensive

All we can say is, Where's the kitchen sink? The IBM PC 365's spec sheet reads like a glossary of new computer technologies. Some of these technologies, like a superfast Pentium Pro-200 processor, are useful right now, while others need some time to catch on. But you pay a premium whether they're useful now or not, which is why the \$5124 IBM PC 365 lands at the bottom of our Power chart.

The PC 365 comes with networking tools that you can put to use right away. Wake on

LAN, for example, lets a network administrator on a remote system turn on unattended PCs in order to update software or perform network audits. The system also has a combination 6X CD-ROM/rewritable optical storage drive. It isn't the fastest CD-ROM drive you can get, but no other desktop PC we've tested lets you swap a regular CD-ROM for a cartridge that holds 650MB of data.

Among the system's cool-but-not-useful-now features are a Universal Serial Bus port, which doesn't attach to many high-speed peripherals yet, and a 4-mbps infrared port that's really only useful if you're using a notebook that

has an IR port, or a strategically situated, IR-compliant printer.

The desktop design is sturdy and sensible but a bit ugly. The sliding front cover does little to enhance the system's beauty, but it protects the drive bays just fine. The motherboard supports symmetric multiprocessing, which helps protect your investment by letting you add a second Pentium Pro to boost performance. There's also a SCSI port for adding several storage devices. A Matrox Millennium video card with 4MB of WRAM drives the crisp 17-inch monitor.

The bundled software is useful but not glamorous. You get IBM AntiVirus, Co-Session remote control software, and Seagate's Backup Exec for backing up data onto optical storage disks. If you have trouble with your PC 365, you can contact IBM around the clock. The three-year warranty covers parts and labor. ▶

## Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Power Desktops chart. For write-ups, see PC World Online (<http://www.pcworld.com/t20pcsnaps>).

- ◆ Austin Power Plus 200
- ◆ Caliber Pentium Pro 200
- ◆ Canon Inova Media MT 9800
- ◆ CyberMax Promax 2 PP200
- ◆ Digital Celebris GL 6200
- ◆ Digital Venturis GL 6200
- ◆ Smartworks P-200
- ◆ Sys Performance C200+



IBM PC 365



HP Pavilion 7280P

nam Press

## Life On Mars!

CALIFORNIA — Astronomers at SOCAL Space Labs have proved life has and still does exist on Mars. For decades, scientists have had the possibility that Mars can sustain life. Now, Robert Packard has found key evidence of its existence.

Using space telescopes at four different sites in the desert, Professor Packard and his team have come up with

# Great. Just when we'd perfected communications software for *this* planet.

We thought we had it all figured out. After all, our new Procomm Plus® for Windows 95 can connect you to virtually anyone, anywhere on this planet.

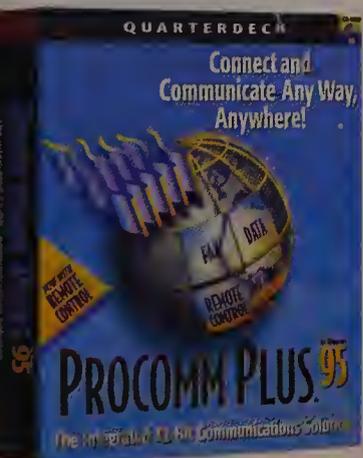
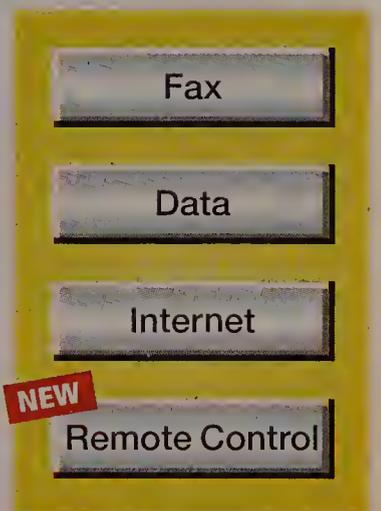
Especially now that we've integrated secure, fast remote control capabilities into the world's best-selling PC communications software. So you have quick, easy access to your files and applications wherever you are.

Our advanced fax features include OCR, annotation and scanner support for graphics and signatures. While our 36 terminal emulations help you link up to a wide variety of corporate host systems. We've also made life simple with access to the Internet via mail, a newsreader and state-of-the-

art web browsing through the included Microsoft® Internet Explorer.

And we integrated it all with a Connection Directory that lets you fax, browse and transfer files without having to jump from one application to another or reconfigure your system settings every single time.

Basically, what we've created is the most advanced 32-bit multitasking communications package on earth. And for now, we'll just have to settle for that. To find out more call 1-800-282-0866, code 01718, visit your nearest store or come to [www.quarterdeck.com](http://www.quarterdeck.com).



QUARTERDECK.

# TOP 20 BUDGET DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (12/9/96)	CPU	Comments
1	 Dell Dimension P133v 800/388-8542 www.dell.com	1	Dec 96	\$1879	Pentium-133	 Fast and affordable; now comes with a 12X CD-ROM drive. Good first PC.
2	 Micron Millennia P133 888/634-8799 www.micron.com	2	Jan 97	\$1749	Pentium-133	As fast as some P-166s; \$150 price drop but lowered reliability score.
3	 Gateway 2000 P5-133 800/846-2000 www.gw2k.com	4	Nov 96	\$1699	Pentium-133	Very quick for a P-133, fast graphics card; sound costs extra.
4	 Dell OptiPlex GS+ 5200L 800/388-8542 www.dell.com	-	Feb 97	\$2454	Pentium-200	For a P-200 it doesn't astound, but it's under \$2500 and network-ready.
5	 IBM PC 350 P-166 800/426-2968 www.pc.ibm.com	-	Dec 96	\$2364	Pentium-166	Big \$405 price drop earns this corporate PC a budget Best Buy.
6	Gateway 2000 G6-180 800/846-2000 www.gw2k.com	5	Dec 96	\$2179	Pentium Pro-180	Faster than a P-200; with a modem, it would be perfect in the home.
7	Compaq Presario 4402 800/345-1518 www.compaq.com	-	Jan 97	\$1799	Pentium-133	 \$200 price drop and top reliability score put it back on chart.
8	HP Vectra VE 5/133 800/752-0900 www.hp.com	6	Dec 96	\$1986	Pentium-133	\$184 off corporate PC. But Unified Memory Architecture slows it down.
9	HP Vectra XM5/120 Series 4 800/752-0900 www.hp.com	10	Oct 96	\$1828	Pentium-120	Well-built corporate system backed by great reliability but short support hours.
10	Quantex QP5/166 SM-2 800/896-4898 www.quantex.com	7	Aug 96	\$2299	Pentium-166	A superb deal, and Quantex has boosted support hours.
11	CyberMax Cyrix Max C3 P166+ 800/443-9868 www.cybmax.com	-	Feb 97	\$1699	Cx6x86-P166+	Ours had 24MB of RAM, but company now sells it with 32M8; \$200 price drop.
12	Quantex QP6/200 Pro-4 800/896-4898 www.quantex.com	9	Aug 96	\$2399	Pentium Pro-200	Only PPro-200 on chart; \$100 price drop. Vendor's PC reliability only fair.
13	ProGen Discover MPEG II P150 888/776-9595 www.progen.com	8	Nov 96	\$1499	Pentium-150	 A good option for game players on a budget.
14	Netis N5133DPS 800/577-7526 www.netistech.com	-	Mar 96	\$1620	Pentium-133	 A \$90 price drop makes this our highest-ranking Netis machine.
15	Vektron Home Office P133 800/725-0026 www.veptron.com	-	<b>NEW</b>	\$1695	Pentium-133	 Fairly generic PC, but it's fast and inexpensive.
16	First Computer FCS P-120 800/325-1911 www.fcsnet.com	15	Aug 96	\$1399	Pentium-120	Nondescript but well-built PC; service and reliability are unknown.
17	Micro Express MicroFlex PCI/5133 800/989-9900 www.microexpress.net	-	Apr 96	\$1599	Pentium-133	Fast system for under \$1600; early returns indicate below-average reliability.
18	Diamond Technologies P133 800/989-7253 www.diamondtech.com	14	Jan 97	\$1545	Pentium-133	Very fast, cheap (\$105 price drop). Great features include 33.6-kbps modem.
19	AST Advantage 9304 800/876-4278 www.ast.com	11	Dec 96	\$1599	Pentium-133	 Home PC performs well and has integrated wavetable sound.
20	Austin Power Plus 133 800/752-1577 www.austindirect.com	-	<b>NEW</b>	\$1712	Pentium-133	At press time, Austin's ownership was changing. See Top of the News.



Best Buy

See features chart, page 212; performance chart, page 214.



Recommended as home system

<sup>1</sup> To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews (\$9.95, available February 26).



PENTIUM-133 SYSTEMS ARE DROPPING FROM THE SKY and landing in our Budget Desktops chart. This month Vektron's \$1695 Home Office P133 and Austin's \$1712 Power Plus 133 give this speedy, affordable CPU the majority on the chart. For an idea of what the next ideal budget processor will be, look to those PCs that just missed the chart. Polywell's Poly P6-180N uses a Pentium Pro-180, like the sixth-ranked Gateway 2000 G6-180, and costs just \$1999. That's top-notch speed for a song. Meanwhile, CyberMax and Micro Express lean on the Cyrix 6x86-P200+ to get Pentium-200 performance for around \$2000. For more details, visit PC World Online (<http://www.pcworld.com/t20pcsnaps>).

## SCORECARD

★ Overall rating	Price	Vendor's system reliability	Features and design	PC WorldBench score/performance	Vendor's support quality/policies	Fax reprint number <sup>1</sup>	Reader service number
91	average	best	outstanding	188/very good	best/best	3462	665
90	inexpensive	good	outstanding	191/very good	best/best	3479	666
85	inexpensive	fair	very good	192/very good	best/best	3449	667
85	expensive	best	very good	201/very good	best/best	3501	668
84	expensive	good	outstanding	197/very good	good/good	3468	-
83	average	fair	outstanding	218/outstanding	best/best	3466	669
83	average	best	good	153/good	fair/good	3481	670
83	average	best	very good	166/good	good/poor	3465	671
83	average	best	good	177/good	good/poor	3455	672
82	expensive	fair	outstanding	209/very good	good/best	3404	673
82	inexpensive	<sup>2</sup>	outstanding	205/very good	<sup>2</sup> /good	3502	674
82	expensive	fair	outstanding	224/outstanding	good/best	3405	675
81	inexpensive	<sup>2</sup>	very good	183/very good	<sup>2</sup> /poor	3451	676
81	inexpensive	<sup>2</sup>	very good	185/very good	<sup>2</sup> /fair	3503	677
81	inexpensive	<sup>2</sup>	outstanding	188/very good	<sup>2</sup> /good	3504	678
81	very inexpensive	<sup>2</sup>	very good	178/very good	<sup>2</sup> /poor	3470	679
81	inexpensive	<sup>2</sup>	very good	190/very good	<sup>2</sup> /fair	3361	680
80	inexpensive	<sup>2</sup>	very good	185/very good	<sup>2</sup> /poor	3484	681
80	inexpensive	poor	very good	189/very good	fair/good	3490	682
80	inexpensive	<sup>2</sup>	very good	181/very good	<sup>2</sup> /best	3505	683
Scorecard weightings	Price 25 percent	Reliability 25 percent	Features 20 percent	Performance 15 percent	Support 15 percent	All products:	907

<sup>2</sup> Insufficient data.

## This Month's Best Buys

### 1 DELL DIMENSION P133V

**PRO:** Fast, well designed, top reliability rating

**CON:** Limited RAM expandability, dark monitor



The Dell Dimension P133v is a powerful multimedia minitower from a company with a solid record for reliability and service, and it

offers good performance and features for \$1879. With its 16MB of SDRAM and 256K pipeline-burst cache, this Pentium-133 scored 188 in our PC WorldBench test suite—on a par for its CPU class. The unit we tested even came with a 16-bit sound card, something you don't usually get with a bare-bones Dell computer. (A pair of speakers costs extra.)

The Dell monitor displays crisp images

and text; however, the screen was a little dark on our unit, and we could not brighten it up.

The graphics system is based on an integrated S3 Trio 64V+ video chip and 2MB of EDO DRAM. This design saves a PCI slot and does a good job of speeding up business programs and video clips. It does not, however, help with 3-D software like many new graphics boards today.

For expanding memory, the P133v uses DIMMs, which hold more memory on a module than SIMMs. The system's two 32MB DIMM sockets can hold up to 64MB of synchronous RAM. People who use a lot of high-end graphics applications like Adobe Photoshop might find a maximum of 64MB to be limiting. Most systems can take twice as much memory.

If you want a little extra power, check out the Dimension P200v, which we reviewed in the November 1996 issue. This minitower is similar to the P133v, but it costs \$120 more and is about 10 percent faster. Dell backs its low-cost "v" line with the same three-year parts and labor warranty that it offers with all its Dimension machines, and technical support is available around the clock.

### 2 MICRON MILLENNIA P133

**PRO:** Fast, well built, \$150 price drop

**CON:** No modem, no software bundle



The \$1749 Micron Millennia P133 performs as well as many Pentium-166s—you'll need to add

only a modem and applications to make it a complete package. This minitower's internal design is spare, clean, and open, and the mother-

board is easily accessible, so adding cards or upgrading memory is a snap.

It also comes with plenty of available expansion slots,

drive bays, and SIMM sockets. Four free drive bays will let you add devices such as an extra hard drive and a tape backup drive, and there are six free expansion ▶



Dell P133v



Micron P133

	SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/viewable diagonal (Inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension P133v*	Pentium-133	16	256	1.6	integrated S3 Trio64V+	2/EDO DRAM	15/14	.25	12X
2	Micron Millennia P133*	Pentium-133	16	512	2.1	Diamond Stealth 3D 2000	4/EDO DRAM	15/13.5	.28	12X
3	Gateway 2000 P5-133*	Pentium-133	16	256	2	STB Lightspeed 128	2/MDRAM	15/13.9	.28	8X
4	Dell OptiPlex GS+ 5200L*	Pentium-200	16	256	2.1	integrated S3 Trio64V+	2/VRAM	15/13.7	.28	8X
5	IBM PC 350 P-166*	Pentium-166	16	256	1.3	integrated S3 Trio64V+	2/EDO DRAM	15/13.7	.28	6X
6	Gateway 2000 G6-180	Pentium Pro-180	16	256	3.2	ST8 Lightspeed 128	2/MDRAM	15/13.9	.25	8X
7	Compaq Presario 4402	Pentium-133	16	-	1.6	integrated S3 Trio64V+	1/EDO DRAM	15/13.6	.28	6X
8	HP Vectra VE 5/133	Pentium-133	16	256	1.1	integrated SiS 6205	2/EDO DRAM	15/14	.28	8X
9	HP Vectra XM5/120 Series 4	Pentium-120	16	512	1.3	integrated S3 Trio64	2/DRAM	15/13.5	.28	-
10	Quantex QP5/166 SM-2	Pentium-166	32	512	2.5	ST8 Lightspeed 128	2/MDRAM	17/15.9	.26	12X
11	CyberMax Cyrix Max C3 P166+	Cx6x86-P166+	24	512	2.1	ST8 Lightspeed 128	2/MDRAM	15/13.8	.28	8X
12	Quantex QP6/200 Pro-4	Pentium Pro-200	32	256	2.5	STB Lightspeed 128	2/MDRAM	17/16	.26	12X
13	ProGen Discover MPEG II P150	Pentium-150	16	512	1.3	ProGen Gold 64V+ PCI	2/EDO DRAM	15/13.7	.28	8X
14	Netis N5133DPS	Pentium-133	16	256	1.6	Diamond Stealth64 Video VRAM	2/VRAM	15/13.9	.28	4X
15	Vektron Home Office P133	Pentium-133	16	256	2.5	Matrox Mystique	2/SGRAM	15/14.1	.26	12X
16	First Computer FCS P-120	Pentium-120	16	512	1.2	Matrox Millennium	2/WRAM	15/13.8	.28	6X
17	Micro Express MicroFlex PCI/5133	Pentium-133	16	256	1.6	STB Velocity 64 Video	2/VRAM	17/13.9	.28	8X
18	Diamond Technologies P133	Pentium-133	16	512	2.1	Diamond Stealth 3D 2000	2/EDO DRAM	15/13.9	.28	8X
19	AST Advantage 9304	Pentium-133	24	256	1.6	integrated S3 Trio64V+	1/EDO DRAM	15/13.8	.28	8X
20	Austin Power Plus 133	Pentium-133	16	256	1.6	VideoLogic GrafixStar 400	1/EDO DRAM	15/13.8	.28	8X

\* Best Buy    † Toll call.

slots at your disposal. This Pentium-133 is quite fast, too. With a PC WorldBench score of 191, it performs as well as some Pentium-166s we've seen.

The Millennia's multimedia setup is about as good as it gets at this price. The included Diamond Stealth 3D 2000 video card brims with a hefty 4MB of EDO DRAM, enough to give you high-resolution images in true color. The 4MB of video memory is also crucial for handling 3-D special effects such as texture mapping and z-buffering. The audio is good if not inspiring, with an integrated Vibra 16 sound chip and fair-quality Advent 270 speakers. The system's 2.1GB hard disk should provide enough room for most users. The 15-inch monitor (its viewable portion comes to 13.5 inches) provides a

good view of your programs. (Micron offers the same configuration in a Pentium-166 model that costs \$200 more and runs about 5 percent faster; that unit is also a good value.)

Strong support is one of Micron's fortes. Aside from 24-hour-a-day technical support, you get a three-year parts and one-year labor warranty and a year of free on-site service. Our readers have been satisfied with the reliability of Micron computers, and the Millennia P133's documentation is clear and concise. Micron hasn't yet joined the growing number of vendors that provide snazzy interactive on-screen help, but the printed manuals are easy to read and contain plenty of diagrams.

### 3 GATEWAY 2000 P5-133

**PRO:** Fast, great documentation, good design

**CON:** No modem or sound card at this price



The Gateway 2000 P5-133 is a dynamite Best Buy for businesses, but it needs sound and a modem to make it a good home PC. It's fast and well designed, and at just \$1699 it's eminently affordable. The low price includes the Microsoft Office Professional suite of business applications. This system is good-looking too, with a clean, angular case style that lends an up-to-date feel to an office. The P5-133 also lives up to Gateway's reputation for speedy machines: It turned in an impressive PC WorldBench score of 192, making it the



Gateway P5-133

## EXPANDABILITY

## CUSTOMER SUPPORT

Modem speed (Kbps)	Sound board	Case style	Max. RAM (MB)	Maximum secondary cache (K)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
28.8	Creative Labs Vibra 16	minitower	64	512	1	3/1	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	integrated Vibra 16	minitower	128	512	2	3/1	6	3/1	24	Sat., Sun.	CIS, WWW
-	-	minitower	128	256	1	2/2	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	Creative Labs Vibra 16	compact	128	256	2	0/0	2	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	-	desktop	192	512	4	1/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	Ensoniq Soundscape Vivo PnP	tower	128	256	2	3/6	5	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
33.6	integrated ESS 1B88	desktop	128	256	2	0/0	2	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
-	Sound Blaster 32 PnP	desktop	192	256	4	1/1	3	3/3	11 <sup>1</sup>	-	AOL, BBS, CIS, WWW
-	-	desktop	128	512	4	2/0	4	3/3	11 <sup>1</sup>	-	AOL, BBS, CIS, WWW
33.6	Ensoniq Vivo 90	minitower	128	512	2	3/2	4	3/1	15	Sat., Sun.	BBS, Prodigy, WWW
33.6	Ensoniq Vivo 90	minitower	128	512	0	3/2	4	3/1	12	Sat.	BBS, WWW
33.6	Ensoniq Vivo 90	minitower	128	256	0	2/1	3	3/1	15	Sat., Sun.	BBS, Prodigy, WWW
33.6	Audio Drive 32 PnP	minitower	128	512	2	3/2	4	3/1	9	-	BBS
28.8	Creative Labs Vibra 16	minitower	128	512	2	3/1	4	1/3	10	Sat.	BBS, WWW
33.6	Sound Blaster 16	minitower	128	256	2	3/0	3	1/1	11	Sat.	BBS, CIS, WWW
-	Audio Drive AD16 PnP	tower	128	512	2	3/0	6	1/lifetime	11	Sat.	-
-	Sound Blaster AWE32	minitower	128	512	2	3/1	7	2/2	9.5	Sat., Sun.	WWW
33.6	Wavestar 32	desktop	128	512	3	3/0	4	1/1	9	-	BBS
33.6	integrated Crystal 4232	minitower	192	256	0	2/2	6	1/1	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
-	integrated 16-bit	minitower	128	256	2	3/0	5	3/3	24	Sat., Sun.	BBS

fastest Pentium-133 on the Budget chart.

The unit we tested came with a nice-size 2GB hard disk and an 8X Toshiba CD-ROM drive. The 15-inch CrystalScan is a fine basic monitor, but it's not equal to Gateway's best (the more expensive Vivitron). The system's 2MB STB Lightspeed 128 video card has ranked on our Top 10 Graphics Boards chart for several months because of its proficiency with business and graphics applications and its ability to handle multiple video clips at once. Like the top-ranked Dell Dimension P133v, the Gateway P5-133 uses DIMM sockets to hold its synchronous DRAM. SDRAM was supposed to be faster than regular EDO DRAM, but so far our tests show little if any improvement in business programs from systems that have SDRAM. If your buying

decision comes down to the type of main memory, it's a toss-up—both SDRAM and EDO DRAM work equally well.

Gateway has put considerable effort into making its documentation very useful and easy to understand. In addition, its support policies are as good as those of any company on the chart, and readers tell us that the quality of service is top-notch. However, they still rate Gateway's system reliability only as fair.

#### 4 DELL OPTIPLEX GS+ 5200L

**PRO:** Small profile, fast, built-in networking

**CON:** No speakers, limited expandability



With Dell discontinuing its OptiPlex GXM line, the OptiPlex GS+ 5200L slips into the budget Best Buy ranks and out of the shadow of last

month's third-ranked OptiPlex GXM 5133. The slim little GS+ 5200L is the entry-level model in Dell's network-ready corporate desktop line. At \$2454 it's barely a budget computer, but the convenient space-saving design and built-in connectivity, plus the firm's highly rated service and system reliability, are worth a few extra dollars.

Inside, you'll notice Dell's usual attention to detail. The OptiPlex GS+ 5200L is clean and easy to upgrade. On top of the processor is the largest heat sink we've ever seen, but in this case bigger is better. A good heat ►



Dell GS+ 5200L

sink is quieter than a fan, and this one doesn't hinder upgradability the way heat sinks often do. A possible downside to the system's low-profile design is that there are only two free add-in card slots and no open drive bays.

Video signals are generated by an integrated S3 Trio64V+ chip with 2MB of VRAM and are pumped to a 15-inch Dell monitor that displays as nice a picture as you'll find in its size.

**5 IBM PC 350 P-166**

**PRO:** Sturdy design, networking tools, two USB ports, infrared support

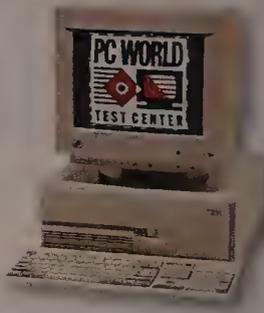
**CON:** Pricy for a budget computer, subpar monitor, no sound included



If you're looking for an inexpensive computer system, you may want to pass on this IBM PC's cutting-edge features. But if you're looking for a networkable computer that comes with a few nice technology perks,

you will be pleased with the value offered by the \$2364 IBM PC 350 P-166.

A Pentium-166 desktop system, the IBM comes with special tools that allow a network administrator to monitor and work on it from a central location: NetFinity can update software and



IBM 350 P-166

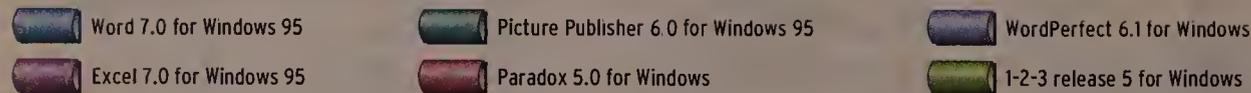
TOP 20 BUDGET DESKTOPS

PERFORMANCE

SYSTEMS	CPU	RAM (MB)	Secondary cache (K)	PC WorldBench score	Faster	Average of tested P-133s	Slower
1 Dell Dimension P133v*	Pentium-133	16	256	188			
2 Micron Millennia P133*	Pentium-133	16	512	191			
3 Gateway 2000 P5-133*	Pentium-133	16	256	192			
4 Dell OptiPlex GS+ 5200L*	Pentium-200	16	256	201			
5 IBM PC 350 P-166*	Pentium-166	16	256	197			
6 Gateway 2000 G6-180	Pentium Pro-180	16	256	218			
7 Compaq Presario 4402	Pentium-133	16	-	153			
8 HP Vectra VE 5/133	Pentium-133	16	256	166			
9 HP Vectra XM5/120 Series 4	Pentium-120	16	512	177			
10 Quantex QP5/166 SM-2	Pentium-166	32	512	209			
11 CyberMax Cyrix Max C3 P166+	Cx6x86-P166+	24	512	205			
12 Quantex QP6/200 Pro-4	Pentium Pro-200	32	256	224			
13 ProGen Discover MPEG II P150	Pentium-150	16	512	183			
14 Netis N5133DPS	Pentium-133	16	256	185			
15 Vektron Home Office P133	Pentium-133	16	256	188			
16 First Computer FCS P-120	Pentium-120	16	512	178			
17 Micro Express MicroFlex PCI/5133	Pentium-133	16	256	190			
18 Diamond Technologies P133	Pentium-133	16	512	185			
19 AST Advantage 9304	Pentium-133	24	256	189			
20 Austin Power Plus 133	Pentium-133	16	256	181			

\*Best Buy

Application test times in minutes



**HOW WE TEST** All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (<http://www.pcworld.com>).

**600 DPI** Color capable on any office paper or transparency.

**5¢** A typical color page. Call for print samples.

Black ink's free, so it practically makes your b&w laser.

**6 PPM** Twice as fast as any competitor's desktop color laser.

**15** Backed by 15 years of award-winning color expertise.

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Phaser 300X

track PC configurations across a network, while Wake-on-LAN lets administrators perform upgrades and take inventory when no one is in the office. In order to take advantage of these features, you need to buy a networking card that is designed to support them. IBM sells token ring and ethernet versions for about \$120 apiece. (At press time we hadn't hooked up the PC 350 P-166 to a local area network to test this software.)

The PC 350 P-166 is also equipped with two Universal Serial Bus ports, which let you daisy-chain several peripherals—from printers to keyboards—to a single high-speed port. With USB, you can swap peripherals while the system is running and not have to reboot. Keep in mind, though, that USB hasn't exactly taken off as a communications standard. Although its lure is undeniable, companies haven't been quick to come out with USB-compliant peripherals.

The IBM also offers built-in infrared support, with a special port in the back of the unit for connecting an external receiver/transmitter. IBM sells its optional infrared kit for about \$80.

With a PC WorldBench score of 197, the PC 350 is an average Pentium-166 performer. The system is extremely well built. Although the desktop case looks awkward (and a bit ugly), with the left side jutting out past the drive bays, it's designed to be sturdy and easily upgradable.

Too often, system vendors cut corners by shipping cheap keyboards, but we liked the solid, responsive IBM keyboard that came with this PC. The 15-inch IBM G50 monitor is crisp and has great controls, though its colors seemed a bit dark. The system also comes with Intel's ProShare collaboration software, which lets users connected via a network or modem share files and hold online conferences.

IBM backs the PC 350 P-166 with a three-year warranty on parts and labor, and technical support is available around the clock. Readers responding to our ongoing fax-back survey rate IBM's service and system reliability as good.

## New This Month

The following PCs made our Budget Desktops chart for the first time this month. For previously tested PCs on the chart, visit our Web page at <http://www.pcworld.com/t20pcs>.

### 15 VEKTRON HOME OFFICE P133

**PRO:** Extremely affordable, good performance, solid features

**CON:** Difficult to upgrade memory, small keyboard, limited support hours

If your mother taught you to buy no-frills, then Vektron's \$1695 Home Office P133 is a good candidate for your shopping cart. This caramel-colored PC has some sturdy features that make it a solid buy.

A hearty PC WorldBench score of 188 makes the Vektron one of the speediest Pentium-133s we've tested, ranking on par with the number one Dell Dimension P133v. But this system's speed isn't its only strength: It's also designed for tinkers. The Vektron has three free externally accessible bays so you can install extra drives. And although the interior is a little cluttered, the one free ISA slot and two free PCI slots are within easy reach. If you want more than the 16MB of RAM that comes with the system, you'll have to do some digging: The two free SIMM sockets are tucked behind cables.

While the PC itself is robust, we didn't think the included Quick Shot mouse felt durable. What's more, the Windows 95 keyboard is on the small side. Since the <Backspace> key is smaller than usual, clumsy fingers could easily hit the <Hyphen> key by mistake.

In addition to practicality, the Vektron Home Office P133 has a spirit of fun. With the system's 12X Toshiba CD-ROM drive, Matrox Mystique 3-D graphics card, and set of Yamaha YST-M7 multimedia speakers, you'll be poised for play. And with a helpful bundle of CD-ROMs that includes work procrastinators such as Microsoft Golf, you're all prepared for gaming. Mom was right: You don't lose much by shopping no-frills.

The one-year warranty is short, but aver-

age for a home PC. Support is limited to business hours—which means families won't be able to get support in the evenings, when they're most likely to need it.

### 20 AUSTIN POWER PLUS 133

**PRO:** Affordable, good performance

**CON:** Hard-to-access SIMM sockets, no modem  
The Power Plus 133 may not have all the frills of other P-133s, but with an above-average PC WorldBench score of 181 and a \$1712 price, it deserves a place on the Budget Desktops chart. (Editor's Note: At press time, Austin's ownership was changing. See Top of the News.)

The package is perfect for the budget-minded business buyer. You get a decent-size hard drive, an 8X CD-ROM drive, and adequate speakers. But make sure you do a rundown of components to ensure that you get what you want. For example, our evaluation unit didn't come with a modem for connecting to the Net, and the its VideoLogic graphics card had only 1MB of video RAM—not enough for displaying 16.8 million colors at 800 by 600 resolution.

Inside the Power Plus 133's plain mini-tower case are five free add-in card slots and three open drive bays, all of which are easy to access and upgrade. Memory upgrades won't be as easy, though, because the two free SIMM sockets are hidden behind a tangled web of cords.

Documentation is sparse, but at least it helps you set up your PC with fairly easy instructions. Austin includes a three-year warranty, a 30-day money-back guarantee, and round-the-clock support. ▶



Vektron Home Office

## Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Budget Desktops chart. For write-ups, see PC World Online (<http://www.pcworld.com/t20pcsnaps>).

- ◆ CyberMax Promax 6 P200+
- ◆ Micro Express MicroFlex 5200 P200+
- ◆ MIS Microniche Pro Pentium 200
- ◆ NMC P-200
- ◆ Polywell Poly P6-180N
- ◆ ProGen Discover MPEG II P166



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*It was just such people who insisted Dodge Stratus ES have standard anti-lock brakes as well as a fully independent, modified double-wishbone suspension like you'd find in race cars. They lobbied for an available speed-sensitive, variable-assist, rack-and-pinion steering system that allows for easy maneuvering in parking situations, yet provides plenty of road input at speed. They wanted the option of an AutoStick® transmission that gives*



*you the responsiveness of a manual. And in their ultimate power play, they saw to it that Stratus ES has an available 24-valve, single overhead cam V-6.*



*But by meeting their demands, it seems we met yours, too. Because in J.D. Power and Associates latest APEAL Study<sup>sm</sup>, Stratus tied as the "Most Appealing Entry Mid-Size Car."<sup>\*</sup>*

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*Dodge is the official vehicle of the Skip Barber Driving School.*

Stratus  The New Dodge

## TOP 20 NOTEBOOK PCs

POWER NOTEBOOKS		Last month	Month tested	Street price (12/9/96)	CPU	Comments
1	 Gateway 2000 Solo 2100 S5-133 800/846-2000 www.gw2K.com	1	Jan 97	\$3949	Pentium-133	Ultrafast, boosted by lots of RAM. \$200 price cut.
2	 Dell Latitude LM P133ST 800/388-8542 www.dell.com	2	Oct 96	\$2999	Pentium-133	Very fast; good price for multimedia and large active-matrix screen.
3	Dell Latitude XPI P133ST 800/388-8542 www.dell.com	3	Aug 96	\$3699	Pentium-133	Expensive for a unit without a CD-ROM drive, but still an excellent value.
4	Compaq LTE 5250 800/345-1518 www.compaq.com	4	Dec 96	\$3759	Pentium-120	Well built and powerful, long battery life, \$539 price drop; small screen.
5	Toshiba Portégé 650CT 800/457-7777 www.toshiba.com	-	NEW	\$3999	Pentium-133	The standard-bearer for subnotebooks; beautiful screen but no CD-ROM drive.
6	HP Omnibook 800CT 800/322-4772 www.hp.com	-	NEW	\$4370	Pentium-133	Nice subnote with roomy keyboard, but all the modules make for a wiry mess.
7	Sharp W100T 800/237-4277 www.sharp-usa.com	5	Feb 97	\$3499	Pentium-133	Fast and lightweight; wide screen for viewing two Web pages side by side.
8	IBM ThinkPad 760E 800/426-2968 www.pc.ibm.com	7	Sept 96	\$5014	Pentium-133	The Rolls-Royce of notebooks—great features, but expensive.
9	Micron Millennia TransPort 888/634-8799 www.micron.com	-	Aug 96	\$3999	Pentium-133	Well built, with a good keyboard and bundled modem; \$359 price drop.
10	NEC Versa 6030H 800/632-4636 www.nec.com	-	Nov 96	\$4499	Pentium-133	A bit pricey, but has a nice design, bright screen, and built-in modem.
BUDGET NOTEBOOKS						
1	 Digital HiNote VP 800/642-4532 www.digital.com	4	Sept 96	\$1799	Pentium-100	Light and well designed, great speed and bright screen, \$200 price drop.
2	 Gateway 2000 Solo 2100 S5-120 800/846-2000 www.gw2K.com	1	Jan 97	\$2499	Pentium-120	Fastest budget notebook on chart, but battery life is second shortest.
3	Toshiba Satellite Pro 420CDS 800/457-7777 www.toshiba.com	2	Sept 96	\$2298	Pentium-100	Great price for a multimedia notebook; internal AC adapter is a plus.
4	Compaq Presario 1010 800/345-1518 www.compaq.com	-	Feb 97	\$2499	Pentium-120	Price drop of \$499 makes this cool multimedia notebook a budget system.
5	HP Omnibook 5500CS 800/322-4772 www.hp.com	6	Jan 97	\$2565	Pentium-100	Sturdy and well designed; can be upgraded with a CD-ROM drive for \$375.
6	Toshiba Satellite 110CT 800/457-7777 www.toshiba.com	7	Nov 96	\$2099	Pentium-100	A good first notebook if you want an active screen; needs more RAM.
7	AcerNote Light Multimedia 374 800/733-2237 www.acer.com	-	Feb 97	\$2699	Pentium-133	Sleek, with a 6X CD-ROM drive and long battery life.
8	Mega Image MegaBook 911 800/250-1876 www.mega.com	-	NEW	\$2699	Pentium-133	Very fast multimedia notebook.
9	AST Ascentia J20 800/876-4278 www.ast.com	5	Feb 97	\$1799	Pentium-100	Price correction drops this sparse but fast unit down the chart.
10	BSI NP8662D 800/872-4547 www.bsicomputer.com	-	Aug 96	\$2060	Pentium-120	Cheap for a multimedia notebook, but support is questionable.
	Best Buy	See features chart, page 220; performance chart, page 222.				

To order fax copies of system reviews, call 800/434-4495 from a touch-tone phone and use your credit card. You can order next month's reviews in advance: Power Desktops, Budget Desktops, or Notebook PCs Top 20 charts and capsule reviews (\$9.95, available February 26).



PORTABILITY IS PRIMO on this month's Power Notebooks chart. The two newcomers, Toshiba's \$3999 Portégé 650CT and Hewlett-Packard's \$4370 Omnibook 800CT, are a study in how to pack features into a compact, highly mobile design. But one notebook that missed the Power chart exemplifies another aspect of portability: ruggedness. The Panasonic CF-25 is encased in ultrasturdy magnesium alloy. Unfortunately, the extra security pumps up the price of this otherwise straightforward business notebook to \$3869. For more details, visit PC World Online (<http://www.pcworld.com/t2opcsnaps>).

## SCORECARD

★ Overall rating	PC WorldBench score/rating	Price	Vendor's system reliability	Features and design	Vendor's support quality/policies	Battery life (hours:min)/rating	Traveling weight	Fax reprint number <sup>1</sup>	Reader service number
90	186/outstanding	average	above average	outstanding	average/fair	3:03/good	average	3797	684
86	180/very good	inexpensive	average	very good	average/good	4:32/good	heavy	3779	685
86	166/very good	average	average	very good	average/good	5:20/very good	average	3771	686
86	149/good	average	above average	good	best/good	5:42/very good	average	3793	687
85	156/very good	average	above average	very good	below average/good	2:33/satisfactory	light	3810	688
84	168/very good	average	average <sup>2</sup>	good	<sup>3</sup> /fair	4:07/good	light	3811	689
84	165/very good	average	average <sup>2</sup>	very good	<sup>3</sup> /fair	2:26/satisfactory	light	3802	690
83	177/very good	expensive	average	very good	average/good	2:02/satisfactory	average	3773	-
83	163/very good	average	average <sup>2</sup>	very good	<sup>3</sup> /fair	3:22/good	heavy	3765	691
83	174/very good	average	average	very good	average/fair	3:04/good	heavy	3785	692
<b>Power scorecard weightings</b>	Performance 22 percent	Price 14 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent		
82	139/very good	inexpensive	<sup>3</sup>	good	<sup>3</sup> /fair	3:36/good	light	3776	693
82	171/outstanding	expensive	above average	good	average/fair	2:15/satisfactory	average	3805	694
81	142/very good	average	above average	good	below average/good	4:02/good	heavy	3771	695
80	143/very good	expensive	above average	good	best/fair	4:00/good	heavy	3803	696
79	152/outstanding	expensive	average <sup>2</sup>	good	<sup>3</sup> /fair	4:00/good	average	3807	697
79	98/good	average	above average	good	below average/fair	3:35/good	average	3792	698
78	142/very good	expensive	average <sup>2</sup>	good	<sup>3</sup> /fair	5:01/very good	average	3812	699
77	165/outstanding	expensive	<sup>3</sup>	very good	<sup>3</sup> /poor	4:38/good	heavy	3813	700
77	137/very good	inexpensive	below average	satisfactory	below average/good	3:25/good	light	3806	701
75	141/very good	average	<sup>3</sup>	good	<sup>3</sup> /worst	2:10/satisfactory	heavy	3814	702
<b>Budget scorecard weightings</b>	Performance 14 percent	Price 22 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	All products:	908

<sup>2</sup> Limited data; score is based on responses for this company and average of all companies.  
<sup>3</sup> Insufficient data.

### POWER NOTEBOOKS

## This Month's Best Buys

### 1 GATEWAY 2000 SOLO 2100 S5-133

**PRO:** Fast, great display, lots of memory

**CON:** Warranty is for only one year



Gateway 2000's Solo 2100 S5-133 notebook is breathtakingly fast and has the big screen, capacious

storage, and multimedia features to make it a mobile power user's dream. It even comes with the Microsoft Office Professional suite of business applications. The \$3949 price is competitive, especially for a system that comes with a heady 40MB of RAM. The abundant memory helps make



Gateway Solo S5-133

this the fastest mobile system that we've ever tested: Its PC WorldBench score of 186 rivals that of many P-166 desktops. The Solo's 1.4GB hard drive is generous, and the 12.1-inch super-VGA screen is stunning, with sharp, bright, and clear display of text and graphics. The re- ▶

	POWER NOTEBOOKS	CPU	Traveling weight (pounds) <sup>1</sup>	RAM (MB)	Hard drive (MB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Gateway 2000 Solo 2100 S5-133*	Pentium-133	8.2	40	1440	active	12.1	800 x 600	65,536	lithium ion	touchpad
2	Dell Latitude LM P133ST*	Pentium-133	8.8	16	810	active	12.1	800 x 600	256	lithium ion	touchpad
3	Dell Latitude XPi P133ST	Pentium-133	7.2	24	1215	active	11.3	800 x 600	256	lithium ion	trackball
4	Compaq LTE 5250	Pentium-120	8.4	16	810	active	10.4	800 x 600	65,536	NiMH	eraserhead
5	Toshiba Portégé 650CT	Pentium-133	6.6	16	1358	active	11.3	800 x 600	16.8 million	lithium ion	eraserhead
6	HP Omnibook 800CT	Pentium-133	6.6	16	1440	active	10.4	800 x 600	256	lithium ion	mouse
7	Sharp W100T	Pentium-133	6.6	16	1080	active	11.2	1024 x 768	16.8 million	lithium ion	touchpad
8	IBM ThinkPad 760E	Pentium-133	7.8	24	1080	active	12.1	800 x 600	65,536	lithium ion	eraserhead
9	Micron Millennia TransPort	Pentium-133	9	16	1215	active	11.3	800 x 600	65,536	lithium ion	eraserhead, touchpad
10	NEC Versa 6030H	Pentium-133	8.6	16	1358	active	12.1	800 x 600	65,536	lithium ion	touchpad
<b>BUDGET NOTEBOOKS</b>											
1	Digital HiNote VP*	Pentium-100	6.8	16	810	dual-scan	10.4	800 x 600	256	NiMH	touchpad
2	Gateway 2000 Solo 2100 S5-120*	Pentium-120	8.2	16	810	dual-scan	11.3	800 x 600	65,536	lithium ion	touchpad
3	Toshiba Satellite Pro 420CDS	Pentium-100	8.8	16	772	dual-scan	11.3	800 x 600	65,536	lithium ion	eraserhead
4	Compaq Presario 1010	Pentium-120	8.6	16	814	dual-scan	11.3	800 x 600	65,536	NiMH	touchpad
5	HP Omnibook 5500CS	Pentium-100	8	16	1358	dual-scan	11.3	800 x 600	65,536	lithium ion	eraserhead
6	Toshiba Satellite 110CT	Pentium-100	7.4	8	814	active	11.3	800 x 600	65,536	NiMH	eraserhead
7	AcerNote Light Multimedia 374	Pentium-133	7.6	16	1080	dual-scan	11.3	800 x 600	65,536	lithium ion	touchpad
8	Mega Image MegaBook 911	Pentium-133	9.2	16	1374	active	12.1	800 x 600	65,536	NiMH	touchpad
9	AST Ascentia J20	Pentium-100	7	16	540	dual-scan	11.3	800 x 600	65,536	NiMH	eraserhead
10	BSI NP8662D	Pentium-120	9.6	16	810	dual-scan	11.3	800 x 600	256	NiMH	touchpad

\*Best Buy ● Yes ○ No

<sup>1</sup>Includes computer, adapter, power cord, floppy drive, and CD-ROM drive if notebook has one.<sup>2</sup>First year only.<sup>3</sup>Toll call.

movable 8X CD-ROM drive alternates in the options bay with the floppy drive or an optional second battery. Two speakers located in the keyboard's wrist rest are decent, but the included Koss headphone set sounds better. The single battery pack lasted for about 3 hours per charge in our test—pretty good for a notebook with this much power.

Good documentation is critical with portables. In striking contrast to the bland offerings that come with many notebooks, the Solo's manual is detailed and well illustrated. Gateway 2000's service quality is rated okay; we only wish that Gateway supported this notebook with a warranty longer than one year.

## 2 DELL LATITUDE LM P133ST

**PRO:** Large and crisp display, terrifically fast

**CON:** No modem at this price

 You don't always have to spend a bundle to get a high-end notebook. Dell's Latitude LM P133ST

costs \$2999, a price that even budget-minded shoppers may find worth considering. And this Pentium-133 notebook is fast: It scored a terrific 180 on our PC WorldBench test suite, placing it high on the curve of test results for Pentium-133

desktops. The Latitude LM P133ST's 12.1-inch active-matrix color screen is vivid and spacious, with true colors and a viewable

area that's close to what you get with a standard 14-inch desktop monitor.

In our test, the Dell managed to wring 4.5 hours per charge out of its lithium ion battery. The notebook's traveling weight of 8.8 pounds, while heavy, isn't bad for a

multimedia portable. As with most power notebooks these days, the unit comes with both a floppy drive and a CD-ROM drive that you can swap in and out of the same bay. The Latitude LM P133ST comes with 16-bit

on-board sound and good integrated stereo speakers, but a 28.8-kbps PC Card fax-modem costs extra.



Dell Latitude LM

## EXPANDABILITY

## CUSTOMER SUPPORT

CD-ROM drive speed	Modem speed (kbps)	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
8X	28.8	40	1	●	●	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
6X	-	40	1	○	●	●	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
-	-	40	0	○	●	●	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
6X	-	72	1	●	●	●	3/3	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
-	28.8	80	0	○	●	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
4X	-	48	0	○	●	●	3/3	12	-	AOL, BBS, CIS, WWW
-	28.8	32	0	○	○	●	3/3	24	Sat., Sun.	BBS, CIS, WWW
-	28.8	80	1	●	●	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
8X	28.8	48	2	●	○	●	3/1	24	Sat., Sun.	CIS, WWW
6X	28.8	48	1	●	●	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
-	-	40	1	●	●	○	1/1	14	-	AOL, BBS, CIS, WWW
6X	-	40	1	●	●	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
6X	-	40	1	○	●	●	3/3	24	Sat., Sun.	BBS, CIS, MSN, WWW
4X	-	40	0	○	○	○	1/1	24	Sat., Sun.	AOL, CIS, Prodigy, WWW
-	-	64	1	●	●	●	3/3	12	-	AOL, BBS, CIS, WWW
-	-	40	0	○	●	○	1/1	24	Sat., Sun.	BBS, CIS, MSN, WWW
6X	-	64	0	○	○	○	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
6X	-	72	0	○	●	●	1/1	24 <sup>2</sup>	Sat.	WWW
-	-	40	0	○	○	●	3/3	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
4X	-	40	0	○	●	●	1/1	9 <sup>3</sup>	-	BBS

The Latitude's keyboard is well laid out, with large, full-travel keys; the only compromise is with the <F1> through <F12> keys, which are whittled down to about half the size of the other keys. The system's touchpad is smooth and responsive, allowing you to click either with the buttons or on the pad itself.

Dell's service for notebooks is okay, according to our ongoing reader fax-back survey. And the Latitude's support policies are strong: You get a three-year warranty on parts and one year on labor, a two-day factory repair turnaround policy, and 24-hour toll-free technical support. Both on-screen and printed documentation is thorough and well written.

## New This Month

The following PCs made our Power Notebooks chart for the first time this month. For previously tested PCs on the chart, visit our Web page at <http://www.pcworld.com/t20pcs>.

### 5 TOSHIBA PORTÉGÉ 650CT

**PRO:** Lightweight, nice display

**CON:** Cramped keyboard

Big things come in small packages: At 6.6 pounds, Toshiba's Portégé 650CT has the power to be a primary computer. This Pentium-133 notebook shows off detailed text and graphics on its 11.3-inch active-matrix display, which supports 24-bit color. You also get a built-in 28.8-kbps

modem, excellent documentation, and a three-year warranty.

The unit's small size means you get a small keyboard. With keys that range from small to tiny, the Toshiba is designed for slender-fingered typists. Thicker fingers could easily hit the <Page Up> key, for instance, when they were aiming for the <Enter> key. And unless you also have tiny hands, the 3.2-inch wrist rest won't serve well for support.

To keep things simple and light, Toshiba includes an external floppy drive. ▶



Toshiba Portégé

While that helps scale back on the traveling weight, there's always the danger that you'll forget the drive in your hotel room.

The 650CT's PC WorldBench score of 156—average for its processor class—and low 2.5-hour performance from its lithium ion battery make the \$3999 price only vaguely compelling. Still, if the idea of a heavy notebook drags you down, this PC will be a weight off your shoulders.

### 6 HP OMNIBOOK 800CT

**PRO:** Lightweight, compact, powerful

**CON:** Pricey, lots of cables

You travel light—one breakfast bar on your way out the door, and just the right number of shirts in your suitcase. With weight requirements like that, the Hewlett-Packard Omnibook 800CT is a perfect companion. In fact, with the base unit weighing a meager 4.4 pounds, you

might think that you packed your down-feather pillow by mistake.

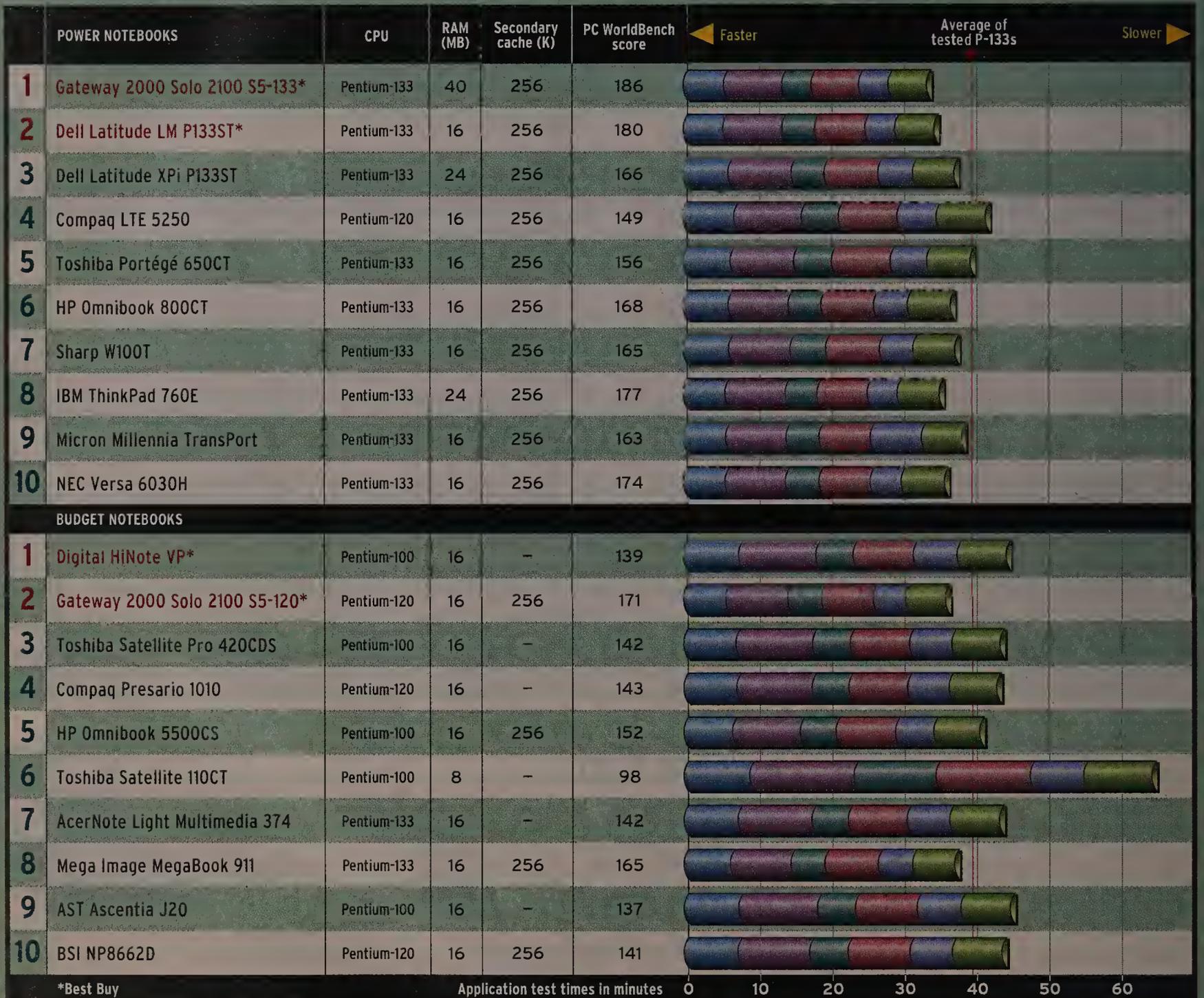
HP packs some punch inside that slender package. This P-133 has a 10.4-inch active-matrix screen and 16MB of RAM. Its modular design sets it apart: The keyboard and



HP Omnibook

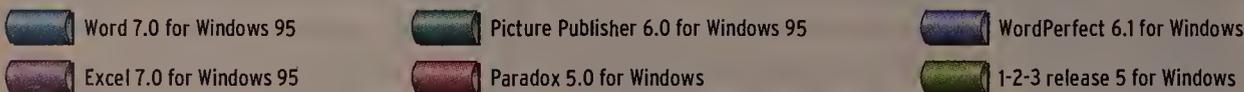
## TOP 20 NOTEBOOK PCs

## PERFORMANCE



\*Best Buy

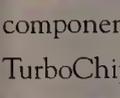
Application test times in minutes



**HOW WE TEST** All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (<http://www.pcworld.com>).



WHEN THE ARMED FORCES REALIZED THAT OUR TURBOCHIP COULD MORE THAN DOUBLE THE SPEED OF THEIR 486S, THEY DECIDED TO PICK SOME UP.



Unleashes the power of Windows NT\*4.0



Am5x86-P75

The military has to be able to act quickly, and so do their computers. Maybe that's why they decided to upgrade their 486s with Kingston® TurboChips—an approved component on the GSA purchasing schedule. The TurboChip™ can extend the life of your fleet, too, whether you have 486-based DX2, DX, SX2, or SX systems. In the words of an Army computer scientist at the Army's Pentagon Automation Technology Branch, "The Kingston chip was completely compatible with all our systems and had an amazing



performance improvement."\* The TurboChip's 5x86 clock-quadrupled technology helps your system run up to three times faster with all the power you need to run today's demanding software. Designed with AMD's Am 5x86-P75 CPU, it upgrades most IBM-compatible desktop systems. And since the TurboChip is a chip-for-chip replacement upgrade, it's easy to install. Plus, it preserves your system configuration. Call today to find out why the military says, "Looking at the true cost of installing an upgrade CPU, the Kingston unit is a steal."



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\*10/31/96 evaluation by Ron Jarmuth, Chief Automation Technology Branch, HQDA-IMCEN, Pentagon Automation Technology Branch. Kingston Technology Company, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699. © 1996 Kingston Technology Company. All rights reserved. Kingston is a registered trademark and Computing Without Limits and TurboChip are trademarks of Kingston Technology Company. Windows NT is a registered trademark of Microsoft Corporation.

Circle 128 on reader service card

unique side-attached mouse are comfortable even after long use. But while the size and design of this notebook are a blessing, if you need to use the external 4X CD-ROM or floppy drive modules, you're going to be caught in a morass of wires. With both modules connected and the base unit plugged in, you'll have cables snaking across your desk.

You'll pay \$4370 for this combination of power and portability, but at least you'll get more than 4 hours from its lithium ion battery. And for an elegant notebook that you can carry easily, you'll find few other contenders in the HP Omnibook 800-CT's weight class.

### BUDGET NOTEBOOKS

## This Month's Best Buys

### 1 DIGITAL HINOTE VP

**PRO:** Good P-100 performance, good battery life, bright display, affordable

**CON:** No built-in CD-ROM option



A \$200 price drop to \$1799 helps Digital's HiNote VP top this month's Budget Notebooks chart.

With a PC WorldBench score of 139, it's among the fastest Pentium-100 notebooks we've tested, outperforming several P-120s. Its 3.6-hour battery life is impressive considering that the HiNote uses a nickel-metal-hy-

dride battery instead of the more expensive and longer-lasting lithium ion kind.

The HiNote's keyboard is comfortable and responsive. The 10.4-inch dual-scan screen is vivid and can display 800 by 600 resolution. The HiNote is not a multimedia portable, although it comes with 16-bit sound and a monaural speaker. It is, however, extremely lightweight at just 6.8 pounds. The optional internal AC adapter can either take the place of the floppy drive or rest on your desk.

The bundled software is a mixed bag of marginally useful applications. Our system

came with CompuServe and America Online software, but no modem. For file transfers it came with LapLink, but you have to supply the cables. (The HiNote VP doesn't have an infrared port.)

Digital backs the HiNote VP with a one-year warranty. Toll-free support is limited to weekdays, but you can get round-the-clock support if you buy Digital's Passport service, which costs \$49 the first year.

### 2 GATEWAY 2000 SOLO 2100 S5-120

**PRO:** Fast, attractive display, modular design

**CON:** So-so battery life



If you've been cruising for a speedy multimedia notebook with a top-notch display at a budget price, slow down and take a good look at Gateway's Solo 2100 S5-120. It's rare to get the speed of a power note along with a high-quality color screen for just \$2499.

With a PC WorldBench score of 171, this sleek, black, and sturdily constructed model is far and away the fastest unit on the Budget Notebooks chart; it even outpaces most of the power notebooks. The dual-scan display is to computer screens what Waterford is to crystal: clear, clean, and classy. There are larger active-matrix displays on the market (such as the 12.1-inch models from Dell and IBM), but for most people this 11.3-inch screen is more than adequate—sharp and bright enough for use over extended periods of time.

The Solo 2100 S5-120's modular drive bay lets you easily swap in the included 6X CD-ROM drive, a floppy drive, or an extra battery—a common configuration these days. With the Solo, however, you can also change devices while the notebook is running. The keyboard and broad wrist rest make typing comfortable, and the touchpad is roomy, with two large buttons.

The 2.3-hour battery life we got in our run-down test was a little disappointing. You can plug an optional second battery pack into the modular drive bay, doubling the time you can run the notebook away from wall power.

Gateway provides great documentation.

## New This Month

The following PC made our Budget Notebooks chart for the first time this month. For previously tested PCs on the chart, visit our Web page at <http://www.pcworld.com/t20pcs>.

### 8 MEGA IMAGE MEGABOOK 911

**PRO:** Fast, long battery life

**CON:** Cheap keyboard, generic documentation

The \$2699 Mega Image MegaBook 911 notebook won't save your life, but it certainly will get the job done. Scoring 165 on our PC WorldBench test suite, this Pentium-133 multimedia portable ranked in the top 15 percent of all the P-133 notebooks that we've tested. Its single NiMH snap-out



Mega Image MegaBook

battery also lets you work away from an outlet for more than 4.5 hours.

Housed in a dark gray case, the MegaBook 911's components aren't cutting-edge, but they're more than adequate. The 12.1-inch active-matrix screen is crisp, the touchpad is responsive, and the 1.4GB hard drive provides plenty of storage. If you're a multimedia hound on the go, you can tote the swappable 6X CD-ROM drive in the notebook's carrying case.

It seems that Mega Image compromised quality on some of the unit's components. The keys on the Windows 95 keyboard lack full travel, and the documentation is just a generic guide on the basics of portable computers. The company offers toll-free phone support, but we don't have enough reader feedback to rate its service and PC reliability. ■

## Beyond the Top 20

We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Notebook PCs chart. For write-ups, see PC World Online (<http://www.pcworld.com/t20pcsnaps>).

- ◆ AMS Travel Pro 185
- ◆ Micro Express NB5133A
- ◆ Nimantics NX-Lite 133 Series
- ◆ Panasonic CF-25
- ◆ Sceptre Soundx Series 4000
- ◆ TI TravelMate 6160



Digital HiNote VP



Gateway Solo S5-120

# AN UNKNOWN ENGINEER. A TWO-HEAD COLOR PRINTER YOU'VE NEVER HEARD OF. AND 10 REASONS WHY YOU SHOULD CARE.

**#1** Two heads are better than one. (But your mother probably already told you that.)

**#2** You're tired of your black inks getting wet and running into Rorschach test patterns.

**#3** You're sick of your kids whining how Jimmy's dad prints out cooler T-shirts than you do.

**#4** You don't think a color inkjet printer should cost as much as a military-issue hammer.

**#5** You really don't care if your inkjet printer comes from a company that builds multi-million dollar supercomputers to solve deep problems in pure mathematics.

**#6** Engineering types are all pretty much faceless guys to you anyway.

**#7** You're tired of calling the psychic hotlines to find out how much ink is left in your print cartridges.

**#8** You're tired of switching color and black ink cartridges in and out, in and out...

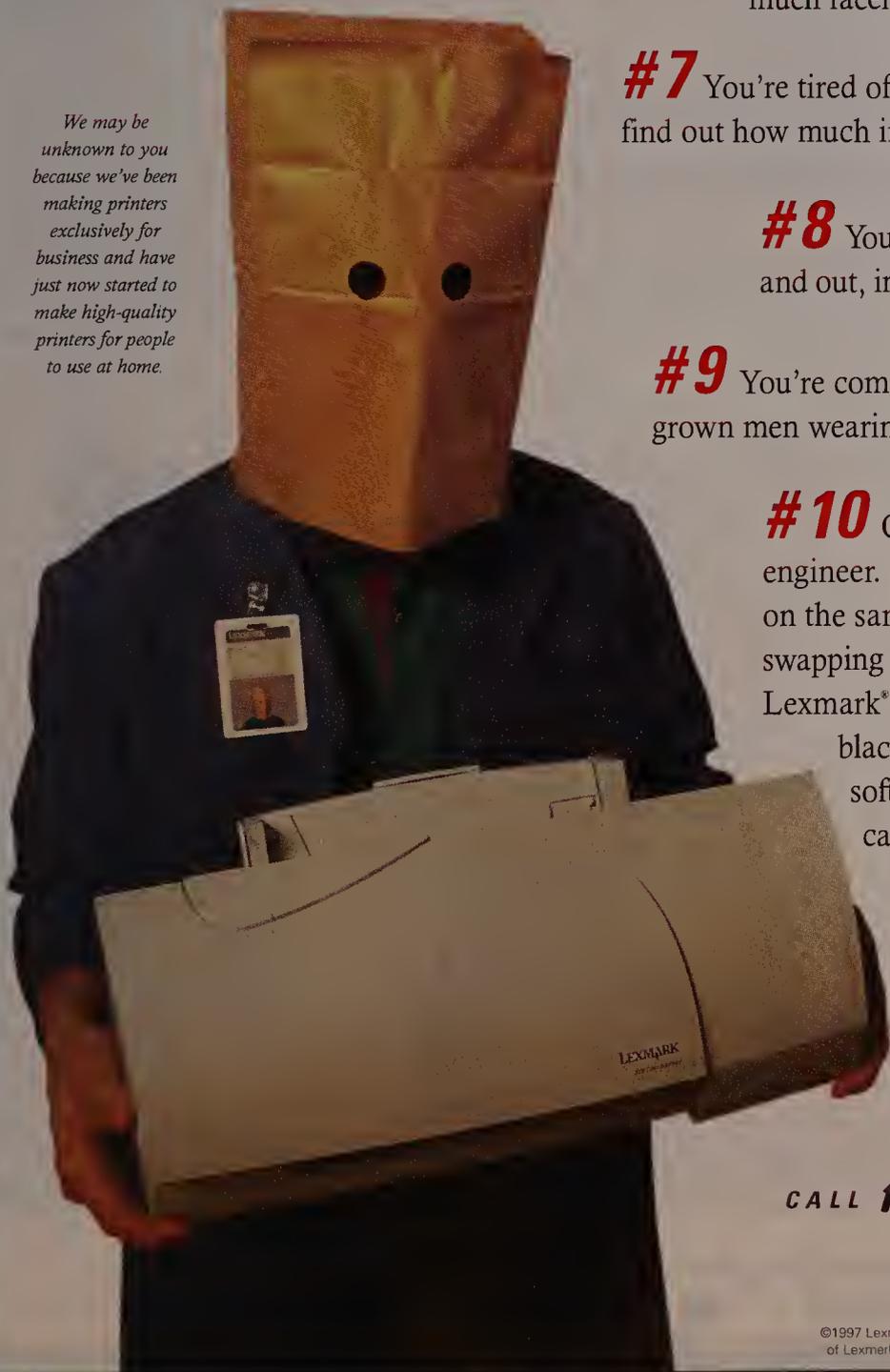
**#9** You're comfortable with the idea of grown men wearing paper bags on their heads.

**#10** OK. You don't really care about our unknown engineer. But for printing vivid colors and true black on the same page at the same time – without constantly swapping ink heads in-and-out – you'll want our two-head Lexmark® 2030 Color Jetprinter.™ It uses water-resistant black ink that won't run. And it comes loaded with software that lets you print everything from greeting cards to T-shirts. In stores now for just \$199.\*



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*We may be unknown to you because we've been making printers exclusively for business and have just now started to make high-quality printers for people to use at home.*



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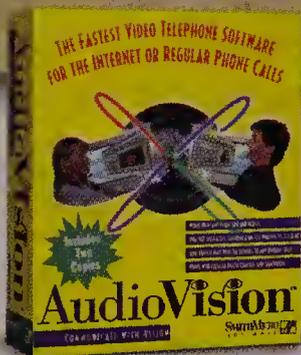
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AudioVision 2.0 is the amazing software that lets you communicate with live two-way audio and video over the Internet and by direct telephone connection. And AudioVision is fast, with transmission rates up to 15 frames a second over ordinary telephone lines.

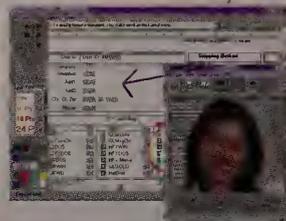
With AudioVision, you can send VMail™, video e-mail that any Windows user can view – without additional hardware. And since it takes two to communicate, AudioVision includes two copies, plus a copy of AudioVision/324, the special edition of AudioVision that lets you connect with standard H.324 video phones worldwide.

AudioVision supports virtually all major digital cameras and most capture boards and it's a breeze to install and use. So stop missing the picture, pick up AudioVision or download a free demo version

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LCD DIGITAL CAMERA  
**QV-100**



Included software



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Take a picture and view it instantly on the brilliant 1.8" color viewfinder. The QV-100 stores up to 192 images at standard resolution or 64 fine resolution VGA images.

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Enjoy viewing your images with the whole family, or leave a lasting impression at business presentations.

**Upload images to a PC**

To create effective reports, proposals, or other documents, simply upload the images to your PC.

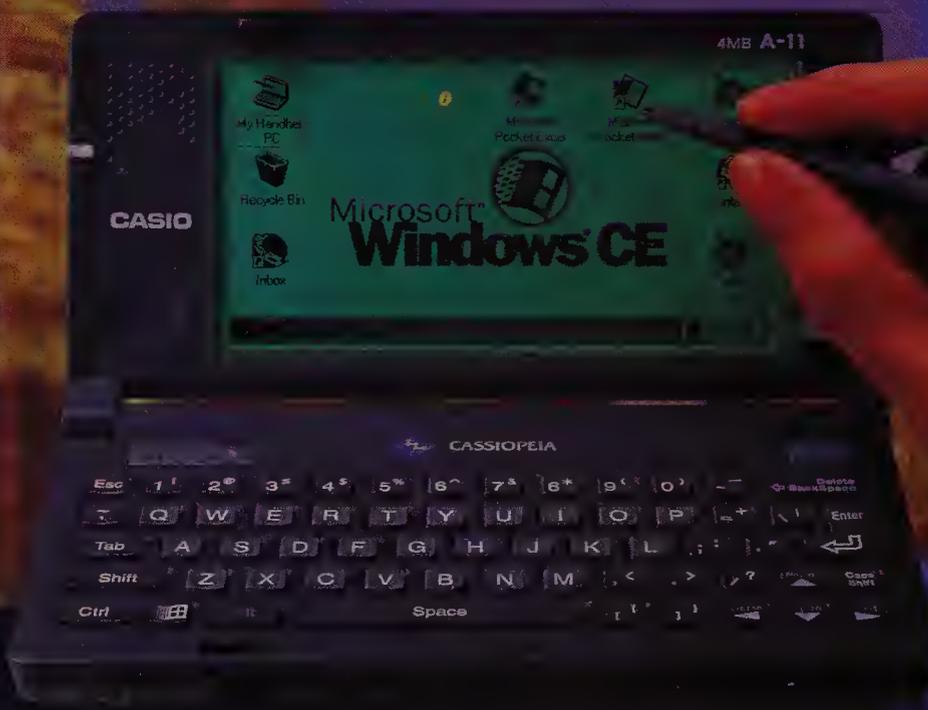
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Connect to the QG-100 Color Printer and produce color prints of images as soon as you shoot them.

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# Win a Quantex QP5/200MMX SM-3

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Quantex QP5/200MMX SM-3, a Pentium-200 MMX PC in this month's Top 20. Send in a separate copy of the survey for each of your PCs.

**HOW TO ENTER:** FOR BEST RESULTS, PHOTOCOPY THIS PAGE. Fax your completed survey to 415/357-4522. Do NOT fax a cover page. Or mail it to *PC World*, Box 3-SS, c/o 800-SCAN, 543 Howard St., San Francisco, CA 94105-3013. Surveys must be received by March 31.

**PRIZE:** One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact winners by telephone and fax. If *PC World* is unable to do so within 30 days of the drawing, a new winner will be selected. No purchase necessary. Void where prohibited by law.

**HOW TO FILL OUT THE FORM:** Print your name (block capital letters) and your fax number, and fill the circles for each digit of your daytime phone number. Then fill out the questionnaire. AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME																				
FAX NUMBER																				
ZIP CODE																				

Please fill in your daytime phone number below.

1	<input type="radio"/>																			
2	<input type="radio"/>																			
3	<input type="radio"/>																			
4	<input type="radio"/>																			
5	<input type="radio"/>																			
6	<input type="radio"/>																			
7	<input type="radio"/>																			
8	<input type="radio"/>																			
9	<input type="radio"/>																			
0	<input type="radio"/>																			

**How did you get this copy of PC World?**

- By subscription    On the newsstand    From someone else

## ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

- |                                    |                                       |                                     |                                    |   |
|------------------------------------|---------------------------------------|-------------------------------------|------------------------------------|---|
| <input type="radio"/> Acer         | <input type="radio"/> Digital (DEC)   | <input type="radio"/> IBM           | <input type="radio"/> Packard Bell | <input type="radio"/> Tangent           |
| <input type="radio"/> Acma         | <input type="radio"/> DTK             | <input type="radio"/> Insight       | <input type="radio"/> Panasonic    | <input type="radio"/> Texas Instruments |
| <input type="radio"/> ALR          | <input type="radio"/> EPS             | <input type="radio"/> Intelesys     | <input type="radio"/> PerComp      | <input type="radio"/> Toshiba           |
| <input type="radio"/> Apple        | <input type="radio"/> Epson           | <input type="radio"/> Leading Edge  | <input type="radio"/> Pionex       | <input type="radio"/> Twinhead          |
| <input type="radio"/> AST          | <input type="radio"/> Everex          | <input type="radio"/> Micro Express | <input type="radio"/> Polywell     | <input type="radio"/> Unisys            |
| <input type="radio"/> Austin (IPC) | <input type="radio"/> Fujitsu         | <input type="radio"/> Micron        | <input type="radio"/> Premio       | <input type="radio"/> USA Flex          |
| <input type="radio"/> Compaq       | <input type="radio"/> Future Tech     | <input type="radio"/> Midwest Micro | <input type="radio"/> Quantex      | <input type="radio"/> Vektron           |
| <input type="radio"/> Compudyne    | <input type="radio"/> Gateway 2000    | <input type="radio"/> MIS           | <input type="radio"/> Robotech     | <input type="radio"/> WinBook           |
| <input type="radio"/> Comtrade     | <input type="radio"/> Hewlett-Packard | <input type="radio"/> Nat'l Micro   | <input type="radio"/> Samsung      | <input type="radio"/> Xi                |
| <input type="radio"/> CTX          | <input type="radio"/> HiO             | <input type="radio"/> NCR           | <input type="radio"/> Sharp        | <input type="radio"/> Zenith (ZDS)      |
| <input type="radio"/> Dell         | <input type="radio"/> Hitachi         | <input type="radio"/> NEC           | <input type="radio"/> Sony         | <input type="radio"/> Zenon             |
| <input type="radio"/> Diamond      | <input type="radio"/> Hyundai         | <input type="radio"/> Netis         | <input type="radio"/> Swan         | <input type="radio"/> Other             |

What size is this PC?

- Desktop  
 Notebook/laptop  
 Handheld

Where did you buy this PC?

- Local dealer  
 Mail/phone order  
 Direct from field sales force  
 Membership discount store  
 Computer superstore  
 Home electronics store  
 Retail store  
 Value-added reseller  
 Other

After ordering, how long did it take to get your PC?

- Less than 1 week  
 1-2 weeks  
 3-4 weeks  
 More than 4 weeks

What is the CPU?

- PowerPC  
 Pentium  
 Pentium Pro  
 80486  
 Other

Who set up your PC?

- Dealer/retailer/VAR  
 Staff computer technician  
 Self or coworker

Where do you use this PC?  At home/home office    At work    Both

## WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

- Jan    Mar    May    July    Sept    Nov    92    94    96  
 Feb    Apr    June    Aug    Oct    Dec    93    95    97

When you first set up your PC, were any components "dead on arrival" (DOA)?

- Yes    No    Don't know

If so, which component was it? (Mark all that apply.)

- |                                    |  |                                       |                                    |
|------------------------------------|--|---------------------------------------|------------------------------------|
| <input type="radio"/> Battery      | <input type="radio"/> Graphics/video board | <input type="radio"/> Modem/fax board | <input type="radio"/> Power supply |
| <input type="radio"/> CD-ROM       | <input type="radio"/> Hard drive           | <input type="radio"/> Monitor/screen  | <input type="radio"/> Sound board  |
| <input type="radio"/> CPU          | <input type="radio"/> Keyboard             | <input type="radio"/> Motherboard     | <input type="radio"/> Other        |
| <input type="radio"/> Floppy drive | <input type="radio"/> Memory               | <input type="radio"/> Mouse           |                                    |

Did your problem occur only after you added your own hardware or software?

- Yes    No    Don't know

How many times have you had a problem with this PC?

- No problem ever    Three  
 One    Four  
 Two    More than four

Would you buy this brand of PC again?

- Yes    No    Not sure

## NEW PROBLEM REPORT

Answer for the most recent problem—other than DOA—not reported in a prior survey.

When did this problem occur? (Specify month and year.)

- Jan    Mar    May    July    Sept    Nov    92    94    96  
 Feb    Apr    June    Aug    Oct    Dec    93    95    97

How long after you purchased your PC did the problem occur?

- Less than 1 month    4-6 months    More than 12 months  
 1-3 months    7-12 months    Not sure

Did the problem occur as a result of adding new hardware or software?

- Yes    No    Don't know

Did the problem occur under warranty?

- Yes    No    Don't know

What was the problem finally identified as? (Mark all that apply.)

- Faulty component    Wrong configuration    Device conflicts    Other  
 Incorrectly installed software    Faulty peripheral    OS problem    Don't know

If a component failed, which one was it? (Mark all that apply.)

- |                                    |  |                                       |                                    |
|------------------------------------|--|---------------------------------------|------------------------------------|
| <input type="radio"/> Battery      | <input type="radio"/> Graphics/video board | <input type="radio"/> Modem/fax board | <input type="radio"/> Power supply |
| <input type="radio"/> CD-ROM       | <input type="radio"/> Hard drive           | <input type="radio"/> Monitor/screen  | <input type="radio"/> Sound board  |
| <input type="radio"/> CPU          | <input type="radio"/> Keyboard             | <input type="radio"/> Motherboard     | <input type="radio"/> Other        |
| <input type="radio"/> Floppy drive | <input type="radio"/> Memory               | <input type="radio"/> Mouse           |                                    |

## SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?

- |                                      |  |   |                                      |                                |
|--------------------------------------|--|---|--------------------------------------|--------------------------------|
| <input type="radio"/> Manufacturer   | <input type="radio"/> Dealer/store where purchased | <input type="radio"/> Manufacturer's authorized repair technician | <input type="radio"/> Self           | <input type="radio"/> Other    |
| <input type="radio"/> Phone          | <input type="radio"/> System swap                  | <input type="radio"/> On site                                     | <input type="radio"/> Component swap | <input type="radio"/> In store |
| <input type="radio"/> Factory return |  |   |                                      |                                |

What types of service and support did you receive? (Mark all that apply.)

If you received phone service, how long were you on hold?

- Not at all    1-2 minutes    6-10 minutes    More than 20 minutes  
 Less than 1 minute    3-5 minutes    11-20 minutes

How long did it take before you talked to the person who finally helped you?

- Less than 15 minutes    2-5 hours    11-24 hours    3-5 days  
 15 minutes-1 hour    6-10 hours    1 1/2-2 days    1 week or more

How long did it take to resolve the problem completely? Was it resolved to your satisfaction?

- 1-2 days    More than 1 month  
 3-7 days    Never resolved  
 8-14 days    Awaiting resolution  
 15-30 days
- Yes    No

How would you rate the person(s) who helped you?

- |                |                       |                       |                       |
|----------------|-----------------------|-----------------------|-----------------------|
|                | Poor                  | Good                  | Excellent             |
| Courtesy       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Knowledge      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Follow-through | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Based on the service and support you received, would you buy this brand of PC again?

- Yes    No

On the whole, how satisfied are you with the service and support you received?

- Not at all    Satisfied    Extremely satisfied

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

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## TOP 10 PRINTERS

	MONOCHROME WORKGROUP PRINTERS	Month tested	Street price (11/12/96)	Overall rating	Speed for plain text (ppm)	Speed for full-page graphics (ppm)	Comments	Reader service number
1	 IBM Network Printer 12 800/426-3333 <a href="http://www.ibm.com">http://www.ibm.com</a>	retested this month	\$1250	92	8.9	2.4	<b>FEATURES:</b> 12-ppm laser. Standard 4MB of RAM, 600-by-600-dpi resolution, 250 sheets input, 270 output. <b>PRO/CON:</b> Fastest full-page graphics speed on the chart, very good print quality, control panel is easy to use. Support policies include 24-hour, 7-day technical help. Manuals are numerous and can be confusing.	-
2	Lexmark Optra Lx+ 800/891-0331 <a href="http://www.lexmark.com">http://www.lexmark.com</a>	July 96	\$1950	89	10.7	1.4	 <b>FEATURES:</b> 16-ppm laser. Standard 4MB of RAM, 600-by-600-dpi resolution (true 1200 dpi with at least 8MB of RAM), 500 sheets input and output. <b>PRO/CON:</b> Excellent print quality, easy-to-read LCD labels on control panel. Somewhat slow, especially printing full-page graphics; IBM laser is faster on graphics.	611
3	Lexmark Optra R+ 800/891-0331 <a href="http://www.lexmark.com">http://www.lexmark.com</a>	Nov 96	\$1199	88	10.8	1.2	 <b>FEATURES:</b> 16-ppm laser. Standard 4MB of RAM, 600-by-600-dpi resolution (true 1200 dpi with at least 8MB of RAM), 200 sheets input, 250 output. <b>PRO/CON:</b> Print quality, speed, and design resemble the Optra Lx+'s, but paper capacity is lower. Price drop to \$1199 makes it the lowest-priced laser on the chart.	612
4	HP LaserJet 5M 800/752-0900 <a href="http://www.hp.com">http://www.hp.com</a>	July 96	\$1799	87	9.5	1.1	 <b>FEATURES:</b> 12-ppm laser. Standard 6MB of RAM, 600-by-600-dpi resolution, 250 sheets input and output. <b>PRO/CON:</b> Very good print quality, easy-to-use control panel. Comes with ethernet standard, unusual for a workgroup printer. Full-page graphics speed is the slowest on the chart.	613
5	Okidata OL1200/PS 800/654-3282 <a href="http://www.okidata.com">http://www.okidata.com</a>	July 96	\$1399	87	8.9	2.3	 <b>FEATURES:</b> 12-ppm LED. Standard 6MB of RAM, 600-by-600-dpi resolution, 500 sheets input, 250 output. <b>PRO/CON:</b> Inexpensive, good print quality and performance. Control panel not as intuitive as others on the chart. On-site service free for first year.	614
<b>COLOR WORKGROUP PRINTERS</b>								
1	 HP DeskJet 1600CM 800/752-0900 <a href="http://www.hp.com">http://www.hp.com</a>	July 96	\$1999	89	4.4	0.5	 <b>FEATURES:</b> 8-ppm monochrome/2-ppm color ink jet. Standard 6MB of RAM, 600-by-600-dpi monochrome, 300-by-300-dpi color resolutions. <b>PRO/CON:</b> Inexpensive for good print quality and adequate speed, PostScript and ethernet are included. Ink jet pages, unlike a laser's, are sensitive to moisture and light.	615
2	Tektronix Phaser 350 800/835-6100 <a href="http://www.tek.com">http://www.tek.com</a>	Jan 97	\$2970	88	3.4	0.9	 <b>FEATURES:</b> 6-ppm solid ink printer. Standard 8MB of RAM, 300-by-300-dpi monochrome and color resolutions. <b>PRO/CON:</b> Stellar color quality, fastest graphics speed on the color chart, solid ink blocks are easy to load, black ink is free for as long as you own printer. Text speed is slow, takes only letter-size paper.	616
3	Xerox XPrint 4920 Plus 800/349-3769 <a href="http://www.xerox.com">http://www.xerox.com</a>	Sept 96	\$6500	86	5.5	0.3	 <b>FEATURES:</b> 12-ppm monochrome/3-ppm color laser. Standard 16MB of RAM, 600-by-600-dpi monochrome and color resolutions. <b>PRO/CON:</b> Superb print quality, optional \$1341 feeder gives it the highest maximum paper capacity (1750) of any color laser on the chart. Slow at printing full-page graphics.	617
4	Tektronix Phaser 550 800/835-6100 <a href="http://www.tek.com">http://www.tek.com</a>	July 96	\$5945	85	5.6	0.5	 <b>FEATURES:</b> 14-ppm monochrome/5-ppm color laser. Standard 8MB of RAM, 600-by-600-dpi monochrome and color resolutions (true 1200 dpi with 24MB of RAM). <b>PRO/CON:</b> Least expensive color laser on the chart, accommodates labels and manual double-sided printing. Proprietary RAM is expensive.	618
5	HP Color LaserJet 5M 800/752-0900 <a href="http://www.hp.com">http://www.hp.com</a>	July 96	\$7395	85	6.9	0.9	 <b>FEATURES:</b> 10-ppm monochrome/3-ppm color laser. Standard 24MB of RAM, 300-by-300-dpi monochrome and color resolutions. <b>PRO/CON:</b> Fastest color laser we've tested, ethernet standard. Print quality is good for text and simple graphics, but not for continuous-tone images like photographs.	619
 Best Buy		 <a href="http://www.pcworld.com/t10printers">http://www.pcworld.com/t10printers</a>			 Windows 95-certified Plug and Play		All products: 902	

**HOW WE TEST** The overall rating for both monochrome and color workgroup printers is based on print quality (27 percent), price (20 percent), features and ease of use (20 percent), speed (15 percent), service and support (13 percent), and cost of consumables (5 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



AFTER AN IMPRESSIVE run of seven months, the Lexmark Optra Lx+ has been knocked off the number one spot on the monochrome printers chart by the IBM Network Print-

er 12. The IBM debuted in January in third place, behind Lexmark's Optra R+. Then IBM raised the printer's standard RAM amount from 2MB to 4MB. Tested anew, the Network Printer 12's faster graphics speed bumped both Optra lasers down a ►

notch in the overall rankings. The Lexmark Optra R+'s small drop in street price, from \$1300 to \$1199, didn't make up for the speed difference. The Digital Colorwriter LSR 2000+ color laser we tested this month didn't make the chart because it was too expensive and fairly slow.

### A RAM BOOST HELPS IBM

AFTER WE FIRST TESTED the Network Printer 12 in January, IBM increased the printer's standard RAM to 4MB. In our tests the additional RAM boosted the IBM's text speed only 2 percent, from 8.7 pages per minute to 8.9 ppm—about 18 percent slower than the Optras. However, its full-page graphics speed increased 20 percent to 2.4 ppm—much faster than either Lexmark Optra laser.

The IBM puts out fine-looking gray-scale graphics and line art, matching the quality of both Optra models. The Optras still print the crispest text we've seen from a laser, but the IBM's deep black toner helps its text look almost as sharp.

Smaller offices will appreciate the IBM's compact size and relatively quiet operation. Clearly labeled buttons make it easy to choose settings from the printer's extensive set of menus.

The IBM's built-in auxiliary tray handles envelopes and card stock well, but if you plan to use the tray with PostScript applications make sure you have the most recent version of IBM's PostScript driver.

The version that came with our printer didn't recognize the auxiliary tray.

IBM claimed not to know about this glitch, but an updated PostScript driver we downloaded from the company's Web site eliminated the bug.

IBM's strong service and support policies include round-the-clock toll-free phone support. The Network Printer 12's manuals are comprehensive to a fault: Do we really need a 100-page booklet warning us in 13 languages not to open the printer and look at the laser beam? And the angled-perspective drawings can be confusing.

The Network Printer 12 had a problem printing our Adobe Illustrator PostScript test file in the PCL printer language. Other printers we've tested in PCL could print the Illustrator file, although it usually took them longer than a PostScript printer needs. The IBM failed until we changed a setting in its driver to convert the Illustrator file to a rasterized image.

The Network Printer 12 is not Windows 95-certified Plug and Play; an error on IBM's part caused us to misreport this fact in the January issue. The printer installed smoothly nonetheless.

### DIGITAL'S NEW COLOR LASER

THE DIGITAL Colorwriter LSR 2000+ is an upgrade to the original Colorwriter LSR 2000, which we tested for our workgroup printer roundup last July. The Colorwriter LSR 2000 was the first color



**FASTER GRAPHICS SPEED (thanks to more standard RAM) helped push the IBM Network Printer 12 above both Lexmark Optras to the number one spot this month.**

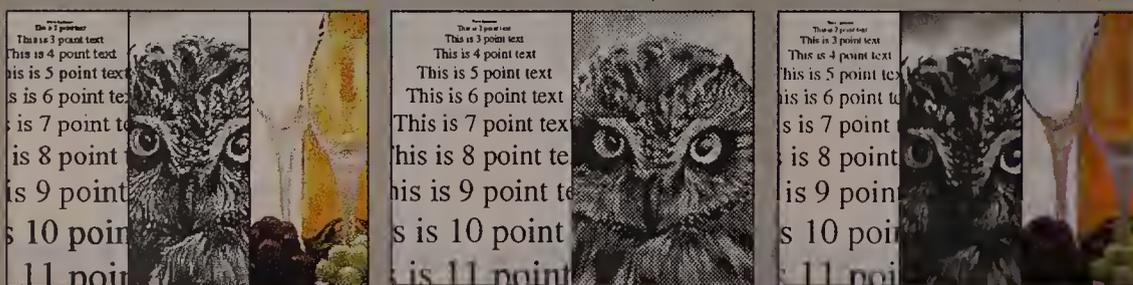
laser we'd seen with the EFI Fiery-driven controller, which was supposed to make color lasers perform much faster. Unfortunately, this has never been borne out in our tests, and Fiery-equipped printers are pricey. We tested the less-expensive version of the Colorwriter LSR 2000+ with 16MB of RAM, but at \$8074 it costs hundreds of dollars more than any color printer on the chart. (A version with 32MB of RAM has a list price of \$10,699.) While the Digital's half-page-per-minute graphics speed is average for a color workgroup printer, its 3.1-ppm text speed is very slow.

Like most color lasers using the Canon engine, the Digital's text looks just slightly fuzzy compared to a monochrome laser's—but color quality is among the best we've seen. The Digital's shiny toner helps colors stand out, but the glare can hamper text legibility.

Digital fixed one design flaw common to color lasers using the Canon engine: Any action that interrupts a print job, such as opening the front panel, no longer forces the printer into a loud and time-consuming restart. But the Colorwriter LSR 2000+ is still very noisy when it prints. At 110 pounds it's also a bear to move—and when you do, fuser oil can leak onto paper and make a mess. And the design of the printer's control panel is less than perfect: The menus are logical, but the buttons are labeled with inscrutable icons that make using the menus needlessly confusing. —Dan Littman ■

## PRINT QUALITY SAMPLES

### IBM's Text and Gray Scale Excel



#### HP DESKJET 1600CM

Our Best Buy color workgroup printer for nine months running, this \$1999 color ink jet prints good text and gray scale, as well as impressive color images.

#### IBM NETWORK PRINTER 12

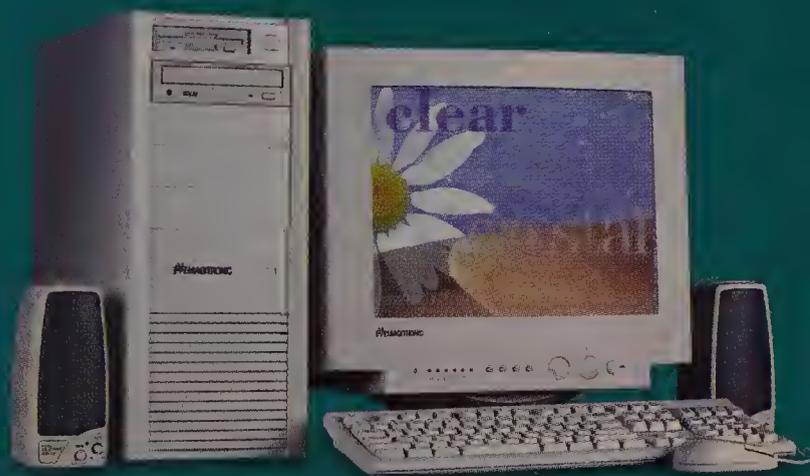
IBM's inexpensive monochrome laser prints very good text and gray-scale images. With its RAM upgrade, graphics come out faster, too.

#### DIGITAL COLORWRITER LSR 2000+

The Digital's Canon laser engine prints some of the best color we've seen, but its shiny toner can impair text legibility.



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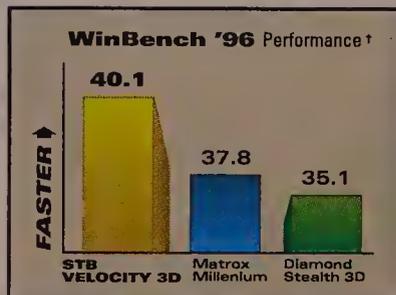


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## TOP 10 MONITORS

	17-INCH MONITORS	Month tested	Street price (12/1/96)	Overall rating	Quality of text/graphics	Comments	Reader service number
1	 Iiyama Vision Master Pro 17 800/394-4335 <a href="http://www.iiyama.com">http://www.iiyama.com</a>	Jan 97	\$799	90	very good/ excellent	<b>FEATURES:</b> 15.9-inch viewable screen, .25mm Diamondtron tube, up to 85-Hz refresh rate <sup>1</sup> , Level 2b Plug and Play ready <sup>2</sup> , three-year warranty, 12-hour weekday toll-free support. <b>PRO/CON:</b> \$30 price cut, best graphics, superb text clarity, easy-to-adjust on-screen menus; two faint lines visible across screen.	620
2	 Panasonic PanaSync S17 201/348-7000 <a href="http://www.panasonic.com">http://www.panasonic.com</a>	Sept 96	\$699	84	very good/ very good	<b>FEATURES:</b> 15.7-inch viewable screen, .27mm dot-pitch tube, up to 85-Hz refresh rate <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 24-hour daily toll-free support. <b>PRO/CON:</b> Low price, very crisp text and graphics; on-screen menu icons are difficult to decipher, must press control buttons too much to find on-screen menu items.	621
3	Mitsubishi Diamond Pro 87TXM 800/843-2515 <a href="http://www.mitsubishi-dlsplay.com">http://www.mitsubishi-dlsplay.com</a>	NEW	\$749	84	very good/ good	<b>FEATURES:</b> 15.7-inch viewable screen, .25mm Diamondtron tube, up to 107-Hz refresh rate <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 12-hour daily toll-free technical support. <b>PRO/CON:</b> Very crisp text detail, accurate colors, intuitive on-screen menus, low-emission approval by TCO; two faint lines visible across screen.	622
4	Princeton Graphic Systems Ultra 17+ 800/747-6249 <a href="http://www.pgr.com">http://www.pgr.com</a>	Jan 97	\$599	83	good/ very good	<b>FEATURES:</b> 15.8-inch viewable screen, .28mm dot-pitch tube, up to 85-Hz refresh rate <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 24-hour daily toll-free technical support (automated after 5 p.m.). <b>PRO/CON:</b> \$36 price drop, lowest price on chart, very detailed graphics; some on-screen menu icons hard to decipher.	623
5	ViewSonic PT770 800/888-8583 <a href="http://www.viewsonic.com">http://www.viewsonic.com</a>	Sept 96	\$749	83	very good/ good	<b>FEATURES:</b> 15.9-inch viewable screen size, .25mm Diamondtron tube, can refresh up to 101 Hz <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 11-hour workday only support. <b>PRO/CON:</b> \$100 price drop boosts unit up two slots, very sharp text, large screen size, color correction software; two faint lines visible across screen.	624
6	Continental DigiView 1709D 888/327-8899 <a href="http://www.digiview.com">http://www.digiview.com</a>	Sept 96	\$799	83	very good/ good	<b>FEATURES:</b> 15.9-inch viewable screen, .25mm Diamondtron tube, up to 101-Hz refresh <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 8-hour toll-free weekday support. <b>PRO/CON:</b> Good price, very crisp text and pictures, main control button looks odd but adjusting screen is easy; rear on/off switch is hard to reach.	625
7	ViewSonic 17GS 800/888-8583 <a href="http://www.viewsonic.com">http://www.viewsonic.com</a>	NEW	\$649	83	very good/ very good	<b>FEATURES:</b> 15.9-inch viewable screen, .27mm dot-pitch tube, up to 85-Hz refresh <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 11-hour toll-free weekday support. <b>PRO/CON:</b> Low price, text and images are fairly crisp, uniform screen brightness, accurate color quality; awkward to navigate through on-screen menus.	626
8	Princeton Graphic Systems E075 800/747-6249 <a href="http://www.pgr.com">http://www.pgr.com</a>	NEW	\$699	82	good/ very good	<b>FEATURES:</b> 15.8-inch viewable screen, .26mm dot-pitch tube, up to 120-Hz refresh rate <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, 24-hour daily toll-free technical support (automated after 5 p.m.). <b>PRO/CON:</b> Very detailed graphics, high refresh rates; sharp but slightly ghosted type, must hunt down on-screen menu items.	627
9	Wyse Technologies Wysevision WY-17PS 800/438-9973 <a href="http://www.wyse.com">http://www.wyse.com</a>	Sept 96	\$799	82	good/ very good	<b>FEATURES:</b> 15.9-inch viewable screen, .25mm Diamondtron tube, up to 101-Hz refresh rate <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, toll-free support 9 hours on weekdays. <b>PRO/CON:</b> Detailed text and images, same controls as Continental; rear on/off switch, two faint lines visible across screen.	628
10	NEC MultiSync P750 800/632-4636 <a href="http://www.nec.com">http://www.nec.com</a>	NEW	\$1049	82	very good/ good	<b>FEATURES:</b> 15.6-inch viewable screen size, .25mm CromoClear tube, up to 117-Hz refresh rate <sup>1</sup> , Level 2b PnP ready <sup>2</sup> , three-year warranty, daily 12.5-hour toll-free support. <b>PRO/CON:</b> Very sharp text, realistic color graphics quality, easy-to-use on-screen menus; smallish viewable screen size, most expensive monitor on chart.	629



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All products: 903

<sup>1</sup> Highest refresh rate at 1024 by 768 resolution.<sup>2</sup> Level 2b Plug and Play monitors and graphics cards can automatically synchronize settings. However, Windows 95 does not fully utilize Plug and Play.

**HOW WE TEST** Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, spreadsheets, Web pages, and scanned images. The overall rating is based on text and graphics quality (25 percent each), features and ease of use (25 percent), price (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



IMPROVED TUBE DESIGNS helped two new monitors onto this month's Top 10 chart. Mitsubishi's \$749 Diamond Pro 87TXM debuts in third place with an enhanced Diamondtron

tube that displays sharper text than previous Mitsubishi monitors. At the bottom of the chart is NEC's MultiSync P750. The \$1049 price is steep, but NEC tweaked its CromoClear tube so fonts look crisper, and contrast is better under bright lights. ■

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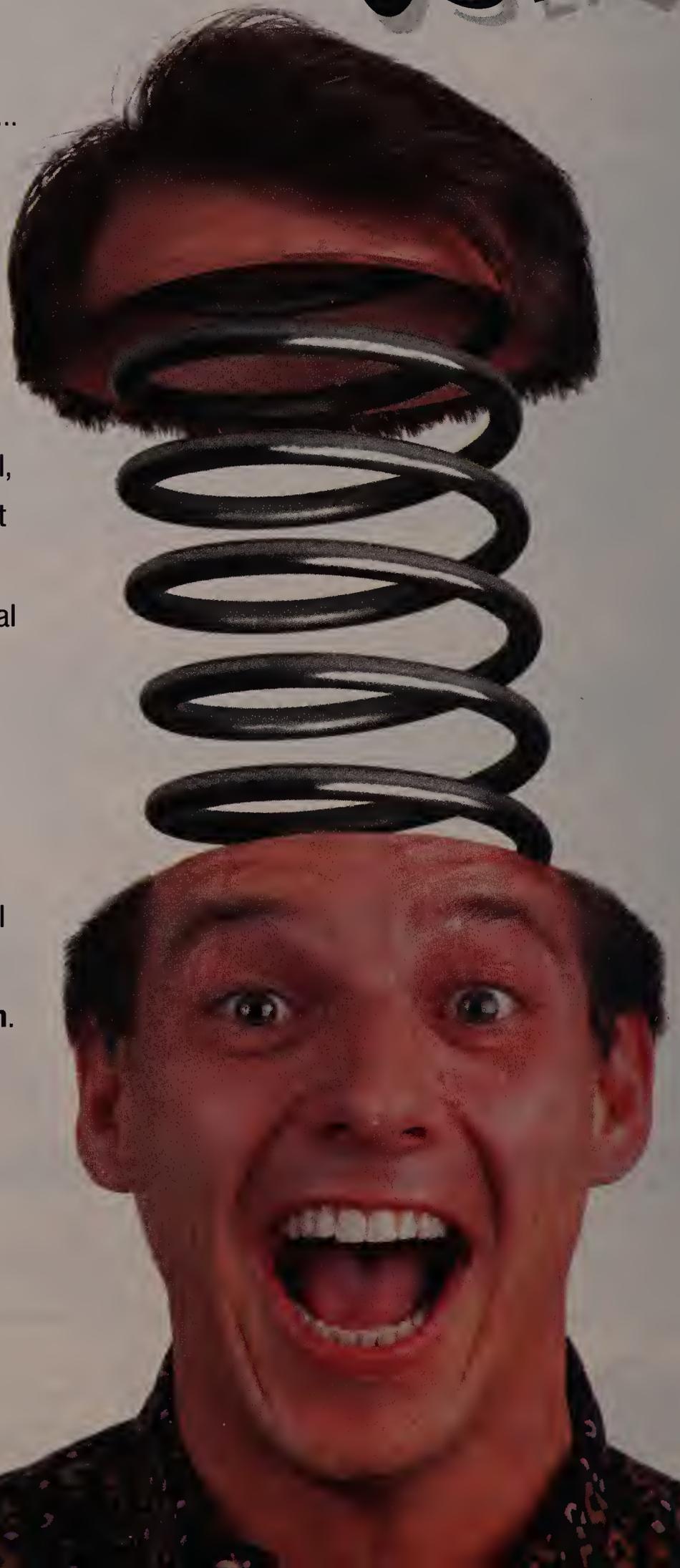
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# TOP 10 GRAPHICS BOARDS

	GRAPHICS BOARD	Month tested	Street price (12/16/96)	Overall rating	PC WorldBench graphics score	Comments	Reader service number
1	 <b>STB Velocity 3D</b> 888/234-8750 <a href="http://www.stb.com">http://www.stb.com</a>	Feb 97	\$199	101	187 very good	<b>FEATURES:</b> 4MB of VRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear interpolation, Mediamatics MPEG software, S3 Virge/VX chip. <b>PRO/CON:</b> Great performance, 4MB of fast memory good for very graphical programs, nice set of utilities; mediocre AVI and MPEG video playback.	713
2	 <b>Matrox Mystique</b> 800/361-1408 <a href="http://www.matrox.com/mga">http://www.matrox.com/mga</a>	Dec 96	\$149	100	181 very good	 <b>FEATURES:</b> 2MB of SGRAM, 130-Hz refresh rate at 1024 by 768, 3-D acceleration, optional MPEG and TV tuner cards, Compcore MPEG software, MGA-1064SG chip. <b>PRO/CON:</b> \$30 price drop, best 3-D performance and quality, good AVI and MPEG video playback; refresh rates hard to set.	714
3	<b>Diamond Stealth 3D 3400XL</b> 800/468-5846 <a href="http://www.diamondmm.com">http://www.diamondmm.com</a>		\$254	99	184 very good	<b>FEATURES:</b> 4MB of VRAM, 120-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, Mediamatics MPEG software, S3 Virge/VX chip. <b>PRO/CON:</b> 4MB of fast memory good for graphical apps, great software utilities, excellent AVI video playback, easy installation; pricey.	715
4	<b>Hercules Terminator 3D</b> 800/532-0600 <a href="http://www.hercules.com">http://www.hercules.com</a>	Dec 96	\$119	99	184 very good	<b>FEATURES:</b> 2MB of EDO DRAM, 90-Hz refresh rate at 1024 by 768, 3-D acceleration, optional MPEG card, Xing MPEG software, S3 Virge chip. <b>PRO/CON:</b> \$20 price drop, inexpensive, handles basic 3-D graphics well, excellent AVI and MPEG video playback, easy installation, toll-free support; poor documentation.	716
5	<b>ATI 3D Xpression+ PC2TV</b> 905/882-2600 <a href="http://www.atitech.ca">http://www.atitech.ca</a>	Jan 97	\$189	99	180 very good	<b>FEATURES:</b> 4MB of SDRAM, 150-Hz refresh rate at 1024 by 768, 3-D acceleration, bilinear video interpolation, ATI MPEG player, ATI Rage II chip. <b>PRO/CON:</b> \$10 price drop, 4MB of memory lets you see more colors at high resolutions, connects to a TV, excellent AVI and MPEG video, flawless installation; 3-D quality is merely okay.	717
6	<b>STB Lightspeed 128</b> 888/234-8750 <a href="http://www.stb.com">http://www.stb.com</a>	Aug 96	\$150	98	186 very good	<b>FEATURES:</b> 2.25MB of MDRAM, 120-Hz refresh rate at 1024 by 768, bilinear video interpolation; Xing MPEG software, Tseng Labs ET6000 chip. <b>PRO/CON:</b> Good price, performs well in business and graphics programs, perfect AVI video playback, excellent MPEG, lifetime warranty; no 3-D acceleration.	718
7	<b>Hercules Dynamite 128/Video</b> 800/532-0600 <a href="http://www.hercules.com">http://www.hercules.com</a>		\$139	97	186 very good	<b>FEATURES:</b> 4MB of MDRAM, 90-Hz refresh rate at 1024 by 768, bilinear video interpolation, Xing MPEG software, Tseng Labs ET6000 chip. <b>PRO/CON:</b> Great price for a 4MB card, good performance all the way up to 1280 by 1024, cool utilities, easy installation; poor documentation, no 3-D acceleration.	719
8	<b>VideoLogic GrafixStar 600</b> 800/578-5644 <a href="http://www.videologic.com">http://www.videologic.com</a>	Oct 96	\$149	97	185 very good	<b>FEATURES:</b> 2MB of MDRAM, 120-Hz refresh rate at 1024 by 768, bundled multimedia apps, Xing MPEG software, Tseng Labs ET6000 chip. <b>PRO/CON:</b> \$10 price drop, fast in business and graphics programs, inexpensive, excellent utilities, top-notch AVI and MPEG video; no 3-D acceleration.	720
9	<b>Matrox Millennium</b> 800/361-1408 <a href="http://www.matrox.com/mga">http://www.matrox.com/mga</a>	June 96	\$199	96	184 very good	 <b>FEATURES:</b> 2MB of WRAM, 120-Hz refresh rate at 1024 by 768, optional MPEG and TV tuner cards, Compcore MPEG software, Matrox MGA-2064W chip. <b>PRO/CON:</b> Good for graphical programs, some 3-D acceleration, superb AVI video; watch for slower refresh rates in version shipped with some PCs.	721
10	<b>Diamond Stealth 3D 2400XL</b> 800/468-5846 <a href="http://www.diamondmm.com">http://www.diamondmm.com</a>	Feb 97	\$179	95	184 very good	<b>FEATURES:</b> 4MB of EDO DRAM, 100-Hz refresh rate at 1024 by 768, 3-D acceleration, Mediamatics MPEG software, S3 Virge chip. <b>PRO/CON:</b> All that RAM displays more colors and helps with 3-D effects; for \$20 less, the 2MB board is also a good buy; original drivers lacked refresh rate utility—we'll test new drivers next month.	722



Best Buy

<http://www.pcworld.com/t10graphics>

Windows 95-certified Plug and Play

All products: 910

**HOW WE TEST** We tested PCI boards under Windows 95 with PC WorldBench 1.0 at 800 by 600 resolution and 16.8 million colors (reported here) and at 1024 by 768 and 65,536 colors. Boards were tested in a Dell Dimension XPS P133c with 16MB of EDO DRAM and 256K of pipeline-burst secondary cache. The overall rating is based on performance (40 percent), features (30 percent), price (20 percent), and support policies (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



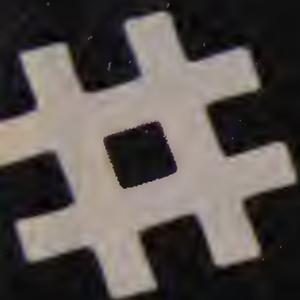
DIAMOND IS IN THE HUNT for a Best Buy. Its new Stealth 3D 3400XL is a good board, especially if you work with lots of colors at high resolutions. It plays video clips more smoothly than

the tenth-ranked Stealth 3D 2400XL. But at \$254, it's the highest-priced board on the chart. Farther down the chart, the 4MB Hercules Dynamite 128/Video is a steal at \$139. It's powerful in business and graphics programs, but its documentation is poor. ■

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Name	In	Out	Lunch	Meeting	Extension	Unit	Days	Time	Comment
BILL			✓		122		12/27	3:25 PM	In court
BRAD					145				
CAROLINE	✓				100				
CATHERYN					97		12/27	12:35 PM	At the Doctor
DAN	✓				148				
DAVE				✓	147		12/27	12:40 PM	In meeting with Accountants
FRANK	✓				182				
GUS					225		12/27	12:41 PM	Out to lunch
JOHN	✓				157				
JRM					133		12/27	12:09 PM	PR Meeting
KEVIN	✓				155				
LARRY		✓			160		12/27	1:32 PM	On sales call
MARK	✓				142				
NEENA	✓				189		1/7	8:30 AM	On vacation
MELISSA					187				
PHILLIPE	✓				152				
REX					177		12/27	1:05 PM	On site service call
STACY					131				
TATAMI	✓				132				
TERRY					167		12/27	4:37 PM	Playing golf with Glenn
WADE	✓				194				

"WhereAbouts? is one of those programs that, once you see it, makes you wonder why no one has done this before." *InfoWorld - April 1995*

"WhereAbouts? is a straight-forward and user-friendly product." *PC Magazine - September 1995*

"PC Week Labs found that *WhereAbouts?* unobtrusively solves several business problems." *PC Week - July 1995*

"For security and detailed reporting, *WhereAbouts?* is the right choice." *Government Computer News - May 1996*

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- Mississippi Attorney General's Office



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## TOP 10 MODEMS

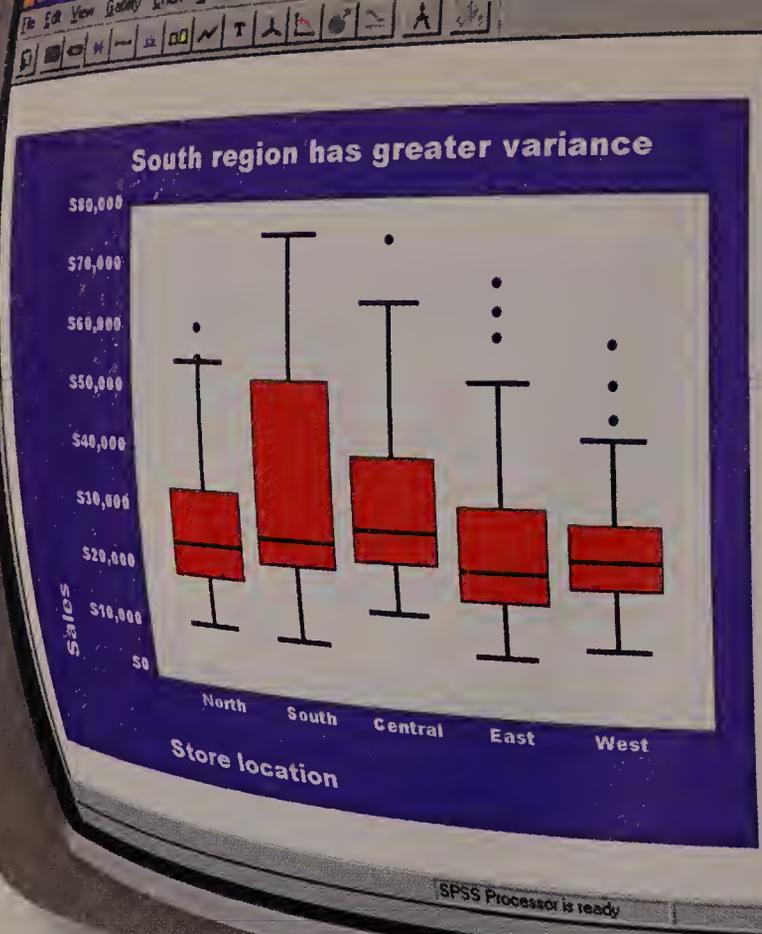
	EXTERNAL MODEMS	Month tested	Street price (12/15/96)	Overall rating	Average transfer time per MB (min:sec)	Comments	Reader service number
1	 Practical Peripherals PC288LCD V.34 770/840-9966 <a href="http://www.practinet.com">http://www.practinet.com</a>	NEW	\$329	85	2:28	 <b>FEATURES:</b> 28.8-kbps, distinctive ring, stores multiple profiles, 230.4-kbps modem-to-PC speed, Quicklink II fax/data software, Caller ID, lifetime warranty. <b>PRO/CON:</b> Best performer on the chart, LCD English-language status display, loaded with features like manual volume control; very expensive.	703
2	U.S. Robotics Courier V. Everything/V.34 800/877-2677 <a href="http://www.usr.com">http://www.usr.com</a>	Jan 97	\$275	82	2:42	 <b>FEATURES:</b> 33.6-kbps, FlashROM, distinctive ring, Quicklink II fax/data software, password protection, callback security. <b>PRO/CON:</b> Above-average performer, loaded with features, manual volume control, phone jack turns off during connect, great documentation; expensive, takes up a lot of room on your desk.	704
3	Zoom V.34X Plus 800/631-3116 <a href="http://www.zoomtel.com">http://www.zoomtel.com</a>	NEW	\$119	80	2:52	 <b>FEATURES:</b> 33.6-kbps, MNP-10EC error control, stores multiple profiles, distinctive ring, DOS/WinFax Lite fax/data software. <b>PRO/CON:</b> Fantastic price, easy-to-follow documentation, seven-year warranty; below-average performance, no security features.	705
4	Motorola ISG Premier 33.6 800/566-3266 <a href="http://www.mot.com/mims/isg/">http://www.mot.com/mims/isg/</a>	Jan 97	\$230	80	2:28	<b>FEATURES:</b> 33.6-kbps, FlashROM, 230.4-kbps modem-to-PC speed, distinctive ring, stores 20 profiles, Quicklink II fax/data software. <b>PRO/CON:</b> Ties with the Practical Peripherals unit for best performance on the chart, toll-free tech support, \$70 price drop since the last review; documentation is not for novices.	706
5	NewCom 33600efx 800/563-9266 <a href="http://www.newcominc.com">http://www.newcominc.com</a>	NEW	\$120	79	2:48	 <b>FEATURES:</b> 33.6-kbps, MNP-10 error control, Quicklink II fax/data software. <b>PRO/CON:</b> A good modem if cost is your overriding concern, includes serial cable, toll-free tech support; below-average performance, few features, no security or upgrade options, poor documentation.	707
PC CARD MODEMS							
1	 Motorola Montana 33.6 800/427-2624 <a href="http://www.mot.com/modems">http://www.mot.com/modems</a>	NEW	\$240	89	2:36	 <b>FEATURES:</b> 33.6-kbps, FlashROM, 230.4-kbps modem-to-PC speed, digital line voltage protection with alert, Quicklink Mobile fax/data software. <b>PRO/CON:</b> Top performer on the PC Card chart, performed especially well over noisy line conditions, good for cellular use; installation required a call to tech support.	708
2	Megahertz XJ4336 800/527-8677 <a href="http://www.usr.com/mobileusr">http://www.usr.com/mobileusr</a>	NEW	\$289	86	2:38	 <b>FEATURES:</b> 33.6-kbps, FlashROM, 230.4-kbps modem-to-PC speed, MNP-10EC error control, stores multiple profiles, digital line voltage protection with alert. <b>PRO/CON:</b> Great performer, thorough documentation for beginners and experts alike, painless installation; expensive.	709
3	Practical Peripherals ProClass 288 V.34 Data/Fax Modem With EZ-Port 770/840-9966 <a href="http://www.practinet.com">http://www.practinet.com</a>	Jan 97	\$199	86	2:42	<b>FEATURES:</b> 33.6-kbps, FlashROM, 230.4-kbps modem-to-PC speed, distinctive ring, stores multiple profiles, password protection, Quicklink II fax/data software. <b>PRO/CON:</b> Above-average performer, built-in phone jack, lifetime warranty, \$30 price drop since the last review; installation is not as easy as we'd like.	710
4	TDK CyberExpress 3000 800/999-4835 <a href="http://www.tdksystems.com">http://www.tdksystems.com</a>	Jan 97	\$199	84	2:49	 <b>FEATURES:</b> 33.6-kbps, MNP-10EC error control, distinctive ring, stores multiple profiles, 250-kbps modem-to-PC speed, Quicklink II fax/data software. <b>PRO/CON:</b> Nice price, toll-free tech support, digital line voltage protection with alert; slowest performer on the chart and below average overall.	711
5	Zoom PCMCIA V.34C Plus Model 2870 800/631-3116 <a href="http://www.zoomtel.com">http://www.zoomtel.com</a>	Jan 97	\$199	84	2:47	 <b>FEATURES:</b> 33.6-kbps, MNP-10EC error control, FlashROM, distinctive ring, stores multiple profiles, DOS/WinFax Lite fax/data software. <b>PRO/CON:</b> Attractively priced, digital line voltage protection, seven-year warranty; no security features, middling performer, installation not recommended for novices.	712
	 Best Buy  <a href="http://www.pcworld.com/t10modems">http://www.pcworld.com/t10modems</a>  Windows 95-certified Plug and Play All products: 909						

**HOW WE TEST** We tested a pair of identical modems on a simulated phone network. For the phone line test, we sent a text file over 55 line conditions. For the file type test, we sent five files—graphics, text, program, and compressed file types, plus a mixture of these four types—over one line condition. We then averaged the results of the two tests. Overall rating is based on performance (43 percent), features (26 percent), price (12 percent), support (10 percent), and ease of use (9 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



FIVE NEW MODEMS appear on this month's chart, two of them new Best Buys. On the external chart, Practical Peripherals' PC288LCD V.34 packages real speed with features like an LCD status

display. The Motorola Montana 33.6 is our new top PC Card, followed by Megahertz's XJ4336, which replaces the XJ4288. The Montana is the best performer of the PC Cards, but installation isn't as easy as we'd like from a Plug and Play modem. ■



**Staff courtesy is inconsistent**

Satisfaction with store

Stores in South		How helpful was the staff?					Total
		Extremely helpful	Very helpful	Somewhat helpful	Not very helpful	Not at all helpful	
Store #216	Mean	8.26	8.00	7.05	5.79	3.42	7.27
	Count	9	17	14	7	2	49
	Std. Deviation	.95	.99	1.54	2.38	4.69	1.90
Store #235	Mean	8.30	7.90	7.44	5.53	4.19	7.32
	Count	12	13	15	3	5	48
	Std. Deviation	.64	.87	.87	2.98	1.67	1.65
Store #241	Mean	8.43	8.54	4.64	5.93		8.13
	Count	34	14	4	1		53
	Std. Deviation	1.29	1.47	1.84			1.71
Store #244	Mean	8.92	8.78	6.04	4.30		8.40
	Count	34	8	7			50
	Std. Deviation	.80	1.81	1.95			1.63
Store #273	Mean	7.84	7.61	7.26	6.03	5.42	7.24
	Count	13	14	8	8	2	45
	Std. Deviation	.95	.96	1.49	1.91	1.14	1.43
Total	Mean	8.49	8.11	6.86	5.78	4.29	7.69
	Count	102	66	48	20	9	245
	Std. Deviation	1.05	1.23	1.61	2.06	2.20	1.74

**New!**  
Version 7.5 for  
Windows® 95  
and NT™

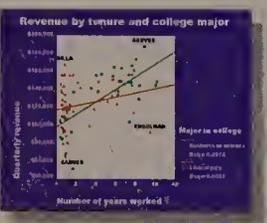
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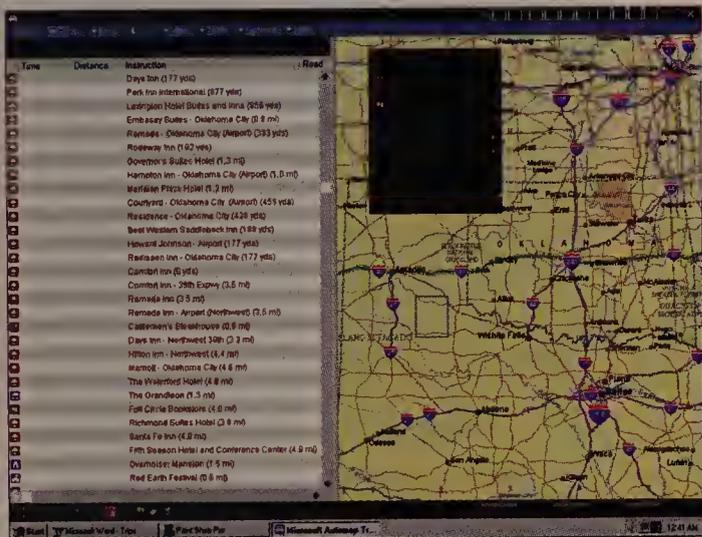
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# Travel To Go, Control the TV, Web Cartoons

## ON THE ROAD AGAIN

IF YOU LIKE to know where you're going before you hit the road, get help from Rand McNally's **TripMaker 1997 Edition** or Microsoft's **Automap Trip Planner**. Both CD-ROMs cover thousands of miles of North American roads, provide directions, and suggest what to do along the way.



**AUTOMAP TRIP PLANNER HELPS YOU** map out your vacation in advance, giving you more time to enjoy the ride.

Microsoft's package is the slicker of the two, with sophisticated maps, gorgeous panoramic views of select sites, and a smooth interface. But Rand McNally's program comes with a printed color road atlas—handy if you don't plan to travel with your computer. Both titles offer wizards that prompt you for travel habits such as how fast you drive and what time of day you like to travel, then automatically calculate itineraries with complete directions, maps, activities, and travel times—all printable. They also have videos, pictures,

maps, and articles pertaining to specific locales and attractions. Web links in both products keep the information fresh.

—James Oliver Cury

## TripMaker 1997 Edition

GRADE: **A-**; PRICE: \$40 street; Rand McNally New Media; 800/671-5006, <http://www.randmcnally.com/catalog/tripmkr.htm>

READER SERVICE NO. 762

## Automap Trip Planner

GRADE: **B+**; PRICE: \$40 street; Microsoft; 800/426-9400, <http://www.microsoft.com/automap/>

READER SERVICE NO. 763

## A HOME OF THEIR OWN

**Kids' World Online** is like a cartoon network on the Internet. Download the software, and it creates a child's place on your computer. It's an Internet browser as well as a kid-safe desktop interface. It won't let the kids play with your financial records or stray into unsavory Net neighborhoods. It's fun, it's educational, and it's *free*. (At least for now; it may become a subscription service later this year.) Kids can carry out basic experiments with Virgil Reality the mad scientist and delve into word matching and math games with Lil' Howie. Or they can send and receive e-mail and chat with other kids. The chat function uses avatars that speak the words kids type, in goofy cartoon voices.

—Aoife McEvoy

## Kids' World Online

GRADE: **A-**; PRICE: free; 7th Level; 800/884-8863, <http://www.7thlevel.com>

READER SERVICE NO. 764

## THE VIRTUAL CONTRACTOR

ANYONE WHO'S HAD a house built or remodeled knows that it helps to have a degree in architecture and the patience of a saint. **Planix Home Design Suite 3D** aims to streamline the experience by letting you test-drive your design before you hire a contractor. Once you study the Planix manual, you can plan interior and exterior walls, add furniture and cabinets, even decorate with artwork, rugs, windows ▶

## Automated Channel Surfing

YOU MAY BE A HIGH-TECH NERD, but my money says you can't program your VCR. Am I right? Well, **Program Master** is all you need to rule that VCR with an iron fist. Program Master's ETV Host software downloads a programming guide (available by subscription) for your area. Search for stuff you like by title, genre, actor, or other more specific criteria; ETV Host then produces a personal viewing schedule. Hold Program Master up to your PC screen. The software transmits the information to the remote control via a series of flashing lights. Leave the remote pointed at the TV and VCR and go about your life. When you get home, you can park yourself in front of the television set and watch the tape your electronic servants made while you were out.

—Christina Wood

## Program Master

GRADE: **A**; PRICE: with six-month programming guide subscription \$49.95 list; subsequent one-year subscription \$49.95; Scottsdale Technologies; 602/998-7300

READER SERVICE NO. 765



by Pella, and wall coverings by Wallpapers to Go. After you build your dream house on-screen, take a 3-D walk-through or an animated tour. It takes a lot of time to learn how to put that virtual wall where you want it and not end up wallpaper the ceiling, but this package is an excellent tool to get you started on that remodel.

—Angela Freeman

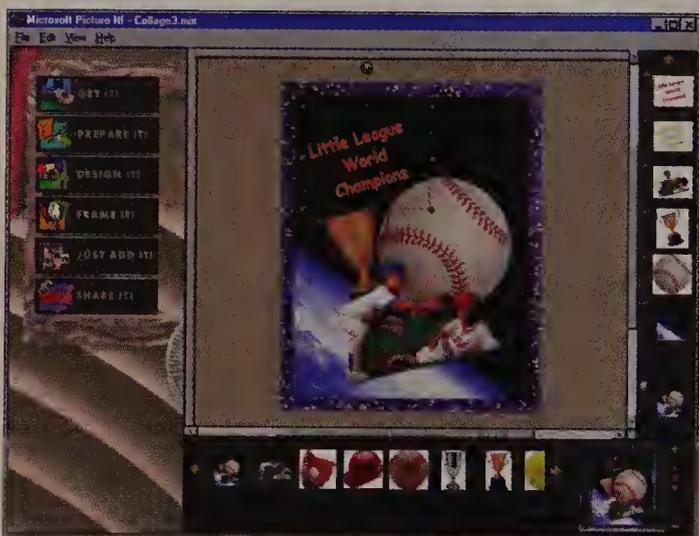
**Planix Home Design Suite 3D**

GRADE: **B**; PRICE: \$59 street; Softdesk; 800/231-8574, <http://www.softdesk.com/>

READER SERVICE NO. 766

**PICTURE THIS**

YOU'VE SCANNED IN the family photos; now you're ready to edit your sister's boyfriend out of all of them. But who has



PICTURE IT'S STEP-BY-STEP PHOTO EDITING makes it easy to produce photo collages and other creative projects.

time to learn a complicated photo editing package? Check out Microsoft's **Picture It**. Just open photos from a scanner, digital camera, or Kodak FlashPix CD, click a *Task* button, and follow wizards to fix red-eye syndrome, add special effects or colorful borders, create a photo collage—you name it. **Picture It** comes with ready-made templates, backgrounds, and clip art. Graphics veterans won't be interested, but

**Picture It** is just right for the rest of us—and our kids. —Richard Jantz

**Picture It**

GRADE: **A**; PRICE: \$79.95 list; Microsoft; 206/882-8080, <http://www.microsoft.com/pictureit>

READER SERVICE NO. 767

**ENCYCLOPEDIAS DUKE IT OUT**

THE NEW BREED of CD-ROM encyclopedia must be both bulldozer and entertainer, opening up new worlds of information and presenting knockout combinations of text, pictures, and sound. **Compton's Interactive Encyclopedia 1997 Edition** and **World Book 1997 Multimedia Encyclopedia Deluxe Edition** rise to the challenge. Neither achieves the elegance of the Microsoft

Encarta 97 Deluxe Edition (see "Best CD-ROMs of 1996," December 1996), but both are logical additions to your library. Each offers access to the Web and monthly content updates.

Tidy on-screen presentation with a simple icon-and-tab format and a lack of gimmicks make **World Book** the no-nonsense choice. It includes a disc of videos, animations, and 3-D panoramas. Less eyestraining than the previous version, **Compton's** still challenges the attention with its amusement park

graphics and games. But once you get used to this midway of learning, **Compton's** search mechanisms and integration of Web addresses prove remarkably efficient. A Planetarium, various browsing and exploring environments, and several factoid features may feel like sound-bite learning to adults, but they make **Compton's** especially appealing to kids.

—Derk Richardson

**Compton's Interactive Encyclopedia 1997 Edition**

GRADE: **B+**; PRICE: \$49.95 street; Compton's New Media; SoftKey Int'l; 800/227-5609, <http://www.comptons.com/products/cie/cie.html>

READER SERVICE NO. 768

**World Book 1997 Multimedia Encyclopedia Deluxe Edition**

GRADE: **A-**; PRICE: \$65 street; IBM; 800/426-7235, <http://www.pc.ibm.com/multimedia>

**Appreciate Depreciation**

THIS TIME OF year the word *taxes* becomes a mantra—especially if you have a small business. Here's a tip from the legal minds at Nolo Press in Berkeley, California (specifically from Frederick Daily, author of *Tax Savvy for Small Business*). If the business software you just bought has a useful life of one year, you can write off its entire cost in the first year instead of the usual 36 months. Even better: You can write off a computer purchase in the first year if the whole thing (including bundled software) cost less than \$17,500.



**Computer Samaritans**

EAGER TO SPREAD computer literacy? **Tech Corps** (508/620-7751, <http://www.ustc.org>) is a nonprofit organization that matches up computer-savvy people with schools that need their expertise. You can do more than simply surrender your old 386 (though you can do that, too): You can connect classrooms to the Internet, set up donated computers, and help teachers incorporate technology into their curriculum. Maybe your computer skills don't set you apart at work (or home), but they'll be appreciated in a technology-hungry classroom.

**The Fashion of Netizens**

PROUD OF BEING a Nethead? Now you can emblazon those cute Internet shorthand symbols—like :- ) for smile and :-( for sad—across your chest, and you don't have to log off to do it. Surf over to <http://www.netrags.com>, design the T-shirt you want, pay \$15.95, and wait for delivery.



**3 a.m. Help**

WORD OR EXCEL has just crashed your computer. It's 3 a.m. and you refuse to pay for after-hours support. Check out Microsoft's redesigned online support at <http://www.microsoft.com/support/>. At the site you'll find electronic support wizards waiting to help you troubleshoot common problems. —Christina Wood



**DO YOU TRUST** salespeople? Turns out 84 percent of the computer-buying masses let the retail sales staff influence their choice. Only 18 percent went to the store knowing what they wanted.

SOURCE: CHANNEL MARKETING, DALLAS

ILLUSTRATIONS: LEFT, TIM CARROLL; RIGHT, DAVID GOLDIN

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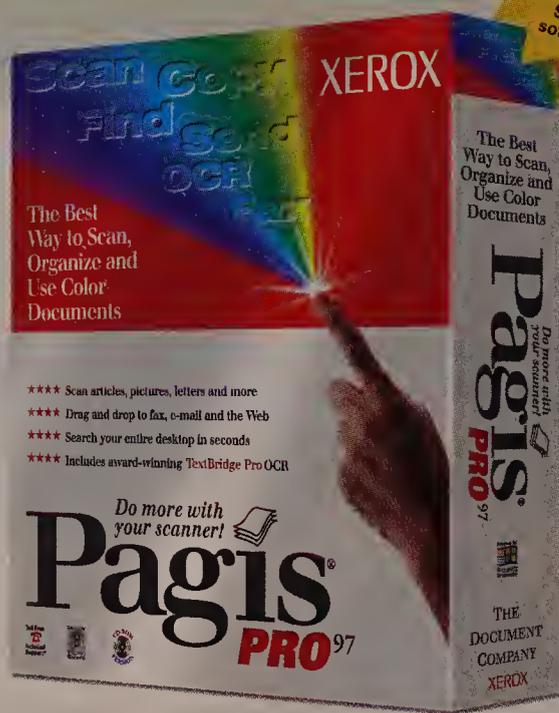
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Circle 257 on reader service card

## TOP 5 HOME PCs

	SYSTEM	Street price (11/25/96)	Overall rating	PC WorldBench score	Reliability/service rating	Setup rating	Comments	Reader service number
1	 Dell Dimension P200v 800/388-8542 <a href="http://www.dell.com">http://www.dell.com</a>	\$2499	88	213 outstanding	best/ best	fair	<b>FEATURES:</b> P-200, 32MB of SDRAM, 2.1GB hard drive, 8X CO-ROM drive, 33.6-kbps fax-modem, 15-inch monitor. <b>PRO/CON:</b> Basic bare-bones power machine gives near-record performance at a very reasonable price. Price here includes MS Office Pro but no other software; mail order only. Good foundation for home office.	731
2	Hewlett-Packard Pavilion 7285 800/724-6631 <a href="http://www.hp.com/Info/pchome">http://www.hp.com/Info/pchome</a>	\$2848	84	207 outstanding	best/ good	outstanding	<b>FEATURES:</b> P-200, 32MB of RAM, 3.1GB hard drive, 8X CD-ROM drive, 28.8-kbps fax-modem, 15-inch monitor. <b>PRO/CON:</b> Lots of muscle makes this a good choice for the power or home-office user. Same family-oriented collection of software as the 7280P.	732
3	Micron Home MPC 800/223-6571 <a href="http://www.micron.com">http://www.micron.com</a>	\$2720	83	215 outstanding	good/ best	good	<b>FEATURES:</b> P-200, 32MB of RAM, 1.2GB hard drive, 12X CO-ROM drive, 33.6-kbps fax-modem, 17-inch monitor. <b>PRO/CON:</b> The fastest home machine we've tested; software package includes Microsoft Office Pro, Quicken, Encarta, and MechWarrior 2. Expensive, but you get what you pay for. Small hard drive.	733
4	Gateway 2000 P5-166 Family PC 800/846-2000 <a href="http://www.gw2k.com">http://www.gw2k.com</a>	\$2199	83	199 very good	fair/ best	good	<b>FEATURES:</b> P-166, 16MB of RAM, 2.5GB hard drive, 8X CO-ROM drive, 33.6-kbps modem, 17-inch monitor. <b>PRO/CON:</b> Very fast, good price, big hard drive and monitor. Available only through mail order. Gateway 2000's less-than-spectacular reputation for reliability makes this a system for the confident user.	734
5	Hewlett-Packard Pavilion 7280P 800/724-6631 <a href="http://www.hp.com/info/pchome">http://www.hp.com/info/pchome</a>	\$2848	82	184 good	best/ good	outstanding	<b>FEATURES:</b> P-166, 16MB of RAM, 3.1GB hard drive, 8X CO-ROM drive, 33.6-kbps fax-modem, 17-inch monitor, built-in color scanner. <b>PRO/CON:</b> Great home machine with snapshot-size color scanner and image editing software. Family-oriented software collection includes Encarta, Quicken, The Great Word Adventure, and SimCity 2000.	735



Best Buy

<http://www.pcworld.com/top5soho>

All products: 912

**HOW WE TEST** The overall rating is based on reliability and service (30 percent), price (20 percent), PC WorldBench performance (20 percent), setup (10 percent), compatibility (10 percent), and extra features (10 percent). Reliability and service ratings are based on results of PC World's Reliability and Service Monitor survey.



DELL HOLDS ON TO THE TOP SPOT with an improved, faster version of its previous winner, the Dimension P200v. Meanwhile, an interesting machine from newcomer Monorail caught our eye but didn't quite make the chart.

The upgraded Dell Dimension P200v, still our Best Buy, now boasts 32MB of SDRAM, a 2.1GB hard drive, and a slightly higher price than last month. This mail-order-only system is now among the fastest home machines we've tested, and at \$2499, it's still a bargain.

In the number two position is HP's powerful \$2848 Pavilion 7285. A P-200 processor, 32MB of RAM, a generous software collection, and a 3.1GB hard drive make this a good choice if you're working and playing at home.

At \$2720, Micron's Home MPC delivers blinding performance, a 17-inch monitor, and a great software bundle for business and pleasure. Directly below it is the P5-166 Family PC from Gateway 2000.

Featuring a 2.5GB hard drive and a 17-inch monitor, this P-166 offers great performance for a rock-bottom \$2199. Coming in fifth once again is HP's Pavilion 7280P, sporting a P-166 processor, a 3.1GB hard drive, a 17-inch monitor, the same software collection as the Pavilion 7285, and a cool 5-by-7-inch color scanner.

Barely missing the Top 5 is the new Monorail PC 7245, an attractive choice if you can trade speed for convenience and a super-low \$999 price. The Monorail looks like one of those flat desktop panels you see on *Star Trek*: Its AMD K5-

PR75 processor (equivalent to a P-75), 1GB hard drive, 4X CD-ROM drive, 33.6-kbps modem, speakers, and 10.4-inch flat-panel display come in a phone-book-size metal case that rests upright on a stand.

Its tiny footprint makes the Monorail ideal for people with limited space; it fits on a kitchen counter and can easily be carried from one room to another. Setup is a snap: Just unpack, plug in the keyboard and mouse, and you're in business.

But the Monorail oozed through PC WorldBench tests with a slow score of just 121, and that was with the \$69 video upgrade we needed for 800 by 600 resolution at 256 colors (a PC WorldBench requirement). Still, if space is tight, the Monorail is a great choice.

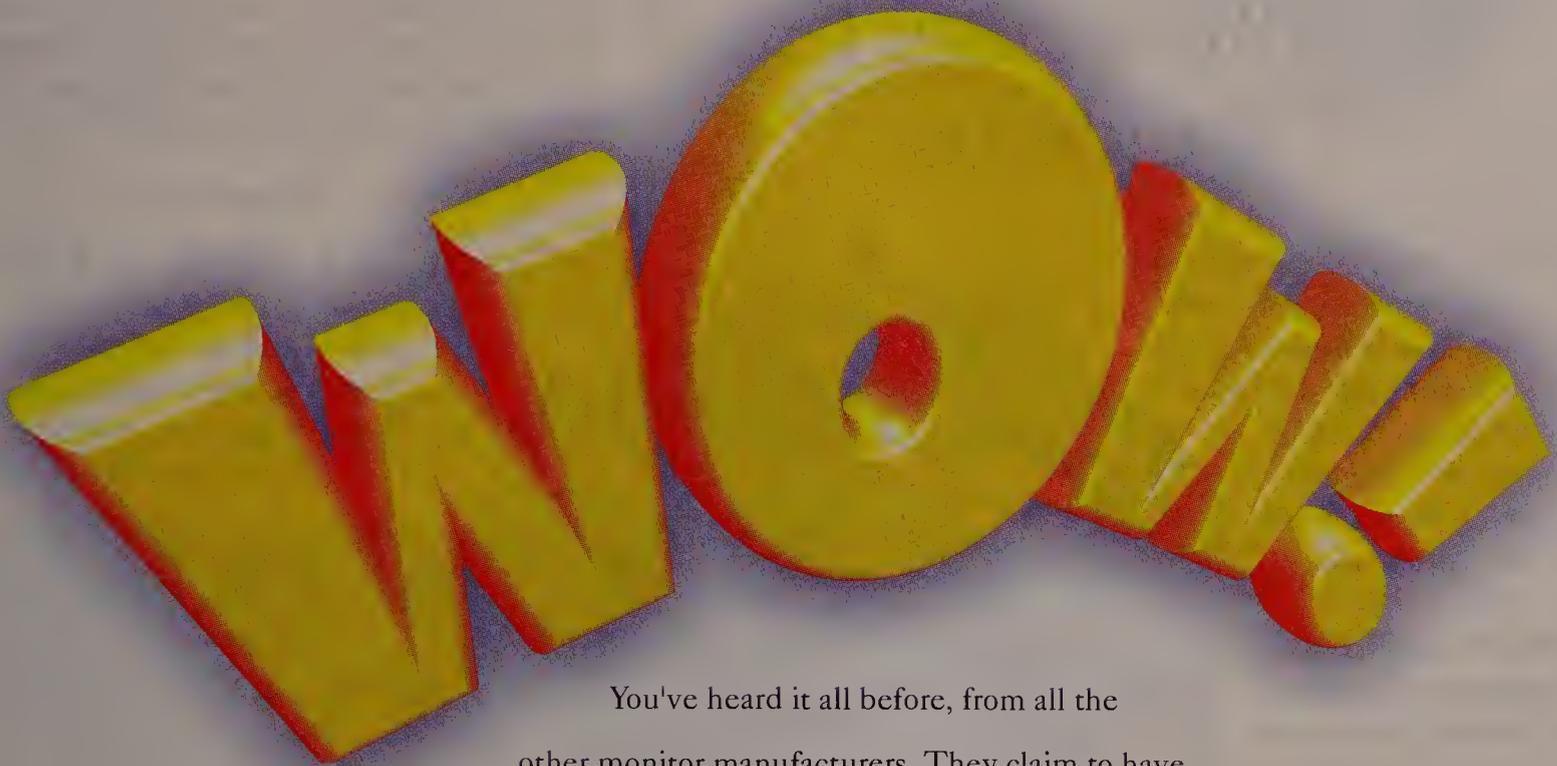
—Kirk Steers

Kirk Steers is a contributing editor for PC World. Testing performed by Ulrike Diehlmann of the PC World Test Center. ■

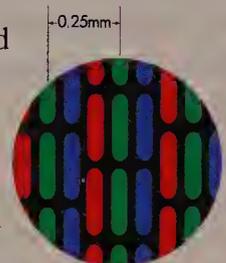


MONORAIL'S COMPACT PC 7245 just missed the Top 5.

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# Fast Browsing, Big Problems

I'M FACING A moral dilemma. I've fallen in love with a program that speeds up my Web browsing tremendously. The rub? People who run Web sites hate it, and while it speeds me up, it slows *your* access to a crawl.

I'm talking about Peak Net.Jet. To understand how Net.Jet works, consider what your modem does most of the time you're surfing the Web: nothing. After downloading a page, it just sits there, wasting bandwidth, and waits for you to click a link.

Net.Jet changes all that. As you read a page, Net.Jet downloads that page's links. So when you click a link, your new destination is probably already on your hard drive. When I tried it with a 28.8-kbps modem, the new page popped up so fast, I thought I was using my ISDN connection. When I did try it with real ISDN, it felt like a religious experience.

Net.Jet is smart, too. Working in the background, it notes the Web sites you visit most often, then maintains local, regularly updated copies for instant access. (You can speed up this learning process by giving Net.Jet a tour of your favorite sites.) If you stop visiting a site, Net.Jet will drop it from its list of your favorites.

Net.Jet won't do a thing for big downloads. You'll still have to wait a long time for the 11MB video of an exploding whale (<http://forteana.mic.dundee.ac.uk/ft/whale.html>) or the 20MB worth of a guy lighting his BBQ grill with liquid oxygen (<http://ghg.ecn.purdue.edu>). But you'll see Net.Jet shine with text-intensive sites or those with a few modest graphics.

## BANDWIDTH THIEF

OKAY, HERE'S THE moral dilemma. The Web works (or at least, it works as well as it does) *because* connections are idle most



Net.Jet gobbles bandwidth faster than my brother-in-law takes in starches at an all-you-can-eat buffet.

of the time. Many people can visit a site simultaneously because each visitor accesses the server only occasionally. But Net.Jet gobbles bandwidth faster than my brother-in-law takes in starches at an all-you-can-eat buffet, downloading page after page on the off-chance you'll want to read them. It can temporarily cripple small servers and slow down large ones.

Some sites have already made Net.Jet use verboten. For example, my favorite source of movie reviews—The Internet Movie Database (<http://us.imdb.com/welcome.html>)—senses Net.Jet's presence and blocks me from the site, with an error message explaining that Net.Jet is the reason. (I can get on just fine by turning Net.Jet off.) More Web sites will inevitably do the same, especially if Net.Jet and similar products become popular.

Use your imagination and think what would happen if *lots* of people used Net.Jet. Right. Net.Jet could bring the Internet to its knees. My guess? Smaller Web sites are going to get hosed, and bigger ones will limit Net.Jet's access time.

## SLOW LOAD

PERHAPS AS A form of karma, Net.Jet also has irritating flaws (though its advantages far outweigh its foibles). For one thing, Net.Jet seems to take forever to load. It first brings up its own dialer to get you online. Then it loads itself, modifies your browser's cache and proxy settings (no damage done—they're restored as soon as you exit Net.Jet), loads its own cache into memory, and finally launches your browser. On my P-166 system, this process takes nearly a minute. My recommendation: When you load your browser

for e-mail purposes, do it from the browser's own icon rather than through Net.Jet.

I looked at Net.Jet 1.1. By the time you read this, a new version should be out with a sorely needed feature: a pause button. That's important because when you download a large file—say, that exploding whale—you don't want your modem distracted by a lot of pages you'll probably never read. Speaking of upgrades, every so often the program will, with your permission, check to see if there's a new version of Net.Jet available, then handle the upgrade automatically at no charge.

The bottom line? I'm going to continue using Net.Jet. It's just too powerful to abandon. But I'll be a good Netizen, use the program judiciously, and when I get a pause button, I'll press it often and early. I hope you do the same.

## Peak Net.Jet

\$29.95 list; Peak Technologies; 800/453-5322, 360/733-6010, 360/733-7818 (fax); [info@peak-media.com](mailto:info@peak-media.com); <http://www.peak-media.com/>

READER SERVICE NO. 759

Steve Bass is a contributing editor for PC World, a licensed marriage and family therapist, and president of the Pasadena IBM Users Group.

# Red Alert Commands Your Attention



QUIT STALIN: RED ALERT pits the West against Russia in an alternative World War II.

## ENTERTAINMENT

WHEN YOU CAPTURE the real-time strategy market the way Command & Conquer did, you face real-time pressure to publish a worthy sequel. **Command & Conquer: Red Alert** fills the bill, with dramatic improvements in animation, weaponry, and missions.

Red Alert uses a fictitious World War II scenario. The story begins as Albert Einstein travels back in time to prevent Adolf Hitler's reign of ter-



ror, thus averting the Holocaust. However, Hitler's demise opens the door for Joseph Stalin, who unleashes his military juggernaut on Europe. In the first mission, the Allies must rescue Einstein from a heavily guarded Soviet base.

Not playing favorites, Red Alert also lets you take the Soviet point of view. And while mastering the game's nuances can be daunting, the game speed is adjustable. Slower is better for monitoring combat, resources, training, and construction, especially as you move into advanced missions.

As in the original game, Red Alert generates super-VGA terrain graphics on the fly as you explore new areas. This makes

the effects of terrain and artificial barriers on combat much more realistic, putting a premium on strategic placement of troops and defensive weapons.

Although the game's artificial intelligence makes a formidable opponent, Red Alert really shines in a multiplayer environment.

The disc includes software for Westwood Chat, a free online service from the developers of Red Alert that allows C&C combatants to exchange strategies and arrange head-to-head contests over the Internet. Fueled by improved graphics and a wealth of new armament, Command & Conquer is rolling again, and stores may face a red alert just trying to keep this one in stock. —Mark Cohen

### Command & Conquer: Red Alert

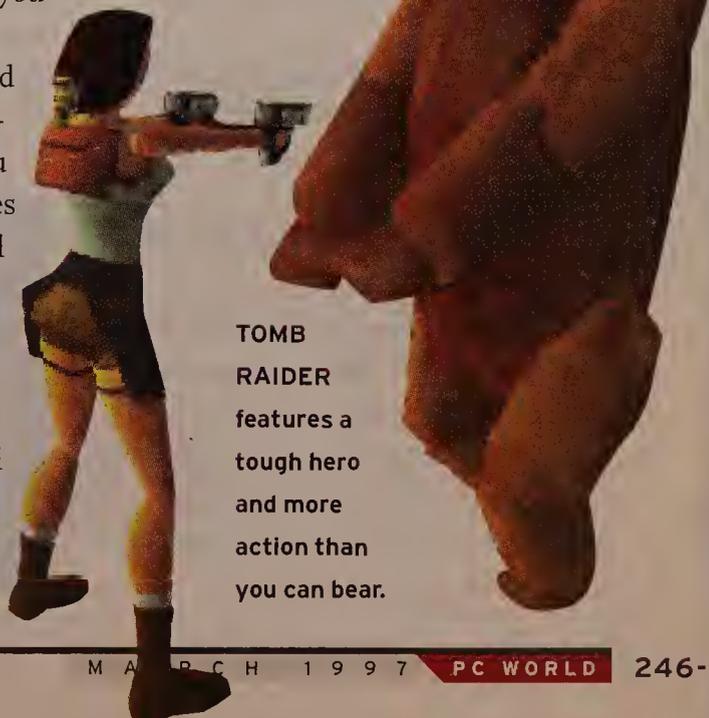
\$49 street; Westwood Studios; 800/874-4607; <http://www.westwood.com>. Grade: **A+**

READER SERVICE NO. 770

### TOMB WITH A VIEW

IN THEIR OWN dweeby way, computer gamers have become pretty demanding. So a game's fun and has drop-dead graphics? Yawn. Nowadays you need that and a hook, too—celebrity voice talent, an intriguing story line, or, in the case of **Tomb Raider**, a cool lead character. This adventure's protagonist, Lara Croft, is sexy, tough, and cultured.

With shades of Indiana Jones plus a dash of Clint Eastwood, she runs, climbs, swims, fights, and thinks her way through 15 impressive levels of Inca ruins, Egyp-



**TOMB RAIDER** features a tough hero and more action than you can bear.



tian pyramids, and—well, not to ruin any surprises, let's just say things get weird pretty quickly.

You control game play through a camera view that follows Lara through a series of 3-D environments. Stay alert or you'll miss a clue—or even die because you didn't keep an eye on what's above Lara's head. Tomb Raider's ruins and catacombs are satisfyingly realistic; empty and asymmetrical chasms are interspersed with artifices and traps.

But don't be fooled by the pretty scenery—you'll quickly get down to some serious bloodletting. Those twin pistols on Lara's hips aren't fashion accessories: Wild dogs, bats, bears, and that other, most dangerous predator—humans—inhabit the gorgeous, gloomy depths. When they show up it's time to draw those irons and go ballistic.



**INCA RUINS AND EGYPTIAN pyramids** give Tomb Raider an impressive look and feel.

One nice touch is the option to visit Lara's stately mansion, where a tutorial takes place. As you move from room to vast room, Lara's British lilt gives you the basics of jumping, climbing, and other special moves you'll need to master for ultimate victory. Tomb Raider is a classy piece of work. I'm already looking forward to the sequels. —Chris Hudak

#### **Tomb Raider**

\$50 street; Eidos Interactive; 415/616-2022; <http://www.eidosinteractive.com>. Grade: **A**

READER SERVICE NO. 771

#### **ROMPING INTO THE FUTURE**

IF DESCENT LEAVES YOU dizzy and Doom makes you queasy, try Viacom New Media's **The Divide: Enemies Within**. Originally designed for the Sony PlayStation, this futuristic 3-D action game emphasizes jumping, leaping, and grabbing as you explore a giant fissure in the surface of an icy, barren planet.

As the game begins, drooling space mutants bonk you on the head and kidnap your partner. Fortunately, your Ter-ragator bodysuit absorbs most of the blows. The mutants steal valuable devices from the space probe and strip you of almost all your weapons and devices, leaving you with one laser and a nasty limp.

Your quest to find your partner and recover the stolen space probe components takes you through eight different worlds and 75 levels. Along the way you meet a wide range of enemies, from pesky, face-hugging insectoids to heavily armed level bosses.

Nasty enemies are nothing new to adventure games.

However, *The Divide* spices up the genre with a touch of Sonic the Hedgehog: You advance to different levels within each world aboard a series of moving platforms. Navigating the platforms requires practice and timing, since many of the surfaces spontaneously dissolve. Adjustable camera angles and zoom views help you stay on track, but to reach the higher platforms you'll need enhanced jumping ability.

The Divide shrewdly reinvents adventure gaming with an entertaining blend of precise movements and all-out firefights. This game gives you a refreshing new universe to conquer. —M. C.

#### **The Divide: Enemies Within**

\$40 street; Viacom New Media; 800/469-2539; <http://www.viacomnewmedia.com/>. Grade: **A**

READER SERVICE NO. 772



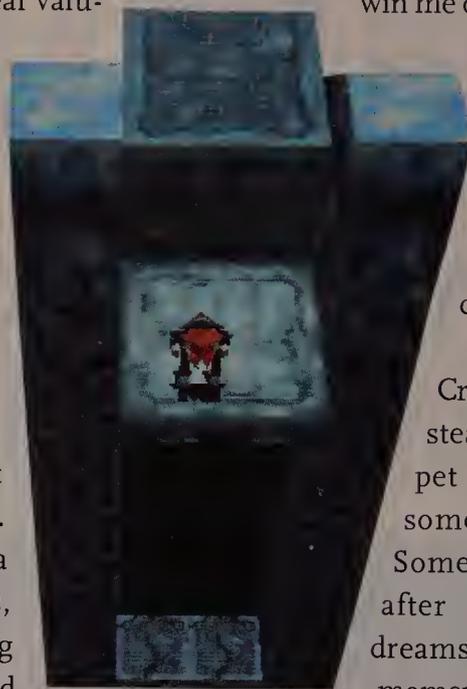
**I'M OKAY, YOU'RE DEAD**  
HATE INTERACTIVE MOVIES? Me too. Yet **A Puzzle of Flesh**, Sierra On-Line's sequel to *Phantasmagoria*, managed to win me over. Like its noteworthy

predecessor, this cinematic horror game is filled with beautifully rendered environments, full-motion video, and a few rather disturbing themes.

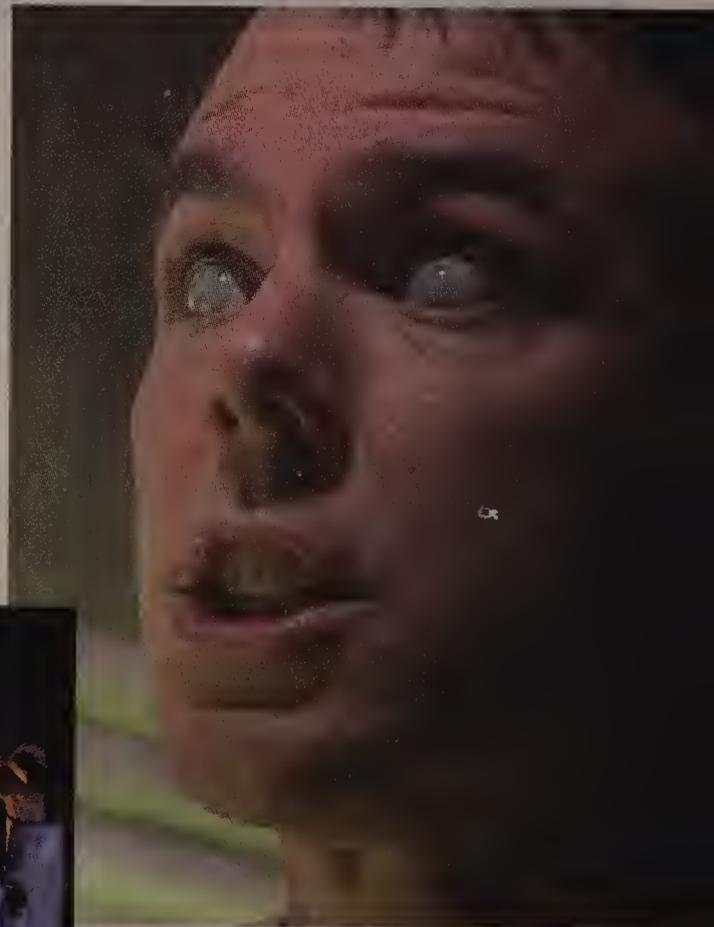
Lead character Curtis Craig is a quiet guy with a steady job, a girlfriend, a pet rat named Blob, and some serious problems. Someone or something is after him, haunting his dreams as well as his waking moments until his psyche is at the breaking point.

What's bothering Curtis? Well, photos bleed, menacing

voices come from computer screens and thin air, and memories of a dark secret buried in his past begin to claw their way into the present. Precisely what Curtis must ultimately confront becomes a shadowy tangle of secrets and revelations as he delves into the mysteries of his employer, the Wyntech Corporation. ►



**THE DIVIDE: Sonic the Hedgehog meets Doom.**



**A PUZZLE OF FLESH** picks up where *Phantasmagoria* leaves off, with gore galore.

A rose is a rose is a... wait a second.



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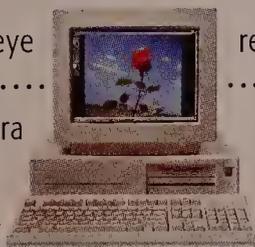
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COMPUTER *City* COMPUSA



At times, Phantasmagoria: A Puzzle of Flesh seems as much a soapbox for the designer's pop psychology concerns as electronic entertainment. Issues like repressed child abuse, homosexual longings, and sado-masochism surface as the story unfolds. As with Phantasmagoria, a password-protection scheme lets you determine whether or not you see the more intense version of the game, which includes frontal nudity and a fair amount of gore.

This isn't so much a game as it is a movie that requires you to intervene in the plot from time to time. I didn't expect that formula to work, but in the end the commendable acting and the occasional skin-crawling moments made A Puzzle of Flesh worthwhile. But don't buy this one for little Billy or Heather—unless you're ready to follow it up with a long, serious discussion. —C. H.

**Phantasmagoria: A Puzzle of Flesh**  
\$60 street; Sierra On-Line; 800/757-7707;  
<http://www.sierra.com>. Grade: **B**

READER SERVICE NO. 773

### SPIN ME A CONSPIRACY

IF YOU LIKE *The X-Files* for its gritty realism, then you'll love **Drowned God**, an adventure game that takes every conspiracy known to humankind (and then some) and wraps them around a 40,000-year-old alien cover-up.

In *Drowned God*, an alien race from Orion has not only genetically engineered humans but also guided their social and scientific development. Then along came the great flood, erasing much of that work and concealing the world's greatest artifacts: the Rod of Osiris, the Holy Grail, the philosophers' stone, and the Ark of the Covenant.



**DROWNED GOD** features gorgeous 3-D graphics and a wealth of bizarre conspiracy theories.



Your challenge is to visit the four earthly and spiritual realms where these items can be found, unlock a labyrinth of puzzles, and complete several tasks to gather these items one by one. Marvelous graphics, an original score, and quality voice-overs help immerse you in this very strange world.

Die-hard conspiracy theorists who own a copy of "Alien Autopsy" will definitely want to get their hands on this game—at least, before the illuminati manage to have it suppressed.

But unless you're a *Myst* addict with a taste for the bizarre, you'll probably find that *Drowned God* is little more than a tough treasure hunt. The conspiracies are ultimately so convoluted that most players will end up dazed and confused. —Shane Mooney

### Drowned God

\$49.95 list; Inscape; 800/510-1791; <http://www.inscape.com>. Grade: **B-**

READER SERVICE NO. 774

### SOFT-BOILED MYSTERY

CYBERDREAMS' *Noir* takes the *multi* out of *multimedia*. This promising but mediocre mystery game relies so heavily upon gorgeous photographs to immerse you in 1940s American film drama that the acting, script, and animation flounder.

Your job in this shadowy thriller is to find a missing L.A. gumshoe by solving six of his cases concurrently (smuggling in Chinatown, missing heiress, and so on). While the cases themselves are unin-

spiring, their variety and overlapping structure offer a welcome change. Casual gamers will appreciate *Noir*'s effortless point-and-click interface, which allows you to gather clues from crime scenes and witnesses. Major plot segues and interviews get full-motion video treat-

ment, though most of the game moves you through static photographed sets.

But oh, what sets they are. *Noir*'s only real star is the scenery: beautiful black-and-white stills of period

architecture and decor. Familiar movie locales like the Griffith Observatory and City Hall are included, as are the tiled hallways, art deco gewgaws, and oversized gadgetry that plant you firmly in wartime L.A. Fans of noir accoutrements will enjoy just browsing the sights.

Like many a wanna-be star, however, *Noir* is a drop-dead-gorgeous package that fails the audition as soon as it opens its mouth. The actors gesture wildly and pound every syllable. The vapid script, riddled with clichés, has none of the noirish corruption or intrigue you'd expect from such an homage.

If you were hoping for an interactive version of *The Big Sleep*, keep look-



**BEAUTIFUL PHOTOS** make *Noir* a visual feast, but the game doesn't have a clue.

ing. Philip Marlowe might peg *Noir* as being easy on the eyes but not much of a conversationalist. —Steven Smith

### Noir

\$45 street; Cyberdreams; 888/357-4337; <http://www.cyberdreams.com>. Grade: **C**

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## A SCI-FI JUNKIE'S JOURNEY

SIERRA ON-LINE'S **Rama**, based on Arthur C. Clarke's book series of the same name, is a dream world sure to seduce even the most hard-bitten realist.

As a member of an elite scientific expedition, you investigate a floating alien space station that has appeared in our solar system. This enormous spacecraft contains eerie worlds populated by elusive octo-spiders and scavenging crabbiots, among other alien species. Atmospheric music and a wandering, unrestricted type of game design—you simply stumble upon most items and puzzle rooms—make it easy to lose yourself for long periods of time.

Stellar graphics combine with excellent acting, absorbing game play, and tough puzzles. Colorful, sweeping vistas and fully rendered 3-D aliens give the eerie, you-are-there-but-you-don't-know-where feeling that all sci-fi junkies crave.

In general, **Rama** is more about the journey than the destination. Though the game's pace is slow and some puzzles re-

quire considerable patience, the real treat is a unique universe, created by one of the sci-fi masters, at your disposal for hours of exploration.

When you eventually uncover the secret of **Rama**, you may regret that you ever finished the game. —Hugh Foster

### **Rama**

\$59.95 list; Sierra On-Line; 800/757-7707; <http://www.sierra.com>. Grade: **B+**

READER SERVICE NO. 776

## FREQUENTLY ASKED QUESTIONS

AN INTRIGUING murder mystery set in Europe, **Circle of Blood** makes you rely on your social skills as well as your cunning.

An American in Paris, you witness a man in a clown suit bomb a sidewalk café. You then spend the rest of your vacation tracking down the killer and uncovering his affiliation with an ancient group of assassins. The game blends fiction with historical fact to create a plausible and thrilling story.

To complete **Circle of Blood**, you need to ask a lot of pointed questions and use your keen powers of observation. A simple interface letterboxes the screen, with a strip of inventory items across the top and a list of conversation topics along the bottom. Solving puzzles in this adventure means exhausting all possible topics with every person you encounter; sometimes you interrogate the same characters repeatedly.

Through conversation, the characters reveal clues that let you explore new areas. But **Circle of Blood** tends to have too much talk and not enough action. For instance, when a man is hit by a Ferrari and then abducted by the driver, you react by interviewing people instead of chasing after the car.

Both the animated scenes and the interactive sequences feature unique camera angles that provide much-needed variety of viewpoint. Even long shots include animated items like passing traffic or construction workers toiling in the background.

Although **Circle of Blood** is often smart and funny, it can get tedious, as you ask the same questions of each character until you stumble upon the correct line of inquiry. With all the talking you have to do, a better title might be **Sewing Circle**. —Jeffrey Adam Young

### **Circle of Blood**

\$54.95 list; Virgin Interactive; 800/874-4607; <http://www.vie.com>.

Grade: **B**

READER SERVICE NO. 777



**ILLEGAL ALIENS:** In **Ravage D.C.X** you try to save the planet from the evil Necron.

## THE RAIL THING

LEAVE IT TO the government to really screw things up. In Inscape's **Ravage D.C.X**, the fed's top-secret Project Vortex opens a doorway to another dimension. Unfortunately, waiting on the other side are the Necron, a cruel race devoid of any purpose save the complete domination of Earth (kind of like Rupert Murdoch).

Your mission is to travel to six other dimensions that are enslaved by the Necron and destroy the converters they use to lock on to our dimension. You help the hero achieve his objectives by blowing up the bad guys along the way.

**Ravage D.C.X** is like an interactive graphic adventure on speed. If you're familiar with titles such as **Cyberia** and **Rebel Assault**, you'll instantly recognize this sort of "rail" game: You move along a predetermined path, shooting at anything unfortunate enough to land within your crosshairs. Though **Ravage** won't exactly set the gaming world on fire, its backgrounds, animated scenes, and music are well executed. The game will entertain shooter fans with its nonstop action and slick looks. —S. M.

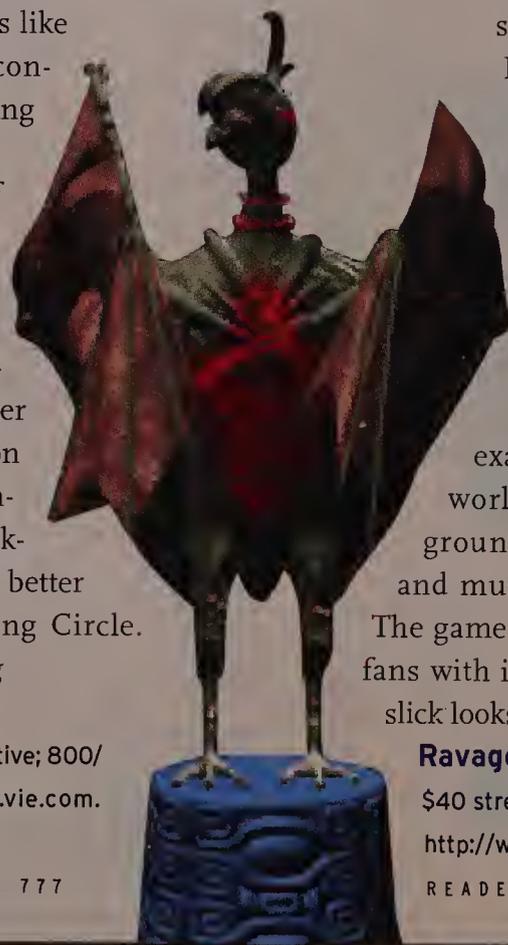
### **Ravage D.C.X**

\$40 street; Inscape; 800/741-3043; <http://www.inscape.com>. Grade: **B-**

READER SERVICE NO. 778



**CAFÉ BOZO:** In **Circle of Blood** you must find the clown who blew up this café.



**RAMA** creates a sci-fi dream world.



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# TOP 5 CD-ROM DRIVES

	CD-ROM DRIVES	Month tested	Street price (12/10/96)	Overall rating	Multimedia performance score	Comments	Reader service number
1	 Toshiba XM-5701B 12X 714/457-0777 <a href="http://www.tais.com/taisdpd">http://www.tais.com/taisdpd</a>	Feb 97	\$195	99	106	<b>FEATURES:</b> Superfast 12X internal drive; SCSI bus; tray-feed mechanism; driver support for Windows 3.1, 95, and NT, and OS/2 and Mac. <b>PRO/CON:</b> Best transfer rate in Top 5 (1.8MB per second), generous 256K buffer, less expensive than some 8X drives; no toll-free or weekend support.	630
2	Plextor 12Plex PX-12TSI 800/886-3935 <a href="http://www.plextor.com">http://www.plextor.com</a>	Jan 97	\$329	98	105	<b>FEATURES:</b> Fast 12X internal drive; SCSI bus; tray-feed mechanism; driver support for Windows 3.1, 95, and NT, and OS/2 and Mac. <b>PRO/CON:</b> Best access time of any drive we've tested, big 512K buffer, two-year warranty, toll-free support; expensive, no weekend support.	631
3	Plextor 8Plex PX-83CS 800/886-3935 <a href="http://www.plextor.com">http://www.plextor.com</a>	Aug 96	\$309	90	90	<b>FEATURES:</b> 8X internal drive; SCSI bus; caddy-feed mechanism; driver support for Windows 3.x, 95, and NT, and OS/2 and Mac. <b>PRO/CON:</b> Speedy, two-year warranty, solid design; expensive, SCSI card not included, no weekend support.	632
4	Teac CD-58E 8X CD-ROM 213/726-0303 <a href="http://www.teac.com">http://www.teac.com</a>	Aug 96	\$149	89	84	<b>FEATURES:</b> 8X internal drive, NT drivers added, Enhanced IDE, tray-feed mechanism with clips for side-mounted use. <b>PRO/CON:</b> Strong performer, reasonably priced; no software bundle, limited 128K buffer, no Mac or OS/2 drivers, no toll-free support, no weekend support.	633
5	NEC MultiSpin 6V 800/632-4636 <a href="http://www.nec.com">http://www.nec.com</a>	Aug 96	\$99	89	65	<b>FEATURES:</b> 6X internal drive, Enhanced IDE, tray-feed mechanism with clips for side-mounted operation, includes adapter card and cables for Sound Blaster card. <b>PRO/CON:</b> Inexpensive, toll-free support; slowest performer in Top 5, no software bundle, no weekend support.	634
 Best Buy <span style="float: right;">All products: 904</span>							

THIS MONTH WE TESTED Teac's new 12X drive, the CD-512E. But sluggish performance keeps this \$149 unit from joining its 8X sibling in the

Top 5. Meanwhile, Sony has discontinued its 8X CSD-880E drive, making room for NEC's MultiSpin 6V to return to the Top 5.

**HOW WE TEST** All drives are tested on a Gateway 2000 P5-166XL with 16MB of RAM and Windows 95. At 1024 by 768 at 256 colors, we run Macromedia Director 5.0 I/O benchmark, Microsoft Encarta 96 script, Power-Finder PhoneDisc 96 timed name search, and MindScape CyberSpeed game installation. We run a 98-image slide show in Corel PhotoLab and run the CD-Tach low-level CD-ROM benchmark utility. The overall rating is based on performance (40 percent), features (30 percent), price (20 percent), and support (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

# TOP 5 SOUND BOARDS

	SOUND BOARDS	Month tested	Street price (12/15/96)	Overall rating	Audio score	Comments	Reader service number
1	 Ensoniq Soundscape Vivo 90 800/776-8637 <a href="http://www.ensoniq.com">http://www.ensoniq.com</a>	Jan 97	\$75	112	89	<b>FEATURES:</b> Plug and Play, telephone answering device/modem. <b>PRO/CON:</b> Very good frequency response, bargain price, low noise, high-quality MIDI wavetable, compatible with PC-based phone answering machine and Internet phone software, trouble-free installation; no IDE connector.	635
2	Orchid NuSound PnP 32 800/577-0977 <a href="http://www.orchid.com">http://www.orchid.com</a>	Jan 97	\$135	104	93	<b>FEATURES:</b> Plug and Play, IDE and Panasonic CD-ROM interface, 3-D audio. <b>PRO/CON:</b> Very good frequency response, low noise, excellent wavetable MIDI, control panel on front of PC; noisy 3-D audio, reversed output channels, limited mike monitor, high distortion on speaker output.	636
3	Creative Labs Sound Blaster 32 800/998-5227 <a href="http://www.creativelabs.com">http://www.creativelabs.com</a>	June 96	\$149	100	90	<b>FEATURES:</b> Plug and Play, 512K of RAM expandable to 8M8. <b>PRO/CON:</b> Excellent audio performance, good microphone input, professional-grade wave editing and MIDI software, easy installation; mediocre MIDI sound, poor frequency response on microphone input.	637
4	Aztech WaveRider Pro32-3D PnP 800/886-8859 <a href="http://www.aztechCA.com">http://www.aztechCA.com</a>	Dec 96	\$69	99	68	<b>FEATURES:</b> Plug and Play, 3-D audio, IDE interface. <b>PRO/CON:</b> Good MIDI wavetable, extremely low price, easy installation, effective 3-D sound; poor microphone recording, low line input overload level, lacks reverb and chorus features.	638
5	CrystaLake Model 110 503/222-2603 <a href="http://www.crystalake.com">http://www.crystalake.com</a>	Aug 96	\$129	97	87	<b>FEATURES:</b> Plug and Play; 3-D sound with adjustable center, fill, and effect depth; stereo microphone input. <b>PRO/CON:</b> High-quality wavetable MIDI sound, realistic 3-D sound effects, good frequency response, three-year warranty; poor cross-talk figures, no reverb or chorus.	639
 Best Buy <span style="float: right;">All products: 905</span>							

NEITHER OF THIS MONTH'S new contenders could crack the Top 5. Ubi Soft's pricey (\$299) MaxiSound Home Studio offers only average

audio. Crystal's \$180 Crystalizer TidalWave 32 PnP couldn't record .wav files due to severe distortion and poor frequency response.

**HOW WE TEST** All sound boards are tested on an Audio Precision System Two audio test set to determine their frequency response, cross talk, noise, distortion, and other audio characteristics. We judge each board's MIDI (Musical Instrument Digital Interface) and .wav audio quality by comparing sample sounds against original source material on digital audio tape. The overall rating is based on performance (40 percent), features (25 percent), price (25 percent), and support (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by Liberman Sound. All rights reserved.

TECHNOLOGY UPDATE

# Patented microelectronic antenna converts your home's wiring into a giant signal-grabbing magnet!

*This little box uses your home's electrical wiring to give non-subscribers, cable subscribers and satellite users better TV reception on your local broadcast networks!*

Until recently, the only convenient way to guarantee great TV reception was to have cable installed or place an antenna on top of your TV. But who wants to pay a monthly cable fee just to get clear reception, or have rabbit-ear antennas that just don't work on all stations? Some people just aren't interested in subscribing to cable. Or they may live in an area where they can't get cable and TV-top antennas

aren't powerful enough. And what about those people who have cable or satellite systems but still can't get certain local stations in clearly?

Now, thanks to fifteen years of microelectronics research, a new device has been developed that actually makes conventional antennas a thing of the past. It's called the Spectrum Universal Antenna/Tuner!

**Advanced technology.** If you live in a rural area, you may have resigned yourself to accept the fact that your local TV reception is poor. (This may be true even if you don't live in a rural area!) Now imagine watching TV and seeing a picture clearer than before. Simply plug the Spectrum Antenna into a standard AC outlet and plug your TV into the Spectrum. Get ready for great reception because your TV will display a clearer, focused picture, thanks to Spectrum's advanced signal controls.

**Uses your home's electrical wiring.** The Spectrum Antenna is a sophisticated electronic device that plugs into a standard wall outlet. Basically, the outlet interfaces the Spectrum with the huge antenna that is your home wiring network. Simply put, it turns the electrical wiring in your house or apartment into a multi-tunable TV reception antenna that will improve your TV's overall tuning capability.

**How it works.** Broadcast TV signals are sent out from the local broadcast station. Those signals interface with your home's AC power line system, creating an aerial antenna network of wiring as large as your home itself. When the Spectrum Antenna connects to the AC line, the signal is sent to its signal processing circuit. It processes and separates the signal into 12 of the best possible antenna configurations. These specially-processed signals route themselves into 12 separate circuits. A 12-position rotary tapping switch, the "Signal Switch" control, gathers 12 of the best antenna configurations resulting in improved picture quality.

## Spectrum Antenna

**Parallel 75 ohm resistance**

For minimum loss of signal

**Signal search control**

For selecting multiple antenna configurations

**Resonant fine tuner control**

For dialing in crisp, clear TV/stereo reception, eliminates ghosting

**Dual outlets with surge protection**

For plugging in additional TV/stereo equipment guarding against damage and surges

**Polarized three-prong plug for grounding**

For optimum signal grounding to stop noise and static



### Why don't conventional antennas work as well as the Spectrum?

#### Bandwidth of TV Signal

1 2 3 4 5 6



When TV signals are tuned at the TV channel's center frequency, optimum tuning has been achieved.

Other antennas can't offer center frequency tuning like the Spectrum Antenna can. They only offer such tuning up to the edge of the center frequency. As a result your TV picture remains snowy.

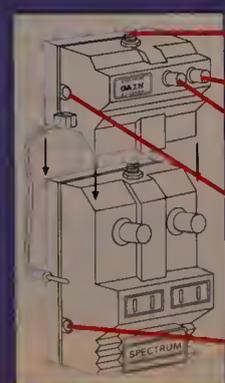
**Spectrum system Precision tuning**

**Other systems Non-precision tuning**



The Spectrum Antenna "activates" the giant antenna that already is in your home. It uses all of the wiring throughout your home's walls and ceilings to make an antenna as large as your house for unbelievably clear reception of local broadcasting.

### Spectrum with Gain Booster Features



**Parallel 75 ohm resistance**

**Resonant fine tuner control**

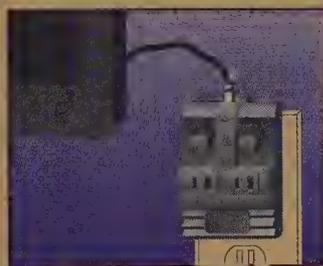
**Spectrum gain control**

**Spectrum auxiliary jack**

**Spectrum Gain Booster Jack**

### Who can use Spectrum?

- **Cable users**-You have cable but you can't get certain local stations in clearly.
- **Non-cable users**-You don't have cable and want the stations to come in more clearly.
- **Satellite users**-You have a digital satellite system but can't get local stations clearly.



The Spectrum Antenna gets plugged into a three-prong outlet and can accommodate two additional plugs in its surge protected ports.

The "Signal Search" offers varying antenna configurations for you to select from the best signals of all those being sent. The signal then passes through the Spectrum Antenna's special "Fine Tuner" circuit for producing more clear reception.

**Rural areas.** Most TV signals in rural areas are weak, making them harder to fine tune. The "Gain Booster" is a high-frequency signal booster designed to increase the output level of the signal entering your television. It delivers a 10-fold greater signal which will bring richer color and a noise-free picture. By using the Gain Booster, Spectrum's fine tuning controls will function better, giving it a stronger signal to tune. It also works in conjunction with your outdoor antenna!

**Risk-free.** The Spectrum Antenna/Tuner comes with our 90-day risk-free trial as well as a 90-day manufacturer's warranty. Try it yourself, and if you're not satisfied, return it for a "No Questions Asked" refund.

**Limited time offer!** We realize that most people have more than one TV in their home. That's why we're offering a special discount on additional Spectrum Antennas so you get great reception on all your TVs!

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# DOS Games Plod Along Under Windows

BY PATRICK MARSHALL AND TOM MARSHALL

 I RECENTLY PURCHASED the NHL 96 CD-ROM by Electronic Arts Sports. I can run this game in DOS under Windows 95, but it's slow and the graphics aren't exactly crisp. If I run the disc in DOS with Windows shut down, the graphics and speed improve dramatically, but the sound card, mouse, and game pad don't work. This happens with all my other DOS games too. How can I improve play in Windows or get those devices to work outside Windows?

*Tyler Gibson, Riverdale, Utah*

ALAS, IT'S COMMON FOR DOS games to perform poorly under Windows 95. The problem isn't with Windows but in the way that some DOS games access memory. Most games require a lot of conventional memory (the first 640K of RAM); and many were written to take advantage

of expanded memory, a separate area of memory that programs access through upper memory (the area of RAM from 640K to 1024K) using a memory manager. While Windows 95 provides controls for adjusting the amount of memory available to DOS applications, the end result is never as gratifying as when you simply run DOS games in DOS.

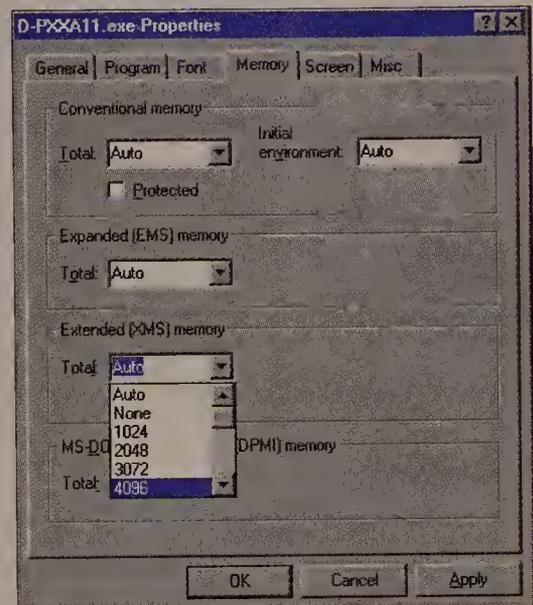
As for the reason your sound card, mouse, and game pad disappear when you go to DOS, that one's easy to figure out. To access those devices under DOS, you also need to install their DOS drivers. The drivers should be available on a floppy disk that came with each device, or on the manufacturer's Web site. Go to the DOS prompt and install the DOS drivers, following the directions specified in the device manuals. This process will copy certain files to your hard drive and will modify your autoexec.bat and config.sys

files to load the appropriate drivers.

But wait, you're not quite finished. While this procedure works fine for all devices using Windows 3.1, it

won't work with mice running under Windows 95. That's because Win 95 automatically loads its own mouse driver even when you open a DOS window. You may have conflicts if you install a DOS mouse driver in autoexec.bat.

Probably the best solution is to use a boot disk to start your system in DOS. Then you can load all the appropriate drivers your system needs by using the autoexec.bat and config.sys files on the floppy boot disk, leaving your Windows 95 configuration untouched.

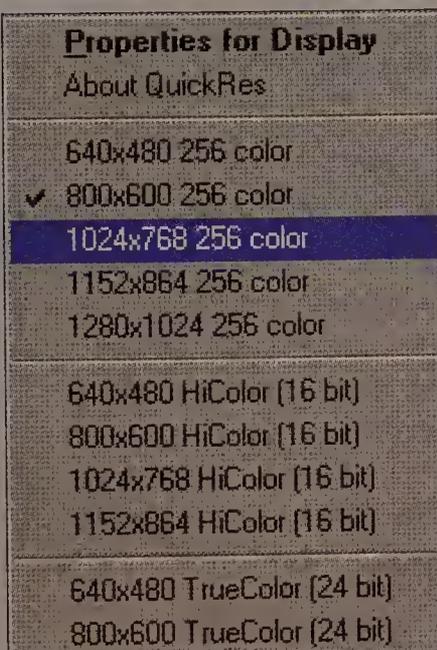


**RECOVERED MEMORY:** Windows 95 lets you reserve memory for DOS apps, but some older games will run only in DOS mode.

## Switch Screen Resolutions on the Fly

 YOU QUIVER WITH ANTICIPATION as you load your favorite shoot-'em-up. Then the dreaded message appears: 'Program can only run in 256-color mode'. So you go to the Display utility in the Control Panel to crank the number of colors down to 256, only to discover that Windows 95 demands you reboot the entire system. All this just to play a game. Sheesh.

Fortunately, Microsoft provides QuickRes, a free Win 95 utility that lets you switch resolutions and color levels on the fly. Why QuickRes wasn't included in Windows 95 is a mystery, but it's a must-have tool. You can download QuickRes from Microsoft's Power Toys Web page (<http://www.microsoft.com/windows/common/aa2729.htm>). Download the quik\_res.exe file to your Windows directory; then go to Windows Explorer and double-click the file to extract its contents, quickres.exe and quickres.inf, to your Windows directory. Double-click *quickres.exe*, and a new icon will appear in the corner of your Windows 95 Taskbar. When you click on that icon, a list of available color depths and resolutions will pop up. Take your pick, and you'll be on your way. If you want QuickRes to load automatically when you start Windows, simply add the program to your StartUp group.



**SWIFT RESOLUTIONS:** Microsoft's QuickRes utility lets you change screen resolutions and color depth on the fly—no rebooting required.

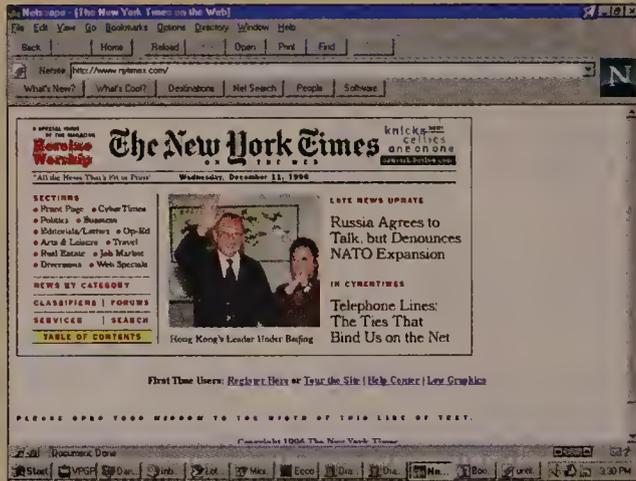
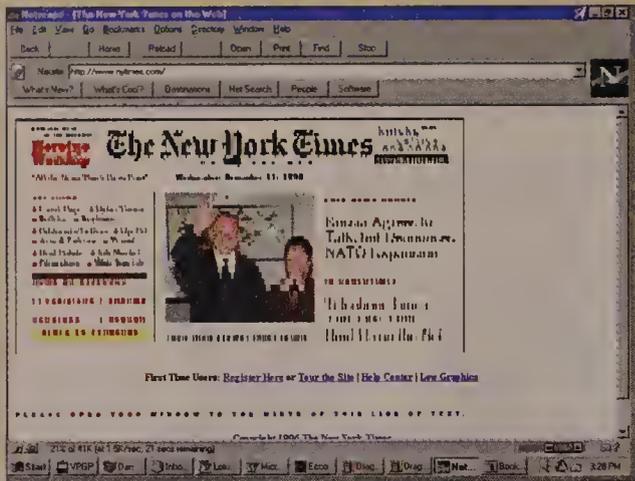
## HOW DO WEB IMAGES FADE IN?

 HOW DO WEB SITE designers manage to make images appear with gradually sharpening detail, rather than having them painted slowly line by line in full detail?

*James Brown, Atlanta*

WHAT YOU'RE DESCRIBING is called *progressive display*, where the screen draws an image in successive passes, increasing the level of detail with each pass. Progressive display is a function of the image file format, but your Web browser must support the format. This type of display is ideally suited to the Web, where users typically don't want to wait for graphics to appear, but do want the option of seeing them in full detail.

Progressive display has been on the Web for years in the form of interlaced GIF files. This format was recently joined by progressive JPEG, which is smoother. All of the leading browsers incorporate p-JPEG as well as GIF capabilities. ▶



**PROGRESSIVE THINKING:** File formats like GIF and p-JPEG display low-res versions of Web images, and then progressively add more detail, so you can keep on surfen' without waiting for the entire image to download.

## A U D I O SOUND FADES IN DOS



I HAVE AN NEC PowerPlayer LE with an Ensoniq Soundscape sound card. No matter what settings I use, the sound is significantly lower while I'm in DOS mode than it is when I'm in Windows 95.

Patrick Anthony Sekinger, Baltimore  
FIRST, CHECK THE SETTINGS in Windows' Volume Control to make sure nothing is out of line. You call up the Volume Control utility by clicking the *Start* button and selecting *Programs•Accessories•Multimedia•Volume Control*.

If that doesn't help, the problem lies with your driver. Ensoniq says early versions of the Windows drivers for the Soundscape card had exactly the problem you describe. Go to Ensoniq's Web site (<http://www.ensoniq.com>), click the *Soundscape Drivers* button on this home page, click the *Windows 95* button, and then click *Install Wizard 1.00.07* to download the new driver.

If all else fails, you can reach Ensoniq at 610/647-3930.

## V I D E O HARDWARE ACCELERATION GRINDS TO A HALT



I HAVE SEVERAL GAMES that use DirectX. Unfortunately, when I load them I keep getting a message that tells me there is no hardware acceleration for my Matrox Millennium graphics adapter. Why?

Jon Stewart, Berkeley, California

DIRECTX IS A programming interface that allows a game's Windows drivers to access hardware directly when displaying graphics, playing audio, and implementing other multimedia features. The result is faster, smoother performance than was possible when drivers had to go through the Windows graphics device interface. As far as your graphics adapter is concerned, the critical parts of DirectX are DirectDraw and Direct3D, which let the game perform certain kinds of screen-drawing operations.

While the Matrox Millennium supports some 3-D capabilities, it can't perform some DirectX functions, such as applying certain effects to 3-D objects in hardware. But even though you won't get full DirectX support, the Millennium will provide better performance of DirectX applications than you would see with a regular adapter.

## PLAYING THE SLOTS



I WANT TO upgrade my video card. Most of the cards I'm interested in say that they require a PCI slot. I have a few expansion slots left in my Compaq Presario CDS 850, but how do I tell if they are PCI?

Richard Ingram, Internet  
MOST OF THE PCS SOLD today come with a combination of PCI and 16-bit ISA slots on the motherboard, though there are still a few 486s on the market with VL bus slots rather than PCI. But your Presario 850 has only ISA slots. If you don't

has should consult the system manual. If the manual isn't handy, pop the cover off the computer and take a look. ISA slots, which are usually black, are constructed in two contiguous sections, with a longer part toward the edge of the motherboard and a somewhat shorter part on the other end. A PCI slot, by contrast, is built as a single section; it's typically white, shorter than an ISA slot, and set back a little farther from the edge of the motherboard. VL bus slots are constructed as extensions to other kinds of slots (usually ISA). To identify one of these, look for an ISA slot with a third section, often brown, added a little distance beyond the first two. (For information on how to add a new graphics card, see *Upgrade Guide*, January 1997.)

Patrick Marshall is research manager for InfoWorld's Reviews and Testing department. Tom Marshall is a Seattle-based freelance writer who specializes in computer technology.

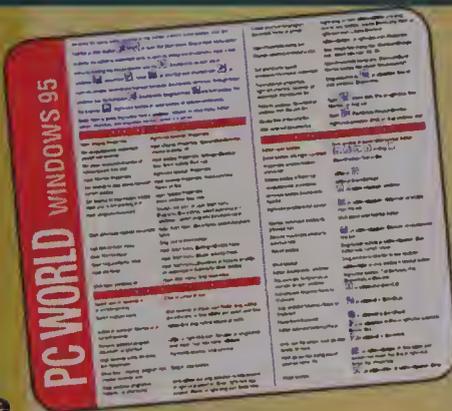


**PUMP IT UP:** Windows' Volume Control lets you specify just how loud you want your sound card to play.

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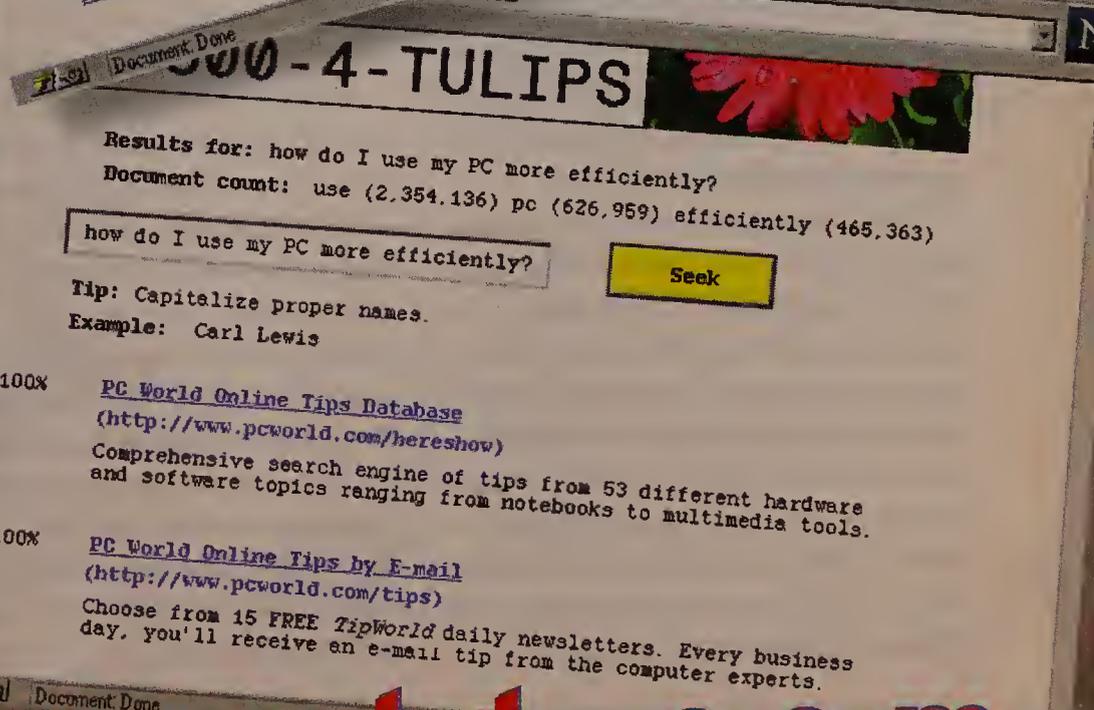
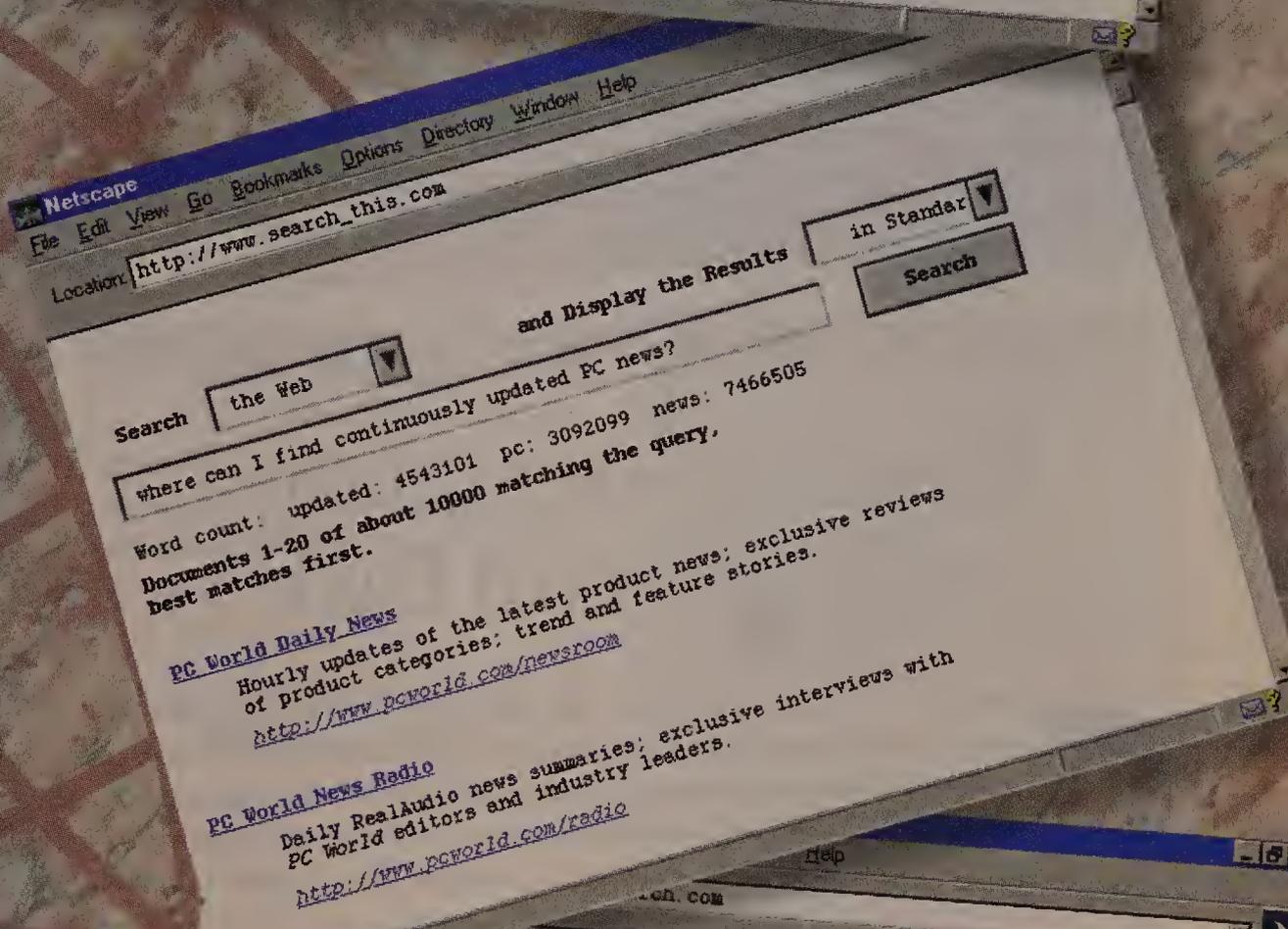
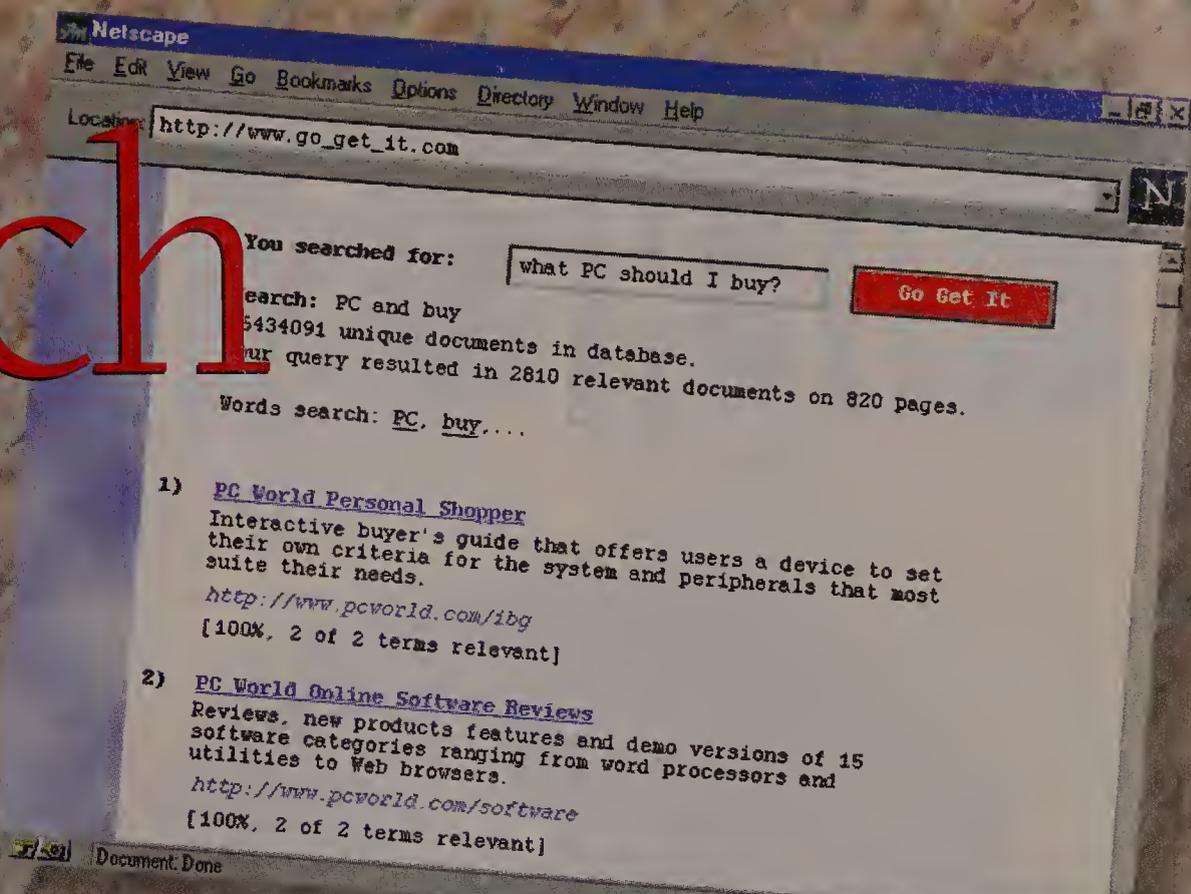
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# HERE'S HOW



A N S W E R L I N E

## New Tips on Adding a Second Hard Disk



I RECENTLY REREAD your February 1996 *Help Line* tip "Add a Second Hard Disk" with great anticipation. I had just purchased a new Seagate 2.1GB hard drive and wanted to transfer the contents of my old drive to it (including Windows 95), then make it drive C:. I followed your instructions but could not get the tip to work.

*Jim Reece, Belmont, North Carolina*

LET ME APOLOGIZE AGAIN for providing incomplete information. That tip omitted an important step, and we ran a correction in the May issue.

I'm still seeing pleas of help from people who need to move an existing Windows 95 installation to a new drive. "Replace Your C: Drive in Win 95" on the next page provides a corrected, streamlined, and enhanced version of the tip.

Besides adding the /r parameter that lets xcopy overwrite read-only files, I've added /c, which lets the program continue copying if it encounters an error when it gets to Windows 95's swap file.

Since the swap file is re-created each time you start Windows 95, you shouldn't have any problem. However, if your swap file is located on a drive that no longer exists, or if it has a different drive letter after you switch the drives, Windows may gripe. For best results, move it back to drive C: before you start the transfer process: Choose *Start•Settings•Control Panel*. In the Control Panel, double-click the *System* icon, click the *Performance* tab and the *Virtual Memory* button, select *Let me specify my own virtual memory settings*, then pick C:\ from the *Hard disk* list and click *OK•Yes•OK*.

If you're uncomfortable using *fdisk*, *format*, and *xcopy* commands, or if you need to upgrade the hard disks of multiple Windows 95 machines, you may want to give Binary Research's Ghost Professional 1.5.1 utility a try. Ghost does much of the dirty work for you.

But you'll still have to physically install the drive (steps 1 and 2 in "Replace Your C: Drive in Win 95"), use Ghost to replicate the contents of the master drives, then switch the drives' master and slave roles (steps 7 and 8). You can run Ghost within Windows 95 from the command prompt, or from an MS-DOS boot floppy disk. Ghost even handles Windows NT NTFS partitions, OS/2 boot manager partitions, and OS/2 extended attributes; it should support FAT32 by the time you read this. It also lets you copy drive contents over networks and parallel cable connections. Download a 30-day trial version from Binary Research's Web site.

• Ghost Professional 1.5.1; \$245; Binary Research; 800/504-9848; <http://www.ghostsoft.com>

READER SERVICE NO. 760

### CONNECT TWO PCS WITH A TWISTED-PAIR CABLE



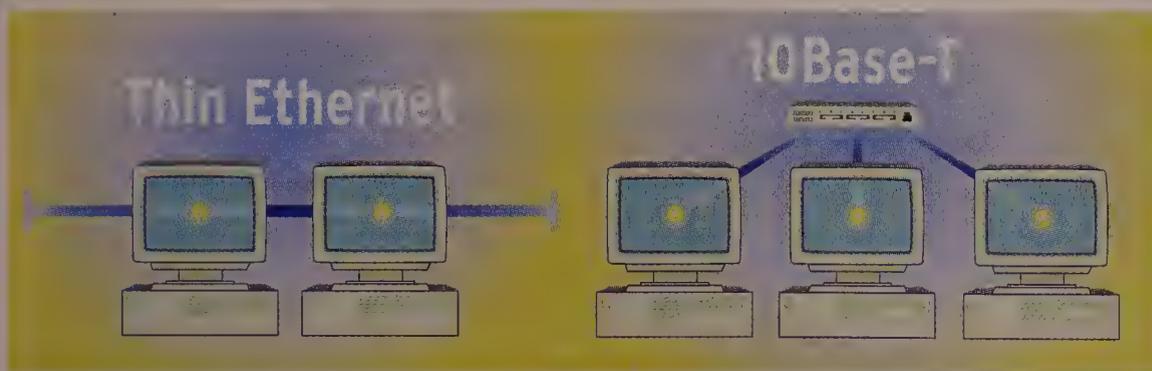
I WANT TO NETWORK two Windows 95 machines directly to each other. Both have 10Base-T network adapters installed, which use unshielded twisted pair cabling and RJ-45 connectors. What are the cabling requirements to connect these two machines? Can I just get a standard twisted-pair cable and hook them together, or do I need to swap some wires?

*James Porter, Lawton, Oklahoma*

A STANDARD TWISTED-PAIR cable won't do. Unlike the thin ethernet cabling scheme, which uses coax cabling and BNC connectors in a daisy-chain configuration, a 10Base-T ethernet network is laid

EDITED BY

Scott Spanbauer



THIN ETHERNET'S DAISY-CHAIN DESIGN (left) is easy to expand, but any break in the bus topology may shut down your entire network. 10Base-T's hub-based star topology is more resistant to broken connections; two PCs can connect without a hub, using a special cable.

out like an octopus. Each computer connects to a central hub, which may in turn connect to other hubs or a high-capacity backbone network (see the figure above). The hub concept is smart, because if one arm becomes damaged, the rest of the network stays up. By comparison, one broken thin ethernet segment can bring down the entire network.

### Replace Your C: Drive in Win 95

1. Turn off your computer and install the new EIDE hard disk as the second (slave) drive, following the drive manufacturer's instructions.

2. Close up the PC and turn it on. Following the manufacturer's instructions, enter the new drive's settings in your system's BIOS setup program. If your BIOS has already recognized and configured the drive, set the type to *Auto*, and write down the current drive's settings.

3. Enter `fdisk` at the DOS prompt, and partition all or part of the new drive as a primary partition (extended partitions aren't bootable).

4. Reboot and enter `format d: /s` at the DOS prompt; *d* is the letter of the new hard disk.

5. Select *Start•Settings•Control Panel*, and double-click *Add/Remove Programs*. Click the *Startup Disk* tab in the resulting dialog box, click *Create Disk*, and follow the instructions.

6. Close all running applications, then choose *Start•Run*. In the Open field, enter `xcopy c:\*.* /e /h /k /r /c d:` and click *OK*.

7. Shut down Win 95, turn off your PC, and rejump the drives following the manufacturer's instructions for exchanging the IDE drives' master and slave roles. Turn on the PC, edit the CMOS drive tables to reflect the change, then continue booting with your start-up disk.

8. Using `fdisk`, make partition one of disk one the active partition, then exit `fdisk` and reboot. Win 95 should boot from the new hard disk.

Nevertheless, 10Base-T's advanced topology makes it tough to whip up a quick-and-dirty home network. You can connect two computers with twisted-pair cabling, but you'll have to use a crossover cable, which transposes the wires within the cable in the same way that connecting both computers to a hub would. And without a hub, your network can never grow beyond two computers. Minihubs that support four or five PCs cost \$80. Network Express, a division of Microcomputer Warehouse, offers dozens of hubs, as well as crossover cables. For more information on installing a Windows 95 network, see this month's *Upgrade Guide*. • Network Express; 800/374-9899, <http://www.nei.com/>

READER SERVICE NO. 761

### DOOMSDAY REALLY IS COMING AFTER ALL

SEVERAL READERS WROTE about my optimistic predictions of PC behavior at the turn of the century (see "Doomsday 2000?" *Answer Line*, November 1996). Contrary to my assertion, they say, not all systems will handle New Year's Eve, 1999, with aplomb. Some older BIOSes may think the day that immediately follows December 31, 1999, is January 1, 1980. (When I changed the date on my system to December 31, 1999, and the time to 11:59 p.m., four of my own systems, including one with a circa-1988 BIOS, welcomed the new year just fine.)

To find out how your system will behave, boot to the command prompt, enter `date 12-31-99`, then enter `time 23:59`. Wait about a minute, and then enter `date`. If your system reports the date as 01-01-

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I N T E R N E T



DON'T MISS ADDITIONAL HERE'S HOW information on <http://www.pcworld.com/hereshow.html>.

1980, make a note to change the date manually on January 1, 2000, with the command `date 01-01-2000`—that is, if the computer is still in use by then.

According to The RightTime Company's Tom Becker, every personal computer's hardware clock rolls back to January 1, 1900, until the next reboot, even if DOS reports the correct date. Mission-critical systems that run 24 hours a day will have to be rebooted when the ball drops in Times Square so that date-dependent ►

applications can avoid a major hangover.

Becker's firm makes two utilities that can help. Year2000.exe, a memory-resident DOS/Windows program, waits for the magic millennial moment and keeps your system from traveling back in time. Doschk.exe, by Bob Stammers, is a diagnostic tool that determines what your machine's year 2000 behavior will be. Both are available free from the company's Web site (<http://www.righttime.com>).

And finally, more than one reader wrote to remind us all that the new millennium starts not on January 1, 2000, but rather on January 1, 2001.

 Find additional tips at <http://www.pcworld.com/hereshow>. Answer Line welcomes questions and tips and pays \$50 for published items. Contributing Editor Scott Spanbauer is author of *The No B.S. Guide to Windows 95* (No Starch Press, 1996, 800/420-7240). See page 12 for contact information.

## Spice Up the Windows 95 Interface With a Free Microsoft Utility

MICROSOFT'S FREE Tweak UI utility offers a host of handy user-interface upgrades to Windows 95. Version 1.1 of this Control Panel Toy offers numerous new features that let you adjust your Windows user interface, including menu speed, window animation, and Internet Explorer. It also lets you hide desktop icons from other users, delete files without confirmation, and make some desktop repairs.

Tweak UI makes Registry-tweaking tips obsolete by including the ability to remove the names of applications from the Add/Remove Programs' Uninstall list. Tweak UI also squashes bugs that plagued early versions, and it supports Windows NT 4.0.

You can download this Power Toy utility from Microsoft's Web site (

[.microsoft.com/windows/common/aa2729.htm](http://www.microsoft.com/windows/common/aa2729.htm)). To install it, run the self-extracting archive *tweakui.exe* in a temporary directory, then right-click the *tweakui Setup Information* file in Explorer and choose *Install*.



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# Training Windows 95 to Hang Up Properly

95

MANY READERS COMPLAIN that Win 95 hangs when they shut down, so they never get to see that tasteful black screen announcing it's safe to turn off the PC. To put your hearts (and PCs) at rest, try these tips. They're designed for incomplete exits, but most are handy for all-purpose troubleshooting.

**1. Check for problem programs.** It's likely that the problem is a running application, rather than Windows itself. Restart Windows with the <Shift> key held down to disable the launching of programs in your StartUp folder and put Windows in "safe" mode. Then exit and see if the problem goes away. If it does, remove all but one Shortcut from your StartUp group, and try again. If all goes well, add one more Shortcut back and try again. Repeat until you find the program causing the hang-up.

If that doesn't find the problem, test for any programs started by the win.ini file: Choose *Start•Run*, type *sysedit*, and press <Enter>. In the win.ini window, type a semicolon at the beginning (extreme left) of the 'load=' and 'run=' lines to prevent any applications listed there from launching at startup. If that fixes things, make a note of everything on these lines and remove all but one item; then restart and exit Windows. As before, add listed applications one at a time, restarting and exiting each time until you find the application that's causing the problem. Then contact the manufacturer to get an update or a suggested work-around.

**2. Study the startup.** Find out if the problem stems from a line in the notorious autoexec.bat or config.sys files. Restart the computer and press <F8> as soon as you see 'Starting Windows 95' on your screen. Choose the *Step-by-Step Confirmation* option and answer yes (press *y*) when prompted whether to load DoubleSpace drivers, process the System Registry, and load himem.sys, ifshlp.sys, the Windows

interface, and all Windows drivers. Answer no (press *n*) to all other prompts. Exit and see if the problem persists.

If the problem is gone, repeat the steps in this tip, but this time press *y* for the above-mentioned items plus one item that you previously blocked from loading. Again, shut down and see what happens. Repeat, loading one additional item each time until you find the problem.

**3. Manage your memory.** To rule out an upper memory conflict, make a backup copy of config.sys and start the System Configuration Editor as described in tip 1. Edit config.sys to include the line `device=c:\windows\himem.sys` followed by the line `device=c:\windows\emm386.exe noemsx=a000-f7ff` (paths may differ on your system). This disables access to upper memory (the area between your first 640K and 1024K) by terminate-and-stay resident programs unless the software is specifically designed to access upper memory unaided. Save the file, restart your computer, and then exit Windows.

If the problem has gone away, the cause is likely an upper memory conflict. Running the Microsoft Diagnostics utility in MS-DOS mode (type *msd* at the prompt in your Windows folder) can identify some software that uses upper memory, but you may need to refer to your documentation or talk to the manufacturer to ferret out hardware conflicts. Once you find the competing entities, consult their documentation on assigning upper memory.

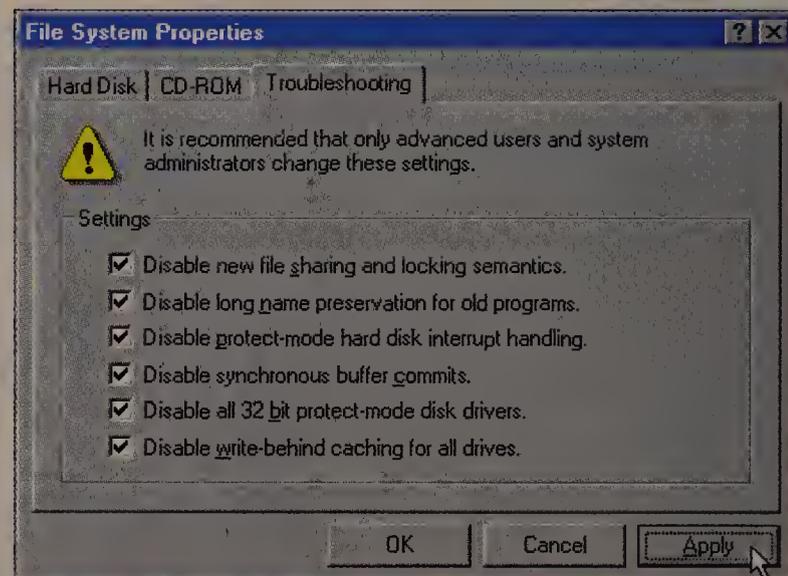
**4. Veto the virtual device.** Find out if the problem lies with a virtual device driver loaded in system.ini. Start the System Configuration Editor as described in tip 1 and, in the system.ini file,

locate the heading '[386enh]'. Put a semicolon at the beginning of each line that follows, beginning with 'device=' and ending with '.386'. Save the file, restart your PC, then exit Windows. If this fixes things, return to the System Configuration Editor and remove one semicolon. Go through the save-restart-exit ritual again to see if the problem returns. Repeat until you find the errant device driver.

If you're lucky, the file's name, path, or comments on the line will give you a clue as to its associated product. You can then contact the driver's manufacturer for help.

**5. File it down.** Your computer may not get along with Windows 95's file system settings. To check this one out, right-click *My Computer* and choose *Properties*. Click the *Performance* tab and click *File System*. Click the *Troubleshooting* tab and check each of the boxes in this properties sheet (see **FIGURE 1**). Click *OK*, then *Close*, then *Yes* to restart your system. If this solves the problem, you can leave all these settings checked, or experiment with unchecking them one at a time. Once you find the guilty party or parties, you'll need to leave them checked.

**6. Silence the sound.** Trying to play a corrupted sound file when you exit could be the cause of your problems. To eliminate that possibility, choose *Start•Settings•Control Panel*. Double-click the *Sounds* icon. In the Events list, select *Exit Windows* and choose (*None*) from the Name dropdown list. Click *Yes*, click *OK*, and exit Windows. If all goes well, get an uncorrupted version from the original source. ▶



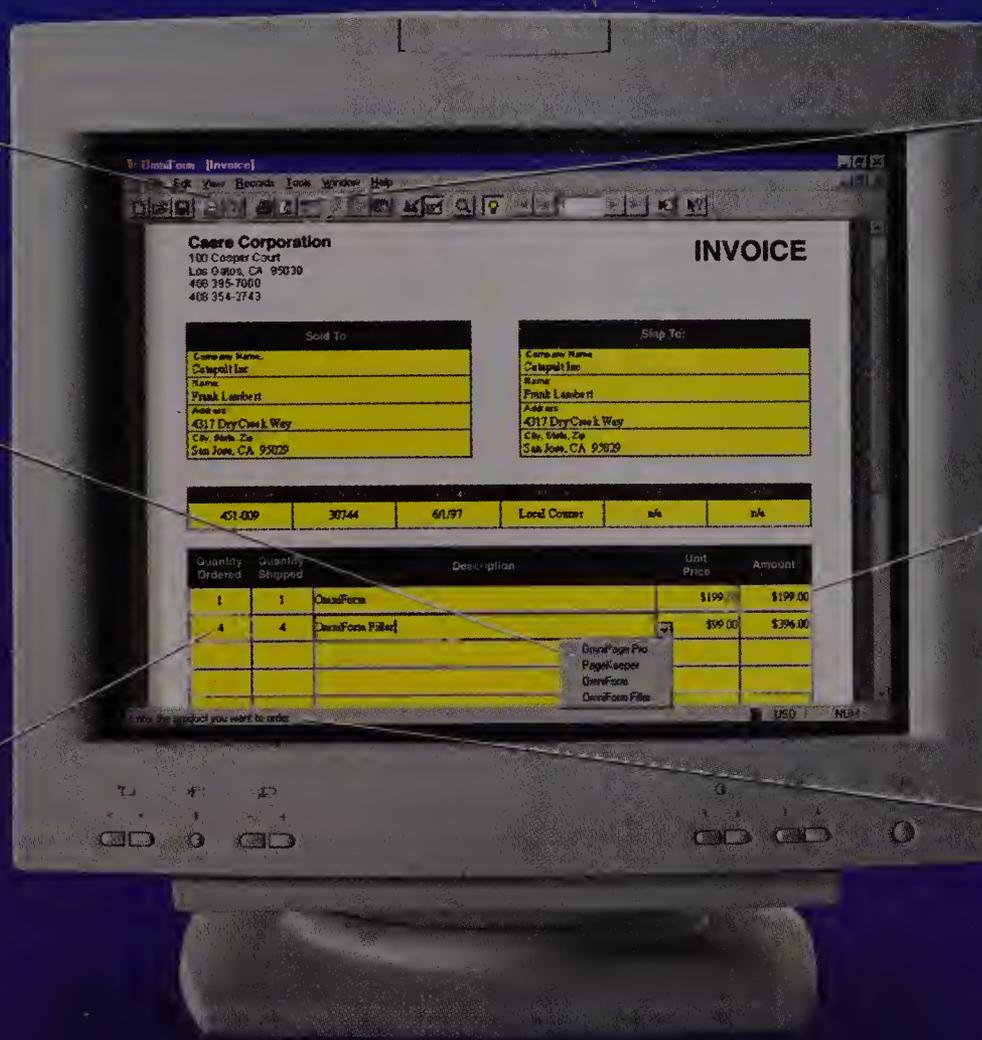
**FIGURE 1: USE WINDOWS 95'S FILE SYSTEM PROPERTIES sheet to rule out problems caused by these settings.**

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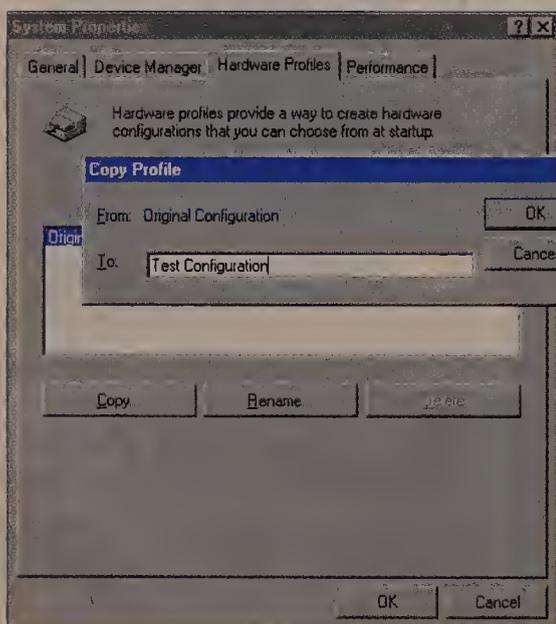
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**7. Shut down the speaker.** To rule out problems with the PC speaker driver, start the System Configuration Editor as described in tip 1; in the system.ini file, look for the line 'wave=speaker.driv'. If you find it, place a semicolon at the beginning of the line. Save system.ini, restart your system, and then shut down. If this solves the problem, get a new driver—or consider investing in a new sound system.

**8. Purge the power.** If your system supports Advanced Power Management, that feature could be to blame. Right-click *My Computer* and choose *Properties*. Click the *Device Manager* tab, then double-click the *Advanced Power Management* icon. Click the *Settings* tab, then uncheck *Enable Power Management*. Click *OK* twice to close the dialog boxes. Restart your computer and shut down Windows. If the problem is gone, contact your system's manufacturer for help.

**9. Do away with devices.** Check out devices and drivers in the Device Manager. If you haven't found the problem so far, you're in for some fun—not!

Right-click *My Computer* and choose *Properties*. Click the *Hardware Profiles* tab. Select *Original Configuration* and click *Copy* (see **FIGURE 2**). Name the new profile **Test Configuration** and click *OK*. Then click the *Device Manager* tab. Select the *Computer* icon and press \* on the numeric keypad to expand the branches in the tree. At the end of one branch, double-click a device icon to open its properties sheet. Click the *General* tab and uncheck the *Test*



**FIGURE 2: SPOT THE PROBLEM DEVICE** by adding devices to a test configuration.

*Configuration* box (not every device displays this). Then click *OK*.

Repeat for every device in the tree. If any of them prompts you to restart Windows, select *No*, unless the device is a PCI hard disk controller. Since this cannot be unloaded dynamically you must restart your PC.

After you've unloaded all possible devices from your test configuration, restart your PC. Windows will whine about not knowing which configuration you want; choose the option for the Test Configuration. When Windows starts, you'll get error messages about your video not being properly installed; click *Cancel* in both the message box and the Display Properties sheet. Now shut down Windows 95 again and see if things are better.

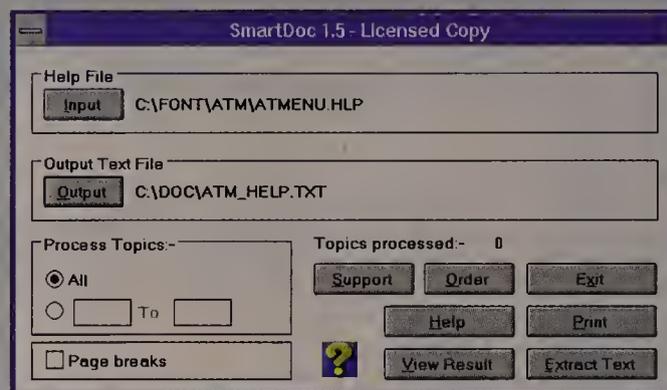
If so, the problem is one of the devices or device drivers. Return to the Device Manager, open a Properties sheet for one device and check *Test Configuration*. Restart Windows, then shut down again. Repeat until the hanging problem recurs; at that point you know the last device you added to the test configuration is the culprit. Contact the manufacturer to make sure you have the latest driver and that it is properly configured. Leaving it out of your normal configuration won't help if you have a Plug and Play system because Windows will automatically configure it again the next time you start up, which brings back your hanging problem.

When you're finished testing, right-click *My Computer*, choose *Properties*, and click the *Hardware Profiles* tab. Select *Original Configuration*, and then restart your computer. Go back to *My Computer*•*Properties*•*Hardware Profiles*, select *Test Configuration*, and click *Delete*.

**10. Crush corruption.** Try reinstalling Windows 95 to a new directory. If the new installation lacks the old problems, your original configuration probably had one or more corrupt files. If your PC still does

### Find Help in Print

DO YOU WISH you could print out an entire Windows Help file instead of just one topic at a time? It's a snap with SmartDoc, which works with Windows 95 and 3.x. Just



download the file *smtdoc.zip* from PC World Online.

not shut down properly, and you have a Plug and

Play BIOS, try installing Windows again with the command line **setup /p 1** to overlook Plug and Play. If this succeeds, you may have a defective BIOS.

**11. Boot it out.** Check out the last line of the *bootlog.txt* file. (This file could be in your root directory or in the Windows folder; make sure you view the most recent one.) This could tell you the last thing Windows successfully terminated as part of its shutdown process. If it ends with 'EndTerminate= KERNEL', shutdown was normal. Otherwise, the last item on a 'terminate=' line may clue you in to a possible source of the problem, to wit: Query Drivers (a memory manager like QEMM), Unload Network (real-mode network drivers in *config.sys*), Reset Display (video driver), RIT (sound card or old mouse driver), or Win32 (some 32-bit program like Microsoft Visual C for Windows).

**12. Seek a higher power.** If none of these tactics bears fruit, you may have a hardware problem or need to change your CMOS settings back to their factory defaults. In either case, you're best advised to talk to your system manufacturer. To tinker with your CMOS on your own (not for the faint of heart), write down all the current settings before doing so, and see "Put BIOS in Its Place" in February's *Hardware Tips*.

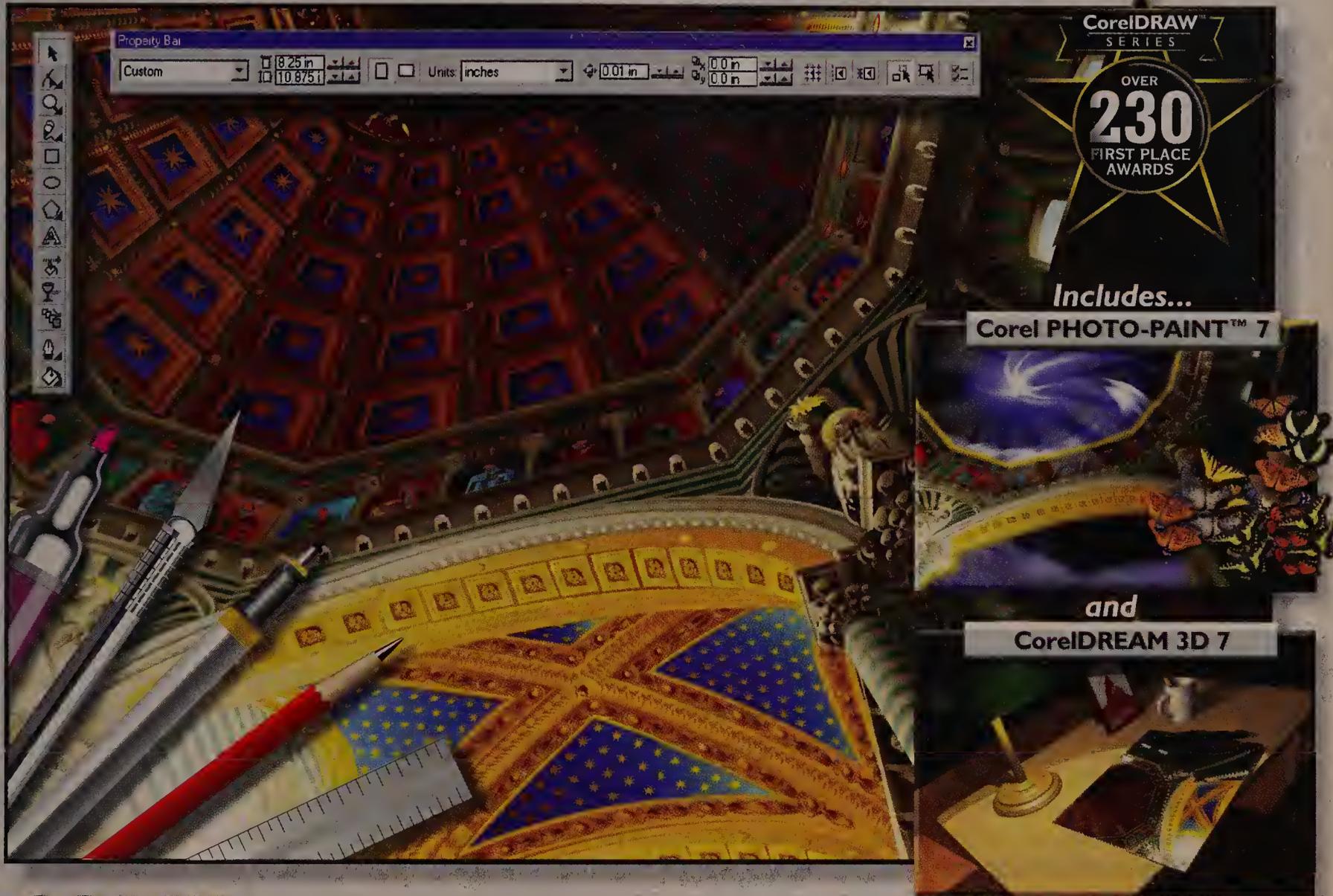
### BRING BACK THE DOS ICON



IF YOU ACCIDENTALLY delete a program icon in Windows 3.x, you know exactly what you need to do: Choose *File*•*New*, select *Program Item*, click *OK*, type in the program ►

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name for Description and the proper .exe file (and its path if necessary) for Command Line. Then click *OK*.

But what do you do if the deleted icon is your DOS prompt? Simple: Just follow the steps above, typing `dosprmt.pif` (or `command.com`) for Command Line.

In Windows 95, right-click the *Start* button and choose *Open* or *Explore*. Open the Programs folder, right-click in an empty area and then choose *New*•*Shortcut*. Type `command.com`, then click *Next* and *Finish*.

## GIVE PROGRAM MANAGER'S ICON A FACELIFT

 GROWING JUST A wee bit tired of that same old Program Manager icon? If so, it's a snap to fix—and you can change Program Manager's name while you're at it.

Just open your StartUp group in Program Manager and choose *File*•*New*. Make sure *Program Item* is selected and click *OK* to open the Program Item Properties dialog box. For Description, type the name you want to use for Program Manager. For Command Line, type the path to the Program Manager application, usually `c:\windows\progman.exe` (your path may differ). Skip the Working Directory option; it's not necessary.

If you want to be able to switch to Program Manager by using keystrokes, click in the Shortcut Key box and press the key combination you want. Then click *Change Icon* and select a new icon. If you don't see one you like, click *Browse*, specify a new file that contains icons (such as `mori-cons.dll` in your Windows directory) and click *OK*. When you've selected a new icon, click *OK*, then click *OK* again to



FIGURE 3: YOU CAN CUSTOMIZE Program Manager's name and icon in about a minute.

close the Program Properties dialog box.

To see the change immediately, double-click your new icon in your StartUp group (see **FIGURE 3**). The changes will stay in effect as long as you leave the icon there; to undo changes, move the icon to another group or delete it and restart Windows.

## KILL THE PASSWORD PROMPT IN WINDOWS NT

 EVERY TIME YOU boot to Windows NT you need to press `<Ctrl>-<Alt>-<Delete>` and type in your password. If this seems to be an unnecessary bother, there is a way to kill the password prompt and make NT log you in automatically—with a few simple changes to the Registry.

It's simple, but not risk-free. Because messing with the Registry can have dire consequences, make sure you have the NT emergency repair disk you created when you installed Windows NT; it can repair problems with the Registry if you goof up. If you don't have an emergency repair disk, create one before proceeding: Choose *File*•*Run* in Program Manager or File Manager (Windows NT 3.51) or *Start*•*Run* (Windows NT 4.0), type `rdisk` and press `<Enter>`.

Now for the real fun. In File Manager or Program Manager, choose *File*•*Run* (version 3.51) or *Start*•*Run* (version 4.0) and type `regedt32.exe` and press `<Enter>`. Click the title bar of the HKEY\_LOCAL\_MACHINE window to bring it to the front. In that window, navigate to `Software\Microsoft\Windows NT\CurrentVersion\Winlogon`. With the Winlogon key selected (it looks like a folder), make sure the `DefaultDomainName` and the

`DefaultUserName` entries are those you normally use when you log on. Choose *Edit*•*Add Value*. For Value Name, type `DefaultPassword`. Make sure `REG_SZ` is selected in the *Data Type* drop-down list and click *OK*. In the String Editor dialog box, type your password and click *OK*. Next, double-click the entry for `AutoAdminLogon`, change the 0 to a 1 and click *OK*. If you don't see an entry for `AutoAdminLogon`, add one like this: choose *Edit*•*Add Value*. Type `AutoAdminLogon`. As

## Lost in the Log-On



I RECENTLY USED the Policy Editor to restrict rights for other users who work on my computer. Everything worked perfectly until I needed to reverse the process and change back to a single-user log-on. Now every time I log on, I get an error message stating, 'The following error occurred while loading the device VNETSUP Error 6101: The string specified by the WORKGROUP keyword in the registry was not found'. When I click *OK*, my computer continues to load without any problems. What's going on?

*Richard Dykes, Internet*

APPARENTLY YOU LOST TRACK of your computer name or workgroup when you switched configurations. This can be a problem in Windows 95 and Windows for Workgroups 3.11. To fix the problem in Windows 95, choose *Start*•*Settings*•*Control Panel*. Double-click the *Network* icon. Click the *Identification* tab and make sure the computer name and workgroup are entered correctly. If you ever see that error message in Windows for Workgroups 3.11, it means that similar entries are missing or are incorrect in the `system.ini` file. Open `system.ini` in a text editor such as Notepad, and look for the [Network] section. Make sure that the correct names are found to the right of the = sign on the lines that begin `Workgroup=`, `ComputerName=`, and `UserName=`. Make any necessary corrections, then save and exit `system.ini`.

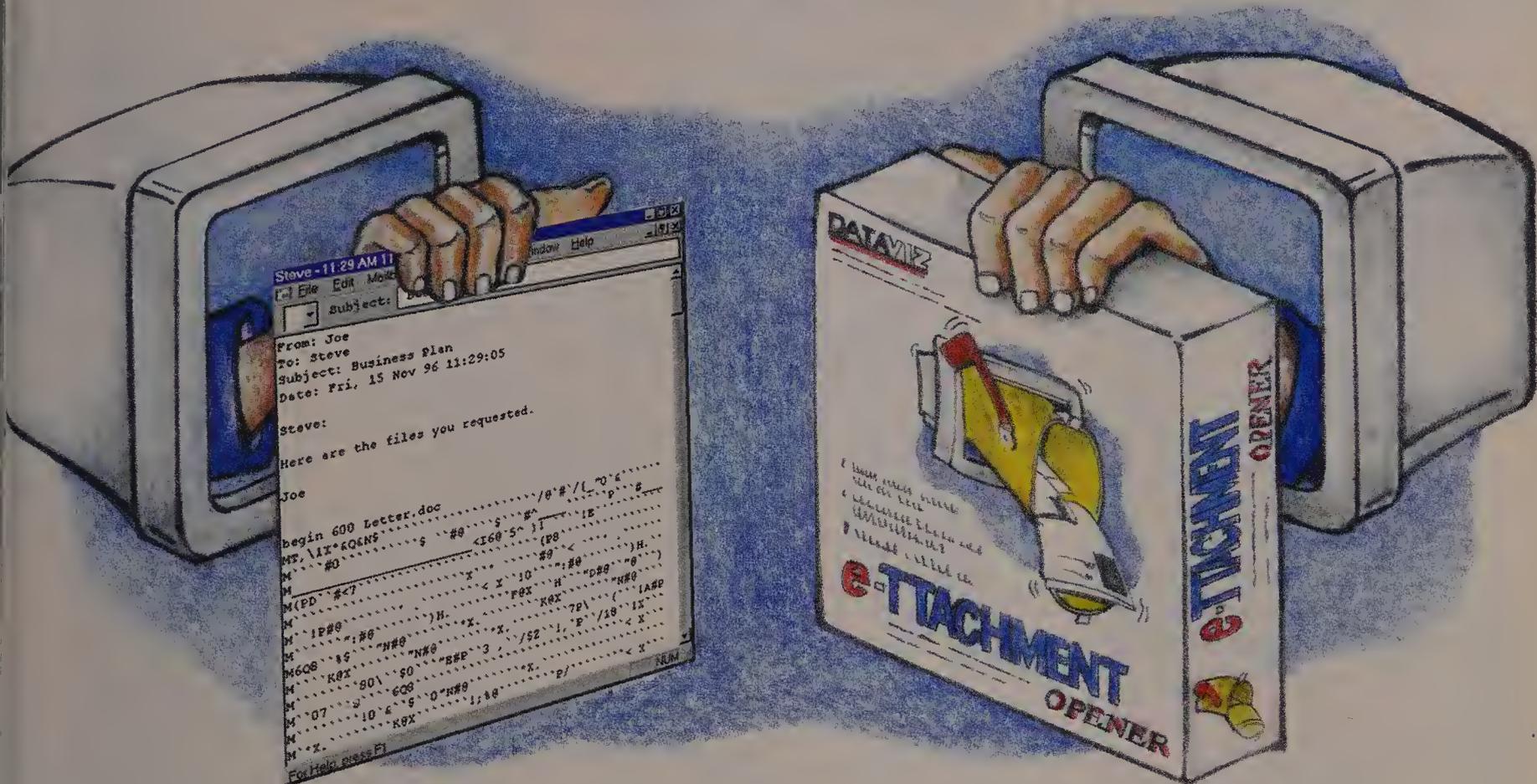
before, make sure `REG_SZ` is selected in the *Data Type* drop-down list and click *OK*. For String, type 1 and click *OK*. Finally, choose *Registry*•*Exit*.

The next time you log on to Windows NT, your password will be processed automatically. But remember that now anyone can use your machine, and your password is emblazoned in the Registry Editor for any savvy user to read.



Find files from this article and additional tips at <http://www.pcworld.com/hereshow.html>. Windows Tips welcomes your questions and tips and pays \$50 for published items. Contributing Editor Scott Dunn is a principal author of *The PC Bible*, 2nd Edition (Peachpit Press, 1995, 800/283-9444). See page 12 for contact information. ■

# Problems Receiving E-Mail Attachments?



**PROBLEM**

**SOLUTION**

**Are you reluctant to have people send you files over e-mail because you have this problem?**

**Well, you're not alone.** If you have trouble receiving e-mail file attachments, **e-attachment Opener™** is your solution. **e-attachment Opener** will decipher and decode any e-mail message you receive, regardless of your mail package. It allows you to **open, view, print, decompress** and save the files.

## Retrieve files from garbage text

If you have ever received an e-mail message where the attached files appear as garbage text at the end of the message, **e-attachment Opener** will extract the files and save them for you.

## View virtually any file

With **e-attachment Opener** you can get a quick view of word processing, spreadsheet, database and graphic files - even if you don't have the program that originally created the file.

## Opens any e-mail attachment

Sometimes you receive a file via e-mail and cannot use it in your program. **e-attachment Opener** will determine the format of the file and allow you to view, print and open the file.

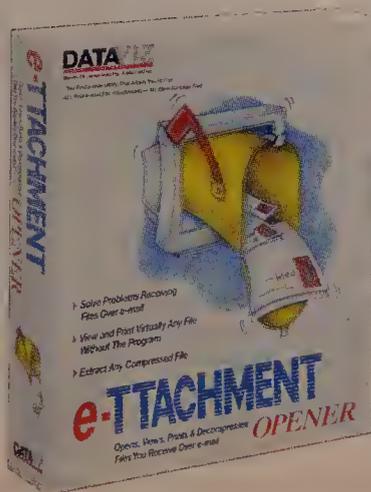
## Easily decompress files

Often times, files you download from the Internet or receive via e-mail are compressed to save space. **e-attachment Opener** will decompress files with a simple double click of the mouse.

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# Looking Up to the Left in Any Spreadsheet



I KEEP MY CLASS ROSTER in Excel, and I was trying to figure out a formula to display the name of the student with the highest average for a series of weekly quizzes. I tried the vlookup function, but found that it can only look up an item located to the right of the reference column. Finally, I came up with the following:

```
=index(A2:A7,match(max(E2:E7),E2:E7,0))
```

What do you think?

Barry W. Spadea,  
Riverside, Rhode Island

C9						
=INDEX(A2:A7,MATCH(MAX(E2:E7),E2:E7,0))						
1	Name	Week 1	Week 2	Week 3	Average	
2	Traynor	57	41	61	53.00	
3	Stengel	99	29	71	66.33	
4	Hooper	26	35	63	41.33	
5	Huggins	12	97	7	38.67	
6	Robinson	0	31	89	40.00	
7	Snider	36	83	12	43.67	
8						
9	Highest Average:	Stengel				
10						

FIGURE 1: EXCEL'S INDEX FUNCTION, along with its max and match functions, returns the name of the person with the highest average.

NICELY DONE! The max function finds the largest average, match finds its position in the list of averages, and index returns the name from the corresponding position in column A, as in FIGURE 1. A similar formula works in 1-2-3 version 5.0:

```
@index(A2..A7,0,@match(@max(E2..E7),E2..E7,0))
```

Quattro Pro lacks a match function, but you can use its lookup function instead:

```
@array(@lookup(@max(E2..E7),E2..E7,A2..A7))
```

## SORT A LIST IN EXCEL

WHILE WE'RE ON the subject of fancy formulas, check out this pair of array formulas (in columns B and C in FIGURE 2) that sorts a list of numbers (in column A) in ascending or descending order, without need for the sort command.

To enter the descending sort formula, select B2:B7, type =large(A2:A7,(row(A2:A7)-

row(A2)+1)) into cell B2, and press <Ctrl>-<Shift>-<Enter>. Enter the ascending formula, =small(A2:A7,(row(A2:A7)-row(A2)+1)), in cell C2, then press <Ctrl>-<Shift>-<Enter>.

B2					
=(LARGE(A2:A7,(ROW(A2:A7)-ROW(A2)+1)))					
	A	B	C	D	E
1	List		Descending	Ascending	
2		21	88	10	
3		71	71	13	
4		10	30	21	
5		13	21	30	
6		30	13	71	
7		88	10	88	

FIGURE 2: SORT A LIST OF NUMBERS IN EXCEL without using the sort command.

To understand how this works, consider that the expression row (A2:A7) yields an array that consists of the row numbers of the list items: {2,3,4,5,6,7}. Subtract the row number of the first item, add one, and you have an ordinal list: {1,2,3,4,5,6}. The formula uses this list with the large function to return the first largest item, the second largest, and so on.

## ADD FANCY FLAGS

HAVE YOU EVER wanted to flag the high values in a report with a smiley face and the low ones with a frowning face? Not your style? Or just never thought it was possible? Well, check out this tip from Bryan Sherman of Cincinnati.

Bryan employs an "if" formula to display '-1' whenever the corresponding value in column B is below 90, '1' when it's greater than 100, and '0' otherwise. Then a custom number format for column A displays a blue 'J' for positive numbers, a red 'L' for negatives, and nothing at all for zeros. Finally, he specifies Wingdings as the font for column A (see STEP BY STEP).

In Quattro Pro use @if(B1<90,-1,@if(B1>110,1,0)). To set the format, select A1..A11, select Format>Block, click the Numeric Format tab, select User defined, and in the Formats defined box, enter N'J';N'';N'L'. Click the Font tab, select Wingdings, specify 16 in the Point Size box, and click OK.



Find more tips at <http://www.pcworld.com/hereshow/>. Spreadsheets welcomes your input and pays \$50 for published items. Contributing Editor Richard Scoville is a software training consultant in Chapel Hill, North Carolina. See page 12 for contact information.

## STEP BY STEP

### Flag High and Low Values in Excel and Quattro Pro

- 1 Enter the data shown in column B.
- 2 Select A1:A11, type =if(B1<90,-1,if(B1>110,1,0)), and then press <Ctrl>-<Shift>-<Enter>.
- 3 Select A1:A11, select Format>Cells, click the Number tab in the Format Cells dialog box, and in the Category list select Custom. In the Type box that appears, enter the formula [Blue]"J";[Red]"L";"".
- 4 In the same Format Cells dialog box, click the Font tab, select Wingdings in the Font list, choose 16 in the Size list, and click OK.

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Model	CRT size/ Viewable	Dot Pitch	Max Resolution	Optimal Res/ Refresh	Plug & Play +
V773	17"/15.8"	.026mm	1280x1024	1024x768/85Hz	Yes
V775	17"/16.0"	.026mm	1600x1280	1280x1024/79Hz	Yes

Circle 247 on reader service card

# Reformatting the Easy Way

IT HAPPENS ALL THE TIME: You've finished a long document, complete with formatting such as italics for your company name throughout or special indentation on some paragraphs. Now the boss shows up and wants those italics changed to boldface and the indentation altered. You could do it manually, but Word, WordPerfect, and Word Pro all offer an easier way. The technique can apply first-time multiple formatting, as well.

**STEP BY STEP** shows how to make this tedious job relatively painless in the current versions of Word and WordPerfect.

## Word 6.0 and 7.0

1. Highlight some text you want to reformat. If you select an entire paragraph, all the formatting in that paragraph, including indentations, will be copied. Make your formatting changes, and leave the text highlighted.
2. Double-click the *Format Painter* button on the main toolbar. This turns on the Format Painter function and makes it persistent so you can reformat several items. (If you single-click the icon, you'll have to relick it each time you want to apply the formatting.) Your mouse pointer will look like a paintbrush.



3. Scroll through the document to locate other text that needs the same formatting, then click and drag the mouse over the text. When you release the mouse button, the formatting will be changed.

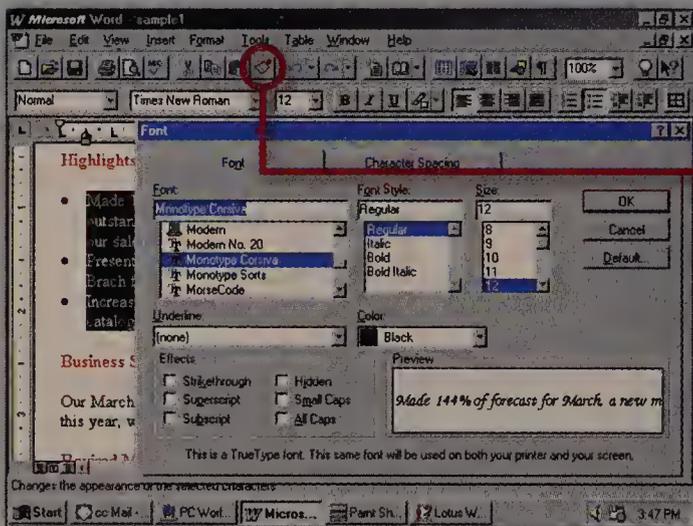
**Hint:** You can use this technique to *apply* formatting as well. Double-click to paint a word, triple-click to paint a paragraph, or **<Ctrl>**-click to paint a sentence. Then double-click the *Format Painter* button. If you selected an entire paragraph in step 1, you can apply the formatting just by clicking anywhere in that paragraph. Repeat as needed, then click the *Format Painter* button again to disable the function.

## WordPerfect 6.1 and 7

1. Highlight some text you want to reformat. Make the formatting changes, and leave the text highlighted.
2. Click the *QuickFormat* icon on the

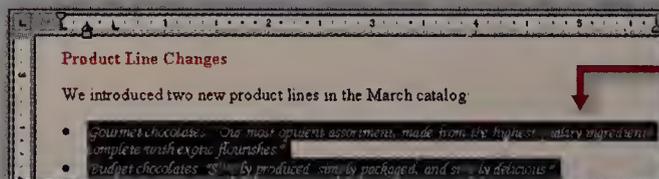
### STEP BY STEP

## Copy Formatting From One Text Block to the Next in Word and WordPerfect

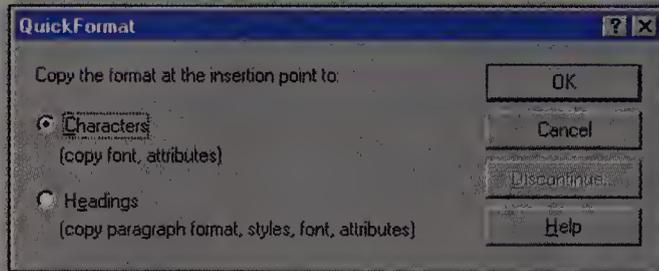
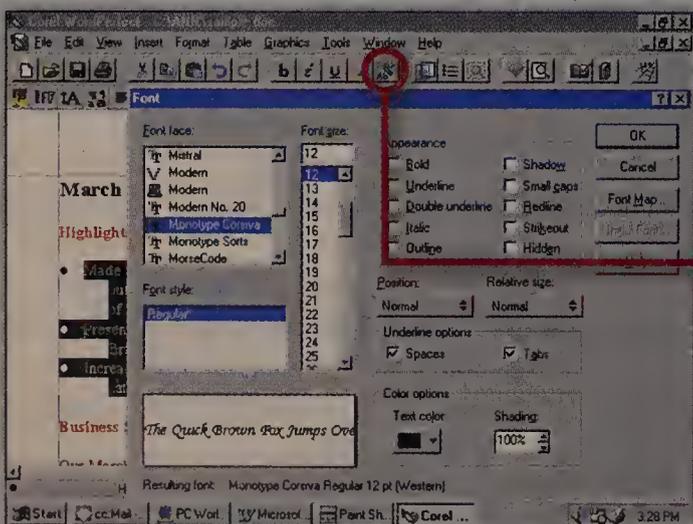


### Word 6 and 7

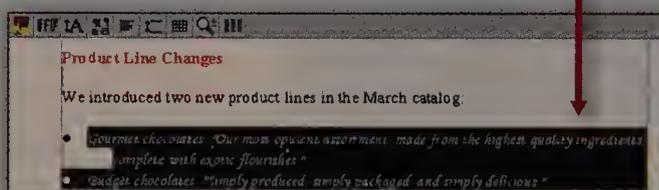
- 1 Highlight a passage of text you want to reformat, make the formatting changes, and leave the text highlighted.
- 2 Double-click the *Format Painter* button on the toolbar.
- 3 Locate another passage of text that needs the same formatting, then click and drag the mouse over this text.



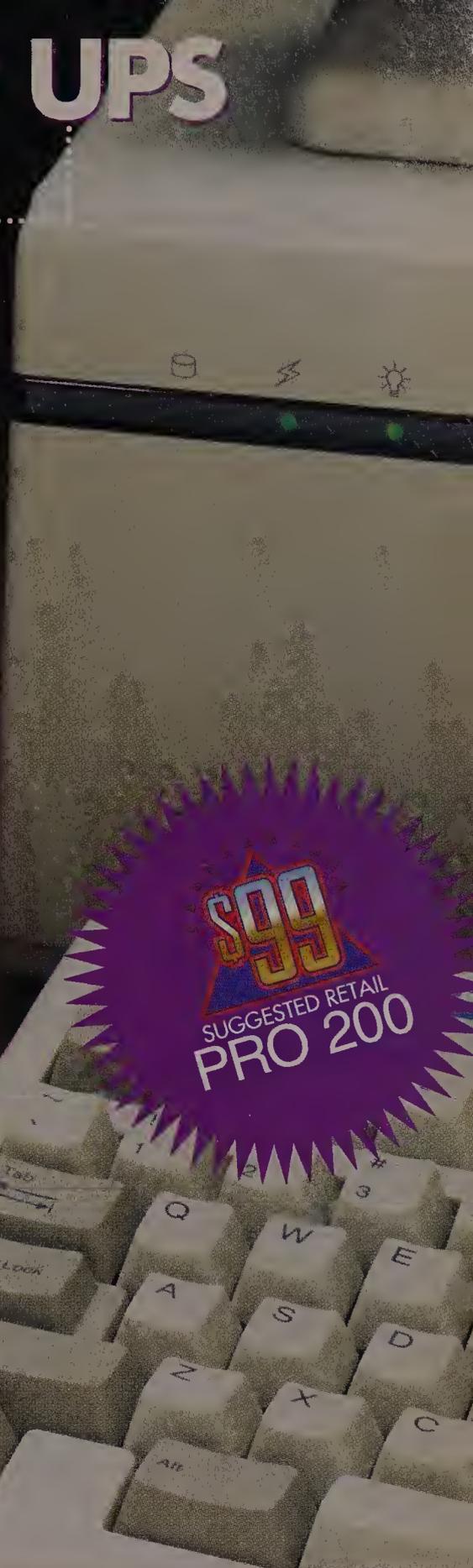
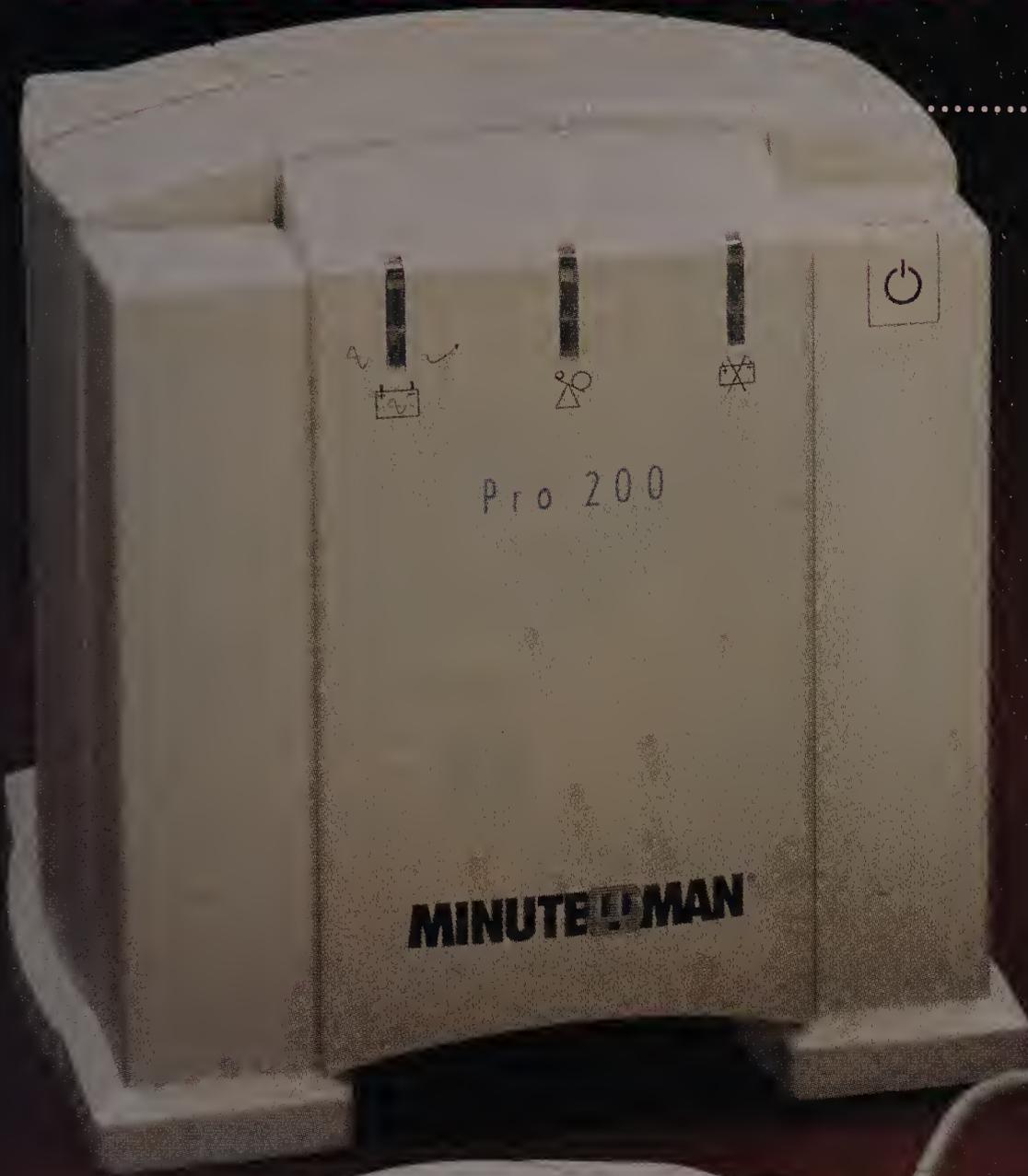
### WordPerfect 6.1 and 7



- 1 Highlight some text you want to reformat, make the changes, and leave the text highlighted.
- 2 Click the *QuickFormat* button on the toolbar.
- 3 Select the *Characters* button to apply your new fonts. Select *Headings* to copy all the formatting in a paragraph.
- 4 If you chose *Characters*, locate other text that needs the same formatting, then click and drag the mouse over it. For *Headings*, click anywhere in the paragraph with the paint roller tool.



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main toolbar (top center of screen).

3. In the QuickFormat dialog box, select *Characters* to apply only character formatting, such as fonts and italics, or *Headings* to copy all formatting for a paragraph, including indentations. Click *OK*. Your mouse pointer will turn into a paintbrush if you selected *Characters*, or a paint roller if you selected *Headings*.

4. If you chose *Characters*, scroll through the document to locate other text that needs the same formatting, then click and drag the mouse over that text. When you release the mouse button, the formatting will match your previous selection. If you chose *Headings*, just click anywhere in the paragraph with the pointer, and the formatting will change.

Repeat steps 3 and 4 as needed, then click the *QuickFormat* icon again to disable the function.

**Hint:** You can use these techniques to apply formatting. Double-click to paint a word or triple-click to paint a paragraph.

### Lotus Word Pro 96

1. Highlight some text you want to reformat, make the formatting changes, then click in the text to remove the highlighting. Close the InfoBox if it's open.
2. Select *Text•Fast Format*, or press **<Ctrl>-T**. In the Fast Format dialog box, select *the look of the text at the insertion point* to copy only the character formatting. Click *the paragraph's named style only (advanced)* if you just want to copy the basic style for a paragraph; it won't copy any of your text formatting. Click *OK*. The mouse pointer will turn into a paintbrush.
3. Scroll through the document to locate other text that needs the same formatting, then click and drag the mouse over the text. When you release the mouse button, the formatting will match the selection from step 2. When you're done, select *Text•Fast Format* or press **<Ctrl>-T** again to disable the function.

### TABLE SELECTION TIPS FOR WINWORD

WHILE WORKING WITH tables in Word 6 and 7, it's easy to become confused on how to properly select text, cells, rows, and

To select	Do this
Any amount of text	Click and drag over the text
All the text in the next cell	Press <Tab>
All the text in the previous cell	Press <Shift>-<Tab>
One cell	Click to the left of the text in that cell
One row	Click outside of the table to the left of the row
One column	Click the top gridline for that column
Multiple cells, columns, or rows	Click and drag across the desired selection
The entire table	Click inside the table, then press <Alt>-<Numpad 5> (Num Lock must be off) or select <i>Table•Select Table</i>

columns in the table. Save yourself some trouble by switching to Word's Normal view of your document (*View•Normal*), making sure that table gridlines are visible (select *Table•Gridlines*; the *Gridlines* option should be checked). Then use the shortcuts given in the table above to select any parts of a table.

### FORMAT WINWORD LINE NUMBERS



IS THERE A WAY to get WinWord 6.0 to use a different font and size for line numbers? When I turn on line numbering in the Page Setup dialog box, these numbers use the same font and size as the default for document text. But once they're turned on, I can't select the line numbers to change their font or size.

Leon A. Goldstein,  
Fayetteville, North Carolina

BY DEFAULT, Word for Windows assigns line numbers the character format of the Normal paragraph style. You can change their font, but the technique isn't obvious. Here's what to do in Word 6.0 and 7.0:

1. In a new document, turn on line numbering by selecting *File•Page Setup*, clicking the *Layout* tab in the Page Setup dialog box, clicking the *Line Numbers* button, and selecting the *Add Line Numbering* check box in the Line Numbers dialog box. Click *OK* twice.
2. Select *Format•Style*. In the Style dialog box, select *Line Number* in the Styles list, then select *All Styles* in the List box. Click the *Modify* button.
3. In the Modify Style dialog box, click the *Format* drop-down list and select *Font*. In the Font dialog box, change the settings to the font and size you prefer for your line numbers, then click *OK*.

4. Back in the Modify Style dialog box, click the *Add to Template* check box, then click *OK* to save these changes as your new line number default settings. If you want these changes to apply only to the current document, just click *OK*. In either case, click *Close* in the Style dialog box.

Enter a few lines in your new document, then select *View•Page Layout* and you'll see the newly formatted line numbers. Just scroll to the left if the line numbers aren't visible.

### DISPLAY MISSING WORDPERFECT COMMENTS



WHILE WORKING ON a document in WordPerfect 6.1, I inserted a comment by using the *Insert•Comment* command. When I clicked *Close* in the Comment editing window, however, the comment was nowhere to be seen. There is supposed to be a little balloon on the screen. When you click on it, the comment should appear in a larger balloon.

I selected *Edit•Preferences•Display* and saw that the *Comments* option was checked. But when I returned to the document window, the comment balloon wasn't there. I need this feature badly. What am I missing?

Marian Barnes, Houston, Texas

THE SAME THING happened to me, and I was at a loss to understand it until I played with the *Zoom* command in the *View* menu and discovered that those comment balloons won't show up under *Zoom* settings that don't display the page margins—any setting above 89 percent.

To see your comments, select *View•Zoom*, then select *Page Width* or specify a setting below 90 percent. Or keep the *Zoom* setting at 100 percent and just scroll the screen to the left until you see the balloons.



Find additional tips at <http://www.pcworld.com/hereshow/>. Word Processing welcomes your tips and questions and pays \$50 for published items. Contributing Editor George Campbell is a contributor to *The PC Bible* (Peachpit Press, 1995, 800/283-9444). See page 12 for contact information. ■

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# Make Exceptions to the Rule With If Functions

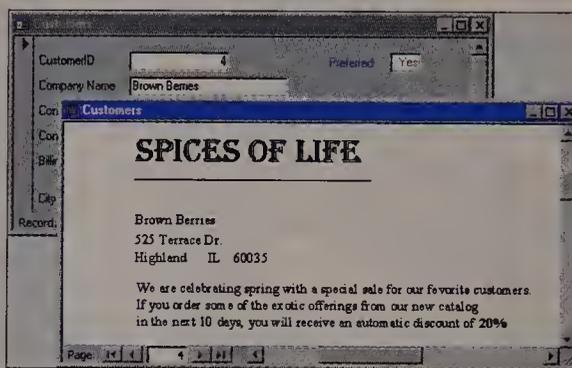
ONE PESKY THING about designing a database is deciding how to handle exceptions to the rules. Suppose you want to send a mailing to customers that gives them an opportunity to receive a 10 percent discount on orders they place in the next few weeks. This would be a simple project except that you have a few preferred customers to whom you would like to offer a discount of 20 percent.

There are a couple of approaches. You can design two mailing pieces from two different database reports—one that shows a 10 percent discount for regular customers and another that offers 20 percent off to preferred accounts. This solution has two drawbacks: You have to include a filter in each report that selects the right customers, and you have to maintain two reports in the database.

A better solution is to design a single report that uses an If function, which allows you to print a subset of data for each condition. In this case, it displays a discount percentage that depends on the contents of a flag field called Preferred in the Customer table.

## ACCESS: EMBED AN IIF() FORMULA IN YOUR LETTER

1. ADD A YES/NO type field named Preferred to your Customer table. Then enter Yes in this field for any records for preferred customers (see **STEP BY STEP**).
2. Design a new, blank report for the letter. You can also use the Report Wizard to cre-



A YES/NO FIELD with an Iif() function lets you print a report with conditional values.

ate a tabular report and rearrange the fields to create the letter's heading.

3. Choose *View>Toolbox* and click the *Label* tool to add a box for the body of the letter. Then enter the letter's text.

4. Use the *Text Box* button in the *ab* Toolbox to add a control to the design to show the percentage discount.

Place the text box in the Label object that contains the body of the report. Right-click the text box, choose *Properties*, click the *Data* tab, and enter `=Iif([Preferred]=Yes, "20%","10%")` on the Control Source line (see **Step by Step**). You can omit `=Yes` if you like. Access assumes that referring to a Yes/No field by name in an Iif() expression automatically tests whether the field is set to Yes.

5. Save the report and view it for preferred and nonpreferred customers.

The Iif() expression has three parts. The first part is a statement that Access evaluates to determine whether it is true or false. In our example, the Iif() expression looks for Yes in the Preferred field of a customer record. The second part, 20%, tells Access what value to display in the text box if the first expression is true. The third part, 10%, says what value should be used when the first expression is false. In this case, the first statement is false when the Preferred field is set to No.

## APPROACH: ADD A DISCOUNT AMOUNT FIELD TO THE LETTER

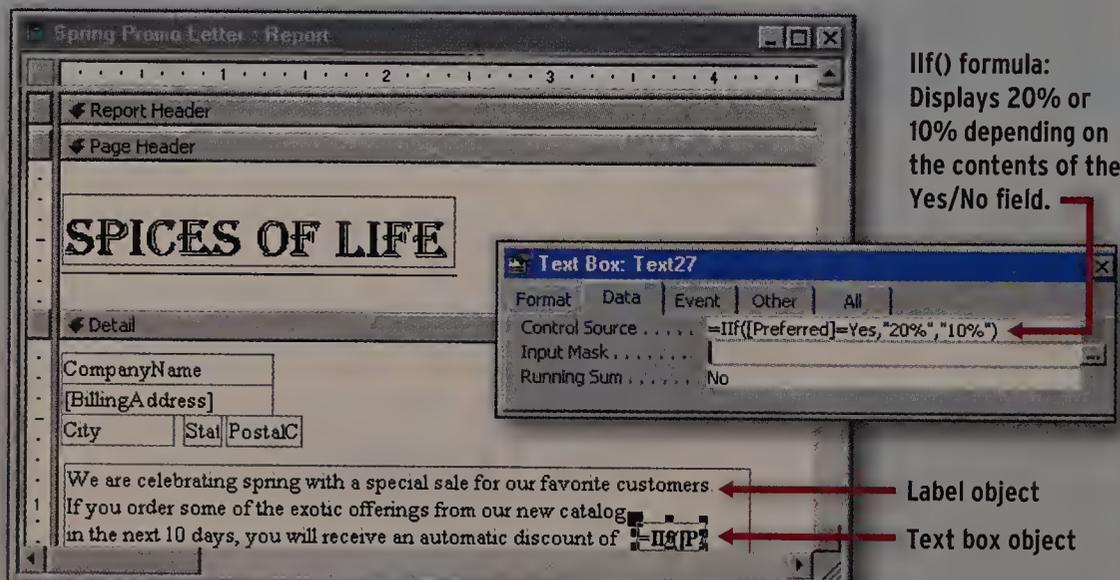
AS IN THE ACCESS EXAMPLE, you need to add a field showing whether a customer is preferred. Open your Customer file, choose *Create>Field Definition*, and add a Boolean field called Preferred. Also add a Calculated field called Discount Amount. In the Formula box, enter `If(Preferred,'20%', '10%')`, and then click OK. Add the Preferred field to the form you use to update customer records, and enter Yes for preferred customers.

Choose *Create>Form Letter* and step through the Form Letter Assistant. Type in the body of the letter, and enter `<<"Discount Amount">>` where you want the discount to appear. When you view the letter in Print Preview, you should see the correct discount.

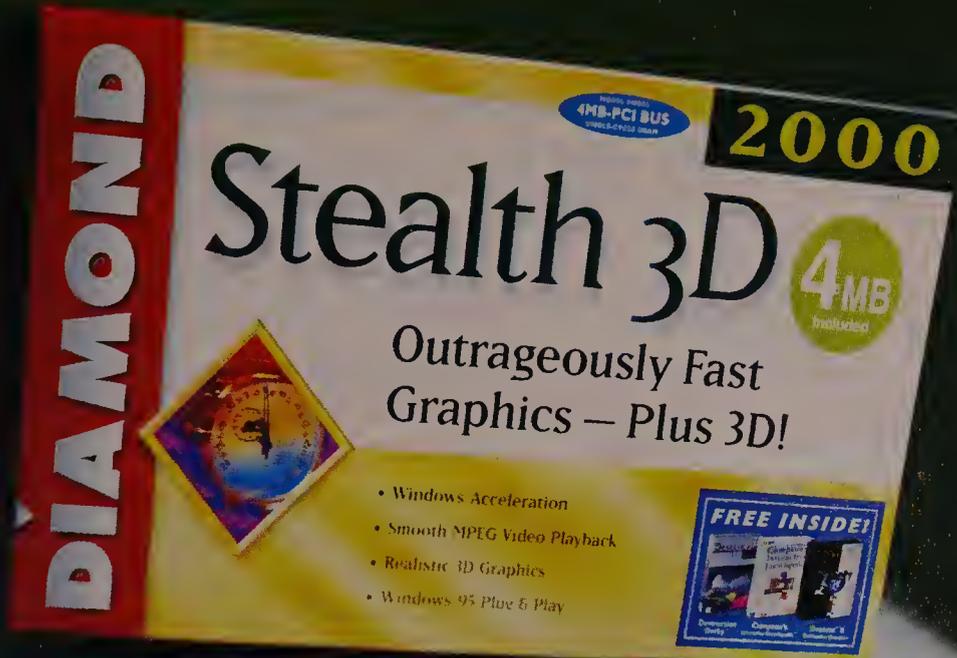
Database Tips welcomes your questions and pays \$50 for published items. Contributing Editor Celeste Robinson is the coauthor of *Mastering Paradox 7 for Windows 95* (Sybex, 1996, 800/227-2346). See page 12 for contact information. ■

## STEP BY STEP

### Design One Access Report for Two Sets of Customers



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Prepare to push your PC into the next dimension with the Stealth 3D family from Diamond. The first in a superior line of affordable Plug and Play 3D accelerators with Outrageously Fast 2D graphics, vivid 3D animation and striking MPEG video playback—from the market leader in high-performance graphics subsystems. The Stealth 3D 2000 and 3000 dramatically improve graphic-intensive business applications, action games and overall system performance through greater resolution, millions of colors

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Look for these logos on a new class of applications designed to take advantage of Stealth 3D graphics.



December 3, 1996



	Stealth 3D 2000XL	Stealth 3D 3000XL
Memory	DRAM	VRAM
RAMDAC	135 MHz	220 MHz
Max Memory	4MB	4MB
Max Resolution	1280 x 1024	1600 x 1200
Bundled Software*	<ul style="list-style-type: none"> <li>• Descent II</li> <li>• Compton's Interactive Encyclopedia 1996</li> <li>• Destruction Derby</li> <li>• MS® Internet Explorer</li> </ul>	<ul style="list-style-type: none"> <li>• Descent II</li> <li>• Compton's Interactive Encyclopedia 1996</li> <li>• 3D F/X</li> <li>• Digital Video Producer</li> <li>• MS® Internet Explorer</li> </ul>

WinBench® 97 Comparison in 24-bit Color Mode	3D Hardware Features Comparison	
	Stealth 3D	MATROX Millennium
DIAMOND Stealth 3D 2000	*Measured in WinMarks™	
MATROX MGA Millennium™	57.5	
MATROX Mystique™	53.6	
STB LightSpeed™ 128	52.8	
ATI 3D Xpression™	50.5	
ATI 3D Xpression™	45.4	
Gouraud Shading	♦	♦
Perspective Correction	♦	
Alpha Blending	♦	
Mip Mapping	♦	
Bilinear Filtering	♦	
Z-Buffering	♦	♦

<http://www.diamondmm.com>

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Circle 60 on reader service card

Download Web pages ♦ Find spammers' addresses ♦ Get financial news from the Web

# Save That Web Page



IS THERE A WAY to save Web pages so that all their graphics and buttons are intact?

Todd Scott, South Boston, Virginia

TRY WEBWHACKER from The ForeFront Group. WebWhacker grabs entire sites, complete with links, graphics, Java applets, sound clips, and video clips, and lets you go back to them offline.

• WebWhacker 2.0 \$49.95 list, trial version free from Web site, The ForeFront Group, 800/653-4933, <http://www.ffg.com/whacker.html>.

READER SERVICE NO. 729

## FIND THE E-MAIL ADDRESS BEHIND THE SPAM

SEVERAL READERS HAVE suggested devicious plans to wreak revenge upon hucksters who fill their e-mail boxes with spam, mass-mailed advertisements for such junk as pyramid schemes or home tanning beds. Not surprisingly, we can't print most of these suggestions.

The annoying reality is that most of these sales pitches include e-mail aliases in the header, which can make it difficult to track down the sender's identity. But one worthwhile idea is trying a \$25 share-

ware utility called NetScan Tools from Northwest Performance Software. NetScan can sleuth out the e-mail address of the spammer's Internet service, to which you can then complain.

Of course, you need to be a sophisticated enough Netizen to know what information to feed NetScan, then translate the mumbo-jumbo it gives you. For example, if you look at the 'Received: from' line in the header of the spam message, you may see the domain name and IP address of the computer from which the message originated. The domain name might be bogus, but the IP address could still be real. If you type the IP address into NetScan Tools, it can scan the Net and find the real domain name for the spam-

mer's address. You can then write the postmaster at this address and inform them that someone at their site is spamming. But make sure that you write the postmaster politely, because even an IP address can be forged.

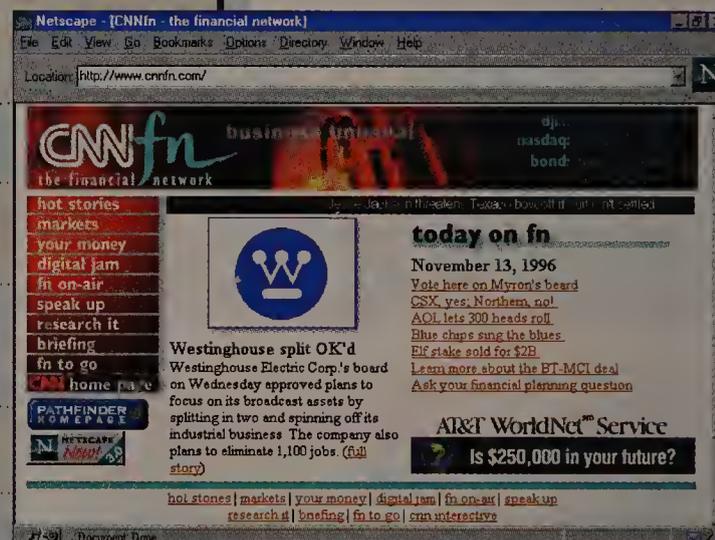
NetScan has other uses, such as determining the IP address of your Internet link and testing your socket connection to find out what breed of Winsock is loaded at any given time. It also includes Ping, which tells you whether you can reach a ►



## Online Sources Teach You To Invest

Can't wait for Lou and his elves on *Wall Street Week in Review* to get advice about investing, or for tomorrow's newspaper to get the latest stock quotes? Here are 12 sites that you can call on anytime for a financial fix.

Site	Description
American Association of Individual Investors ( <a href="http://www.aaii.org/">http://www.aaii.org/</a> )	The club devoted to teaching members how to invest wisely.
CNN Financial Network ( <a href="http://www.cnnfn.com/">http://www.cnnfn.com/</a> )	Financial headlines, market indexes, 15-minute delayed stock quotes, interesting money-related feature stories.
Douglas Gerlach's Invest-O-Rama ( <a href="http://www.investorama.com/">http://www.investorama.com/</a> )	Online brokerage with trading simulation game that helps you learn how to invest.
E-trade ( <a href="http://www.etrade.com/">http://www.etrade.com/</a> )	Terrific source of information and tutorials for the novice investor, database of dividend reinvestment and direct purchase stock programs, articles, links to other financial sites.
Fortune Magazine ( <a href="http://pathfinder.com/@@ODQrWwUArCORzCCM/fortune/">http://pathfinder.com/@@ODQrWwUArCORzCCM/fortune/</a> )	The latest issue of <i>Fortune</i> , plus archives of back issues.
Kiplinger Online ( <a href="http://kiplinger.com/">http://kiplinger.com/</a> )	News, personal finance features, stock quotes, retirement advice.
Money Magazine Online ( <a href="http://pathfinder.com/@@ODQrWwUArCORzCCM/money/">http://pathfinder.com/@@ODQrWwUArCORzCCM/money/</a> )	Features and advice on personal finances.
The Motley Fool ( <a href="http://www.fool.com/">http://www.fool.com/</a> )	Web site for the irreverent investment forum on America Online that everyone in the financial world is talking about.
NETworth ( <a href="http://networth.galt.com/">http://networth.galt.com/</a> )	Morningstar mutual fund reports, fund searching, stock quotes.
SEC Online ( <a href="http://www.sec.gov/">http://www.sec.gov/</a> )	EDGAR database with full text of public company filings and 10-K reports, made available within 24 hours of filing.
StockMaster ( <a href="http://www.stockmaster.com/">http://www.stockmaster.com/</a> )	Stock and mutual fund quotes, historical charts.
The Syndicate ( <a href="http://www.moneypages.com/syndicate/">http://www.moneypages.com/syndicate/</a> )	Bill Rini's links to over 1000 financial pages around the world.



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to the limit," said Robin Bechtel, senior director of new media at Capitol. "With Shockwave, we're at the forefront of a new frontier in multimedia and Web audio. As a medium to get music to the masses, it's the best thing going." But don't just take her word for it. First,

see and hear for yourself by getting Shockwave free at our Web site, where you'll also find a link to Capitol Records. Then give us a call today. And you'll become a multimedia sensation overnight.

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computer on the Internet; Finger, which helps you find out about the person who sent you e-mail; and Whois, which gives you the names, addresses, telephone numbers, and e-mail addresses of those who are responsible for a specified domain. NetScan is handy for those who run Internet services, but even if you don't, it's a fun toy to play with. You can download NetScan from the vendor's Web site, or look for the file nst32230.zip on PC World Online.

• NetScan Tools, \$25 registration fee, Northwest Performance Software, <http://www.eskimo.com/~nwps/index.html>

READER SERVICE NO. 730

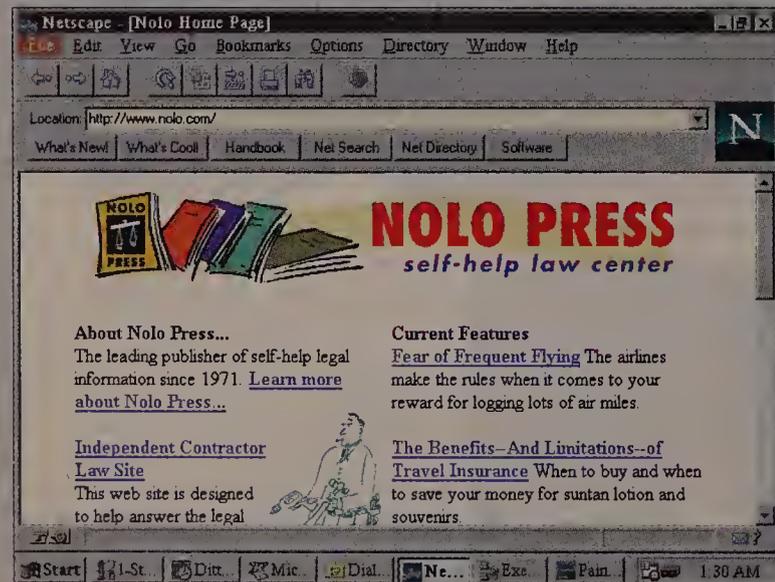
## WILL ADSL OFFER SUPERFAST INTERNET LINKS?

 I'VE HEARD OF AN Internet connection device called ADSL that is supposedly faster than an ISDN connection. What exactly is ADSL, and what do I have to do to get it?

Mary Paska, Williamson, West Virginia  
WHAT A TECHNOJUNKIE you are, Mary. While you may not yet understand the new technology, you are nonetheless eager to buy it.

## Legal Overdose

TIRED OF LAWYERS? Check out Nolo Press's Self-Help Law Center (<http://www.nolo.com/>). Nolo publishes irreverent tomes on how ordinary people can circumnavigate the legal system, avoid lawyers, and serve as their own lawyer if they must. Their site offers spicy features true to the Nolo spirit on consumer issues like frequent flying. It's also a good source for lawyer jokes.



Asymmetric Digital Subscriber Line is the local phone companies' latest scheme for hopping onto the Internet money-making wagon. Among its appeals is that it offers speeds 12 times that of ISDN, yet it doesn't require the telephone companies to spend beaucoup bucks buying new switches and burying fiber optic phone lines, as ISDN does. ADSL also offers cleaner connections to the Internet and more bandwidth than the cable links that the telephone companies' archrivals—the cable companies—hope to sell to households.

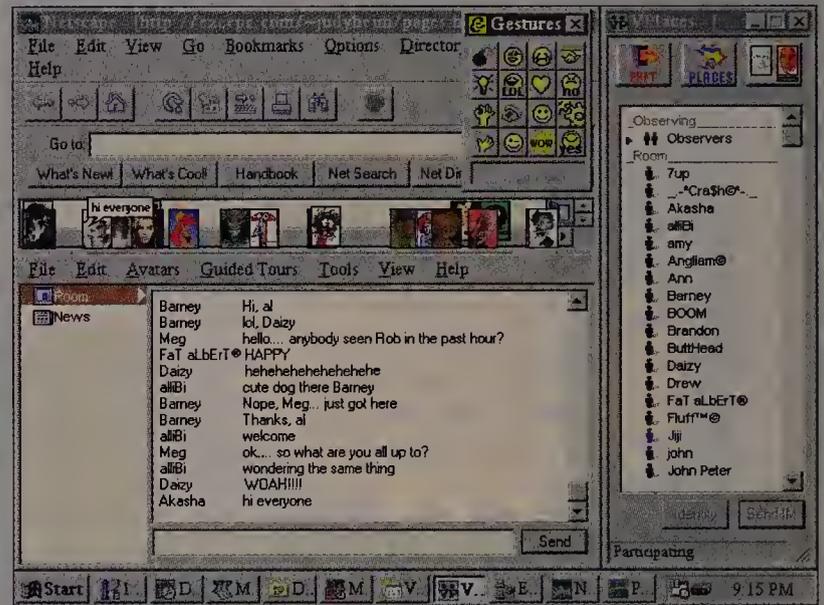
Initially, ADSL will offer downloading speeds of 1.5 megabits per second and uploading speeds of 64 kilobits per second. Eventually, the technology will boost those speeds to 6 mbps and 640 kbps, respectively.

To use ADSL, you will need a special modem card—the few such devices that are currently available on the market cost around \$1000 each. You'll also need a special phone link—it will be your same old phone line, but the phone company will put its own ADSL modem on the other end. That is estimated to cost consumers about \$35 to \$40 a month. And don't forget that your Internet service provider must also be equipped with ADSL.

Many phone companies—Ameritech, AT&T, Bell Atlantic, Bell South, GTE, Nynex, Pacific Telesis, and U.S. West—are testing ADSL in limited areas around the country and within companies. Bell Canada, for example, has been testing ADSL with Internet services. It's hoped that ADSL

## Virtual Places Brings Web Chat to Life

IN RESPONSE TO THE OCTOBER 1996 item about Web chat with animation ("Look at Me When I'm Talking to You!"), Michael Chuen of New Canaan, Connecticut, wrote that he enjoys a free program called Virtual Places. Used as a plug-in to Netscape's Navigator or Microsoft's Internet Explorer, it lets you talk to anyone on the Web through an avatar. You can choose to be a monster, a bathing beauty, or a muscle man. Dialogue appears in bubbles over others' avatars. You can mouse-click from site to site, or chat room to room around the Web. Download Virtual Places from <http://www.vplaces.com/vpnet>.



lines will be available in major cities throughout the country sometime this summer.

But there are hurdles to the new technology. Standardizing ADSL modems so that they talk to the phone companies' modems is one challenge. Also, the current technology requires that your modem be within 3 miles of your phone company's modem for the ADSL connection to work.

 Find files from this article and additional tips at <http://www.pcworld.com/hereshow>. Internet Tips welcomes your questions and tips and pays \$50 for published items. Contributing Editor Judy Heim is the author of *The Needlecrafter's Computer Companion* (No Starch Press, 1995, 800/420-7240). See page 12 for contact information.

# Are you the kind of person who always wants everything your own way?

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bLINK  
THE STORE

**START PAGE**  
HELP  
MODIFY

**SEARCH**  
SEARCH  
INFOSEEK  
BIGBOOK  
DOWNLOAD.COM  
EARTHLINK

**WEATHER**  
LOS ANGELES  
Monday  
Partially cloudy and cool  
55 / 69  
Tuesday  
Rainy and cool  
60 / 66

**NEWS [modify]**  
Your Start Page news is provided by Individual

Travel & Tourism	Interactive Games & Entertainment	Music
<a href="#">Airlines Offer Travel Bargains Up to 75% Off; Consumers Can ...</a>	<a href="#">Acclaim Entertainment's Space Jam Video/PC Game Makes a Fast Break ...</a>	<a href="#">Online giants accused of copyright scoremongering</a>
<a href="#">Vanguard Airlines' Incredibly-Low-Everywhere-We-Go Sale</a>	<a href="#">LIVE Entertainment Offers Walk-on Role in Motion Picture to Web ...</a>	<a href="#">Rolling Stones to tour U.S.-British newspaper</a>
<a href="#">Guest service soars with Vail and Beaver Creek revolutionary in-flight ...</a>	<a href="#">Tim Allen, Dana Carvey, Dennis Miller, Kevin Bacon, Carl Reiner, ...</a>	<a href="#">Windham Hill Composer/Pianist Jim Brickman to Release Third Album 'Picture ...</a>
<a href="#">Pennsylvania Governor Ridge Announces Unique Regional Public/Private Partnerships to Impact ...</a>	<a href="#">US space-style ride for the public -- at \$10,000</a>	<a href="#">Bone Thugs-N-Harmony Keep Promise to Take Tre to the Top ...</a>
<a href="#">Sampling Japanese Theme Parks</a>	<a href="#">Digital maps of New England to make life easier for ...</a>	<a href="#">Regina Regina Release Debut CD on Giant Records New Duo ...</a>

**STOCK QUOTES [modify]**  
Quotes are provided by PC Quote. Data is delayed 20 minutes unless noted.

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<b>Last Sale</b>	79 7/8	39 1/8	151 7/8	10 3/4	22 1/2	54 3/8	6337.16	1283.04
<b>Net Change</b>	+ 3 1/8	0	+ 3 1/4	- 1 3/8	- 1/8	- 1 5/8	+ 28.83	+ 16.72
<b>Time of Last</b>	16:01	17:01	16:29	16:00	16:01	16:01	14:04	13:44

**WEB LINKS [modify]**

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<a href="#">Daily bLink</a>	<a href="#">ESPN</a>	<a href="#">MovieLink 777FILM</a>	<a href="#">Smart Money</a>	<a href="#">News.com</a>
<a href="#">The Arena</a>	<a href="#">SportsLine USA</a>	<a href="#">Hollywood Online</a>	<a href="#">CNN Finance Network</a>	<a href="#">Hotwired</a>
<a href="#">The EarthLink Store</a>	<a href="#">The Sports Network</a>	<a href="#">Movie Reviews</a>	<a href="#">NASDAQ</a>	<a href="#">CNN</a>
<a href="#">What's Hot</a>	<a href="#">The Sports Server</a>	<a href="#">The Internet Movie Database</a>	<a href="#">Investor Dictionary</a>	<a href="#">Word</a>
<a href="#">Technical Support</a>		<a href="#">The Ultimate TV List</a>		<a href="#">Sharesware.com</a>
				<a href="#">USC</a>

- 1 **STYLIZE** Choose how your page looks and what goes on it.
- 2 **GOT E-MAIL?** We'll tell you as soon as it comes in.
- 3 **NEWS** Select from 25 categories you're interested in and we'll gather it for you from over 700 sources.
- 4 **STOCK QUOTES** Watch your wallet fatten with your choice of stock quotes updated by PC Quote.
- 5 **PREMIUM CONTENT** Enjoy discounted rates and direct links to services from Quote.com, CompuServe® and others.
- 6 **WEATHER** Find out if you need shades or a scarf, with a 4-day local forecast.
- 7 **WEB LINKS** Select personal links to your favorite Web sites so they're only one click away.
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Circle 85 on reader service card

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# Improve Your View

WHEN IT COMES to your computer, what you see is what you get. And if what you see is a blurred, flickering image or a video clip that looks like a slide show, what you usually get is a headache.

Most older computers—and even many newer ones—aren't equipped to handle the greedy demands of today's software. Here's a guide to getting the right stuff from your monitor and graphics card.

## IT'S IN THE CARDS

LIKE TELEVISIONS, monitors offer several adjustments for controlling picture quality. But it's your graphics card that collects all the screen-bound data and then sends it to the monitor. The two key settings are easily changed in Windows 95: Go to Control Panel, double-click the *Display* icon, and click the *Settings* tab.

*Screen resolution* is the number of individual dots, or pixels, that make up the screen image. The most common settings are 640 horizontally by 480 vertically and 800 by 600, and some people use 1024 by 768 comfortably on a 17-inch monitor. The more pixels displayed, the sharper the image. Most applications automatically adjust to the set resolution, but some, including certain multimedia titles and games, may work at only one setting.

*Color depth* is the total number of colors available for each pixel. It's often denoted by the bits allotted to each pixel: 8-bit color is 256 ( $2^8$ ) colors, 16-bit color (or *high color*) is 65,536 ( $2^{16}$ ) colors, and 24-bit color (or *true color*) is 16,777,216 ( $2^{24}$ ) colors.

Selecting 8-bit color can noticeably increase your graphics performance. Most business applications and many multimedia titles work fine at this color depth.

You usually must reboot the computer for the change to take effect.

## GET REFRESHED

VERTICAL REFRESH RATE IS THE number of times per second that the graphics card draws (*refreshes*) the image on the

screen. Rates lower than 75 screens per second (75 Hz) produce a flicker on the screen that can cause eyestrain after long periods of viewing.

To reset the refresh rate, run the utility software that comes with your graphics card. Some cards can be set as high as 120 Hz. But unless you're constantly working

driver, there's no guarantee you have the best that's available. Your best bet is to download the latest drivers from your card vendor's Web site and install them yourself. Even if you've got a new graphics board with drivers on a floppy disk or CD-ROM, check the Web site; video drivers tend to be updated very frequently.

## KEEPING IT IN MEMORY

ONE OF THE BIGGEST bottlenecks in getting high-resolution data to the screen is video memory. To gauge how much mem-

## How Much Video Memory Do You Need?

RESOLUTION	256 colors (8-bit color depth)	65,536 colors (16-bit color depth)	16,777,216 colors (24-bit color depth)
640 by 480	1MB	1MB	2MB
800 by 600	1MB	2MB	2MB
1024 by 768	2MB	2MB	4MB
1280 by 1024	2MB	4MB	4MB



**SCREEN RESOLUTION AND COLOR DEPTH dictate the amount of video memory you need.**

with very detailed graphics, rates higher than 80 Hz just add an unnecessary processing burden.

If both your monitor and graphics card support Plug and Play Data Display Channel specifications, then you may not need to reset the refresh rate. The DDC spec allows the card and monitor to talk with each other and automatically adjusts the refresh rate to the highest possible setting. But beware: If Windows 95 can't find the monitor's .inf file, it will set the refresh rate to a lowly 60 Hz. To check, look in your monitor's setup utility for an announcement of the current refresh rate.

## IN THE DRIVER'S SEAT

MAKE SURE YOU'RE running the best software driver available. If you upgraded to Windows 95 you may still be stuck with a clunky real-mode driver instead of a more efficient protected-mode driver. Open Control Panel, double-click the *System Properties* icon, and click the *Performance* tab for a list of current real-mode drivers and other suboptimal conditions.

Even if you're using a protected-mode

ory you need for a particular resolution and color depth, just multiply the resolution (in pixels) by the color depth (in bytes), then add 30 percent for overhead. Or just take a look at the figure above.

If you're not sure how much memory is on your video card, open Control Panel and double-click the *Display* icon to see if the card's driver supports an information tab (names vary) that shows the amount of video memory currently installed.

If you need more memory, consult the manual or check with your vendor to see if your video card is expandable; some cards have sockets for memory upgrades. If yours doesn't, you'll need a new card. When ordering memory for an upgrade, make sure you know what type your card uses—DRAM, VRAM, or one of the other new types of video memory.



Find additional tips at <http://www.pcworld.com/hereshow.htm>.

Hardware Tips welcomes your questions and pays \$50 for published items. Kirk Steers is a PC World contributing editor. See page 12 for contact information. ■

# DTK Networking Solutions...

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# NETWORKING SOLUTIONS

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DTK QUIN-55M/Pentium® Processor/200MHz	#20	Power PCs
DTK QUIN-55M/Pentium® Processor/133MHz	#9	Budget PCs
DTK DTN-5A Pentium® Processor/120MHz	#10	Budget Notebooks

### "HP, DTK lead the Pentium Pro pack"

"The DTK APRI-31M/P200 is a price/performance leader, and an excellent value." *Computer Reseller News, 9/2/96*

"If you need a high-speed, easily configured and expandable system at a good price, the DTK APRI-31M system is an excellent value." *Windows NT Magazine, 2/97*

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Circle 84 on reader service card

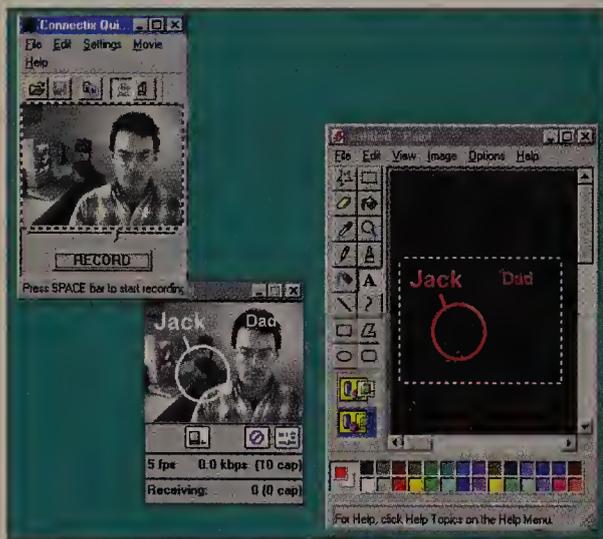
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# Accessorize CU-SeeMe

IF YOU TRIED THE CU-SeeMe Internet videoconferencing software I reported on last month, you're probably ready for a couple of add-ons that make videoconferencing easier and more fun.

The first add-on is a must if you want to participate in a CU-SeeMe conference but lack a video camera. Though quite a few people have Internet accounts, and the software is downloadable, digital video cameras and video capture boards are still a luxury. And while CU-SeeMe allows you to transmit chat text and audio without video, an image is more interesting to the people you're trying to reach, and is the only way to access some *reflector* (CU-SeeMe transmitter) sites.

Bill Neisius's free CU-Doodle utility solves this problem by letting you send parts of your screen—and provides the camera-endowed with a cool way to place text and graphics overlays onto their video.



**FIGURE 1: ANNOTATE VIDEOCONFERENCES** with circles and arrows and all kinds of groovy things (apologies to Arlo Guthrie) using the free CU-Doodle add-on with CU-SeeMe.

Download CU-Doodle from Neisius's FTP directory (<ftp://ftp.netcom.com/pub/ne/neisius/cudoodle.zip>).

CU-Doodle is a single DLL file you install into Windows; a text file guides you through the simple installation process. The program puts two movable windows on your desktop—the main capture area and the overlay area. The capture window

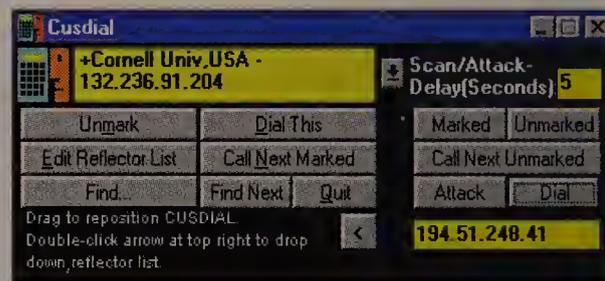
reads a part of your screen and feeds it to CU-SeeMe in place of video from a digital video camera or capture board. To transmit an area of your screen, position the capture window over the part you want to send, or move the program window you want to transmit under the capture window. The overlay window works similarly, but places any nonblack pixels in the overlay window on top of the capture window contents or your video camera's output, allowing you to annotate, censor, or just doodle on top of your outgoing image.

In **FIGURE 1**, the window on the left is the Connectix QuickVideo recorder, with CU-Doodle's capture frame (the dotted-line rectangle) over it. On the right are some text and graphics I whipped up in Windows' Paint—you can use any program that lets you create a black background or foreground. In the center, the local video window of the freeware CU-SeeMe displays the results. If I were using White Pine Software's color-capable Enhanced CU-SeeMe, my text and graphics would display in color.

CU-Doodle may also come to your rescue if you own a video capture board or other device that CU-SeeMe doesn't support. For example, Play Inc.'s Snappy, a hardware module that you attach to the parallel (printer) port of your Windows PC, isn't intended to capture motion video, and CU-SeeMe doesn't support it—it's for capturing still images from a video source such as a VCR or camcorder. But hook your videotape up to the Snappy and let it roll, and you'll see a choppy version of your video rolling in the Snappy software. Place CU-Doodle's capture frame over this display to capture the video frame, call out "Roll 'em!" and you're in show biz. The technique probably won't work with capture boards that bypass your video board's frame buffer and send video directly to the screen, however.

After a few sessions with CU-SeeMe, you'll discover that many reflectors are perpetually busy. If you persist, though,

you'll eventually get in. The second add-on, Richard Cekal's free Cusdial (see **FIGURE 2**), makes it easier for regular users to log on to their favorite CU-SeeMe reflectors. Neither the free nor the shareware version of CU-SeeMe lets you automatically retry a reflector until you connect; you have to sit and click until the reflector gods allow you to enter. Cusdial does this job for you, and it comes with an extensive reflector list that you can update as you find new sites. You can mark favorite



**FIGURE 2: AUTOMATE YOUR CU-SEEME connections with Cusdial, a free utility that takes a lot of hassle out of Net videoconferencing.**

reflectors and have the program dial them until it hits the jackpot, retry a single reflector ad infinitum at an interval you determine, or simply dial every reflector on the list, one at a time, while you continue to do your real job.

Like CU-Doodle, Cusdial works with both CU-SeeMe versions. Check Cekal's Web site (<http://www.spherenet.com/rcekal/index2.htm>) for the latest version.

## SEE YOU IN THE FUNNY PAGES

IT'S BEEN FUN writing this column for the last six months, but it's time for me to fade to black. Next month, longtime *PC World* contributor and media expert Richard Jantz takes over, so send your multimedia tips and questions to him. I'm still writing *Answer Line* and *Bugs and Fixes*, so continue to ask me general questions about hardware and software.

 Find files from this article and additional tips at <http://www.pcworld.com/hereshow.html>. Multimedia Tips welcomes your questions and tips and pays \$50 for published items. Contributing Editor Scott Spanbauer is author of *The No B.S. Guide to Windows 95* (No Starch Press, 1996, 800/420-7240). See page 12 for contact information. ■

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Product comparison based on independent third party testing using a 200 MHz Pentium computer with Windows 95. Scanners were operated in best quality mode using Adobe Photoshop, TWAIN drivers and SCSI cards included in the box. Images were single-pass scanned at 400 dpi. Executive Mac bundle also available with Adobe Photoshop LE, e. Paper™ and SCSI cable. Other scanner configurations available. Awards given to the ES-1200C, one in the line of Epson award-winning scanners. Do not scan published material without permission of the copyright holder. EPSON is a registered trademark of Seiko Epson Corp. Expression and TrueScan are trademarks of Epson America, Inc. All other trademarks are the property of their respective owners. ©1996 Epson America, Inc.



# Build a Windows 95 Network

IF YOU HAVE MORE than one Windows 95 PC in your business or home, hooking them together into a network makes plenty of sense. You can share files without using floppies. You also can share printers, CD-ROM drives, and even outbound faxing—although you need a specialized software package to share modem operations. Best of all, Windows 95 itself can handle all the networking chores—and Windows for Workgroup machines can come along for the ride.

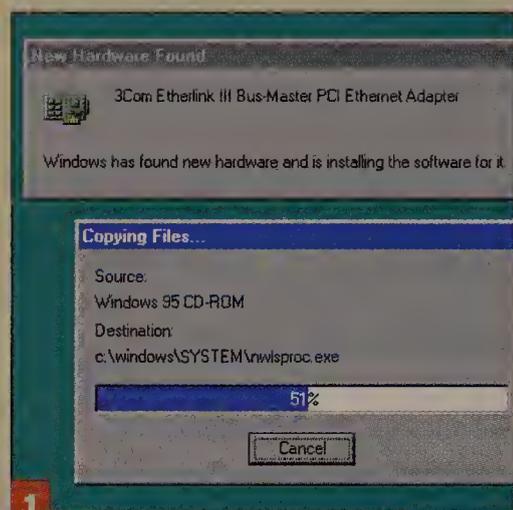
Installing the necessary network adapters and cabling is a relatively simple matter. To start off, you pick either coaxial or

twisted-pair cabling. Coaxial is easier to hook up, but the thick cable is often difficult to run and to keep from getting in the way.

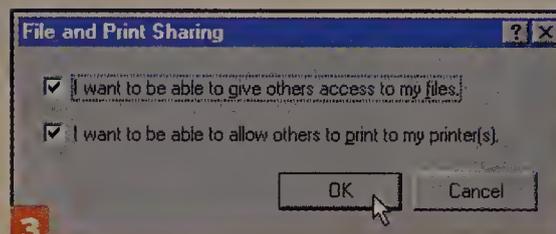
Thin twisted-pair cables, similar to phone wires, are easier to work with and often produce a more robust network. They do require you to shell out for a central connection box, called a hub. But costs for low-end hubs have dropped below \$200, in some cases substantially below, so these devices are well within reach.

Here are the steps you should take to set up each Windows 95 computer to join a network. For more detailed tips, check out <http://www.pcworld.com/hereshow/>.

Stan Miastkowski is a PC World contributing editor.



**1 Install the hardware, add a driver.** Open your PC, insert the network card in a free slot, and connect the network cable. Do the same for the other PCs, and make sure everything's hooked together properly. Turn on the power. Windows 95 should automatically detect each network card, ask you to insert the floppy disk that came with it, and install the appropriate driver software for the card. In some cases, the Windows 95 CD-ROM itself will offer the driver you need.

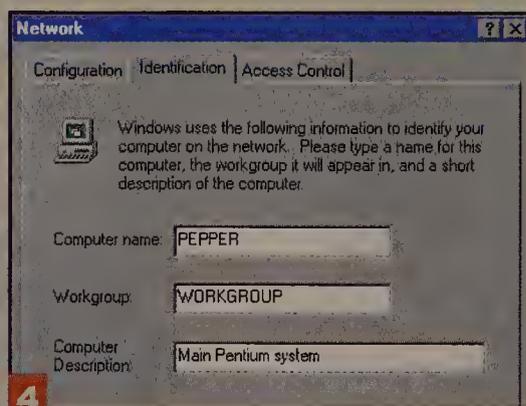


**3 Set up file and print sharing.** You want to be able to swap files and share the printers—that's why you're building the network in the first place, right? In the main Network box, click *File and Print Sharing*, indicate which items you want to share, and click *OK*.

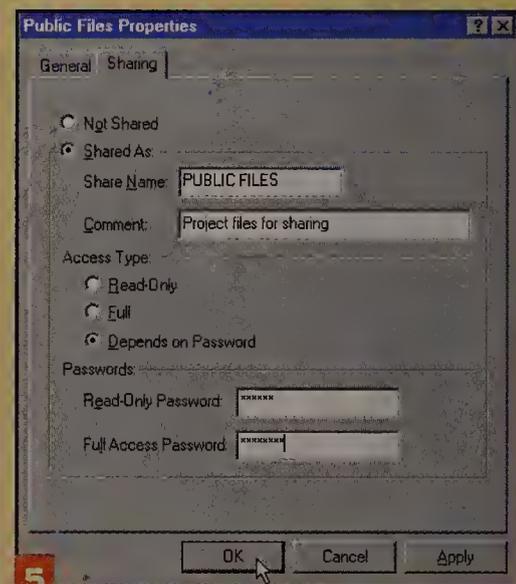
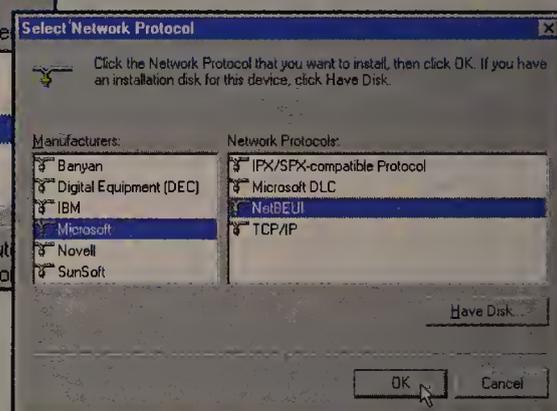
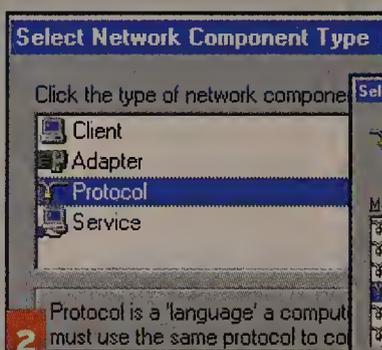
**2 Install the client software.**

Double-click *Control Panel's Network* icon and click *Add*. In the *Select Network Component Type*

*Component Type* box, highlight *Client* and click *Add*. Highlight *Microsoft* in the *Select Network Client* box, make sure that *Client for Microsoft Networks* is highlighted, and then click *OK*. In the main Network box, click *Add*, highlight *Protocol* on the next screen (above), and click *Add*. In the *Select Network Protocol* box (above right), highlight *Microsoft* in the left-hand box and *NetBEUI* in the right-hand box. Click *OK*.



**4 Identify yourself.** Choose the *Identification* tab in the main Network box, and enter a name for your PC, a Workgroup name, and a description. Click *OK*. Windows 95 will attempt to copy the network files. If they are not on your hard disk, it will ask for the Windows 95 CD-ROM. You'll eventually be told to restart your PC.



**5 Log in, share, add other PCs.** Enter a user name (and a password if you want one) the first time you start your PC after all the network components are installed. Right-click a disk or folder in Explorer, select *Sharing* from the shortcut menu, and pick the *Sharing* tab in the resulting dialog box. Enter your preferences and click *OK*. Install networking on the other PCs. Turn off the PCs, replace the covers, turn everything on again, and start networking!



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### LifeBook™ 600 Notebook

- 133MHz Pentium processors
- Only 1.2" thick and 4.2 lbs.
- 12.1" Active Matrix displays
- Integrated 28.8 fax modem

Lifebook™ 635T  
as low as  
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Model	CPU	Screen	RAM/HD	CD	Price
635T	133MHz	12.1" Active	16MB/1.3GB	Opt.	\$3999
635T	133MHz	12.1" Active	16MB/1.3GB	Opt.	3999*

\* Includes Windows for Workgroups or Windows 95



LifeBook™ 600 Notebook  
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Satellite Pro 430

### Satellite Pro 420 & 430

- Up to Pentium 120MHz processors
- Up to 10X CD-ROM drives
- 11.3" Dual Scan & Active Matrix displays
- Built-in SoundBlaster Pro compatible audio

Satellite Pro 420CDS  
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**\$2148**  
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5-Year TAP Warranty... \$349.97

Model	CPU	Screen	RAM/HD	CD	Price
420CDS	100MHz	11.3" Dual Scan	8/772MB	6X	\$2148
430CDS	120MHz	11.3" Dual Scan	16MB/1.2GB	10X	2499
420CDT	100MHz	11.3" Active	8MB/1.2GB	6X	2899
430CDS	120MHz	11.3" Active	16MB/1.2GB	10X	3399



Tecra 510

Call about 200, 660 and 730 models

### Tecra 500 & 510

- 120 & 133MHz processors
- Up to 10X CD-ROM drives on selected models
- 16MB EDO RAM memory
- 12.1" Super VGA displays

Tecra 500CS  
as low as  
**\$2199**  
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Model	CPU	Screen	RAM/HD	CD	Price
500CS	120MHz	12.1" Dual Scan	16MB/1.3GB	Opt.	\$2199
500CDT	120MHz	12.1" Active	16MB/1.3GB	6X	3899
510CDT	133MHz	12.1" Active	16MB/2.1GB	10X	4599

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ThinkPad® 760EL  
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- 16-bit SoundBlaster compatible audio
- Built-in 28.8 fax modems on selected models
- 11.3" and 12.1" Super VGA displays

Model	CPU	Screen	RAM/HD	CD	Price
760EL	100MHz	11.3" Dual Scan	8/810MB	Opt.	\$3399
760ED	133MHz	12.1" Active	16MB/1.2GB	4X	5399
760E	150MHz	12.1" Active	16MB/2.1GB	Opt.	5699
760ED	133MHz	12.1" Active	16MB/2.1GB	6X	5999

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ThinkPad® 365XD  
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- Infrared port for wireless communications
- External floppy drive on 365XD

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Model	CPU	Screen	RAM/HD	CD	Price
365X	133MHz	11.3" Dual Scan	8MB/1.1GB	Opt.	\$2299
365XD	120MHz	10.4" Active	8MB/1.1GB	6X	2499
365XD	133MHz	11.3" Active	8MB/1.4GB	6X	3499

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## digital™

### HiNote VP & VP 500

Model	CPU	Screen	RAM/HD	CD	Price
HiNote VP	100MHz	11.3" Dual Scan	8/810MB	Opt.	\$ 1399
HiNote VP	120MHz	11.3" Dual Scan	8MB/1.08GB	Opt.	1499
HiNote VP	120MHz	11.3" Active	8MB/1.08GB	Opt.	1999
VP 500	120MHz	11.3" Dual Scan	8MB/1.08GB	6X	2449
VP 500	120MHz	11.3" Active	8MB/1.08GB	6X	2949
VP 500	133MHz	12.1" Active	8MB/1.44GB	6X	3599

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- Up to 150MHz Pentium processors
- 11.3" Super VGA, Active Matrix displays
- 16MB of RAM memory

Model	CPU	Screen	RAM/HD	CD	Price
Ultra II	133MHz	11.3" Active	16MB/1.35GB	Opt.	\$4499
Ultra II	150MHz	11.3" Active	16MB/1.44G	Opt.	4799*
Ultra II	133MHz	11.3" Active	16MB/1.35GB	Opt.	4699**
Ultra II	150MHz	11.3" Active	16MB/1.44G	Opt.	4799

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Model	CPU	Screen	RAM/HD	CD	Price
5250	120MHz	10.4" Active	16/810MB	Opt.	\$3099
5280	120MHz	11.3" Active	16MB/1.35GB	Opt.	3859
5300	133MHz	12.1" Active	16MB/1.35GB	Opt.	4349
5380	133MHz	12.1" Active	16MB/2.2GB	Opt.	5439
5400	150MHz	12.1" Active	32MB/2.2GB	Opt.	5539

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- 10X CD-ROM drive
- 64-bit PCI bus architecture

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6200MX	166MMX	13.3" Active	32MB/2.0GB	10X	CALL

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- Pentium 133MHz processor
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Model	CPU	Screen	RAM/HD	CD	Price
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### Widenote

Model	CPU	Screen	RAM/HD	CD	Price
W100D	133MHz	11.2" Wide Dual Scan	16MB/1.1GB	Opt.	\$2799
W100T	133MHz	11.2" SHA Wide Active	16MB/1.1GB	Opt.	\$3299

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### Hitachi E™

Model	CPU	Screen	RAM/HD	CD	Price
E100D	100MHz	11.3" Dual Scan	8/810MB	Opt.	\$1499
E133DN	133MHz	11.3" Dual Scan	16/1.08GB	Opt.	1799
E133T	133MHz	11.3" Active	16/810MB	Opt.	2599

### Hitachi Mx™

Model	CPU	Screen	RAM/HD	CD	Price
MX133T	133MHz	12.1" Active	16MB/1.35GB	8X	\$4299
MMX166T	166MMX	12.1" Active	16MB/2.1GB	8X	5199

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## olivetti personal computers

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Echas	100MHz	10.4" Active	8MB/1.3GB	6X	2149
Pra	133MHz	12.1" Dual Scan	16MB/1.3GB	8X	3499
Pra	133MHz	12.1" Active	16MB/2GB	8X	3999
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Model	CPU	Screen	RAM/HD	CD	Price
A41	120MHz	11.3" Dual Scan	16MB/1.0GB	6X	\$2199
A42	120MHz	12.1" Active	16MB/1.0GB	6X	2799
P50	133MHz	12.1" Active	24MB/1.0GB	6X	3699*
P50	133MHz	12.1" Active	24MB/2.1GB	6X	4299*

### Ascentia J

Model	CPU	Screen	RAM/HD	CD	Price
J55	133MHz	11.3" Active	16MB/1.0GB	Opt.	\$2399

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Ascentia A

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### Extensa 600

Model	CPU	Screen	RAM/HD	CD	Price
600CD	120MHz	12.1" Dual Scan	8/810MB	6X	\$1819

### TravelMate 6000

Model	CPU	Screen	RAM/HD	CD	Price
6020	120MHz	11.3" Active	8MB/1.08GB	6X	\$2699
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Extensa 600CD

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### HP OmniBook 800

Model	CPU	Screen	RAM/HD	CD	Price
800CS	100MHz	10.0" Dual Scan	16/810MB	Opt.	\$2449
800CT	133MHz	10.4" Active	16MB/1.4GB	Opt.	4279

### HP OmniBook 5500

Model	CPU	Screen	RAM/HD	CD	Price
5500CTS	120MHz	10.4" Active	16MB/1.35GB	Opt.	\$3129
5500CTS	133MHz	12.1" Active	16MB/1.35GB	Opt.	4029
5500CTS	133MHz	12.1" Active	16MB/2GB	Opt.	4299

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S76	200MHz	32MB/2.5GB	8X	1999*
S66	166MHz	16MB/3.2GB	8X	2169*
S80	166MMX	32MB/3.2GB	8X	2399*
S90	200MMX	32MB/3.2GB	8X	2599*

\* Cordless mouse and joystick included

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4712	166MHz	24MB/2.5GB	6X	1699
4716	200MHz	32MB/2.5GB	8X	1999
4764	166MMX	24MB/2.5GB	16X	1899
4770	200MMX	32MB/3.8GB	16X	2299

#### Presario Monitors

Model	Size	View	Resolution	Price
Presario	14"	12.9"	1024 x 768	\$399
Presario	15"	13.5"	1024 x 768	479
Presario	17"	15.6"	1280 x 1024	749

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7360	200MHz MMX	32MB/3.8GB	16X	2399

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## TOSHIBA

UP TO 200MHz  
PENTIUM



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- 28.8 full duplex data/fax modem
- 2MB EDO video RAM
- Tons of FREE software



Model	CPU	RAM/HD	CD	Price
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7160	166MHz	16MB/2.1GB	8X	1599
7200	200MHz	16MB/3.0GB	8X	2199

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Infinia	17"	16.23"	1280 x 1024	759

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- 3-D graphics and sound
- Loads of FREE software

Model	CPU	RAM/HD	CD	Price
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9406	200MHz MMX	64MB/4.0GB	16X	2799

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UP TO 200MHz  
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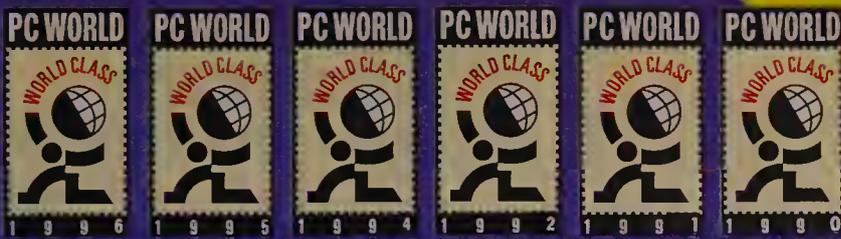
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36744	E-P133 D	Pent/133	Dual/11.3"	1.0GB	16/40MB	28.8	1899
36746	E-P133 DC	Pent/133	Dual/11.3"	1.0GB	16/40MB	-	1899
36748	E-P133 T	Pent/133	TFT/11.3"	1.0GB	16/40MB	28.8	2399
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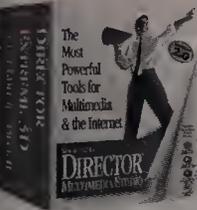
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EtherFast 10BT TX LAN 5-pk/10pk	469/857
PCMCIA 10BT	104
Workgroup Hub 10-port/20-port	105/186
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NE2000+ 10BT/COAX	75/75
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EN104 4-port 10BT Hub	69
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Bravo MS-T P-166 2G 16M 8X	1679
Bravo MS-T P-200, 2G 16M	1989
Bravo MS-T P Pro-180 1.6G 16M 8X	2029
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PC350 P-166 1.6G 16M	1951
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Prosignia 500, P-150, 2.1G, 32M	3621
Prosignia 500, P-150, No HD, 32M	2849
Proliant 1500, P-166, No HD, 32M	6699
Proliant 1500, P-166, 2x4.3G, 32M	11,299
Proliant 5000, PP-166, 12BM	15,499
Proliant 5000, PP-200, 12BM	19,799
<b>HEWLETT PACKARD</b>	
Netserver LC, P-166, no HD, 32M	2499
Netserver LC, P-166, 2.1G, 32M	3399
Netserver LH, PP-200, No HD, 32M	9989
Netserver LX Pro, PP166, No HD, 64M	9999
Netserver LX, PP-200, No HD	11,689
<b>IBM</b>	
PC Server 320, P-133, 2.5G, 16M	4659
PC Server 320, P-166, 2.5G, 32M	6999
PC Server 520, P-100, 4x2.25G, 32M	10,499
PC Server 704, P-166, 4x2.25G, 32M	13,489
<b>Multimedia PC's</b>	
(Models listed below come complete with an integrated 8X CD-ROM drive, 28.8 or higher modem & mouse.)	
AST Advantage 829 P-200, 2.5G 16M	2699
Canon Innova 9210 P-120, 1.6G 16M	1499
Canon Innova 9350 P-133, 1.6G 16M	1799
Canon Innova 9610 P-166, 2.1G 16M	2229
Compaq Presario 4716 P-200, 2.5G 32M	2799
Compaq Presario 6708 P-200, 2.5G 32M	2949
HP Pavilion 7208 P-166, 2.5G 16M	2399
HP Pavilion 7275 P-166, 2.5G 32M	2599
IBM Aptiva 584 P-166 2.5G 16M	2629
IBM Aptiva 578 P-200, 3.2G 32M	3099
Sony Vaio PCV-70 P-166, 2.1G 32M, 28.8M Video	Call
Sony Vaio PCV-90 P-200, 2.1G 32M, 28.8M Video	Call

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<b>TravelPro 1950CS P-133 1.3G 16M 12.1" DS 10X</b>		2798
<b>TravelPro 1950CT P-133 1.3G 16M 12.1" TFT 10X</b>		3228
<b>TravelPro 2000CX P-150 2.1G 16M 13.3" TFT 28.8X</b>		3999
<b>AST</b>		
**** PRICE DROP! ****		
Ascentia J55 P-133 1.0G 16M 11.3" SVGA TFT 33.6		2204
NEW!! Ascentia A41 P-120 1.0G 16M 11.3" OS 6X		2254
Ascentia P50 P-133 1.0G 24M 12.1" TFT 28.8 6X		3579
Ascentia P50 P-133 1.0G 24M 12.1" TFT 28.8 6X		3939
<b>Canon</b>		
NoteJet 3CX P-90 810M 8M 11.8" TFT		4799
NoteJet 3CX P-120 1.2G 8M 11.8" TFT		5499
4900CS P-133 1.08G 16M 11.30S		2449
4900CT P-133 1.08G 16M 11.8" TFT 6X		4369
<b>COMPAQ</b>		
Armada 4120 P-120 1.61.08G 11.8" TFT		3079
Armada 4130 P-133 1.61.08G 11.8" TFT		4369
Lite 5300 P-133 1.6M/1.35G 12.1" Act Cir.		4387
Lite 5380 P-133 1.35G 16M 12.1" Act Cir.		5369
Lite 5400 P-150 32M/2.1G 12.1" Act Cir.		5499
<b>HITACHI</b>		
E100D P-100 810M 8M 11.3" Oual		1798
E130N P-133 1G 16M 11.3" Dual		1789
E133T P-133 810M 16M 11.3" TFT		2389
M133T P-133 1G 16M 11.8" TFT 6XCO		3429
MX133T P-133 1.35G 16M 12.1" TFT 33.6		4279
MX150T P-133 2.1G 16M 12.1" TFT 33.6		4759
<b>IBM</b>		
365XO P-120 1.08G 8M 11.3" Oual		2499
365X P-133 1.08G 8M 11.3" Oual		2503
560 P-100 810M 8M 11.3" Oual Scan		2598
560 P-120 810M 8M 12.1" TFT		3629
760EO P-133 1.2GB 16M 12.1" TFT, CO.		5455
760EL P-133 1.08GB 16M 12.1" Active		4429
<b>MAGTRONIC</b>		
610 P-133 2.1G 16M 12.1" Active		3529
620S, P-120, 1.3G 16M 6XCO 12.1" Act		2699
620TF, P-133, 2.1G 16M 6XCO 12.1" Act		3649
620, P-166, 2.1G 16M 6XCO 12.1" Act		3779
<b>NEC</b>		
Versa 4230 P-133 1.08G 6XCO 10.4" Actv		3446
Versa 6000HP P-100 16/16G 11.3" TFT		3449
Versa 6030HP P-133 16/1.35GB 12.1" TFT		4379
Versa 6030X P-133 16/1.44GB 12.1" TFT		4479
<b>olivetti</b>		
Echos P-100 1.3G 8M 11.3" Oual 6XCO		1889
Echos P-100T 1.3G 8M 10.4" TFT 6XCO		2356
Echos P-120 1.3G 8M 11.3" Oual 6XCO		2769
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Echos Pro P-133 2.1G 16M 12.1" TFT 6XCO		3989
<b>TEXAS INSTRUMENTS</b>		
Extense 570COT P-100 1.2G 10.4" Actv		2729
Extense 570COTSE P-100 2G 8M 10.4" Actv		2949
Extense 600HP P-133 1.35G 16M 12.1" Oual		2979
TM6050 P-150 1.35GB 16M 12.1" TFT		4729
<b>TOSHIBA</b>		
110CS P-100 810M 8M 11.3" Oual		1579
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650CT P-133 1.2G 16M 11.3" Active		3939
730COT P-150 2.0G 16M 6XCO 12.1" Actv		5009
<b>SHARP</b>		
PC 9020 P-120 1.1G 16M 12.1" Dual 8XCD		1879
PC 9070 P-133 1.1G 16M 12.1" TFT 4X		2819
PC 9080 P-133 1.3G 16M 12.1" TFT6XCD		4229
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MicroScan 5V 17" 25mm, 1280x1024	541
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F2-15 15" 28mm 1280x1024 TCO	579
T2-17TS 17" 25mm 1600x1200 TCO	919
TX-C7S 17" 25mm 1280x1024	1029
T2-20 20" 30mm 1280x1024 TCO	1819
<b>MAG</b>	
OX1595 15" 28mm 1280x1024	343
OX1795 17" 28mm 1024 26mm	599
OX700T 17" 28mm 1024 25mm	699
DX15T 15" 28mm 1024 25mm	369
MX21F 21" 1600x1280 28mm	1549
<b>MAGNAVOX</b>	
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447L0590 17" 1024x768 28mm	239
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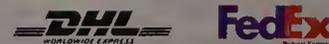
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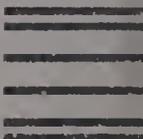
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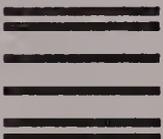
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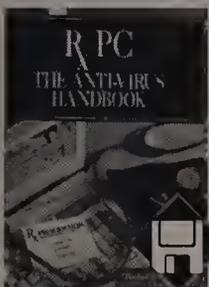
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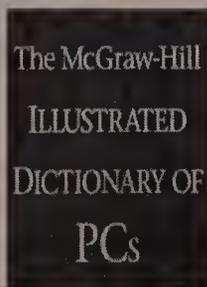
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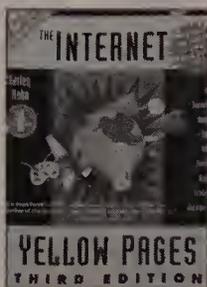
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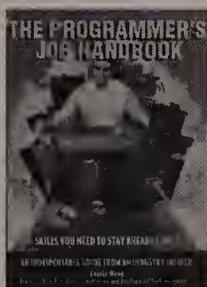
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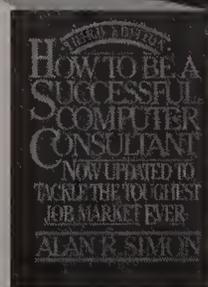
0304106 \$24.95



8821827-XX \$29.95  
Counts as 2



8821371 \$24.95



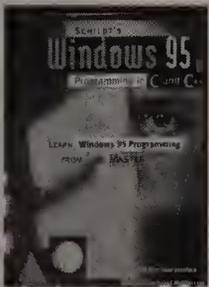
0576173 \$30.00  
Hardcover



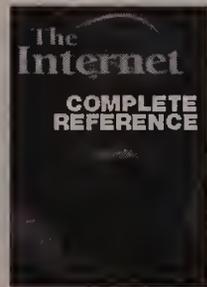
0501815-XX \$34.95  
Counts as 2



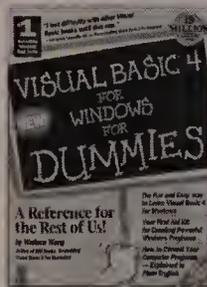
0570639-XX \$45.00  
Hardcover/Counts as 2



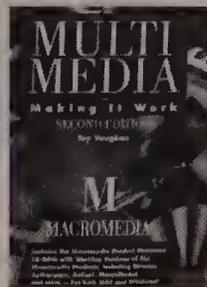
8820812 \$29.95



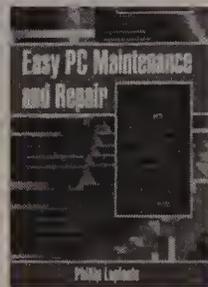
882138X-XX \$32.95  
Counts as 2



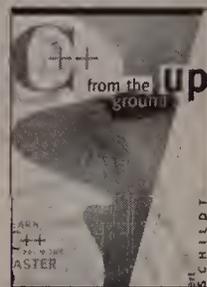
5873141 \$19.99



8820359-XX \$36.95  
Counts as 2



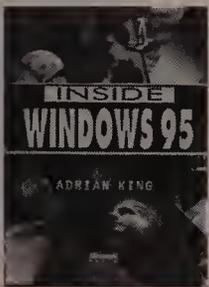
036432X \$29.95  
Hardcover



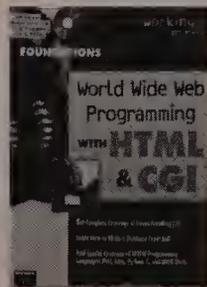
8819695 \$27.95



8821428 \$29.95



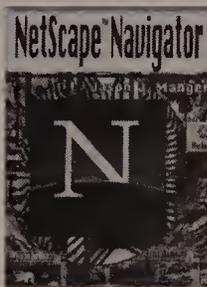
5869632 \$24.95



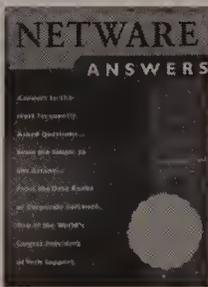
5872781-XX \$39.99  
Counts as 2



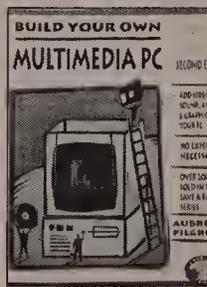
0242070 \$19.95



7091906-XX \$24.95  
Counts as 2



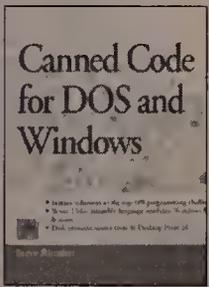
8820448 \$16.95



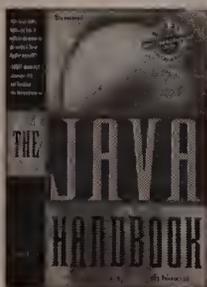
9122264-XX \$39.95  
Counts as 2



8821983 \$27.95



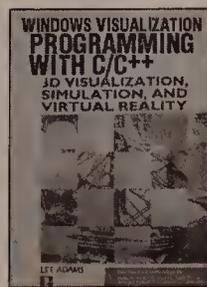
0530025-XX \$39.95  
Hardcover/Counts as 2



8821991 \$27.95



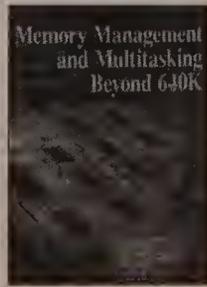
9120482 \$39.95



0003998-XX \$39.95  
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0359768 \$19.95



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IBM PS/1, PS/2 MEMORY MODULES

Table listing IBM PS/1 and PS/2 memory modules with columns for model, capacity, and price.

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CALL FOR NOTEBOOK AND LAPTOP BATTERIES Compaq, IBM, Toshiba, Epson, AST, TI and More!!

Table listing various notebook and laptop batteries from brands like Acer, Compaq, and Toshiba.

TOSHIBA LAPTOP MEMORY

Table listing Toshiba laptop memory modules with columns for model, capacity, and price.

IBM NOTEBOOK & LAPTOP MEMORY

Table listing IBM notebook and laptop memory modules with columns for model, capacity, and price.

COMPAQ MEMORY MODULES

Table listing Compaq memory modules with columns for model, capacity, and price.

COMPAQ NOTEBOOK/LAPTOP MEMORY

Table listing Compaq notebook and laptop memory modules with columns for model, capacity, and price.

LASER PRINTER MEMORY UPGRADES

Table listing laser printer memory upgrade options with columns for amount upgraded, model, and price.

72 PIN SIMMS (FPM, EDO)

Table listing 72 pin SIMM modules with columns for capacity and price.

CACHE MODULES

Table listing cache modules with columns for type, capacity, and price.

CACHE MEMORY

Table listing cache memory options with columns for capacity and price.

DIMMS (168 pin)

Table listing DIMM modules with columns for capacity and price.

INTEL Math Chips

Table listing Intel math chips with columns for model and price.

Individual D-RAM Chips

Table listing individual D-RAM chips with columns for capacity and price.

ECC SIMMS

Table listing ECC SIMM modules with columns for capacity and price.

SIMM MODULES

Table listing SIMM modules with columns for capacity and price.

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AST MEMORY

Table listing AST memory modules with columns for model, capacity, and price.

NEC MEMORY

Table listing NEC memory modules with columns for model, capacity, and price.

HEWLETT PACKARD MEMORY

Table listing Hewlett-Packard memory modules with columns for model, capacity, and price.

We also sell Memory for: Dell, Gateway, DEC, Sun, Zenith, Acer and Epson

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PC CARDS (PCMCIA) VERSION 2.0

Table listing PC cards (PCMCIA) version 2.0 with columns for model, price, and features.

HARD DISK DRIVES (EIDE)

Table listing hard disk drives (EIDE) with columns for capacity, price, and brand.

HARD DRIVES FOR LAPTOP & NOTEBOOK

Table listing hard drives for laptop and notebook with columns for capacity, price, and brand.



### CD RECORDERS - BUILD YOUR OWN KIT!

It's as easy as 1,2,3,4,5!

(Please note: Software, controller, and media prices listed in this box are good only with the purchase of a CD Recorder drive. Please call for individual pricing.)

#### 1 - CHOOSE YOUR DRIVE

2X4 Ricoh, 2MB Buffer (R01420C2M)	\$349
2X4 JVC (JVC2010)	\$385
2X6 Sony (CDU926S)	\$395
4X4 Teac, tray loading (CDR50S)	\$699
4X4 Yamaha (YCDR100)	\$719

#### 2 - CHOOSE INTERNAL OR EXTERNAL

If internal - go on to step 3. If external, add an external case (EXTCDCASE) \$100, and the proper cable. We will even install the drive in the case for you.

#### 3 - CHOOSE YOUR SOFTWARE

Incat Easy-CD	\$50
-Supports Windows 3.1, 95, NT (INCATPC)	
Astarte Toast CD-ROM Pro	\$85
-Supports Macintosh (TOAST)	
Elektroson Gear Multimedia for PC	\$69
-Supports OS/2, Windows 3.1, 95, NT	
-Also supports Macintosh (GEAR)	
Creative Digital Research CDR HYCD for PC	\$359
-Supports Windows 3.1, 95, NT	
-Creates hybrid CDs for PC/Mac/Unix (CDRHYWIN)	
Creative Digital Research CDR HYCD for Unix	\$1299
-For Unix workstations	
-Creates hybrid CDs for PC/Mac/Unix (CDRHYUNIX)	

#### 4 - CHOOSE YOUR SCSI CONTROLLER

16Bit ISA PIO Adaptec (A1505CDKIT)	\$50
16Bit ISA Bus Master Advansys (ABP5140)	\$95
32Bit PCI Bus Master Advansys (ABP940)	\$125
32Bit PCI PIO Adaptec (A2920KIT)	\$159
32Bit PCI Bus Master Adaptec (A2930KIT)	\$189

#### 5 - CHOOSE YOUR BLANK MEDIA

5 Pack (CDR74-5)	\$40
20 Pack (CDR74-20)	\$149
50 Pack (CDR74-50)	\$359
100 Pack (CDR74-100)	\$699

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	System	Extra Cartridge	Extra Frame
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SCSI	\$85	\$40	\$54
WIDE SCSI	\$129	\$64	\$75

Weather resistant case to store and transport cartridge \$55

### OPTICALS

All Optical Drive prices below include 1 FREE cartridge.

230MB Fujitsu IDE	\$339
230MB Smart Storage Solutions SCSI	\$339
640MB Smart Storage Solutions SCSI	\$539
640MB Fujitsu (230MB backwards compatible)	\$555
650MB Toray 4xCD and 640MB Optical comb.	\$299
2.6Gig Smart Storage Solutions	\$1649
2.6Gig Maxoptix	\$1599
2.6Gig Hewlett Packard	\$1599
52Gig Sony 20 slot Juke box w/ 2.6 Gig drive	\$4599

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### CD RECORDERS

These COMPLETE KITS include drive, controller, software, and 1 recordable CD disk. Smart Storage Solutions kit includes 5 FREE recordable CD disks!

Smart Storage Solutions	2X Write 6X Read	\$429
Hewlett Packard	2X Write 4X Read	\$549
Ricoh	2X Write 4X Read	\$445
Teac	4X Write 4X Read	\$829
Smart Storage Solutions	4X Write 4X Read	\$799
Yamaha	4X Write 4X Read	\$759

### CD ROM DRIVES

#### SCSI

Brand	Spin	Model	Speed	Int	Ext
NEC	4X	CDR222	200ms	\$99	\$189
Plextor	6X	PX63CS	145ms	\$269	\$359
Philips	8X	PC80S	195ms	\$205	\$305
NEC	8X	CDR1410	145ms	\$205	\$295
Plextor	8X	PX83CS	115ms	\$299	\$389
Plextor	12X	PX12TS	105ms	\$319	\$409
Toshiba	12X	XM5701B	115ms	\$199	\$289
Plextor	12X	PX12CS	105ms	\$349	\$439
Toshiba	12/16X	XM3801B	99ms	\$259	\$349

#### ATAPI IDE

		Int	Int kit
NEC	8X CDR1400	140ms	\$110 \$140
Mitsumi	8X CRMCFX800	150ms	\$110 \$140
Acer	10X AC910A	150ms	\$125 \$155
Lite On	12X LTN126A	155ms	\$129 \$159
Acer	12X AC612A	125ms	\$135 \$165
Toshiba	12X XM5702B	115ms	\$159 \$189
Teac	12X CD512A	160ms	\$145 \$175
Cyber	12X CYBER12X	150ms	\$115 \$145
Mitsumi	12X CRMCFX12X	150ms	\$139 \$169
NEC	12/16X CDR1600	100ms	\$175 \$205

#### IDE CD ROM CHANGER

NEC	4X CDR4X4	4 Disk	250ms	\$99
Panasonic	10X SQTCS10N	5 Disk	130ms	\$249

#### SCSI CD ROM CHANGERS

Nakamichi	8X MJ48S	4 Disk	150ms	\$299
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### TAPE DRIVES

**QIC MINICARTRIDGE** (SAVE \$10 with hard drive purchase)

Includes DOS/Win backup software and 1 free tape.		
800MB Seagate	TST800R	\$129
3.2Gig Seagate	TST3200RFT	\$199

#### PRINTER PORT MINICARTRIDGE

Includes DOS/Win backup software.		
800MB Seagate	TST800RPT	\$159
3.2Gig Seagate	TST3200RP	\$249

**IDE or SCSI TRAVAN** (SAVE \$10 with hard drive purchase)

Includes DOS/Win backup software and 1 free tape.		
4-8GB Seagate	TST8000(A)	\$349

#### SCSI 4mm DAT

2GB Hewlett Packard	C1534AI	\$609
2-4GB Seagate	C4324RP	\$679
2-4GB Hewlett Packard	C1536AI	\$699
4-8GB Sony	SDT5000AI	\$809
4-8GB Seagate	C4326NP (DDS2)	\$859
<b>4-8GB Sony</b>	<b>SDT7000AI</b>	<b>\$909</b>
12-24GB Sony	DDS3 SDT9000AI	\$1399
12-24GB HP	DDS3 C1554AI	\$1599
24-48GB HP	External 6 tape loader C1553AX	\$2299
32-64GB Sony	TSL7000 8 tape autoloader	\$2199
48-96GB Seagate	C4586NP 12 tape autoloader	\$2399

#### SCSI 8mm DAT

3.5-7GB ExaByte	EXB8205XL	\$1269
7-14GB ExaByte	EXB8505XL	\$1889
7-14GB ExaByte	EXB8700LT	\$1029
20-40GB ExaByte	EXB8900	\$4799
70-140GB ExaByte	EXB10H 10 tape autoloader	\$5439

**BACKUP SOFTWARE** (SAVE \$10 with hard drive purchase)

NovaStor's NovaBack CD contains software for DOS, Win 3.1, Win 95, OS/2, Warp, and Macintosh	\$79
NovaStor's NovaDisk CD contains software to backup to disk drives and removables	\$79
Seagate Arcada for Windows NT (call for network version) workstation/single server/enterprise	\$239/499/869
TAPEDISK, allows DAT drive to be used as hard drive under DOS/Win 3.1, Win 95	\$189

Call for the best prices in the industry on backup tapes!

### IDE HARD DRIVES

IDE	Speed	RPM	Brand	Model	Wty	Price
631MB	14ms	3600	Seagate	ST3630A	3	\$145
1200MB	10ms	5400	Fujitsu	M1636T	3	\$189
1200MB	14ms	4103	JTS	JTS1200	3	\$179
1275MB	12ms	4500	Seagate	ST31276A	3	\$195
1280MB	11ms	4500	Quantum	TM31280A	3	\$195
1281MB	11ms	5200	Western Digital	WDAC21200	3	\$199
1624MB	10ms	5200	Western Digital	WDAC21600	3	\$219
1670MB	11ms	4480	Maxtor	M81750A	3	\$215
1700MB	10ms	5400	Fujitsu	M1623T	3	\$209
1700MB	12ms	4500	Seagate	ST31720A	3	\$215
2000MB	14ms	4103	JTS	JTS2000	3	\$219
2004MB	11ms	4480	Maxtor	M72004A	3	\$255
2100MB	11ms	5200	Western Digital	WDAC22100	3	\$239
2100MB	9ms	5400	Fujitsu	M1624T	3	\$235
2132MB	12.5ms	4500	Seagate	ST32132A	3	\$247
2168MB	10.5ms	4500	Quantum	TM32160A	3	\$249
<b>2500MB</b>	<b>9ms</b>	<b>5400</b>	<b>Fujitsu</b>	<b>M1638T</b>	<b>3</b>	<b>\$249</b>
2550MB	15ms	3600	Quantum	BF2500A	3	\$229
2550MB	10.5ms	4500	Quantum	TM32550A	3	\$262
2559MB	11ms	5200	Western Digital	WDAC32500	3	\$275
2560MB	11ms	5400	Seagate	ST52520A	3	\$275
2700MB	12ms	4480	Maxtor	M72700A	3	\$269
3166MB	12ms	5200	Western Digital	WDAC33100	3	\$299
3254MB	10.5ms	4500	Quantum	TM33200A	3	\$292
3500MB	12ms	4480	Maxtor	M83500A	3	\$365
3840MB	10.5ms	4500	Quantum	TM33840A	3	\$333
4000MB	12ms	5200	Western Digital	WDAC34000	3	\$389

### SCSI HARD DRIVES

SCSI	Speed	RPM	Brand	Model	Wty	Int	Ext
1050MB	9ms	5400	Seagate	ST31055N	3	\$339	\$409
1280MB	12ms	4500	Quantum	TM31280S	3	\$279	\$349
2110MB	10.5ms	4500	Quantum	TM32110S	3	\$329	\$399
2147MB	9ms	5400	Micropolis	MC4421	5	\$369	\$439
2150MB	9ms	5400	Seagate	ST32155N	5	\$475	\$545
2150MB	8ms	7200	Seagate	ST32171N	5	\$699	\$769
3254MB	10.5ms	4500	Quantum	TM33200S	3	\$379	\$449
4350MB	8ms	7200	Seagate	ST34371N	5	\$1089	\$1159
4400MB	8ms	7200	Fujitsu	M2954S	5	\$819	\$889
4550MB	8ms	7200	Quantum	XP34550S	5	\$939	\$1009
4550MB	7.9ms	7200	Micropolis	MC4345	5	\$959	\$1029
<b>4550MB</b>	<b>7.5ms</b>	<b>10,000</b>	<b>Seagate</b>	<b>ST34501N</b>	<b>5</b>	<b>\$1669</b>	<b>\$1739</b>
4550MB	7.9ms	7200	Micropolis	MC4345AV	5	\$1129	\$1199
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9091MB	8.5ms	7200	Micropolis	MC3391AV	5	\$1899	\$1969
9100MB	9ms	7200	Seagate	ST19171N	5	\$2099	\$2169
9100MB	8ms	7200	Quantum	XP39100S	5	\$1539	\$1619
9100MB	10ms	7200	Fujitsu	M2949S	5	\$1549	\$1629
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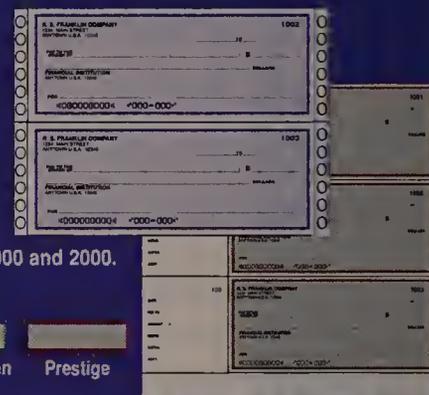
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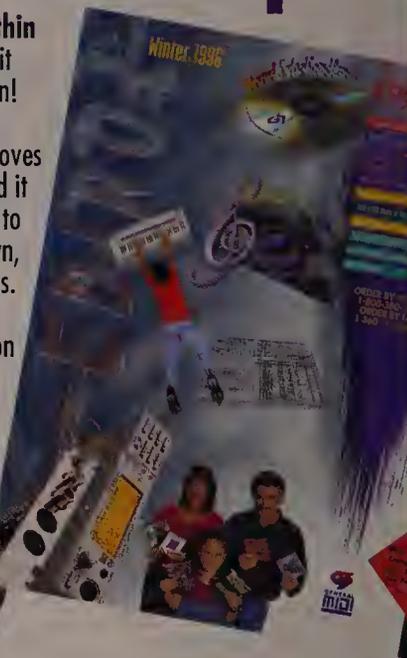
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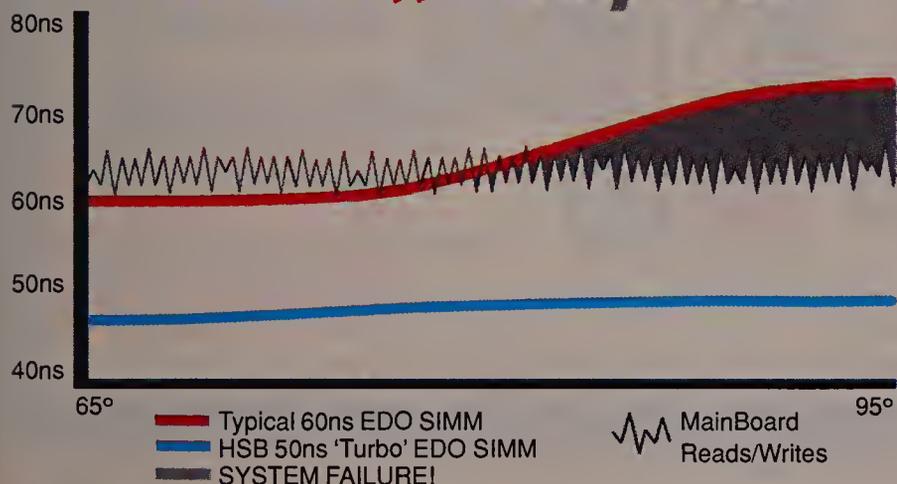
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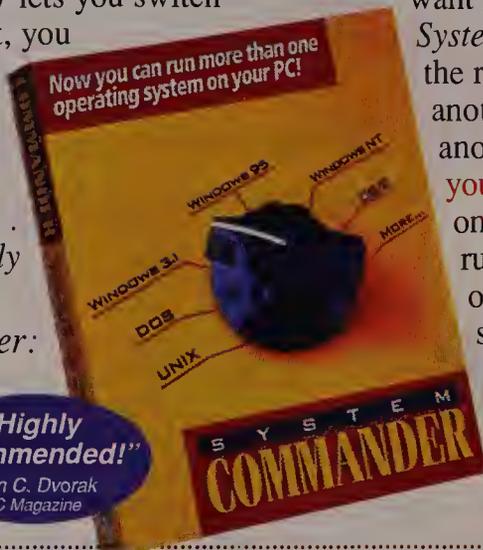
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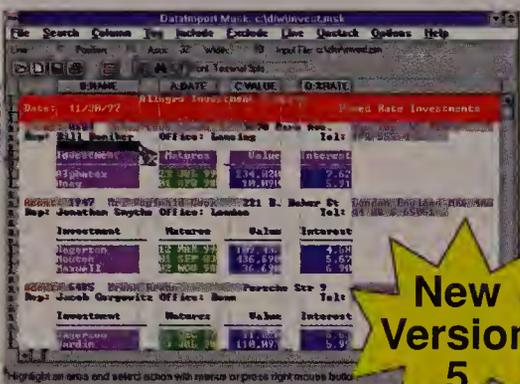
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- 951 Desktop computers
- 952 Notebook computers
- 953 Windows 95 software
- 954 Monitors and video boards
- 955 Accounting software
- 956 Graphics software
- 957 Network/sharing products
- 958 Printers
- 959 Multimedia products
- 960 Utilities
- 961 Mail order companies
- 962 Storage devices

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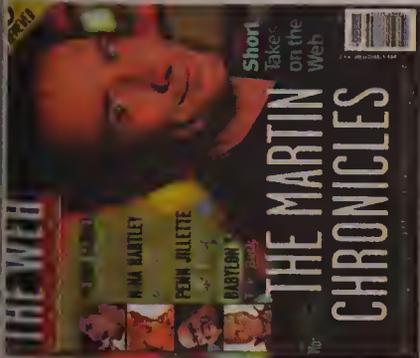
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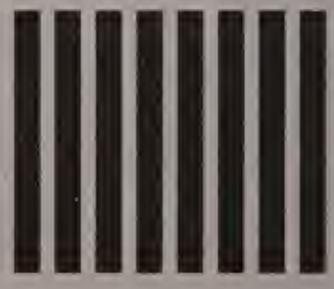
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## AGENDA

### 8:45-11:50 MORNING SESSIONS

- ◆ **Introduction**
- ◆ **Capturing the Top 10 IT Growth Opportunities**  
*Frank Gens, Senior Vice President, Research*
- ◆ **Will the Telcos Own the Internet? IT Opportunities and Impact**  
*Gigi Wang, Senior Vice President, Communications Industry Research*
- ◆ **Outlook for New Internet Technologies**  
*John Gantz, Senior Vice President, Personal Systems and Services Research*
- ◆ **Software Economics Beyond Microsoft: What Works?**  
*Tony Picardi, Group Vice President, Software Research*

Session A 1:15 - 2:00	Session B 2:15 - 3:00	Session C 3:15 - 4:00
<b>TRACK 1: Internet Hot Spots</b>		
Internet Technologies: Opportunities & Challenges Ted Julien	Java's Race to Overtake HTML Evan Quinn	New Media: Is It Ready for Prime Time? Bill Ablondi
<b>TRACK 2: PCs for the Next Millennium</b>		
Plugging in the Toaster: IDC's Outlook on the Information Appliance Marketplace Bruce Stephen	The Vibrant World of the PC Eric Lewis	Semiconductor Opportunities: System on a Chip Solutions Mario Morales
<b>TRACK 3: Winning Software Strategies</b>		
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<b>TRACK 4: NT in the Enterprise</b>		
NT Adoption — How Fast Will It Happen? David P. Vellante	NT Servers and Clients: Building Winning Strategies Jay Bretzmann	NT: Unix Killer or New Market Growth? Dan Kusnetzky
<b>TRACK 5: LAN/WAN Dynamics</b>		
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<b>TRACK 6: Market Spotlight</b>		
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### 4:05-4:50 Keynote Address

*Dr. Robert M. Metcalfe, Vice President of Technology, IDG*

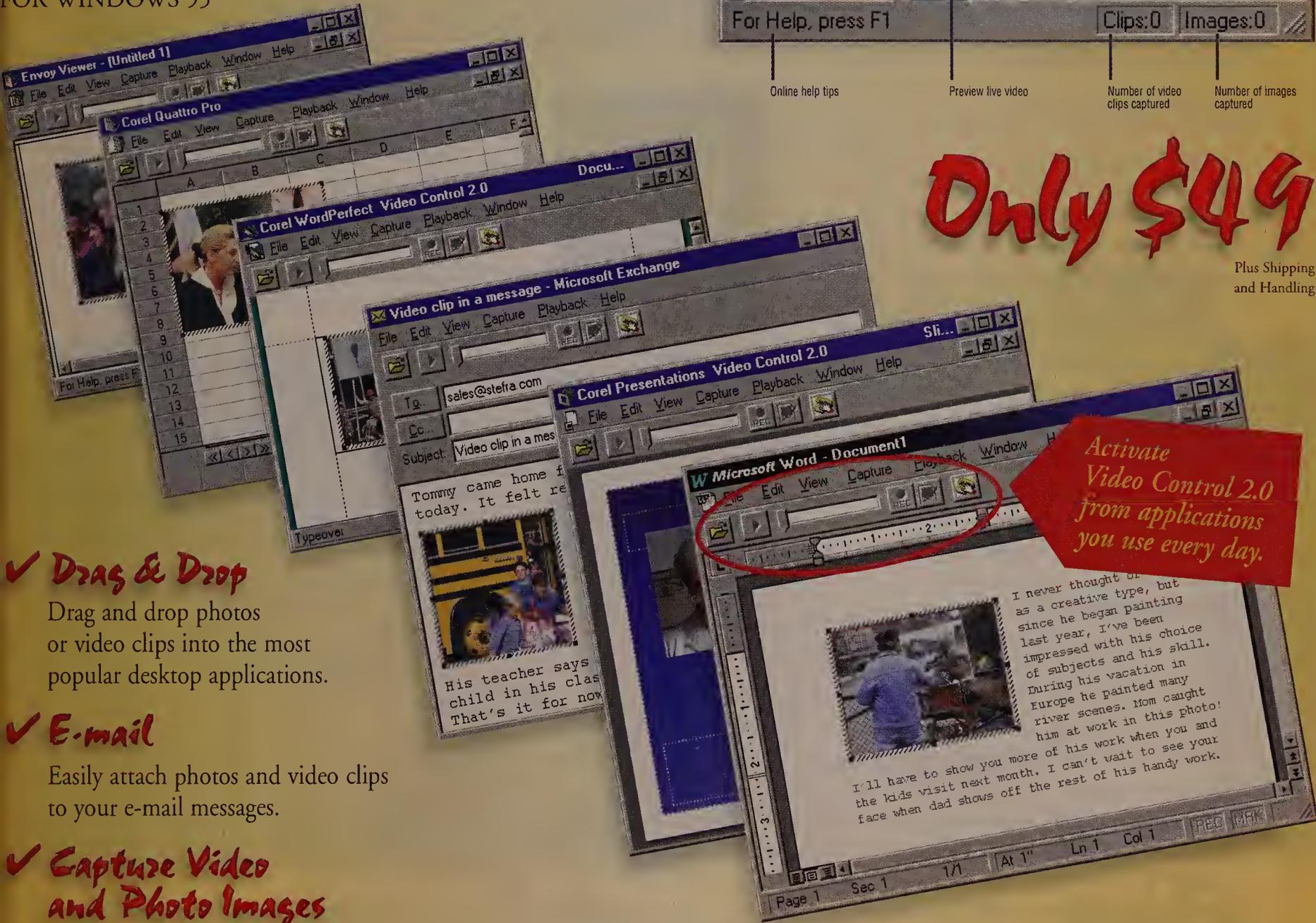
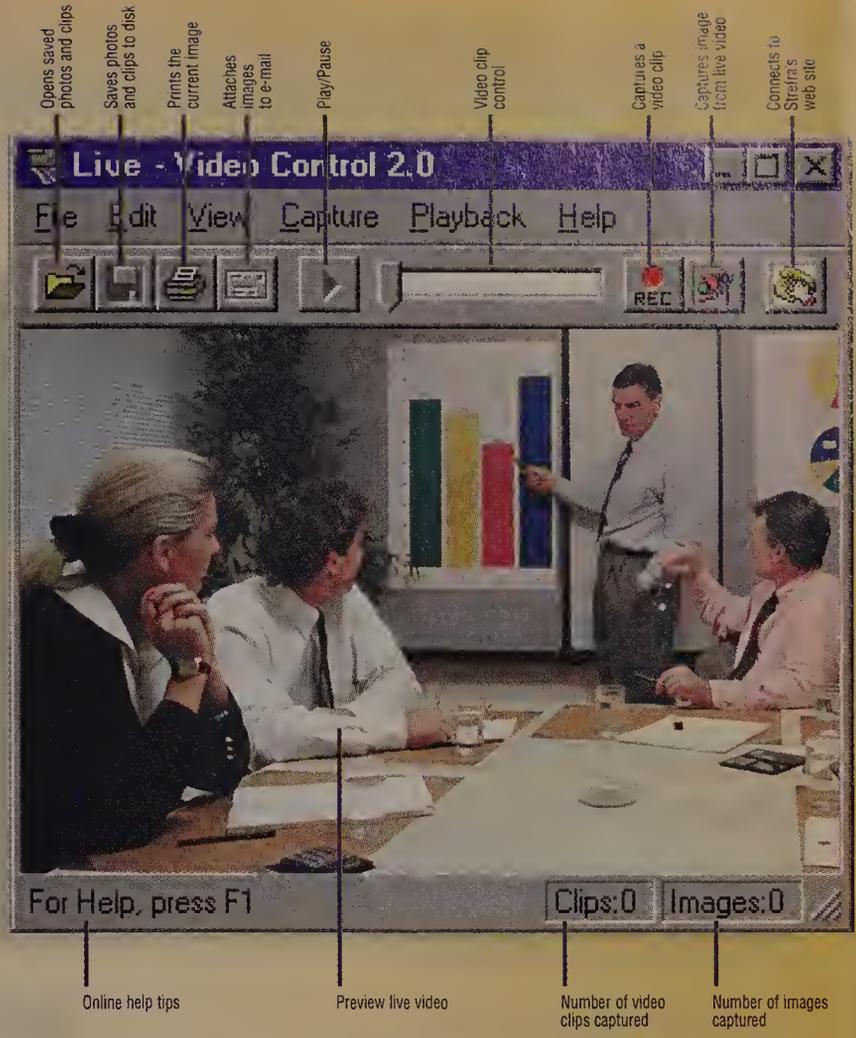
### 4:50

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# Is That a Computer in Your Pocket?

GREAT NEWS: HANDHELD COMPUTERS now include every feature you could possibly want. Not-so-great news: The features are never all in a single machine. We won't see the perfect palmtop anytime soon, but we can dream, can't we? I've got an idea or six.

**Size and weight:** The new handhelds using Windows CE get this about right. At a bit under a pound, they're too heavy to carry around in a shirt pocket, but at least they fit there. Another form factor I like: IBM's Palm Top PC-110, a 1<sup>3</sup>/<sub>8</sub>-pound Windows machine about the size of a paperback book. Unfortunately, it's available only in Japan—and IBM isn't saying whether it will be released over here.

**Screen:** The new Windows CE models have nice wide screens, but their feeble backlighting will really strain your eyes. Hewlett-Packard's forthcoming CE machine will have more pixels but no more juice. The IBM's razor-sharp backlit color screen is a bit smaller, but it's easily the best I've seen on a handheld.

**Battery:** The two AA cells in the initial Windows CE units can't keep a decent backlight running for long. The Palm Top cleverly uses a potent battery that's standard in video cameras. I'll trade battery life for a readable screen any day of the week.

**Handwriting and drawing:** There's no easy way to use a keyboard while standing up, so handwriting recognition is critical. I haven't seen Apple's latest Newtons, but their recognition is said to be much improved. Another approach, used in U.S. Robotics' Palm Pilot and HP's OmniGo, employs Graffiti handwriting-recognition software. Unfortunately, you have to write the way the machine wants you to. Of units with a keyboard, the OmniGo gets points for its ability to bend over backwards, making the screen a usable tablet.

**Keyboard:** Okay, there is one way to use a keyboard when you're standing up: Hold the machine by the sides and type with your thumbs. The Palm Top's keyboard is so tiny, that may be the *only* way you can type, but other units are not much better. A "butterfly" type keyboard that expands beyond the palmtop's edges could



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make touch-typing possible instead of painful. Engineers, forget mousetraps! Build a better small keyboard, and the world will beat that path to your door.

**Pointing device:** When you're writing with it, a stylus makes a fine mouse surrogate. When you're typing, the stylus is hopelessly awkward, unless you have a third hand to hold the thing. IBM's eraserhead pointing devices offer maximum flexibility in minimum space, even if they're poorly implemented on the Palm Top PC. Both stylus and eraserhead, please.

**Connectivity:** The Windows CE units accommodate PC Card hardware and Web browser software. That's a step in the right direction, but PC Card modems can drain batteries in a flash. Philips's Velo 1 model builds in a power-saving modem with its own RJ-11 jack, and omits the card slot. Personally, I'd keep the slot and wait for new developments in wireless modems and low-power cards.

**Storage:** IBM's Palm Top stuffs its PC Card slot with a hard drive, a big problem on a machine with only a 2400-bps modem. I want a hard drive *and* a free slot.

**Operating system:** If you know how to use Windows 95, you can figure out how a Windows CE machine works in about 10 minutes. Unfortunately, CE isn't optimized for its environment. Double-clicking with a stylus is hard, and astoundingly, you can't minimize the Taskbar to reclaim some screen space. Besides, once you include a hard drive, you can run Windows and the apps you already have instead of cut-down versions. That's what the Palm Top PC allows.

So let's see where that leaves me: I want a Windows or Windows CE device with a usable keyboard and an eraserhead. Its flip-back backlit color screen handles handwriting recognition

and drawing. It comes with a software modem, a hard drive, a PC Card slot, and compact batteries. It fits into a shirt pocket and weighs less than a pound. And, like Casio's Cassiopeia, it has an LED on the outside of the case to signal appointments.

Oh, and price? I'd be willing to fork over \$1000, but today even that might not buy what I really want. Still, I can dream, can't I?

PC World contributing editor Stephen Manes is a columnist for the New York Times and coauthor of *Gates: How Microsoft's Mogul Reinvented an Industry* (Touchstone/Simon & Schuster, 1994, 800/223-2348).



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— *Business Week*,  
November 4, 1996 —

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