

NEXT-GENERATION PCs: Blazing Athlon 64 Systems

FREE
Potent New
Antispam Tools

PCWORLD



**QUICK, SECURE
WIRELESS NETS**

LAB REPORT: WI-FI GEAR



**Foil the Latest WEB
PRIVACY Threats**

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FASTER & BETTER!**

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SPEEDUPS

HIDDEN WINDOWS

SHORTCUTS

WEB & E-MAIL

ACCELERATORS



Take work with you, wherever work takes you. Gateway wireless solutions offer you the freedom and flexibility to make any place the office place.



Linksys Wireless G Broadband Router

- 5x the speed of Wireless-B
- Interoperable w/Wireless-B
- Up to 128-bit WEP Encryption
- Free technical support

\$129⁹⁹

Linksys Wireless B Router

- Share Internet access
- 4-port 10/100 switch
- Wireless access point
- Built-in firewall

\$79⁹⁹



Linksys Wireless G Access Point

- Get wireless connectivity
- Supports 802.11a/b/g
- Work in different bands
- Encrypt transmissions

\$129⁹⁹

Linksys Wireless B USB Adapter

- Plug & Play connectivity
- 11Mbps transfer rate
- Share data, Internet
- For desktops & notebooks

\$59⁹⁹



Sierra Wireless AirCard 555[®]

Standard PC card modem for notebook connections, enables a connection to the Verizon Wireless Express Network.SM

\$299

with 1- or 2-year customer agreement.⁶

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Verizon Wireless calling plans are tailored to your data needs. Gain faster mobile data access to e-mail, the Internet and your VPN.

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Gateway
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Gateway recommends Microsoft® Windows® XP Professional for Business.

Prices and configurations subject to change without notice or obligation. Prices exclude shipping, handling and taxes. Not responsible for typographical errors. ⁴Limited warranties and service agreements apply; visit gateway.com or call 1-800-846-2000 for a free copy. May not be available in all states.



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Feature-Heavy, Lightweight:

Travel light with this 802.11b enabled notebook

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- Value Service Plan³ – 3-Yr. Parts/Labor/No On-site/3-Yr. Technical Support
- (2) Type II or (1) Type III PC Card Slots
- (2) USB 2.0, IEEE 1394 (FireWire), VGA, Parallel, Serial and PS/2
- Microsoft® Windows® XP Professional
- 15" SXGA+ TFT active matrix
- Integrated V.92 56K modem³
- Integrated Intel® PRO 10/100 VE network connection
- Integrated 802.11b wireless networking

\$1649



Gateway® 200E

Ultraslim & Ultralight:

Powerful computing that won't slow you down

Featuring Intel® Centrino™ mobile technology and¹

- Intel® Pentium® M processor 1.4GHz
- 256MB DDR SDRAM
- 20GB Ultra ATA hard drive²
- Integrated 10x min./24x max. CD-ROM
- Value Service Plan³ – 3-Yr. Parts/Labor/No On-site/3-Yr. Technical Support
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- (2) USB 2.0, IEEE 1394 (FireWire), VGA, S-Video TV out
- Microsoft® Windows® XP Professional
- 14.1" XGA TFT active matrix
- Integrated V.92 56K modem³
- Integrated Intel® PRO 10/100 VE network connection
- Integrated 802.11b wireless networking

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The evolution of the Notebook:

A powerful PC that works like a notepad

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- 40GB hard drive²
- Value Service Plan³ – 1-Yr. Parts/Labor/No On-site/1-Yr. Technical Support
- Desktop stand and hard cover top
- Type II PC card slot
- USB, IEEE 1394 (FireWire) and VGA

- Microsoft® Windows® XP Professional Tablet Edition
- 12.1" XGA TFT Display
- External mobile keyboard with touchpad
- Digitizer pens (two total)
- Integrated sound and stereo speakers, headphone/speaker jack and mic jacks
- Integrated V.92 56K modem³
- Integrated 10/100 Ethernet adapter
- Integrated 802.11b wireless networking

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Gateway Advanced Presentation Technologies for the high-tech office space. Gateway projectors feature a micro-portable design and revolutionary technology, delivering images with incredible brightness and clarity for brilliant presentations anywhere, anytime.



Gateway® 205 Projector

- Projector Model 205 with SVGA resolution featuring DLP™ technology
- DCDi™ by Faroudja for clear and vivid video images
- Brilliant images with 1100 market comparable lumens (1000 ANSI lumens)/1100:1 contrast ratio
- Multiple connectivity support including RGB, composite, S-Video, component (YPbPr, YCbCr), USB (wired mouse)
- AC power cable, VGA cable, S-Video cable, VGA-Component cable, Composite cable, remote control with laser pointer, (2) batteries, soft carrying case and user's guide
- Dimensions: 9.8" x 6.7" x 2.2" (W x D x H), approximate weight 3.75 lbs.⁵
- 2-Yr. Service Plan⁴ – Parts/Labor/Support/Mail-in service/90-day limited lamp warranty

\$1099



Gateway® 210 Projector

- Projector Model 210 with XGA resolution featuring DLP™ technology
- Brilliant images with 1500 market comparable lumens (1200 ANSI lumens)/900:1 contrast ratio
- Multiple connectivity support including RGB, composite, S-Video, component (YPbPr, YCbCr), audio (RCA and mini jack), USB (wired mouse), M1DA
- AC power cable, VGA cable, S-Video cable, VGA-Component cable, Composite cable, (2) batteries, soft carrying case and user's guide
- Dimensions: 9.1" x 9.6" x 2.7" (W x D x H), approximate weight 3.85 lbs.⁵
- 2-Yr. Value Service Plan⁴ – Parts/Labor/Support/Mail-in service/90-day limited lamp warranty

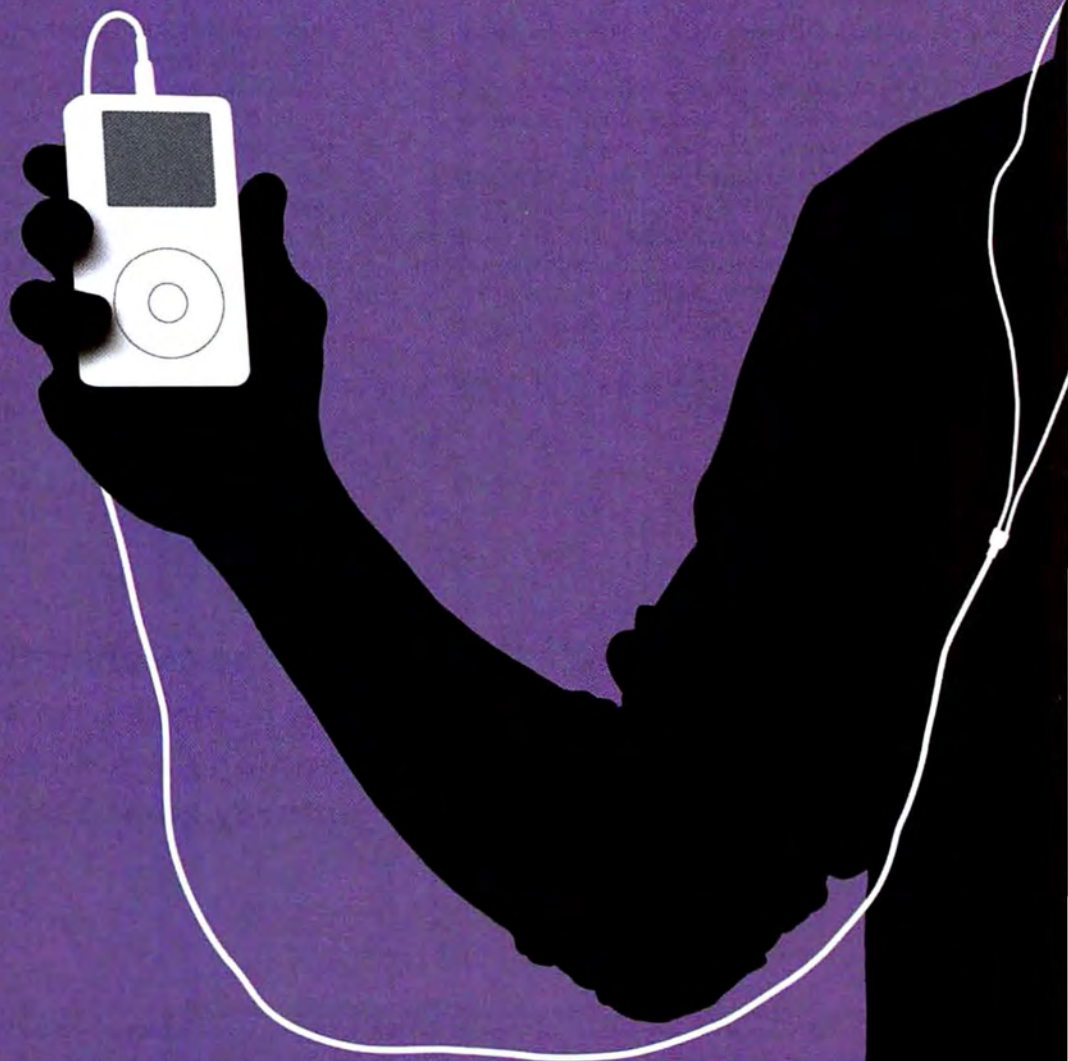
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Professional

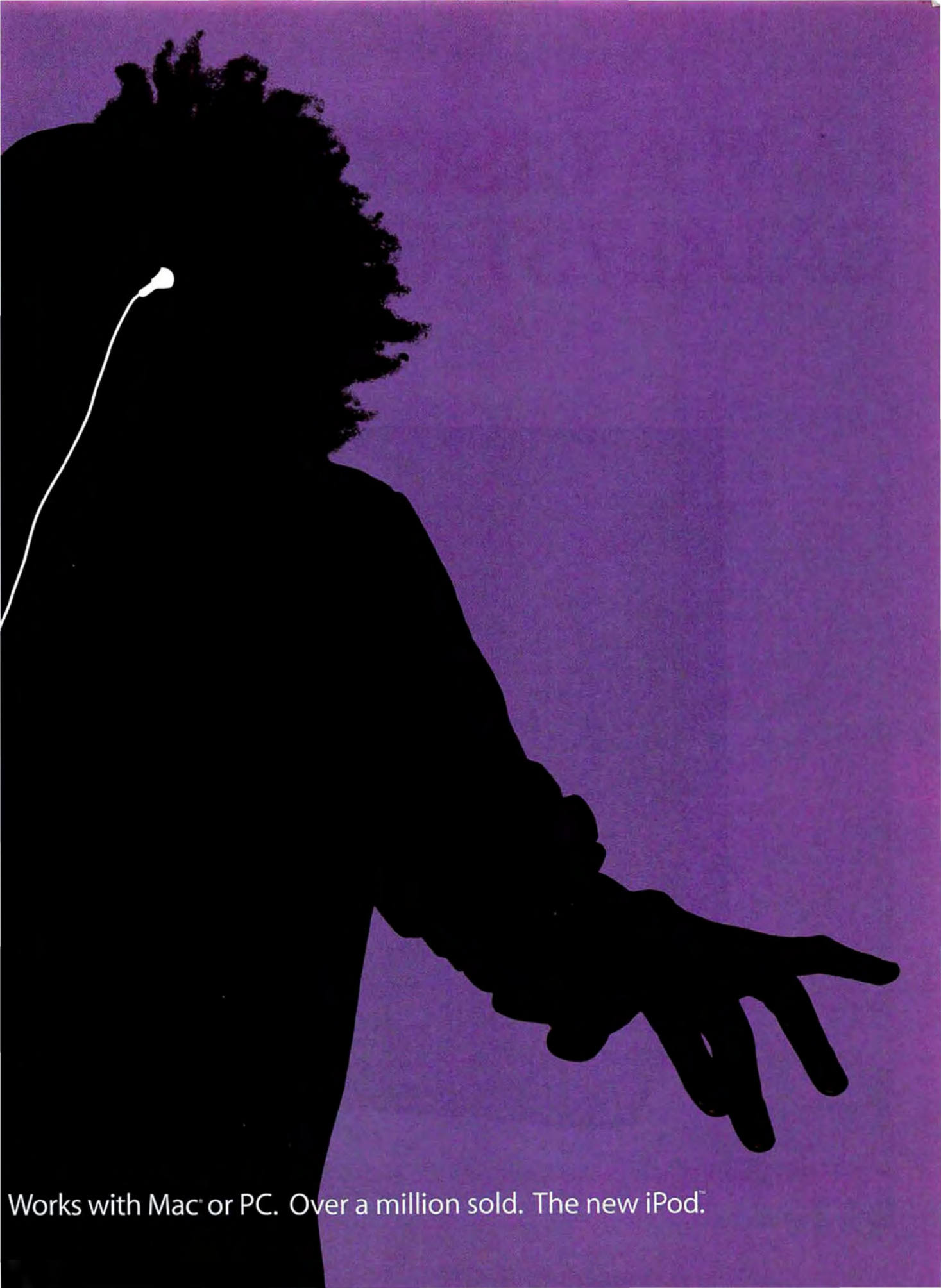
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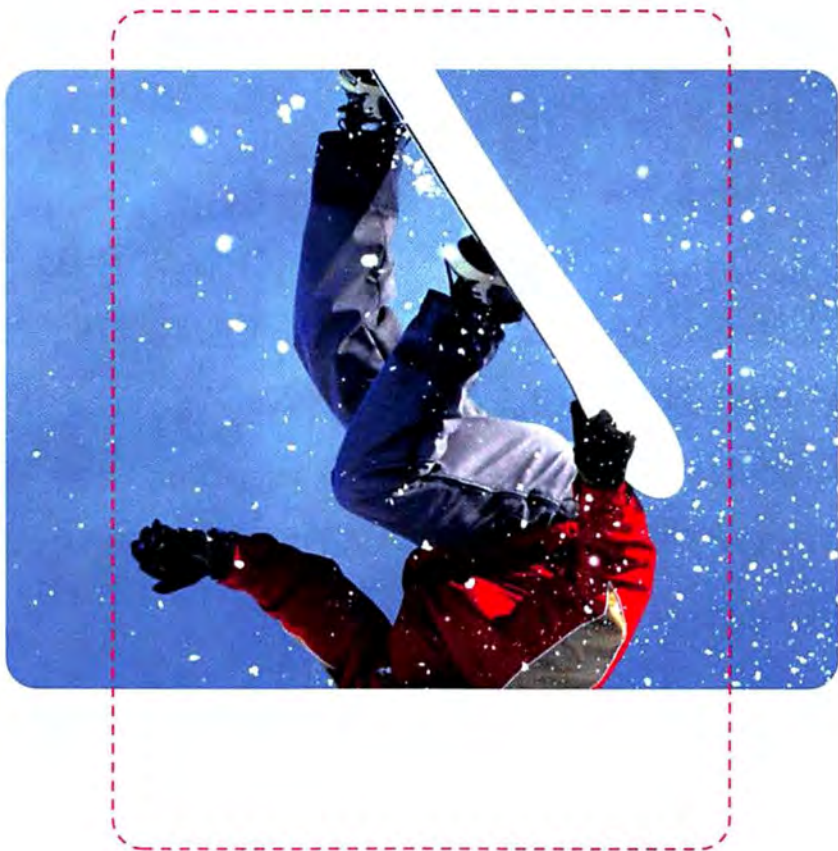
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COVER STORY

PC TIME-SAVERS

104 Time-Saving Tips From the Pros

Had we but world enough, and time, a coy computer were no crime. But when you need to get down to business, you can't wait. So we asked five experts to cut to the chase, helping you save precious minutes of your workday with a marvelous array of tips for speeding up Windows, accelerating the Internet, optimizing Office, streamlining hardware, and fast-tracking your digital photos.



Cover Photograph by Kevin Candland

PC WORLD

20TH ANNIVERSARY YEAR
NOVEMBER 2003
VOLUME 21 ♦ NUMBER 11
AOL KEYWORD: PCWORLD
WWW.PCWORLD.COM

FEATURES

WIRELESS NETWORKS

125 Warp-Speed Wireless

New 802.11g networking products provide higher data throughput and better security while remaining compatible with the earlier 802.11b standard. Our tests of nine wireless kits—each a bundle of a company's router and cards—confirmed their ability to send data through open space at impressive rates. But vendors still must overcome tenacious glitches afflicting product reliability, equipment setup, and customer support.

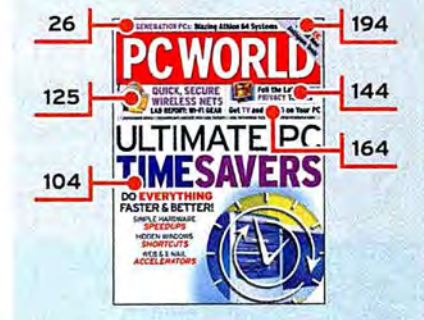
SPECIAL REPORT: PRIVACY

144 The Great American Privacy Makeover

An exclusive survey by *PC World* finds that many otherwise savvy surfers leave themselves vulnerable to spammers, crackers, and identity thieves. How at risk are you? What can you do to strengthen your privacy? Take our quiz, read our tips, and get the answers and tools you need.



ON THE COVER



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With Push to Talk, a simple push of a button lets you contact the people you need to speak to most, whether they're across the street or across the country on the Verizon Wireless network. Hold a conversation one on one or make group calls. We've made it easy to create and manage group calling lists right over the Web. It's what you'd expect from America's best, most reliable national wireless network.

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TOP 100

- 164 Spotlight: Graphics Boards**
These latest, speediest graphics cards put cinema-quality visuals on your computer screen.
- 170 Top 15 Desktop PCs**
- 174 Top 15 Notebook PCs**
- 177 Top 10 Laser Printers**
- 179 Top 10 19-Inch CRT Monitors**
- 181 Top 10 Digital Cameras**
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DEPARTMENTS

- 23 Up Front**
- 43 Letters**
- 49 Plugged In**
New super toolbars, fast Wi-Fi, and more.
- 51 Consumer Watch**
Save big bucks with shareware (safely).
- 61 Home Office**
Cool Windows tools.
- 65 Bugs and Fixes**
Bar the door to worms and viruses.
- 208 Full Disclosure**
Stephen Manes weighs giving his 85-year-old father a PC.

RESOURCES

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- 198 PC World Marketplace**
- 206 Advertiser Index**

TELL US WHAT YOU THINK

Visit www.pcworld.com/pcwininput and rate this issue—you could win an Olympus C-4000 Zoom digital camera, which currently sells for approximately \$449. You'll need the subscriber number from your mailing label to take this survey online. The site explains the official rules and also how to participate in the drawing if you're not a subscriber. You can enter from October 6 through November 5, 2003.

COMING UP IN DECEMBER

Big-Screen TVs: Find out everything you need to know to make the best buying decision.

Reliability and Service: Which hardware makers stand by their products? Our readers tell all.

Digital Living Room: Take a peek at the latest in networked home theater, video, audio—and more.

Hardware Guide: Our editors reveal the best of the best, from digital cameras to DVD drives.



NEWS & TRENDS

- 26 Athlon 64 Arrives**
AMD's powerful CPU has joined Apple's G5 in stores. Our tests show that a 64-bit chip runs current 32-bit apps quite well. But how soon will the vast potential of 64-bit computing become reality?
- 36 Windows Update Update**
In an effort to protect PCs from future Blaster-like worms, Microsoft might make automatic patch downloads a default setting in Windows.
- 38 Microsoft's New Media Center**
With enhanced features for managing living-room entertainment, the revised XP Media Center will be available on a wide range of systems.
- 40 Dial-Up Deals**
Tired of paying \$22 per month to your dial-up ISP? Some competitors give customers decent speed and a few services at ultralow prices.

NEW PRODUCTS

- 78 PDAs**
Palm Tungsten E, Tungsten T3, and Zire 21
- 79 PDA**
Research In Motion BlackBerry 7230
- 80 Internet Security Suites**
McAfee Internet Security Suite 6, Symantec Norton Internet Security 2004
- 84 Portable Projectors**
NEC VT46, Toshiba TLP-S10U
- 86 Business Card Scanners**
Alestron PenPower WorldCard Office 5, Corex CardScan Executive, Iris Business Card Reader II
See page 79 for a complete list of new products reviewed.

HERE'S HOW

- 184 Windows Tips**
Use commands to navigate Windows and the Web, launch apps, and do other PC tasks; simplify copying and moving multiple files and folders.
- 190 Hardware Tips**
What to look for in a flat-panel display; optimize your audio with a free sound-check utility.
- 192 Step-By-Step**
Immerse yourself in PC surround sound by adding a new audio card or sound processor.
- 194 Internet Tips**
Use a Bayesian spam filter to keep your in-box clean; directions to a free PowerPoint viewer.
- 196 Answer Line**
Try several tactics when Windows XP or 2000 won't boot; keep XP's Start menu under control.



Planar PQ191

- > Exceptional 700:1 contrast ratio for ultra-chip images and vibrant color
- > 360° swivel base with built-in 2 port USB hub
- > "Customer First" warranty with advance replacement via 2-day air for 3 years



\$739.96
CDW 514689



US Robotics 802.11g 100Mbps Wireless Turbo Cable/DSL Router

- > Exclusive 100 Mbps Accelerator Technology
- > 4 products in 1: Access Point, Router, 4-port Ethernet switch and Advanced firewall
- > Greater 802.11g/b wireless compatibility
- > Wirelessly network with 30% greater range



\$109.99
CDW 491051



SimpleTech SimpleDrive 120GB External Hard Drive

- > FireWire and USB 2.0 connections
- > SimpleTech 7200 RPM HDD Technology
- > Easy and expandable storage



\$189.67
CDW 511920



hp LaserJet 1150

- > Resolution: 600 x 600 dpi
- > Print speed: 17 ppm
- > 133MHz processor
- > RAM: 8MB



\$299.00
CDW 509972



WatchGuard Firebox 700

- > For smaller offices or remote offices requiring a secure, private network
- > Internet Security Appliance for 250 users
- > Firewall packet filtering throughput: 150Mbps
- > VPN (3DES) throughput: 5Mbps



\$1899.00
CDW 317669



> CDW has more than lots of technology,
we have the right technology.



Additional hard drives sold separately

hp ProLiant DL320 G2 series servers

- > 2.26GHz Intel® Pentium® 4 processor
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- > Memory: 128MB std., 4GB max.
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> **5:05 am.** Custom configuration expert Henry Young trains for the mother of all last minute orders.

A man, Henry Young, is shown from the chest up, wearing a dark blue jacket with white sleeves and a "CDW" logo on the left chest. He is sitting at a dark table, intently solving a Rubik's cube. On the table around him are several other Rubik's cubes in various states of being solved. In the background, there are two shelves. The left shelf holds a small potted plant, a stack of books, and a CD player. The right shelf holds a green vase, a stack of books, and a small Rubik's cube sculpture. In the bottom right corner, there is a CDW logo and a promotional message.

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This Month We Look at Projectors, Wireless Networks, and More

BUDGET-FRIENDLY projectors, no-nonsense wireless networking kits, and powerful PDAs highlight our latest issue. A list of the newcomers follows, along with each item's star rating, if any. Visit find.pcworld.com/10860 for more information on *PC World's* Star Ratings.



86

DESKTOP PCs

- 170 Amax AMD Max 3200+ ★★★★★
- 170 HP Compaq Business Desktop D325 ★★★★★
- 170 HP Pavilion A250n ★★★★★
- 170 MPC Millennia 920i Professional ★★★★★
- 170 PC Power & Cooling SleekLine 3000MX ★★★★★

NOTEBOOK PCs

- 174 Acer TravelMate 290LMi ★★★★★
- 174 Acer TravelMate 803LCi ★★★★★
- 174 Gateway 200XL ★★★★★
- 174 HP Nx7000 ★★★★★
- 174 IBM ThinkPad R40 ★★★★★
- 174 Toshiba Satellite A15-S127 ★★★★★

GRAPHICS BOARDS

- 166 AOpen Aeolus FX5600S-DVO256 ★★★★★
- 166 ATI All-In-Wonder 9800 Pro ★★★★★
- 166 ATI Radeon 9800 Pro ★★★★★
- 166 BFG Technologies Asylum GeForce FX 5900 Ultra ★★★★★
- 166 Crucial Technology Radeon 9800 Pro ★★★★★
- 166 EVGA Personal Cinema E-GeForce FX 5200 ★★★★★
- 166 MSI Nbox N5900 Ultra-VTD256 ★★★★★

19-INCH CRT MONITORS

- 179 BenQ V991 ★★★★★
- 179 Hansol 920A ★★★★★
- 179 IBM C190 ★★★★★
- 179 NEC MultiSync FP912SB ★★★★★
- 179 ViewSonic G90fb ★★★★★

MONOCHROME LASER PRINTERS

- 177 Dell M5200n ★★★★★
- 177 HP LaserJet 1300 ★★★★★

DIGITAL CAMERA

- 181 Toshiba PDR-M700 ★★★★★

WIRELESS NETWORKING KITS

- 126 Belkin F5D7230-4 ★★★★★
- 126 Buffalo Technology AirStation WBR-G54 ★★★★★
- 126 D-Link AirPlus DI-714P+ ★★★★★
- 126 D-Link AirPlus Xtreme G DI-624 ★★★★★
- 126 LinkSys Wireless A+G WRT55AG ★★★★★
- 126 LinkSys Wireless-G WRT54G ★★★★★
- 126 Netgear MR814 ★★★★★
- 126 Netgear WGR614 ★★★★★
- 126 U.S. Robotics Wireless Turbo USB8054 ★★★★★

WIRELESS RANGE EXTENDERS

- 98 Buffalo Technology AirStation Wireless Compact Repeater Bridge-g WLA2-G54 ★★★★★
- 98 D-Link AirPlus Enhanced 2.4GHz (802.11b) Wireless Range Extender DWL-800AP+ ★★★★★

PDAs

- 78 Palm Tungsten E ★★★★★
- 78 Palm Tungsten T3 ★★★★★
- 78 Palm Zire 21 ★★★★★
- 79 Research In Motion BlackBerry 7230 ★★★★★

DVD-REWRITABLE DRIVE

- 90 LG Electronics Super-Multi DVD Drive GSA-4040B ★★★★★

PORTABLE PROJECTORS

- 84 NEC VT46 ★★★★★
- 84 Toshiba TLP-S10U ★★★★★

BUSINESS CARD SCANNERS

- 86 Alestron PenPower WorldCard Office 5 ★★★★★
- 86 Corex Technologies CardScan Executive ★★★★★
- 86 Iris Business Card Reader II ★★★★★

INPUT DEVICE

- 84 Microsoft Wireless Optical Mouse ★★★★★

MP3 PLAYER

- 98 Rio Audio Rio Nitrus

CPU

- 26 AMD Athlon 64 FX-51

TABLET OPERATING SYSTEM

- 94 Desktop/LX Tablet Edition (on De-Tablet hardware) ★★★★★

INTERNET SECURITY SUITES

- 80 McAfee Internet Security Suite 6
- 80 Symantec Norton Internet Security 2004

SECURITY SOFTWARE

- 96 Zone Labs IMsecure Pro ★★★★★

VALUE-PRICED ISPs

- 40 550Access
- 40 650DialUp
- 40 Access4Cheap
- 40 Access4Less.net
- 40 AllVantage
- 40 NetZero

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FEATURED NEWSLETTER



Mobile Computing

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Every week, James A. Martin offers advice on wireless connectivity, explanations of new technology, and practical tips for computing on the go.

MORE NEWSLETTERS

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Daily Product Review

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REVIEWS

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|-------------------------------------|-------|
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| 2. Internet Download Manager 3.14 | 798KB |
| 3. FreeRam XP 1.40 | 540KB |
| 4. SpamCatcher | 2.3MB |
| 5. Sygate Personal Firewall Pro 5.0 | 5.4MB |

MOST POPULAR PRODUCTS

At press time, these were the top sellers, by category, at *PC World's* Product Finder.

- **DVD Burner**
NEC ND1300A
find.pcworld.com/38216
- **PDA**
Palm Zire 71
find.pcworld.com/38219
- **Notebook**
IBM ThinkPad T40
find.pcworld.com/38225
- **Motherboard**
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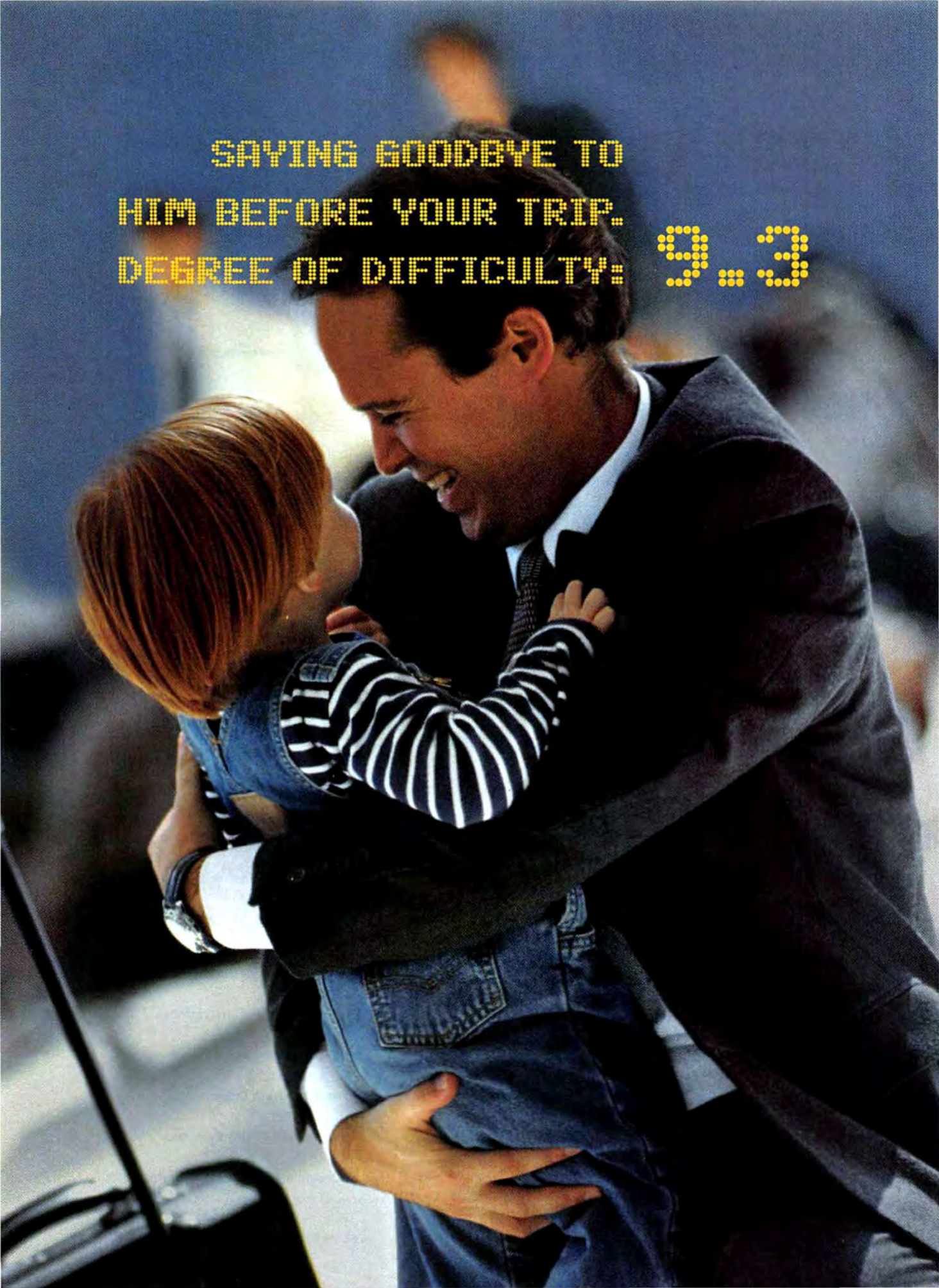
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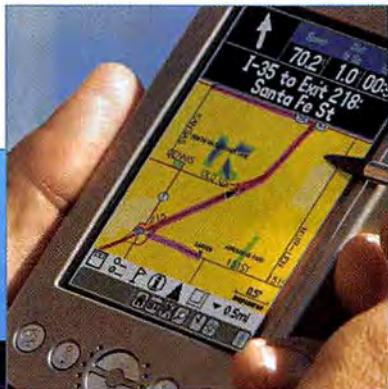
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Putting America's Privacy to the Test

Essential security advice for busy people. Plus: The new *Top 100*.

THE RIGHT TO PRIVACY: It's a quintessentially American notion. Instinctively, we bristle at anything that threatens it. And yet when it comes to our PCs, privacy—defined by my trusty Merriam-Webster's as “freedom from unauthorized intrusion”—feels less like a right and more like

a vanishing natural resource. Tally up every piece of spam, every virus attack, and every probe of your PC seeking vulnerabilities, and you may find that your privacy is being invaded dozens of times a day.

Enter “The Great American Privacy Makeover,” which you'll find on page 144. This special report is the result of five months of work by a *PC World* all-star team: columnists Anne Kandra (*Consumer Watch*) and Andrew Brandt (*Privacy Watch*), Senior Editors Rebecca Freed and Anush Yegyzarian, and Executive Editor Edward N. Albro.

The project began when we fielded our first-ever survey of Americans' privacy opinions and practices. Some of the results weren't a shock—for instance, 88 percent of respondents said they were concerned about Web sites that share or sell their e-mail addresses.

But we also gleaned some revealing factoids. “What surprised me most,” says Yegyzarian, “was that about 34 percent of the people we surveyed admitted they never change their passwords.”

Every respondent got a Privacy Quotient—a personal security rating, with a maximum score of 100. The average PQ was 56; you can see how yours compares by taking the short-form survey on page 148, or the complete one, with automated scoring, at find.pcworld.com/38099.

Once we'd crunched the data, Senior Associate Editor Brandt hit the road to



PRIVATE EYES: From left, “Great American Privacy Makeover” editors Yegyzarian, Freed, and Brandt.

visit respondents in three cities, analyze their current privacy habits, and give them new tools and strategies. His advice makes for fascinating reading, and many of his recommendations—along with tips and product picks throughout the article—are bound to make sense for you.

One of our key conclusions from all this research: Even sophisticated tech users aren't doing everything they can to defend themselves from today's threats.

As Brandt puts it, “Computer users everywhere know they need to take security seriously—the problem is the scope of that job.” Simply finding the time to erase your browser cache, choose hacker-resistant passwords, and patch Windows early and often can be a daunting challenge for busy professionals.

Busy professionals like, for instance, *PC World* editors. “Working on this story,” says Freed, “spurred me to finally get a password manager app and encrypt the sensitive files on my hard drive.”

As for your obedient editor, my Privacy Quotient was (gulp) 57—a shade above average, but still a wake-up call. You can bet I'll find the time to give myself a privacy makeover—with the help of this month's article.

TOP 100: BEYOND THE PC

ON ANOTHER NOTE entirely, this issue also features an improved version of our *Top 100* hardware section. At first blush, the section—spearheaded by Executive Editor Tracey Capen, Test Center Director Ulrike Diehlmann, and the reviews and testing teams—doesn't look much different. But unlike every edition before it, this one doesn't lead off with PCs. Instead, it opens with tests of new, ultra-versatile graphics cards.

Why the change? When the *Top 100* debuted back in 1996, the big story about hardware was nearly always...well, the PC itself. But today, the most newsworthy hardware often lies beyond the box.

So the *Top 100* will now start with a “Spotlight”—an expanded roundup of products in an ever-rotating range of categories. But don't worry, system buffs: Reviews of the latest desktops and notebooks will still appear every month.

We hope that you'll find this revised approach useful—and that you'll suggest product categories for us to cover in upcoming issues. I'm at mageditor@pcworld.com—and I'm all ears. ■

Harry McCracken is editor of *PC World*.

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64-BIT TAKES OFF

AMD'S CHIP SUPPORTS 64-BIT COMPUTING, USHERING IN A NEW ERA FOR DESKTOPS. BUT THE BEST REASON TO BUY THE CPU IS STRONG PERFORMANCE ON FAMILIAR 32-BIT APPS.

BY TOM MAINELLI

64-BIT DESKTOP computing has taken a significant step toward becoming a pervasive reality: AMD's release of its Athlon 64 chips—and Apple's launch of its G5 CPUs—means 64-bit processors, once reserved for servers and high-end workstations, are now in PCs available on retail shelves.

In time, 64-bit PCs could change the face of desktop computing. A 64-bit chip can run longer, more complex instructions than a 32-bit one, improving performance of data-intensive tasks such as audio and video encoding, advanced engineering design apps, and, naturally, games.

Equally key is a 64-bit CPU's ability to recognize and use a lot more RAM. Today's 32-bit chips, such as AMD's Athlon

XP and Intel's Pentium 4, can address up to 4GB of RAM split between the OS and applications. Few PCs have that much memory, and even fewer apps use it. But with ever-more-complex software, that limitation may become a bottleneck, making Athlon 64's ability to address a whopping terabyte (1000GB) of physical memory very attractive.

But you will need a 64-bit-capable operating system, new hardware drivers, and 64-bit applications to fully take advantage of such a chip, and therein lies the rub.

A few Linux distributions, including Red Hat and SuSE, already offer (or will soon) 64-bit editions for Athlon 64s, but Microsoft's 64-bit Windows XP for these chips won't



ILLUSTRATIONS: MARK MATCHO

ship until early 2004—and even it won't offer most users what they really need (see "Sneak Peek" on page 33). Aside from a handful of expected programs, such as DivXNetworks' DivX video encoder, 64-bit desktop software will be an even longer wait. The lack of full support is one reason Intel has no current plans to introduce a 64-bit desktop chip (see "Why 64-Bit Now?" on page 33 for more on Intel's views).

AMD knew 64-bit desktop computing wouldn't be ready for prime time right away, so it made its 64-bit Athlons hybrid CPUs that can also run today's 32-bit apps. And our initial tests show the chips run them very well (see the chart on page 28).

Apple's latest OS X has 64-bit extensions, providing the new Mac G5s and a few optimized apps a taste of greater power. But that isn't quite enough to give Apple a wholesale performance edge. (For more on Apple's 64-bit platform, and its G5's performance versus Athlon 64 PCs, see "64-Bit Computing According to Apple" on page 34.)

THE SCORE

WE TESTED THREE systems using the high-end 2.2-GHz Athlon 64 FX-51 chip with dual-channel memory, and a PC with the more mainstream Athlon 64 3200+, which runs at 2 GHz and has single-channel memory. We also looked at an identically configured 3.2-GHz P4 PC for comparison. All PCs had 1GB of DDR400 memory and an



THE BIT MAP

SIXTEEN years passed between the first 32-bit chip and a full 32-bit Windows. The 64-bit switch may be faster: Both chips and OS are here.

64-BIT ERA

Sept. 2003: Athlon 64 3200+ (2 GHz), Athlon 64 FX-51 (2.2 GHz)

Sept. 2003: Windows XP 64-Bit Edition for Athlon 64 beta

April 2003: AMD Opteron 240, 242, 244

July 2002: Itanium 2 (900 MHz, 1 GHz)

Oct. 2001: Windows XP 64-Bit Edition for Itanium

May 2001: Intel Itanium (733, 800 MHz)

32-BIT ERA (ONGOING)

Oct. 2001: Windows XP

Oct. 2001: Athlon XP 1500+ (1.33 GHz)

Nov. 2000: Pentium 4 (1.4, 1.5 GHz)

Sept. 1999: AMD Athlon (600 MHz)

Feb. 1999: Pentium III (450, 500 MHz)

May 1997: Pentium II (233 MHz)

March 1993: Pentium (60, 66 MHz)

April 1989: 486DX (25 MHz)

Oct. 1985: Intel 386DX (16 MHz)

16-BIT ERA (ONGOING)

Feb. 2000: Windows 2000

June 1998: Windows 98

Aug. 1995: Windows 95

April 1992: Windows 3.1

May 1990: Windows 3.0

Nov. 1985: Microsoft Windows 1.0

Feb. 1982: Intel 80286 (6 MHz)

*Has 32-bit extensions.

ATI Radeon 9800 Pro graphics card. All tests were performed with 32-bit software.

The three Athlon 64 FX-51-based units—from Alienware (\$3535), Falcon Northwest (\$3245), and Voodoo (\$3250)—notched an average PC WorldBench 4 score of 142, the fastest we've seen.

ABS' Athlon 64 3200+ PC (\$1924) scored 139; Alienware's P4 comparison unit (\$3143) earned 126. The scores for three previously tested 32-bit Athlon XP 3200+ PCs averaged 136; seven previously tested 3.2-GHz P4 units earned an average of 127. (Prices above exclude a monitor and speakers.)

Systems with the FX-51 showed pronounced improvements in some of our more CPU-intensive tests, particularly AutoCAD, where they were about 44 percent faster, on average, than the P4 unit. The FX-51 PCs also stood out on our Premiere tests, and posted top scores on the Photoshop and VideoWave tests. The P4-based PC had the best score in our Musicmatch test.

In our game tests, again the FX-51 PCs were clear winners, posting noticeably higher scores. (Note: Lower resolutions show CPU power better than higher ones because the graphics subsystem contributes more at high res.)

MEMORY BOOST

BESIDES ADDING 64-bit capabilities, AMD made other improvements to its new CPUs. They include a 1MB L2 cache (up from 512KB), a faster system bus based on HyperTransport technology (up to 1600 MHz), and new SSE 2 instructions. But probably the most important change was the move to an on-chip memory controller.

Typically the memory controller resides on the motherboard as part of the chip set, connected to the CPU via

IN BRIEF

Product Pipeline



NEW POWERBOOKS: Apple's latest PowerBook G4 lineup includes an all-new 15-inch unit and refreshes of its 17- and 12-inch laptops with more powerful CPUs. The 15-inch PowerBook G4, with a 1.25-GHz G4 CPU and built-in Wi-Fi, Bluetooth, FireWire 800, USB 2.0, and gigabit ethernet, starts at \$1999.

OFFICE AT LAST: Microsoft's Office 2003, which we previewed in the October issue (find.pcworld.com/38192), goes on sale October 21.

Preinstalled versions of the productivity suite will be on some new PCs by the time you read this.

PC CLEANUP: Executive Software has updated Diskeeper 8. The disk-defragmentation utility now monitors hard-disk reliability and estimates performance gains of defragging. Pricing starts at \$50 for the Professional Edition and \$250 for the Server Standard Edition.

Tidbyte

SPAM Watch Spam filters used by major Internet service providers may be overly aggressive, a study finds. Seventeen percent of messages—almost one in five—that a recipient wants are blocked by the nation's top 12 ISPs, Denver e-marketing firm Return Path reveals.



the frontside bus. Athlon XP has a maximum frontside bus speed of 400 MHz; Intel's latest P4s offer 800 MHz. By integrating the memory controller, AMD gives memory a private channel to the CPU: It no longer has to share a pipe with other components and needs no middleman to process its request. Unlike CPU cache, the integrated memory controller runs at the memory speed, not CPU speed.

"The on-board memory controller provides more bandwidth and drops the latency,"

says Kevin Krewell, general manager at research firm MicroDesign Resources. Lower latency means less time between the CPU asking for data from RAM and getting it.

TWO ATHLONS

AMD'S NEW CHIPS also have real architectural differences between them. For example, the FX-51's dual channels can move up to 6.4GB of data per second with DDR400 while the mainstream Athlon 64's single-channel DDR can move up to 3.2 GBps. More: The FX-

51 requires a 940-pin socket (the Athlon 64 3200+ uses the new Socket 754), and more expensive registered-memory DIMMs. Usually reserved for servers, a registered DIMM includes an internal buffer that allows more memory chips per DIMM, but with a delay of half a clock cycle required to help prevent errors. The FX-51 is also easier to overclock than the Athlon 64, although AMD won't officially recommend doing that (it still voids the warranty).

AMD charges vendors \$733

for each FX-51 in lots of 1000, versus \$417 for the Athlon 64 3200+. (The 3.2-GHz P4 is \$637.) That's a hearty premium for the FX-51, but it's a price that performance buffs are likely to pay, says Dean McCarron, principal analyst with Mercury Research.

There should be little confusion between AMD's two new chips, but you'll note the company gave the 2-GHz Athlon 64 the same 3200+ performance rating as that of its last 32-bit Athlon XP chip (FX-designated chips dropped the

TEST REPORT

64-BIT ATHLON PCs SHINE ON GRAPHICS APPS...

THE NEW 64-BIT Athlon FX PCs did particularly well on AutoCAD, Premiere, and Unreal Tournament (all 32-bit applications).

SYSTEM	Processor	PC WorldBench 4 score <small>Faster</small>	TIME (IN SECONDS) REQUIRED TO RUN TEST. LOWER IS BETTER				
			AutoCAD	Musicmatch 7.1	Premiere 6	Photoshop 7.0.1	VideoWave 1.5 (DivX)
Alienware Aurora <small>find.pcworld.com/38318</small>	2.2-GHz Athlon 64 FX-51	141	171	153	174	257	78
Falcon Northwest Mach V <small>find.pcworld.com/38321</small>	2.2-GHz Athlon 64 FX-51	142	169	150	181	256	68
Voodoo Fury <small>find.pcworld.com/38324</small>	2.2-GHz Athlon 64 FX-51	143	174	153	168	253	78
ABS Awesome 5100 <small>find.pcworld.com/38327</small>	2-GHz Athlon 64 3200+	139	189	165	197	271	72
Alienware Area 51 <small>find.pcworld.com/38330</small>	3.2-GHz Pentium 4	126	246	140	217	269	82

...AND THEY GOT GAME, TOO

SYSTEM	Processor	Return to Castle Wolfenstein (IN FRAMES PER SECOND)				Unreal Tournament 2003 (IN FRAMES PER SECOND)			
		1024 by 768 resolution, 16-bit	1024 by 768 resolution, 32-bit	1280 by 1024 resolution, 32-bit	1600 by 1200 resolution, 32-bit	1024 by 768 resolution, 16-bit	1024 by 768 resolution, 32-bit	1280 by 1024 resolution, 32-bit	1600 by 1200 resolution, 32-bit
Alienware Aurora	2.2-GHz Athlon 64 FX-51	145	136	131	108	378	263	173	124
Falcon Northwest Mach V	2.2-GHz Athlon 64 FX-51	147	139	133	112	382	281	187	134
Voodoo Fury	2.2-GHz Athlon 64 FX-51	144	138	132	112	377	285	188	134
ABS Awesome 5100	2-GHz Athlon 64 3200+	100	96	95	90	340	269	182	131
Alienware Area 51	3.2-GHz Pentium 4	133	127	121	105	292	243	173	124



HOW WE TEST: All PCs had 1GB of RAM. The ABS PC had an ATI Radeon 9800 Pro graphics card with 128MB of RAM; all others used the same card with 256MB. All units ran Windows XP Home except the Alienware Aurora, which ran Windows XP Professional. All systems included RAID-striped 7200-rpm hard drives, except the Voodoo, which had 10,000-rpm drives. All PCs tested with PC WorldBench 4, PC World's application-based benchmark; see www.pcworld.com/benchmark. In AutoCAD we time AutoDesk Group International's AUGI Gauge 15 tests, which run CAD tasks. In Musicmatch Jukebox 7.1 we time the conversion of six .wav files into 160-kbps .mp3 files, then resample the files to 64 kbps. In Adobe Premiere 6 we time the preview rendering of two video tracks and one audio track, export the finished movie to various video formats, and verify the encoding. In Photoshop 7.0.1 we rotate a JPEG file, save it as a thumbnail and EPS file, and apply a variety of filters, timing the whole process. In VideoWave 1.5 we time the process of taking a raw AVI video file, adding effects, and converting it into an MPEG-2 file using the DivX codec. In Return to Castle Wolfenstein, we measure frame rates during a recorded demo; the Unreal Tournament 2003 test measures frame rates during a fly-through of one game level. Tests developed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** On PC WorldBench 4 and games, higher is better; elsewhere, lower is better. Best scores in bold.

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performance ratings altogether). Check before you buy: AMD will sell both 3200+ CPUs for the near future.

WHY 64-BIT NOW?

SO IF ATHLON 64s perform so well at 32-bit tasks, why is AMD pushing the 64-bit angle at all? Because company executives believe the 64-bit desktop age is dawning now.

Once video editors watch a 64-bit PC encode video directly to a DVD on the fly, they'll want one, says Rich Heye, vice president of AMD's micropro-

cessor unit. And once gamers see the cinematic quality that 64-bit chips help make possible, they'll want one. Though mass-market adoption will take a few years, "the average lifetime of a PC is three to four years, and I think a lot of people will be running 64 bits before that's up," Heye says.

Executives at Intel disagree, seeing 64-bit computing as largely a server technology in the short term. "With just 5 percent of servers using 64-bit addressability, there is little need today [for 64 bits] on the

desktop," says George Alfs, Intel spokesperson, adding that without software and other tools to make it work at its best, 64 bits doesn't mean much.

MDR's Krewell sees Intel's resistance to 64 bits for the desktop as a move to protect its sizeable investment in its 64-bit Itanium CPU, designed for servers and workstations.

Should AMD's 64-bit initiative take off, Krewell says he's convinced Intel has a backup plan. "There is no technical reason they cannot implement a 64-bit extension in

their desktop chips," he says.

Intel's Alfs says the company will continue to focus on "bringing benefits that PC users can use now." To that end, at press time the company announced a new chip, the 3.2-GHz P4 with Hyper-threading Technology, Extreme Edition, aimed at gamers who want top performance. This 32-bit chip boasts 2MB of L3 cache and should be shipping shortly after you read this. (The chip was unavailable in time for testing for this story. Go to find.pcworld.com.)

OPERATING SYSTEM

SNEAK PEEK: WINDOWS XP 64-BIT EDITION

ALTHOUGH THE first 64-bit Athlon PCs will ship with a standard Windows XP (a 32-bit operating system), a version of the OS that can fully harness the new chip's power is on its way: Windows XP 64-Bit Edition is in beta testing, and Microsoft expects to ship the OS in the first quarter of 2004.

(Note: Although the new OS bears the same name as the 64-bit version of Windows for Intel's Itanium platform, the two OSs are not interchangeable and do not have the same features.)

But upgrading to XP 64 could mean giving up functionality without getting much in return. In fact, XP 64 looks like a throwback to Windows past: Its interface mirrors that of Windows 2000 or even Win 98. Microsoft has not disclosed what else will be in the OS, so it is possible that you'll still get most of XP's other features.

XP 64 won't have the 32-bit XP's support for DOS apps at all, nor will it run 16-bit apps (but it should have no trouble with 32-bit software). More important, 64-bit drivers for common hardware, such as printers, will be scarce when the OS debuts.

"People should not expect to take all of their existing hardware, get one of these 64-bit systems [both OS and PC], and get everything to run," says Greg Sullivan, Windows XP lead product manager. However, as



64-BIT WINDOWS XP keeps some of 32-bit XP's look, such as a two-column Start menu.

with previous Windows releases, there will be some drivers bundled with the OS.

Expect no big marketing displays at your local CompUSA for this Windows' debut: It will be an option for new PCs once it ships, but it won't be offered at retail. Sullivan says Microsoft is working on ways to distribute it to users who buy early 64-bit PCs (most likely via a CD, and not free).

What about the next version of Windows, code-named Longhorn? When it arrives (unlikely before 2005), Longhorn will also come in 32- and 64-bit flavors, but even then the

64-bit version may not be offered at retail.

After the new OS launches, the transition to full 64-bit computing will likely take far longer. That's because XP 64 will benefit only those users who have 64-bit applications—which won't be in great supply, at least for the next couple of years.

Among the first 64-bit consumer apps will be high-end games such as Unreal Tournament 2003 (via a patch developer Epic Games planned to make available at Athlon 64's launch) and video encoders such as DivXNetworks' Dr. DivX (due shortly after the Athlon 64 launch; it should be bundled with higher-end Athlon 64 PCs). Accordingly, Microsoft is working hard with video-capture-card and joystick vendors to develop 64-bit drivers for their gear.

But even users who get XP 64 and the Unreal patch won't see much of a difference from the 32-bit version of the game. Tim Sweeney, Epic Games' founder and lead programmer, says the true benefits of 64-bit computing will be fully exploited only in a new generation of games (including the next Unreal) that won't ship until 2005.

IDC analyst Roger Kay says it will take at least 18 months for new apps and lower hardware prices to make a 64-bit desktop OS mainstream. "Give it time," he counsels.

—Yardena Arar

com/38201 for performance results.) Intel's next-generation chip, code-named Prescott, will also debut before year's end. Prescott's boosts include a larger L2 cache, new

instructions, and improved hyperthreading technology.

Meanwhile, with Athlon 64, AMD has reignited the chip wars. That's always good news for users, says MDR's Krewell.

Power users are well served by Athlon 64 FX PCs, which are currently atop the performance heap—with prices to match. If you don't need to squeeze every last bit of power

from your PC, a unit with the Athlon 64 3200+ or Intel's 3.2-GHz P4 may be your best bet—though systems with the former are likely to save you some money over P4 PCs. ■

64-BIT COMPUTING ACCORDING TO APPLE

APPLE TOUTS ITS new 64-bit Power Mac G5 as the world's fastest personal computer, but our initial tests indicate bragging rights may belong to PCs using AMD's Athlon 64 FX-51 chip.

Even Apple's 2-GHz dual-CPU G5 unit had a hard time keeping up with a single-chip FX-51 PC in most tests. (Tests were not exhaustive, however: Working with our sibling publication, *Macworld*, we selected four applications available on both platforms and then ran seven hand-timed tests. Our test suite, PC WorldBench 4, cannot run on Macs.) The new Macs aren't great values either, as the top-of-the-line G5 (\$3549 as configured) costs about \$200 more than the similarly configured Alienware Aurora. (Prices do not include a monitor or speakers.)

The dual-G5 sparkled in one main area: our Photoshop test, which it completed in 18 seconds, or about 17 percent faster than the Aurora's 21 seconds. The 1.8-GHz single-chip G5 (\$2999) trailed at 27 seconds.

Elsewhere, the Alienware earned top marks, performing particularly well in the



APPLE'S POWER MAC G5 (right) faces off against Alienware's Aurora, an Athlon 64 FX-51-based system.

Premiere QuickTime test. (See chart for more detail; for test results with additional Athlon 64 and Pentium 4 systems, go to find.pcworld.com/38348.)

OS READY TODAY

LIKE 64-BIT Athlons, G5 CPUs (developed by Apple and IBM) can run 32-bit and 64-bit applications. However, while Athlon owners must await shipment of Microsoft's 64-bit Windows XP (or choose a 64-bit Linux

OS) to use the chip's 64-bit capabilities, Mac G5 owners have a 64-bit-capable desktop out of the box.

That's because Mac G5s come with a modified version of the OS X operating system, code-named Jaguar, which works with apps that can make 64-bit requests. Later this year Apple will launch another OS revision, code-named Panther, with even more 64-bit enhancements; neither is a fully 64-bit OS.

Yet G5 owners still face one of the same hurdles as Athlon 64 buyers do: scarce 64-bit software. The most notable app available—and the most relevant to many Mac users—is Photoshop 7.0.1, which has a 64-bit plug-in that lets it make better use of G5s. But despite Apple's OS advantage, it will probably take a year or more for a sizeable number of 64-bit apps to ship for both G5 and Athlon 64, says Kevin Krewell, general manager at research firm MDR. Expect media creation apps first, he says, because that's Apple's core market, and those developers will like the larger address space. —T. M.

TEST REPORT

ATHLON 64 VS. APPLE G5 SYSTEMS: NOT EVEN CLOSE

APPLE POWER MACS did well on Photoshop, but the Athlon 64 FX-51-based system won handily on most other tests.

SYSTEM	Processor	TIME (IN SECONDS) REQUIRED TO RUN TEST					FRAMES PER SECOND	
		Premiere 6		Photoshop 7.0.1	Word		Quake III	
		Render	QuickTime		Search and replace	Auto summarize	1024 by 768	1600 by 1200
Apple Power Mac G5	Two 2-GHz PowerPC G5s	4	72	18	16	12	294	207
Apple Power Mac G5	1.8-GHz PowerPC G5	5	84	27	19	14	147	141
Alienware Aurora	2.2-GHz Athlon 64 FX-51	4	37	21	8	6	335	257



HOW WE TEST: All units had 1GB of RAM and an ATI Radeon 9800 Pro graphics card with 128MB of memory. In Premiere we timed the rendering of our workspace, and export of a movie at 720 by 480 resolution, 30 fps, into QuickTime format. In Photoshop we timed the operation of ten filters on a 50MB image file. In Word we timed execution of a search-and-replace and the auto summarize function, each on a large document. We recorded average frame rates running Quake III version 1.32's "timedemo four." PC tests performed by PC World Test Center; Apple system tests performed by Macworld Test Center. All rights reserved. **CHART NOTES:** In Quake III, higher is better; elsewhere, lower is better. Best scores in bold.

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WINDOWS UPDATE

MICROSOFT'S PATCH POLICY PICKLE

BLASTER ATTACKS COULD PROMPT DEFAULT ENABLEMENT OF AUTOMATED UPDATES.

IN THE WAKE of recent widespread worm attacks on the Internet, Microsoft is considering taking an unprecedented step: making automatic download and installation of security updates the default option for Windows and perhaps Microsoft Office. But first, experts say, Microsoft needs to improve the quality of both its patches and the Windows Update system that delivers them.

Despite problems with current patches, many people could be better off with automatic updates as the default (users currently must enable them). A Windows Update download to repair the RPC (remote procedure call) flaw that the Blaster worm exploited had been available nearly a month before Blaster showed up in mid-August, and Blaster didn't affect Windows XP, NT, 2000, and 2003 Server users who installed the patch. But those who don't accept updates probably didn't know about the patch until too late.

FORCED PATCHES?

TRUSECURE Corporation's self-styled Surgeon-General Russ Cooper—an advisor to corporate clients on Windows security, and a longtime moderator of the NTBugtraq security forum—says businesses don't need to apply every patch Microsoft puts out but recommends that users without specialized security expertise apply all patches as soon



as possible. "The vast majority of users don't want to be asked about updates and would love to see it all done for them without their ever being aware," Cooper adds.

Whether they are automated by default or not, updates def-

initely won't be mandatory, says Greg Sullivan, Windows client division lead product manager. In the meantime, Microsoft's Protect Your PC program has been running full-page newspaper ads and a Web site (www.microsoft.com/protect) to urge users to install updates and use firewalls and antivirus software.

Microsoft needs to improve the quality of both its patches and the system that delivers them.

Microsoft is also considering strengthening Windows' anemic built-in Internet Connection Firewall and enabling it by default in future Windows versions and service packs. Even without the anti-Blaster RPC patch installed, Windows XP users who managed to locate ICF buried deep

within their system's network settings and then enable it were safe from Blaster, though not from the in-box-clogging Sobig worm that followed. "Since ICF doesn't stop outbound connections, it has no way of preventing things like Sobig," explains Cooper, noting that some free firewall programs, such as Zone Labs' ZoneAlarm, do police outbound data. However, while beefing up ICF could look like unfair competition to Zone Labs and other third-party firewall makers, Cooper deems the risk

well worth taking: "Microsoft could make big points with consumers by giving them a really decent firewall and taking the heat from the Department of Justice."

BITTER MEDICINE

PC USERS have swallowed security pills before. America Online users have long endured lengthy, mysterious downloads when logging off. Top antivirus utilities rely on automatic signature updates to catch the latest viruses; the best packages enable these updates by default. But outcries over potential privacy issues related to product activation in Windows XP and

Office XP show that computer users don't want a software vendor snooping around their PCs—especially when that vendor is Microsoft.

The company would do well to fix its often buggy Windows Update system. Subscribers to Microsoft's Windows Update newsgroup report a litany of glitches that often prevent the patches from installing. Even worse, Cooper says, Windows Update told some users the RPC patch was installed, when in fact it was not. Even experts like Cooper can't easily tell if an update is really installed, due to obscure Registry, file, and log file changes. But, Cooper notes, patches rarely trouble most people—"say, 1 out of every 100 or so."

Privacy consultant Richard M. Smith says that before making updates automatic by default, Microsoft should disable many of Windows' potentially flawed, and often non-essential, component software services. For example, the Messenger service allows network administrators—and spammers—armed only with a PC's IP address to pop up text message windows from any remote computer.

Smith doesn't believe that Microsoft can make its developers as passionate about security as they are about features. "I don't think they have what it takes, culturally, to write more-secure software." Until that changes, Windows users must patch and bear it.

—Scott Spanbauer ■

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OPERATING SYSTEM

XP MEDIA CENTER, TAKE 2

ENTERTAINMENT OS GAINS NEW FEATURES AND NEW CONVERTS.

MICROSOFT'S LATEST version of Windows XP Media Center Edition improves on the original's TV, photo, and music features, while adding new functions such as support for an optional FM radio tuner and links to online games and movies. Unlike the first version, which launched last fall exclusively on Hewlett-Packard systems and was gradually adopted by other vendors, Windows XP Media Center Edition 2004 (formerly code-named Harmony) will be on PCs from more than 40 computer makers worldwide, including Dell and Sony—notable holdouts last year. (Dell cites stability improvements as one reason for climbing aboard.)

Varying in form, from Gateway towers and Dell micro-towers to HP and Toshiba laptops, these new Media Center PCs will all meet Microsoft's beefy hardware requirements, including a TV tuner and plenty of processing power to encode and decode video.

LIVING ROOM PC

THOUGH MICROSOFT initially touted Media Center Edition systems for studio apartments and dorm rooms, where PCs might double for TVs, the company is now aiming more at the living room. The new Display Calibration Wizard helps users optimize settings for traditional CRT televisions as well as for digi-

tal projectors and wide-aspect LCD and plasma TVs. Media Center still doesn't support dual TV tuners for picture-in-picture mode or for recording one program while watching another, but product manager Tom Laemmel says that fea-



DELL'S FIRST PC based on Windows XP Media Center Edition is the Dimension 4800.

ture "has bumped up high on the list" for next time, as has high-definition TV support.

Other TV enhancements include a wizard that trains the Media Center infrared remote to work with more digital cable or satellite set-top boxes, and TiVo/ReplayTV-like genre filters that let viewers browse the free program guide by such categories as sports and movies.

Media Center 2004's new audio features include a basic FM tuner with a pause function that lets you walk away for up to 20 minutes without missing anything when you return (but you can't schedule

advance recording as you can with TV). Media Center PCs can now rip a CD at the touch of a single button.

The last major addition, Online Spotlight, wasn't ready at press time, but Microsoft says the feature will link to other digital entertainment, such as on-demand movies from Movielink, paid music downloads from the soon-to-be-launched Napster 2.0, and games from WildTangent.

For owners of older Media Center PCs, Microsoft is providing upgrade software to system vendors, each of which will set the upgrade procedure and cost, Microsoft's Laemmel says. Gateway, for example, will offer the upgrade disc for free.

COMPETITION

MEANWHILE, some PC makers—even those carrying Media Center systems—are providing other entertainment software options. Sony, for example, will continue to install its GigaPocket audio-video software on several of its VAIO PCs. And Dell is providing its own Media Experience software—resembling a "lite" version of Windows XP Media Center Edition 2004 without TV- and radio-tuning capabilities—on all Dimension PCs that don't meet Microsoft's hardware requirements. If you're in the market for a living-room PC, you have more choices than ever.

—Sean Captain ■

IN BRIEF

Product Pipeline



PICTURE THIS: Why buy four different digital devices when one can meet all of your needs? Panasonic's SV-AS10 D-Snap multimedia digital camera features 2-megapixel resolution, along with a QuickTime video recorder, a digital audio player, and a digital voice recorder. Yet the \$300 device can still fit in your pocket, as it measures just over 4 inches long, 2 inches wide, and one-third of an inch thick. Find, pcworld.com/38135



NO GLASSES NEEDED: Sharp's latest notebook enters a new dimension—the third dimension. The Sharp Actius RD3D, which is scheduled to ship in the United States in the middle of October, features an LCD that can show images in 3D without your having to use special glasses. The notebook also offers a 2.8-GHz Intel Pentium 4 processor, 512MB of memory, and a 60GB hard drive; it is expected to retail for \$3299. Find, pcworld.com/38138



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ISPs

DIRT-CHEAP DIAL-UP

YOU CAN FIND BARGAINS IF YOU'RE WILLING TO MAKE TRADE-OFFS.

WHY PAY \$20 or more each month for Internet access? Dial-up deals abound—an increasing number of national firms offer Internet access for as little as \$5 monthly.

Value-priced ISPs offer a competitive alternative, and some customers are switching. For example, America Online reports it lost 846,000 subscribers in the second quarter of this year. Many switched from dial-up to broadband, but others chose cheaper dial-up service, says Dominic Ainscough, a Yankee Group senior analyst. He says the only major ISP gaining dial-up subscribers is United Online, which sells several budget services, including Juno and NetZero.

United Online is the value-ISP market leader, but it's not the only option—or the cheapest. Access4Less.net and 650DialUp are less than \$7 a month, and 550Access promotional rates start at \$4.75.

"Ask not why we are so

cheap, ask why they are so expensive," points out Vivek Dave, president of VIP PowerNet, which owns 550Access. Anthony Minnessale, president of 650DialUp, agrees. "The last line of defense in ISP competition is offering the best price," he says.

CHECK IT OUT

BUT WITH THE bargains come trade-offs: You'll find subpar customer support; caps on your monthly usage; and some disparity in technical support, news-group access, Web-hosting space, and even e-mail features (see the chart below).

PC World informally tested five very inexpensive ISPs (550Access, 650DialUp, Access4Less, Access4Less.net, and AllVantage) for two weeks. We gauged their performance against that of NetZero, which is a budget ISP but not dirt-cheap; and EarthLink, which charges the standard \$22-per-

month fee. We tested the ISPs in Boston, Chicago, and San Francisco for network availability and throughput.



The bandwidth and overall performance of all seven ISPs were consistent and comparable as gauged by PC Pitstop's Download Bandwidth Test. (PC World licenses PC Pitstop's technology.) All ISPs had occasional minor performance hiccups with our 56-kilobits-per-second modem (speeds fell to 12 kbps at times), but speeds averaged 28 to 33 kbps; highest was 40 kbps. The low-cost ISPs performed on a par with both

EarthLink and NetZero. We got no busy signals and only three dropped connections (including once each from EarthLink and NetZero). All the companies have local access numbers nationwide.

All the ISPs offer free tech support by e-mail, but charge for phone contact. Each replied within 8 hours to a simple e-mail query.

WHAT'S THE DEAL?

CHEAP ISPs HAVE drawbacks: Access numbers may change with little or no notice (this happened with two of the ISPs), and the services are not intended for constant connection; many drop you if you idle for 10 minutes, and some limit your monthly hours. And there's the risk that the ISP won't survive on its superthin profit margins and will go out of business without warning.

So before you sign up, read the fine print. Some ISPs may require you to view ads in exchange for low rates. (None of the services we tested did; NetZero Platinum puts a thin toolbar on your screen with no ads but links to popular Web sites.) Contracts should spell out such terms.

Do your research. ISP directories are available at several sites, such as TheList.com and Freedomlist.com. Call the ISP to try to reach a person. And be wary of signing a long-term service contract: It might be cheaper, but you'll lose out if the ISP goes under—and you'll still have to pay if performance tanks. Even month-to-month, low-cost ISPs can save you plenty of money.

—Liane Cassavoy
and Tom Spring ■

FEATURES COMPARISON

HOW BARGAIN-BASEMENT ISPs STACK UP

SOME SUB-\$7 SERVICES limit your time online, as well as support hours.

ISP ¹	Monthly fee	Setup fee	Usage limits	Phone support	E-mail accounts	Personal Web site size
550Access	\$5.50	\$7	150 hours/month	\$3.99/call	None	None
AllVantage	\$5.95	\$4.99	10 hours/day (5 consecutive hours)	Free (toll call)	2	None
Access4Less.net	\$5.95	\$8	None	\$5/call	2	None
650DialUp	\$6.50	\$8	None	Free	5	10MB
Access4Cheap	\$6.95	None	None	Free	2	10MB
NetZero	\$9.95	None	None	\$1.95/minute	1	None
EarthLink	\$21.95	None	None	Free	8	10MB

¹ Ranked by monthly fee.



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LETTERS

LETTERS@PCWORLD.COM

UPGRADE HINTS
FROM THE FIELD

TRIPPING OVER
ONLINE MUSIC

PLAY IT SAFE,
TURN IT OFF



COPYRIGHTS AND FILE SHARING

STEPHEN MANES misses the point with his analogies ("Copyright Law: Ignore at Your Own Peril," *Full Disclosure*, September). People don't see file sharing as theft because they have been allowed to copy music ever since tape recorders became available. The powers that be let the genie out of the bottle when cassette recorders became a part of every music system.

Frank Lemire, Montclair, New Jersey

WHAT IS TROUBLING for me, as a professional teaching historian, is the locking up of content via copyright laws to protect a reputation or a bottom line—and hiding history in the process.

For example, I know that studios like Disney and Warner Bros. prohibit the legal distribution of their cartoons from the World War II era, due to political correctness (the characters were used in a less-than-sensitive manner when it came to the Germans and Japanese).

Carlos R. Rivera, Gahanna, Ohio

WHILE I AGREE with most of the article, Manes and the music industry don't acknowledge that many files people download are rarities (concerts, remixes,

music videos, out-of-print vinyl records or VHS tapes) that *can't* be bought in stores.

Jim Patterson, Iowa City, Iowa

I'M PLANNING to make available online some of my own songs and write off the downloads as promotional expenses. Other performers who have tried this, such as Janis Ian, have found that it works. Her sales go up every time she posts a free MP3 on her Web site.

P. F. Bruns, Tampa

MANES SOUNDS like the head of one of the world's last buggy whip companies shaking his fist in the air and railing against Henry Ford for mass-producing the automobile.

People will still want movies and records, and artists will still make them—it's what artists do. Plucking a guitar always beats the hell out of digging a ditch.

William Kerr, Houston

IF THE RECORD industry just sold products that people want (individual songs) rather than telling them what they should

buy (entire albums), illegal music swapping would be greatly diminished.

Tom Winsor, Bartlett, Illinois

IF "UNDERMINING A foundation of our culture" means that the music industry can no longer bully radio stations into foisting more Barry Manilows upon us, then I say undermine away.

Arland Miller, Lawrenceville, Georgia

MORE ON UPGRADES

AS A TECHNICIAN in a small computer store, I'd like to add to your "60-Minute Upgrades" [September].

The article states that after a CPU upgrade, "we closed the case" before trying it out. I leave the case open for the first power-on after a CPU installation, primarily to make sure the fan turns properly. If it doesn't, you may have seconds to cut the power and avoid damage.

The article recommends using a vacuum cleaner to remove dust from inside the case. But this may introduce static electricity, which can damage your machine. Compressed air is much safer. ▶

LETTER OF THE MONTH

Disposable Digital Cameras Decried

WHEN I STARTED TO READ your online article "Digital Cameras Go Disposable" [find.pcworld.com/38069], I just had to double-check the date—no, it was not April 1. The Ritz/Wolf chain wants to charge people to process and print images from a cheap digital camera, images of undoubtedly poorer quality than those from disposable film cameras.

The popularity of digital photography is exploding largely because it is quicker and more convenient than film photography. No processing. No printing bad pictures.

No waiting for the drugstore photo lab to return poorly processed images. People enjoy the fact that they can preview images, discard bad ones, and immediately retake shots. Moreover, with most modern digital cameras, a person can shoot considerably more pictures than can be held on a roll of film.

Ritz/Wolf has thrown out all the desirable features of digital photography and maintained the aspects of conventional photography that people dislike!

Ted Inoue, New Hope, Pennsylvania

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HP recommends Microsoft® Windows® XP Professional for Business.



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LETTERS

Finally, be sure the PC is out of warranty—companies often stipulate that opening the case voids the warranty.

J. Ryan Beardall, Orem, Utah

YOUR "PC Tune-Up Calendar" did not mention the importance of regularly running a good spyware/adware utility. I learned from recent painful (and costly!) experience about the damage to computers that mischief perpetrators can do.

Woe to the Internet surfers who pay no attention to the detritus being scattered across their hard drives by browser hijackers, data miners, dialers, keystroke loggers, and modem hijackers. May such naive surfers never have to wonder, "Just who is making these \$6-a-minute phone calls to the Solomon Islands?"

Jill Posuniak, McLean, Virginia

JEFF BERTOLUCCI'S test machine, an aging Dell XPS T700r (which I also have) was outfitted with a 200-watt power sup-

ply. But today's 64MB or 128MB graphics cards draw enough juice to warrant upgrading the power supply. I found only one card that requires just 250 watts. Dell sells a 300-watt power unit for \$49 that fits into my dinosaur's very tight quarters.

John Kasper, San Francisco

LESSONS OF CHEAP INK

ARTICLES LIKE "Cheap Ink Probed" [*News and Trends*, September] easily justify the price of a subscription.

When ink jet printers were new, I experimented a lot with alternate sources, refill kits, and such. Some worked okay, but most were a disappointment. And the permanence issue became obvious only after some time. Once you realize the real stuff costs more for a reason, it becomes easier to plunk down the extra change.

Rodney McFarland, Bay City, Michigan

TURN IT OFF!

REGARDING THE DEBATE on turning PCs off at night [*Plugged In*, September]: With the increased use of always-on DSL and other high-speed Internet connections, and with the growing threat of hackers and worms, it makes even more sense to shut a PC down when it is not in use. A computer not running and not connected cannot be hacked.

Raymond Richardson, Lafayette, Louisiana

LEGAL DOWNLOAD STILL COPY-PROTECTED

YOUR ARTICLE about online music services ["Online Music: New Hits and Misses," September] should have noted that some actions, such as the important chore of backing up files, may kick in the copy protection of songs downloaded from services like PressPlay.

When asked about this, a customer service rep from PressPlay gave an answer that must be read to be believed: "When doing a backup, you should back up all of your other files, but *not* the ones you downloaded from PressPlay."

Robert Mello, Annandale, Virginia

PC World welcomes letters to the editor. We reserve the right to edit for length and clarity. Send e-mail to letters@pcworld.com. ■

CORRECTIONS

IN OCTOBER'S "The Best Software You're Not Using," we should have identified the vendor of Diamond Cut 5 (page 114) as EnhancedAudio.com and listed the cost as \$199.

In October's *Top 15 Desktop PCs* chart, the Acer Veriton 7600G should have been given a Good reliability rating, and the CPU of the Polywell Poly 880NF2-2700 should have been listed as a 2.17-GHz Athlon XP 2700+.

Contrary to an item in September's *Windows Tips*, Windows XP Home is capable of supporting the NT file system (NTFS). To convert XP Home to NTFS, users should go into Windows Help, type NTFS, and follow the instructions in the third item displayed. Though NTFS adds security features, XP Home lacks XP Pro's Encrypting File System, which lets you encrypt files and folders on an NTFS-formatted hard drive.

September's *New Products* review of Drive Image 7 should have noted that the software runs only on Windows 2000 Pro, XP Home, and XP Pro.

PC World regrets the errors.



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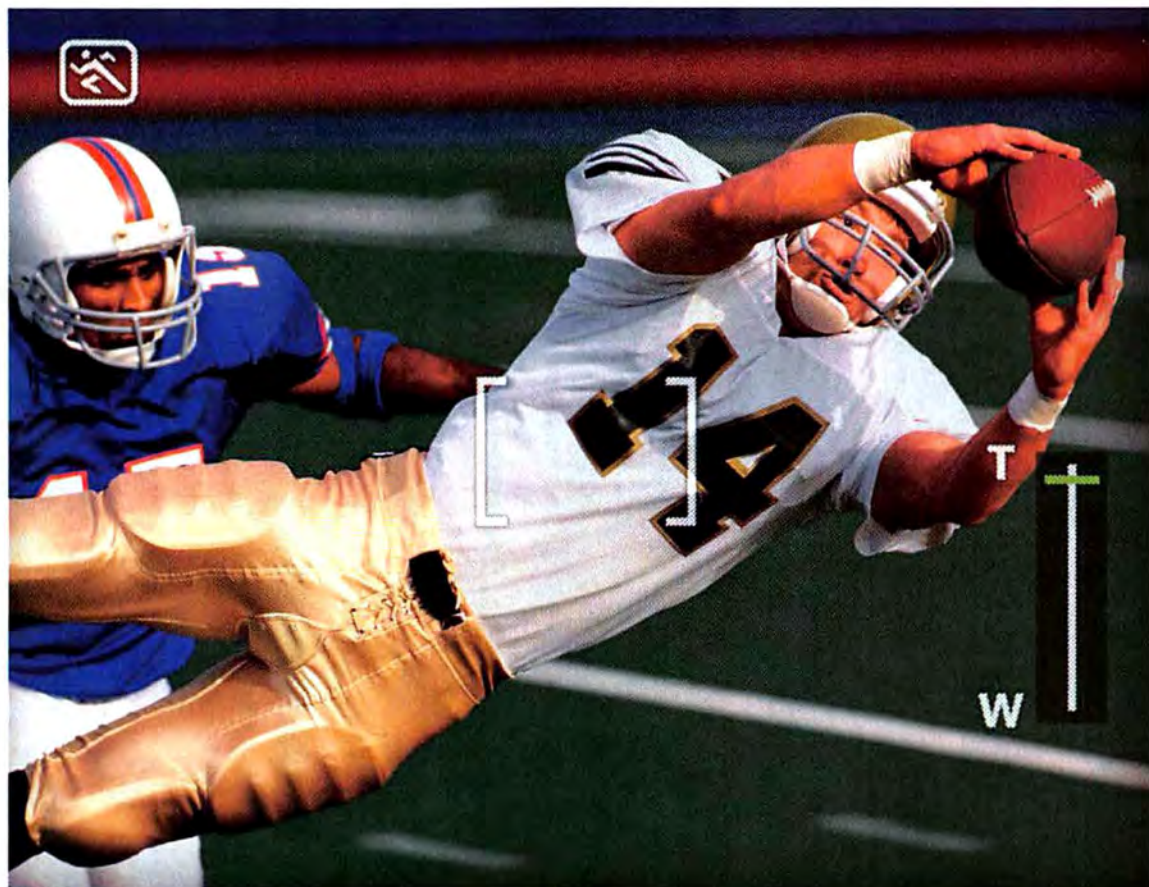
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PLUGGED IN

STEVE FOX

New Search Tools Invade the Browser

Plus: Walkie-talkie phones, an 8-megapixel camera, and double-fast Wi-Fi.



1 Search Engines Tool Up

The Buzz: The search engine battle moves uptown—or at least up-page—with dueling releases of flashy toolbars from Google and AltaVista. Both über-bars slide in beneath the existing toolbars of Internet Explorer 5.0 or later and offer the expected search functions, plus a pop-up blocker. Google's 2.0 toolbar also throws in an automatic form filler, a tool for posting to blogs, and even a calculator and units converter. The entry from AltaVista (soon to be acquired by Yahoo) can translate Web pages or text into ten languages and dishes up weather, zip codes, definitions, and such on the fly.

Bottom Line: A few more toolbars like these, and I'll never need to consult my browser again. Good thing, since there won't be room for my browser anyway.

2 Getting Pushy About Talk

The Buzz: If you haven't heard much about "Push to Talk" (PTT), you will soon. A variation on instant messaging, but for voice, PTT transforms your phone into a walkie-talkie. Select a name from your pick list, hit a button, and, bingo, you're connected. PTT uses VoIP (voice over IP) technology, so you'll need a new handset with a two-way radio built in. Nextel has provided PTT for several years, but Verizon Wireless has just introduced it, and Sprint, Cingular, and AT&T Wireless, plus a few regional carriers, are preparing rollouts. The service will be offered as a paid add-in to standard calling plans.

Bottom Line: Perfect for campus residents, Boy Scouts, and other people who wander a lot in their work. A basic cell phone should do fine for the rest of us.

3 Pixels to the Max

The Buzz: The ante goes up yet again this month when Sony introduces an 8-megapixel digital camera for \$1200. The black, magnesium alloy Cyber-shot DSC-F828—with a sophisticated color filter technology that Sony claims will dramatically improve color accuracy—can store pics on CompactFlash media or a Microdrive or Memory Stick. The camera will also do 30-frames-per-second video recording up to the capacity of the storage device that you use.

Bottom Line: Despite its lofty specs, the DSC-F828 is being marketed to "enthusiasts." Ah, finally, the camera for all those



4 Whizzy Wireless Networks

The Buzz: Wi-Fi not zippy enough for you? Netgear has found a way to push data at 108 megabits per second. That's twice as fast as the 802.11g standard. To get "108 mode" (which is backward-compatible with the 802.11b and g Wi-Fi standards), you'll need Netgear's WGT624 Wireless Firewall Router (\$150) and WG511T Wireless PC Card (\$90),

both built on Atheros Communications' chip set with Super G.

Bottom Line: Netgear is aiming this at streaming video fans, small offices running bandwidth-intensive apps, and anyone opening a Starbucks in their front yard. ■

Contributing Editor Steve Fox covers buzz-worthy products, ideas, and trends. Contact him at steve_fox@pcworld.com. Visit find.pcworld.com/31643 for more Plugged In.

NAGGING QUESTION

What Does Comdex Stand For?

AS THE LAS VEGAS mega-trade show preps for its 24th annual opening day on November 16, its sponsors are touting the tagline "The Global Technology Marketplace." Back in 1979, when computers were mini-computers and Bill Gates was just another



penniless geek, the "Computer Dealers Exposition"—with 125 exhibitors hawking their silicon to 4000 attendees—was less ambitious. And though the name has stuck, nowadays you'll find more Wi-Fi, Net stuff, and services than good old PCs.

U.S. Robotics means **wireless connectivity** @ 100 Mbps.

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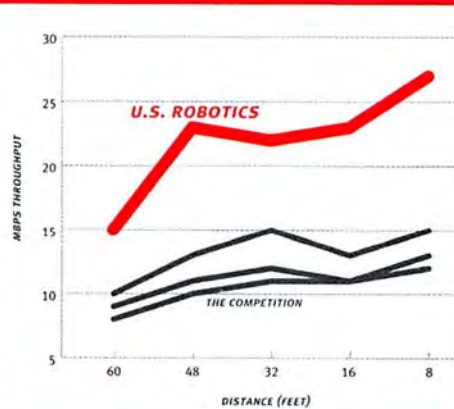
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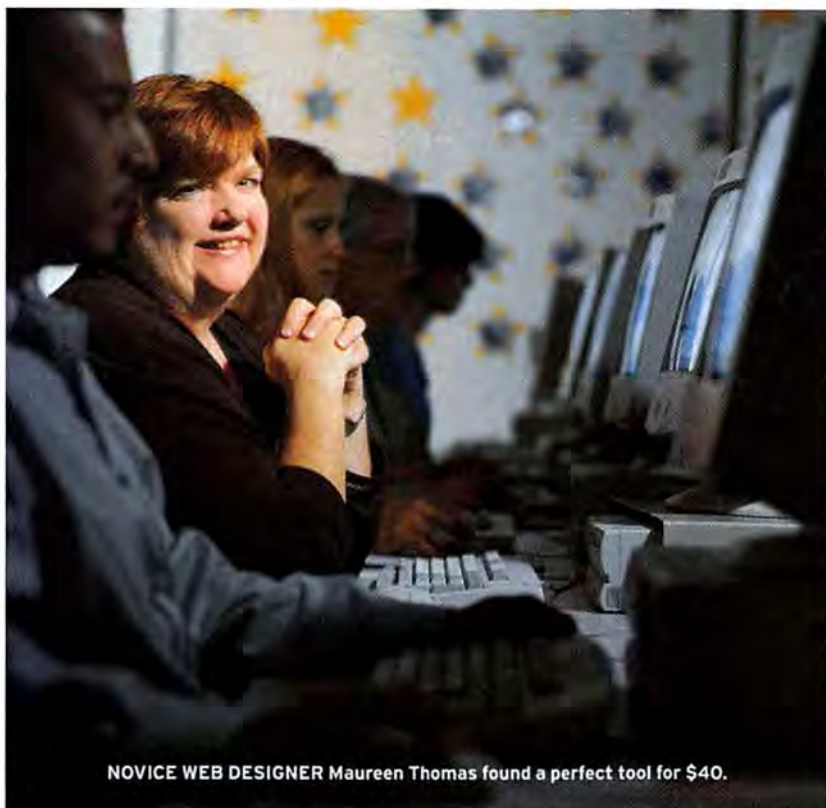
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AT REASONABLE PRICES**

**PRIVACY WATCH: TEST
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**ON YOUR SIDE: REBATE
HOLDER LAST TO BE PAID**

How to Save on Software—Safely

Shareware can save you a bundle if you avoid the downside of downloading.



NOVICE WEB DESIGNER Maureen Thomas found a perfect tool for \$40.

MAUREEN THOMAS HAD a challenge: to create a Web site that would provide information and links to job placement resources for welfare-to-work participants, many of whom had never used a PC, much less a Web browser. Complicating the task further, Thomas, a computer resources manager for the Los Angeles County Office of Education, had no experience building Web sites and no budget to speak of.

Thomas tried several Web design programs but found most of them too time-consuming to learn, too expensive, or

both. Then she came across the CoffeeCup HTML editor (www.coffeecup.com/html-editor) on a shareware download site, which filled the bill perfectly.

"Basically, I needed something with easy image placement and resizing, font versatility, and the ability to easily place lots of links on the site," Thomas explains. "CoffeeCup let me do all that without ever even visiting the help page." The price? A bargain-basement \$40.

Of course, everyone's needs are different, and anything less than a full-featured, shrink-wrapped software package with all

the bells and whistles might not work for you. But if you're like a lot of managers these days, you have to do more with less, on a budget that's seen more slashing than the projectionist at a drive-in. If you're willing to do a little research, you might be able to save a few bucks on your next software purchase—without compromising productivity or security.

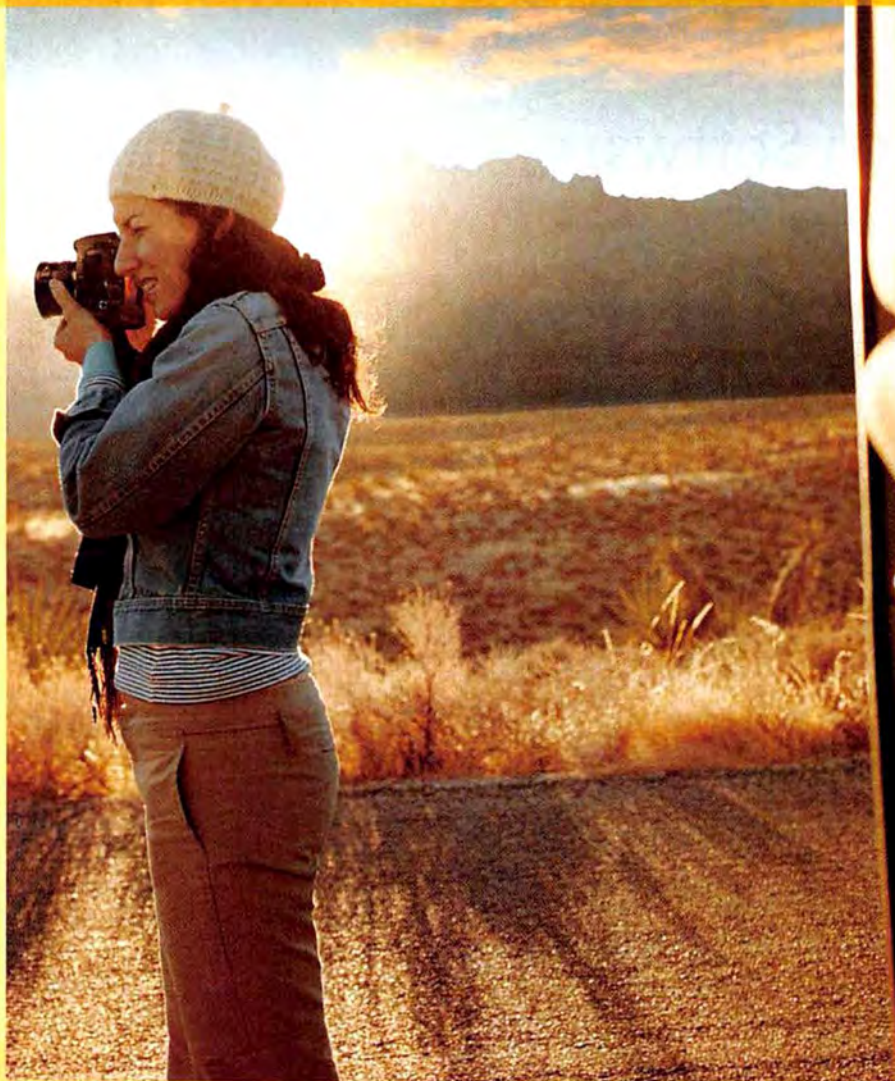
The first step is to take a hard look at which features you really need. (If you're shopping for a utility, start by making sure Windows doesn't already provide one that'll suffice.) Maybe you've already got an antivirus program and a firewall, for example, but you need a better spam filter—and who doesn't? If so, the \$20 IHateSpam for Outlook (find.pcworld.com/37625) is a great, inexpensive choice. Or maybe you need to do occasional word processing and spreadsheet work, but not enough to warrant opening your wallet for Microsoft Office. In that case, try the free OpenOffice (www.openoffice.org).

GOTTA SHOP AROUND

ONCE YOU'VE DETERMINED what you need, you can focus on finding the most affordable software for the job. Since most software developers now offer free trial versions of their products, it's easier than ever to shop around and determine first-hand which tool works best for you. You might settle on a simple downloadable freeware utility, or a collection of individual apps that together can do what a more expensive, bundled package does.

If you're lucky, you'll find downloadable shareware that does the job and costs less than anything you'd find ensconced in shrink-wrap. Prices for seemingly ►

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Microsoft

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comparable shareware apps can vary as widely as share values on the Nasdaq index over the past five years, so if you find a tool that sounds promising but breaks your budget, just keep searching. Chances are there's another one out there that'll do the job for the right price.

Patty DeViva learned that lesson firsthand. When DeViva, Web and media manager at Wyoming Seminary in Kingston, Pennsylvania, needed a Web statis-

tics application, she looked around online and downloaded a trial version of Funnel Web Analyzer, a package that retails for \$900. "It was useful software," she says, "but with the school's budget constraints, I really couldn't afford it." Eventually, DeViva discovered AccessProbe, an application that had all the features she needed. "The icing on the cake," says DeViva, "was going to my boss and letting her know that all we needed was \$40." ▶

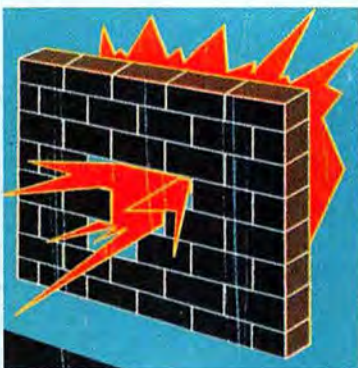
PRIVACY WATCH

Make Sure Your Firewall Is Sturdy

FIREWALLS PROVIDE AN essential layer of protection by blocking the port probes and scans that some bad guys and worms use to decide which PCs are vulnerable to attack. But firewalls aren't foolproof.

Even one from a reputable company can be leaky if it's misconfigured, and a holey firewall combined with an unpatched copy of Windows could permit malicious hackers to break into your system. But a

good firewall does its job in the background. So how do you know whether all is quiet because your firewall is operating perfectly or because the hackers just haven't yet spotted your vulnerable system? It's best to test the fire-



wall yourself. (If you don't have a firewall, check find.pcworld.com/37553 for a list of free ones and for tips on installing them.)

I use several free sites to test my firewalls. They all work similarly: The Web site runs a script that scans the ports at your computer's IP address. If your firewall is properly configured, the test results usually will show that no probes from the scan made it through to your computer. If you run a Web server from your PC, or other software (like an online game) that listens for requests from the Internet, and you've opened a port in the firewall for that program, a scan will show the port as open.

Sygate Online Services Security Scan

(find.pcworld.com/37550) is one of the most comprehensive scan sites. It offers six varieties of scans, though for most people the Quick Scan or Stealth Scan—which takes less than a minute—will be sufficient. The truly paranoid can choose to scan every well-known port, but that takes 45 minutes.

Once I've run the Sygate test, I head to Audit My PC (find.pcworld.com/37556) for

its privacy scan. In addition to testing the firewall itself, Audit My PC tests your machine for other vulnerabilities. The privacy scan reveals the weaknesses in your browser and identifies the kinds of information that any

Web site can find out about you. The site also explains how to fix the problems.

Last on my list of scans is RV10scan (find.pcworld.com/37559), the real-time service from Qualys, which can be found on www.Vulns.com. RV10scan not only looks at the port, but also sends commands to the port to see how the computer responds. It effectively figures out which buggy parts of your Windows installation are unpatched—and which spots in your firewall may not cut the mustard.

Once your firewall passes the RV10scan, you can put your feet up, lean back, and breathe a well-deserved sigh of relief.

—Andrew Brandt

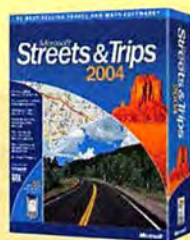
Because there's
more to life.



Balance it. With our most useful personal finance software that lets you manage your money the way you want.



Discover it. With the leading multimedia encyclopedia that brings subjects to life with the most up-to-date, dynamic information that's easy to use.



Find it. With the comprehensive, personalized travel companion software that helps you map your daily activities or plan a successful trip.



Accomplish it. With a collection of six complete programs for your everyday tasks like writing letters, scheduling, managing money, sharing photos and more.

Microsoft

It's important to find a trustworthy download site. Okay, I'm a little biased, but PC World's own download library (www.pcworld.com/downloads) does a great job of testing its offerings for stability, spyware, and viruses. Also helpful are sites that include user reviews and ratings. Evaluations from other users can often help you spot functionality holes or incompatibilities that could mean the software just won't work for you.

SHAREWARE HAVENS

TWO OF THE BIGGEST and most widely known shareware sites are Download.com (www.download.com) and Tucows (www.tucows.com). Both of these sites are comprehensive and well organized, with thousands of shareware and freeware apps for virtually any operating system. You'll also find evaluations, advice, and such practical details as file sizes, download times, and system requirements.

No doubt the biggest hassle involved in

ON YOUR SIDE

Bankruptcy Ends Rebate Promises

I BOUGHT LapLink Gold 11 from LapLink Incorporated, when the company was offering two rebates worth \$150 total. I submitted the paperwork and waited. When I called several weeks later, I was told a check would be coming. Soon after, LapLink Incorporated, declared bankruptcy. According to court documents, the company has not honored rebates for 15,000 customers. If each customer has the same rebate amount as me, that's \$2.25 million the company got from its customers.

John McCusker, Tarzana, California

On Your Side responds: LapLink Incorporated, maker of the popular and long-established remote-access package, filed for bankruptcy in March and has shut down, but its products live on. Thomas Koll purchased

LapLink Incorporated's assets and formed a new company called LapLink Software. Customers who haven't been paid their rebates can visit www.wawb.uscourts.gov or call 206/553-7545 for information on filing a claim with the bankruptcy court. But don't get your hopes up: Customers are unlikely to receive any payment.

LapLink Software is offering customers who didn't receive a rebate check a free copy of LapLink 11.5, a LapLink USB 1.1 cable (excluding shipping fee), and a three-month subscription to LapLink Everywhere. Write to newcompany@laplink.com and provide your name, the serial number from your LapLink software, the name of the store where you bought it, and the date when you bought it.

—Grace Aquino



reTHINK COLOR

trying out any software—but especially freeware—is ousting unruly gangs of spyware, adware, and other pests that can end up clogging your hard drive.

To guard your hard drive against unwanted guests, look for sites that test and screen the shareware for tagalongs. (Not many sites do this, since most make money by posting adware-supported downloads.) Some sites, like Download.com, say they'll "do their best" to label the titles that include adware; but ultimately, it's up to you to keep the spies at bay.

Always read the end-user licensing (also called *terms of service*) agreement before you download. If the software includes any spyware or adware, the agreement should mention it. Also, perform a custom install if you can, and closely monitor what's coming on board during the download. If you see files with the names of companies known as adware producers (Cydoor and Gator, for example) or with names other than the maker of the pro-

gram you're downloading, chances are you're getting adware.

If you haven't already done so, install a good antiadware application and regularly use it. Lavasoft's Ad-aware (find.pcworld.com/37628) and Spybot Search & Destroy

A burly uninstaller is essential to evict unwelcome apps.

(find.pcworld.com/37631) are popular (and free) utilities that will reliably rid your system of unwanted adware files.

Before you invite any strange files onto your hard drive, make sure you have a burly uninstaller that will make them disappear—for good—when you want them to. A good free option is MyUninstaller, available at find.pcworld.com/37649. Finally, don't forget to flush out your Registry regularly; Registry Healer (find.pcworld.com/37634)

will do the job painlessly. (The free version of this utility fixes only a few problems at a time. If your Registry is really messy, you're better off investing \$20 in the full version of Registry Healer.)

Make no mistake: Shareware isn't always the answer. A lot of lazy, sloppy programs lurk out there, and insidious spyware makes security a constant battle. But if you're patient and you know how to download safely, you just might find exactly the software you need—and keep your budget healthy to boot. And what could be better than that? ■

Anne Kandra is a contributing editor and Grace Aquino and Andrew Brandt are senior associate editors for PC World. E-mail them at consumerwatch@pcworld.com. To read more Consumer Watch, Privacy Watch, or On Your Side columns, go to find.pcworld.com/31703, find.pcworld.com/31706, or find.pcworld.com/31709, respectively.

Get low cost color without raising the cost of your black & white.

Color gets ideas noticed. What gets in the way of that is cost. But now you can move your ideas forward in color with the new Aficio® 1232 Multi-Function Printer. This MFP prints 10 ppm low cost color. And best of all, 32 ppm low cost black and white. So, you only pay for color when you need it. As for the cost of the 1232 itself? Just slightly more than a b/w MFP. All this leaves you with just one more question: **How well do you share?**

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IBM recommends Microsoft® Windows® XP Professional for Business.



Wireless IBM PCs give users the easiest wired and wireless connectivity. So you can rein in helpdesk calls. Yeehaa!

Outfit users with IBM ThinkPad® notebooks including Access Connections software and wireless Intel® Centrino™ mobile technology (select models), and you may experience something really wild: a quieter helpdesk. Because Access Connections helps users switch between wired and wireless settings at the drop of a hat. So whether you're working on upgrades, security enhancements or integration, you won't have to keep diverting resources to help users connect. Wireless IBM ThinkPad notebooks with Access Connections software. Welcome to the new wireless frontier. **think freedom**

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NEW! IBM ThinkPad R40

Distinctive IBM Innovations:

Access Connections – Easiest wired and wireless connectivity; IBM Embedded Security Subsystem 2.0¹ – Strongest security as a standard feature

System Features:

- Intel® Centrino™ mobile technology
 - Intel Pentium® M processor 1.3GHz²
 - Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional⁴
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 20GB hard drive⁵
- Ultrabay™ Plus CD-RW/DVD-ROM combo drive
- 6.1-hr battery life⁶ • 5.6-lb travel weight⁷
- 1-yr system/battery limited warranty⁸

\$1,299*

■ NavCode 289723U-M537

ServicePac® Service Upgrade:⁹
2-yr Onsite Repair/9x5/Next Business Day Response
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System Features:

- Intel Centrino mobile technology
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 - Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional⁴
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 30GB hard drive
- Ultrabay Slim DVD-ROM
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- 1-yr system/battery limited warranty⁸

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determine the complete list of parts for which onsite service is available for a particular machine, contact IBM. IBM will attempt to diagnose and resolve any problems remotely before sending replacement part or technician. ¹⁰These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. ¹¹Standard shipping included when you order online. U.S. only. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM Company. Intel, Intel Inside, the Intel Inside logo, Celeron, Intel Centrino, the Intel Centrino logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 2003 IBM Corp. All rights reserved.

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System Features:

- Intel® Centrino™ mobile technology
- Intel Pentium® M processor 1.3GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional¹
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 20GB⁴ hard drive
- Ultrabay Plus CD-RW/DVD-ROM combo drive
- 6.1-hr battery life⁵ • 5.6-lb travel weight⁶
- 1-yr system/battery limited warranty⁷

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ServicePac® Service Upgrade:¹⁸

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IBM ThinkPad R40

Distinctive IBM Innovations:

Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.3GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 15" XGA TFT Display (1024x768)
- 256MB DDR SDRAM • 40GB hard drive
- Ultrabay Plus CD-RW/DVD-ROM combo drive
- 6.1-hr Li-Ion battery • 6.3-lb travel weight
- 1-yr system/battery limited warranty⁷

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NavCode 289754U-M537

IBM ThinkPad T40

Distinctive IBM Innovations:

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System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.4GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM
- 30GB hard drive
- Ultrabay Slim CD-RW/DVD-ROM combo drive
- 5.0-hr battery life • 4.5-lb travel weight
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Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.4GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 14.1" SXGA+ TFT Display (1400x1050)
- 256MB DDR SDRAM
- 40GB hard drive
- Ultrabay Slim CD-RW/DVD-ROM combo drive
- Integrated Gigabit Ethernet and modem
- 4.7-hr battery life • 4.5-lb travel weight
- 3-yr system/1-yr battery limited warranty⁷

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Day Response

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IBM ThinkPad X31

Distinctive IBM Innovations:

Rapid Restore – Push-of-a-button data backup and recovery

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.3GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility Radeon graphics
- 256MB DDR SDRAM • 20GB hard drive
- 5.5-hr Li-Ion battery • 3.6-lb travel weight
- 1-yr system/battery limited warranty⁷

\$1,499

NavCode 2884BRU-M537

ServicePac® Service Upgrade:

3-yr Depot Repair

#30L9192 *132

IBM ThinkPad X31

Distinctive IBM Innovations:

Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.4GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility Radeon graphics
- 256MB DDR SDRAM • 40GB hard drive
- 5.5-hr Li-Ion battery • 3.6-lb travel weight
- 1-yr system/battery limited warranty⁷

\$1,699

NavCode 2884CRU-M537

ServicePac® Service Upgrade:

4-yr Depot Repair

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IBM ThinkPad X31 Solution Pack

Distinctive IBM Innovations:

Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.3GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility Radeon graphics
- 256MB DDR SDRAM • 20GB hard drive
- 5.5-hr Li-Ion battery
- 1-yr system/battery limited warranty⁷

Accessories Included:

- UltraBase™ X3 Media Slice
- Ultrabay Plus DVD-ROM

\$1,749

NavCode 2884BSU-M537

ServicePac® Service Upgrade:

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Day Response

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IBM ThinkPad X31 Solution Pack

Distinctive IBM Innovations:

Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Centrino mobile technology
- Intel Pentium M processor 1.4GHz²
- Intel PRO/Wireless Network Connection 802.11b³
- Microsoft® Windows® XP Professional
- 12.1" XGA TFT Display (1024x768)
- 16MB ATI Mobility Radeon graphics
- 256MB DDR SDRAM • 40GB hard drive
- 5.5-hr Li-Ion battery
- 1-yr system/battery limited warranty⁷

Accessories Included:

- UltraBase™ X3 Media Slice
- Ultrabay Plus CD-RW/DVD-ROM combo

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NavCode 2884CWU-M537

ServicePac® Service Upgrade:

4-yr Onsite Repair/9x5/Next Business

Day Response

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IBM recommends Microsoft® Windows® XP Professional for Business.



(Monitor not included)



(Monitor not included)



IBM ThinkCentre A50p

Distinctive IBM Innovations:

IBM Rapid Restore – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with Hyper-Threading Technology 2.40GHz, with 800 MHz front side bus
- Microsoft® Windows® XP Professional Edition
- 256MB DDR SDRAM*
- 40GB hard drive
- CD-ROM
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- 3-yr parts/1-yr limited onsite service limited warranty*

\$759

NavCode 843293U-M537

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/Next Business Day Response
#30L9199 '99

IBM ThinkCentre A50p

Distinctive IBM Innovations:

IBM Rapid Restore – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 2.60GHz, with 800MHz front side bus
- Microsoft® Windows® XP Professional Edition
- 256MB DDR SDRAM
- 40GB hard drive
- CD-RW
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- 3-yr parts/1-yr limited onsite service limited warranty*

\$849

NavCode 843294U-M537

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response
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IBM ThinkCentre M50

Distinctive IBM Innovations:

IBM Rapid Restore – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 2.40GHz, with 533 MHz front side bus
- Microsoft® Windows® XP Professional Edition
- 256MB DDR SDRAM
- 40GB hard drive
- CD-ROM
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- 3-yr parts/3-yr limited onsite service limited warranty*

\$1,009

NavCode 8185A3U-M537

ServicePac® Service Upgrade:
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#69P9161 '89

IBM ThinkCentre M50

Distinctive IBM Innovations:

IBM Rapid Restore – Push-of-a-button data backup and recovery

System Features:

- Intel Pentium 4 Processor with HT Technology 2.60GHz, with 800MHz front side bus
- Microsoft® Windows® XP Professional Edition
- 256MB DDR SDRAM
- 40GB hard drive
- CD-ROM
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- 3-yr parts/3-yr limited onsite service limited warranty*

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IBM @server xSeries™ 225

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Diagnostic LEDs, Automatic Server Restart® and Predictive Failure Analysis® help to improve uptime; Integrated RAID-1 mirroring and Chipkill™ memory improve the reliability of your data.

System Features:

- Dual capable Intel Xeon™ processor @ 2.80GHz w/ 533MHz front side bus
- 512MB ECC memory std/8GB max
- 6 hot-swap drive bays for up to 880GB internal storage
- Integrated Gigabit Ethernet
- Toolless tower chassis with optional 4U rackmounting
- 1-yr parts and labor limited warranty*

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#96P2248 '149

IBM @server xSeries 335

Distinctive IBM Innovations:

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System Features:

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- 512MB ECC memory std/8GB max
- 2 hot-swap drive bays for up to 293GB internal storage
- Dual Integrated Gigabit Ethernet
- Integrated system management processor
- Cable Chaining Technology (C2T) support to reduce cable clutter
- 3-yr parts and labor limited warranty*

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a particular machine, contact IBM. IBM will attempt to diagnose and resolve any problems remotely before sending replacement part or technician. *These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5/4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7/24-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. **Standard shipping included when you order online. U.S. only. *ThinkPad Protection is not available in all states; contact your sales representative for details. ThinkPad Protection cannot be combined with other warranty service upgrades. ThinkPad Protection #56P8774 is for purchase with 3-year warranty systems; #56P8772 is for purchase with 1-year warranty systems. IBM does not manufacture, warrant or support this product. IBM logos and trademarks used under license. Contact IBM for details. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM Company. Intel, Intel Inside, the Intel Inside logo, Celeron, Intel Centrino, the Intel Centrino logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. © 2003 IBM Corp. All rights reserved.

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STEVE BASS

Steve's Do-It-Yourself Windows Upgrade

These tools make your current OS act the way Longhorn should in two years.

I'M HAPPY WITH Windows XP, but that doesn't mean I don't have suggestions for Longhorn—Microsoft's next version of Windows. (So does *PC World* columnist Stephen Manes: Browse to find.pcworld.com/37607 for his take.)

But who wants to wait two years for the operating system of our dreams? These nine tweaks and tools give current versions of Windows some long horns of their own. Visit find.pcworld.com/37610 for the downloads.

Uninstaller extraordinaire:

The next version of Windows will, I hope, include an uninstaller similar to Nir Sofer's **MyUninstaller**, a free tool that provides rich details about the program that's being uninstalled, such as its vendor, its product version, its Web site, when it was installed, and the folder it resides in. The utility also lets you uninstall programs not removed properly by Windows' Add/Remove Programs.

Two cool Registry tools: I hope that in Windows' next incarnation I never have to touch the Registry. But to make Windows work the way I want until then, I have little choice but to tweak the Registry occasionally. DC Software Design's **RegEditX** is a brilliant little freebie that adds features to all versions of Windows' own Registry Editor. My favorite innovation: RegEditX lets you enter a long Registry key into the address field and be whisked right to it. No more having to use the Registry's tree to navigate to a key.

If you're willing to spend \$25, Super Win Software's **WinRescue** eliminates all the drudgery from backing up and restoring the Registry. Better than the backup

in Windows' Registry Editor (and more comprehensive than System Restore), WinRescue backs up your Start Menu, Favorites, and desktop folders, as well as all your system configuration files. The

Clear disk space by searching for *.dmp and deleting the files. To learn more about controlling how Windows XP handles these files, visit the **Registry Guide for Windows** (find.pcworld.com/37613).



Sock it to pop-ups: I'm really tired of ads popping up (and under) my PC screen. I wish Windows would offer a way to control them—but until then I'll use the free **Google Toolbar 2**, which has a built-in pop-up blocker for Internet Explorer that bests most commercial ad stoppers.

Beef up the Restricted Zone: IE's Restricted Zone prevents Web sites from damaging your PC, but this underused tool can also protect

you from spyware and adware when you load the URLs of these sleazeballs into the Zone. Why not invite Camtech 2000's **SpySites** to handle this job for you? The free utility will place more than 2700 Web sites into IE's Restricted Zone.

Crash control times two: I'll wager that even if you use Windows XP, your system still crashes. While XP sends crash details to the Crash Keeper at Microsoft, it does not let you in on why it happened. Until there is a crash-proof version of Windows (ha!), or at least a version with more informative reporting, I'll use **Bugtoaster**. This free utility provides intricate crash details that I can analyze and use to diagnose my machine. An alternative is Alexander LAN's \$39 **Alexander System Protection Kit**, which captures information about Windows XP and 2000 crashes, automatically restarts the system, and provides a detailed report that isolates the problem.

Quick tip: System crashes may create large crash-dump files in XP systems. (I found two such files on my PC, each 80MB.)

Stop pushing my buttons: "Mr. Bass, are you sure you want to delete that file?" Sure I'm sure, pal, and I spend too much time answering this type of pesky Windows dialog question (not to mention questions from pesky editors). But with Paul A. Roberts's free **PTFB**, I sidestep dozens of repetitive confirmations. (Okay, I know you're wondering—it stands for "Push The Freakin' Button.") ■

Contributing Editor Steve Bass is the author of PC Annoyances: How to Fix the Most Annoying Things About Your Personal Computer, published by O'Reilly (ISBN: 0-596-00593-8). Contact him at homeoffice@pcworld.com.

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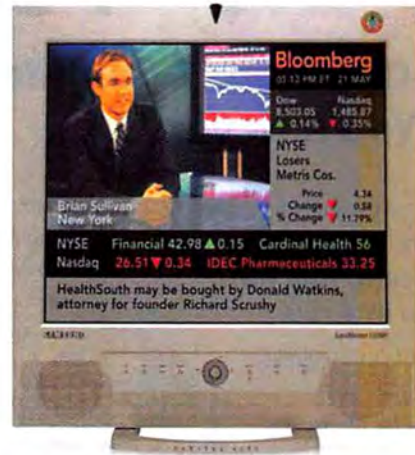
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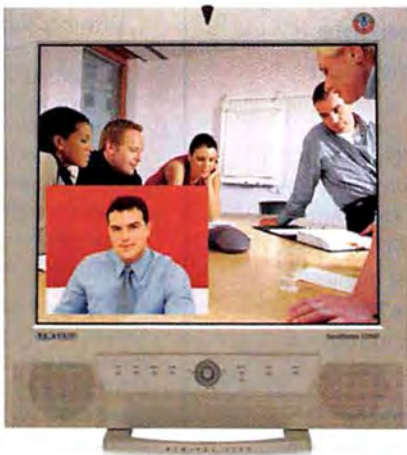
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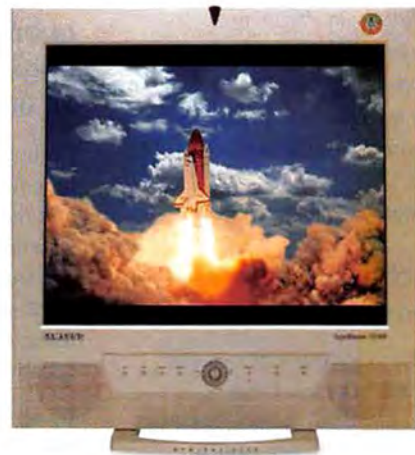
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From the inventor of the multi-function display comes the all-new 172MP — Samsung's reinvented addition to a family of smart, versatile displays. With a super-crisp TFT-LCD display, a detachable TV tuner, video inputs and HDTV compatibility, the 172MP lets you take control of your desktop and keep all your information right where you need it — in front of you. From the world's first to the world's best, Samsung has done it again.

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Were you awarded Computer Shopper's "Best Place to Buy RAM" two years in a row?

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— Computer Shopper magazine

Do you actually make the memory you sell?

WARNING! Listen carefully to the answer when you ask this question. Other memory companies claim to manufacture memory, too. What they actually do is assemble the memory chips made by someone else into memory modules. Ask them this: Do you make the chips that go on your memory modules? The chips are the important part, after all.

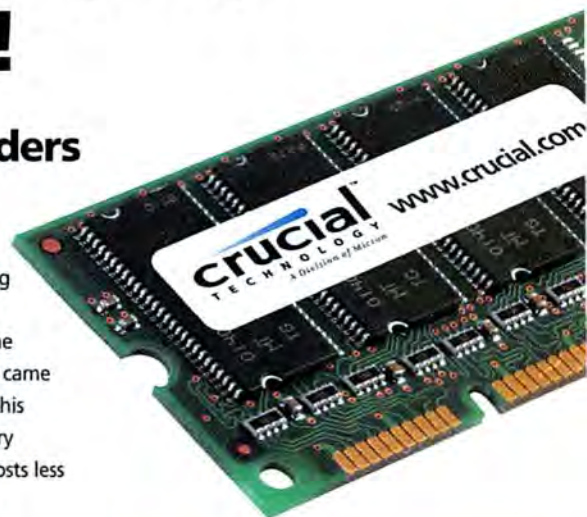
Crucial is the only memory upgrade supplier that's part of a major DRAM manufacturer, Micron. We actually make the chips that go on the modules.

In fact, because the world's leading computer manufacturers use our memory, chances are good that the memory in your system right now came from Micron. Crucial brings this same high-quality memory directly to you. It only costs less because you don't pay middleman mark-up fees.

Do you offer easy access to over 110,000 guaranteed-compatible upgrades for more than 20,000 systems?

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Using Crucial's award-winning Memory Selector™, finding the right memory is as easy as 1, 2, 3. In just three easy clicks, you'll find your upgrade—and it's 100% guaranteed to be compatible with your specific system or we'll give you your money back. With more than 110,000 upgrades for over 20,000 computers, notebooks, servers, and electronic devices, we've got what you need.



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Prices may vary according to specific system requirements. The price listed was valid on 9/9/03 when we sent this ad to the publisher; however, prices may have dramatically increased or decreased since then. Visit the FAQ section of Crucial.com to learn more about why memory prices go up and down.

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BUGS & FIXES

STUART J. JOHNSTON

Halt Worms and Viruses in Their Tracks

Take the steps necessary to protect your PC from Internet nasties.

REMEMBER the virus blitz that struck late this summer? First, we were bombarded by the Blaster worm, and then by variants of the Sobig virus. Further, Microsoft had discovered, as of this writing, three new holes similar to the ones that Blaster exploited. If you haven't already, go to find.pcworld.com/38126 to grab Microsoft's fix and keep hackers off your turf.

Welcome to the new era of viruses. Blaster and its subsequent variants are good examples of how yesterday's "theoretical" attacks become today's real-world problems. The security sleuths who find holes in software often publish online the code they used to expose the weakness. And in the case of Blaster, cyberthugs were able to employ the code to create a catastrophic worm.



So expect crackers to cook up attacks more quickly than before. That means you need to step up your defense practices, now more than ever.

WHAT YOU CAN DO

UPDATE YOUR virus definitions regularly—ideally on a daily basis. Just as often, visit sites that document the latest threats to find out what subject lines and file-attachment names the newest viruses are using. Look at McAfee (find.pcworld.com/37985),

Symantec (find.pcworld.com/37982), and Trend Micro (find.pcworld.com/37988).

Install Microsoft's "critical" updates (go to find.pcworld.com/19081), but be careful. I always look out for any serious problems with patches before I adopt them, though I don't wait longer than

a week or so. I usually visit support forums to read users' descriptions of problems. My favorites: Microsoft Technical Communities (find.pcworld.com/38063), Tech Support Forum (find.pcworld.com/37991), and WinGuides Support Forums (find.pcworld.com/37994). If I read any reports about a patch causing crashes, problems with the operating system I use, or conflicts with installed programs (such as a particular antivirus application), I steer clear of the patch for a while.

On top of being proactive about virus research, there are other things you can do. Be skeptical about e-mail attachments even from people you know, unless you are expecting something; the same advice goes for strange subject lines. Avoid looking at suspicious e-mail messages in preview mode. Better yet, disable the preview feature entirely.

Whenever you step away from your computer, put your machine into hibernation or standby mode. Doing so will help stop attacks like Blaster, which infected systems by wandering the Internet looking for PCs with communications ports left unguarded.

The frustrating thing is that Microsoft had already released a patch for the very security hole that the Blaster worm exploited a month later (the fix is rolled into the patch mentioned in the first paragraph). To head off potential problems, Microsoft says, it may soon make automatic installations of updates the default setting in Windows. (See this month's *News and Trends* on page 36 for a report on Microsoft's proposal.) I think that's a bad idea. Sure, such automation may help prevent the rapid spread of virus infections. But allowing Windows to automatically download and install updates that may be half-baked could be dangerous for your PC's health. ■

Stuart J. Johnston is a contributing editor for PC World. Visit find.pcworld.com/31580 to see more Bugs and Fixes columns.

NETGEAR ROUTERS WAGE WAR ON UNIVERSITY

WHO KNEW THAT the University of Wisconsin was on Netgear's blacklist? Just kidding. Netgear released fixes for several of its routers after the University of Wisconsin at Madison discovered that thousands of the company's units were flooding the university with time server requests (see find.pcworld.com/37958). Such attacks are usually deliberately created by crackers. In this case though, the blizzard of requests was created by Netgear routers all over the world asking "What time is it?" thanks to a bug in the firmware for models RP614, RP614v2, DG814, MR814, and HR314. If you own one of those units, you can download an updated version of the firmware at find.pcworld.com/37961.

BUGGED?

FOUND A hardware or software bug? Tell us about it via e-mail at bugs@pcworld.com.

All Together Now

Richard A. Goldberg, www.ragmedia.com



The products that make up the digital lifestyle are learning to play together better than ever

“The world is too much with us,” wrote William Wordsworth 200 years ago. Back then, that was a complaint. In today’s wired world, it’s an advantage.

In the years BC (Before Computers), people communicated with sound (mostly grunts but sometimes words), graphically (cave paintings), or kinesthetically (screaming while running away from a T-Rex). Fast-forward a few centuries into the 1940s and the first signs of integrated communications appear—video and sound in television.

About 10 years ago, technology’s contributions to advancing the quality and convenience of people-to-people communications soared. Today, the wide range of personal electronics and communication devices envelops us through the con-

vergence of video, audio, and data. If you believe, as many do, that the best technology is invisible and anticipates rather than reacts to your needs, personal electronics has achieved that goal. At the same time, it remains convenient and affordable, so much so that we often take it for granted. Then again, some people acquire technology solely for its “gee-whiz, isn’t this cool” effect. But that’s OK. After all, today’s technology really

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is cool—and even better, it’s useful.

“I always wanted to organize, duplicate, and distribute my favorite bytes, but I never could,” says Ross Weale, an Internet product manager for Guide Internet Services in

Brewster, N.Y. “Now I can connect my digital software, Canon Mini DV video camcorder, 3-megapixel digital camera, 5GB FireWire-connected PC, and CD burner.

Continued on page 3



Thousands of Possibilities

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Continued from page 1

Everything has changed."

As computing and communications continue to converge, it's wise to choose products that are built to work well with other digital entertainment devices. Consider these three hot products, each perfect for the holidays and each engineered with the present as well as the future in mind. Moreover, each is available from Best Buy (BestBuy.com®), the largest-volume specialty retailer of consumer electronics, personal computers, entertainment software, and appliances.

At less than 4 inches deep, the Philips 42-inch widescreen plasma HDTV is a digital marvel that delivers ultra-crisp, flicker-free images to go with its extremely wide 160° viewing angle. This HDTV also works in tandem with a PC to organize music and photos, while playing audio files by title, genre, or play list.

Speaking of PCs, the Sony PCV-RZ44G comes with Click To DVD™ software that allows users to easily burn DVD movies from Sony camcorders with one simple mouse click. This versatile, futuristic PC also allows you to record, store, and burn TV shows to DVD with unrivaled flexibility, while enabling the easy conversion of analog videos to DVD format.

Got digital photos? Now you can spread their enjoyment and excitement throughout your home via your wireless network with the Linksys 2.4GHz Wireless-B Digital Media Adapter. Both digital photos and music stored on your PC can now be enjoyed with ease on your home entertainment center—all aided by



simple on-screen menus.
■ For great deals on these and many other superb technology products that maximize your digital entertainment pleasure, visit the Best Buy Web site at BestBuy.com®.

Getting Better All the Time

So versatile is the new crop of integrated personal electronics that they not only add quality to your life, they also add convenience. For example, all-in-one still and video imaging helped Shawn Carlson, a New York-based quality assurance coordinator, save time and \$2.00-a-gallon gas when he purchased a new home.

"Pictures on the real estate agents' Web sites enabled us to eliminate certain houses right away," he says. In fact, digital pictures helped Carlson save time and money right through to the day of closing. "Our

digital camera was a great tool for the final walk-through," he explains. "Instead of taking pictures and racing off to the one-hour photo processor, or relying on the old distorted Polaroid camera, the digital photos let us quickly address any issues prior to the closing."

Small Wonder

Many digital lifestyle products today are engineered to work in tandem with other products to enhance the overall digital experience. But once in a

while, a truly innovative product comes along that skillfully combines the functionalities of multiple high-quality products into a single great package. That's the case with the Optura 300 from Canon (www.canondv.com), a compact, full-featured digital camcorder that also functions as a 2.0 Megapixel digital camera.



Canon's Optura 300: full-featured digital camcorder that also functions as a digital camera. And it fits in your pocket.

Small enough to literally fit in your pocket, the Optura 300 will delight users who don't want to be weighed down by both a digital camera and a digital camcorder. The Optura 300 captures high-quality video and still photos backed by Canon's exclusive technologies. These technologies include the powerful Genuine Canon 10x Optical Zoom lens and the DIGIC DV Image Processor.

The DIGIC DV Image Processor lets users achieve accurate color for both video and digital photos.

Continued on page 5

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Which decision is no longer necessary?
July or August? Beach or mountains?
Camera or camcorder?



DIGIC
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The rather obvious answer: camera *and* camcorder. Specifically, the Canon Optura 300: a state-of-the-art camcorder that also functions as a 2.0 Megapixel digital camera. It's small enough to fit in your pocket, yet it houses big things like our Genuine Canon

10x Optical Zoom lens and DIGIC DV Image Processor.

There's also a pro-like RGB Color Filter, for more accurate color and finer gradations. All of which

results in legendary Canon image quality.

We even threw in manual audio control. So, happy trails. Here's to shooting well. And traveling light.



2.0 MEGA
PIXELS



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KNOW HOW®

Continued from page 3

Since video and photos have different color requirements, it utilizes two different color techniques to maximize video quality on a TV and still-image quality for print or computer display.

The Optura 300 also integrates an RGB Primary Color Filter that separates light passing through the lens into individual red, green, and blue color components, similarly to professional 3CCD camcorders.

The Optura 300's Direct Print feature converts images into prints in seconds, even without a PC. The camcorder offers flexible connectivity with a variety of Canon printers, and can also connect to any PictBridge compliant printer. A single USB cable connects the printer to the camcorder, and all printing options can be controlled from the LCD screen.

■ *For more information on this innovative answer to carrying less gear without compromising photo or video quality, visit www.canondv.com.*

Charge!

Some consumer needs are abundantly obvious. Despite the wealth of intelligent technology built into today's generation of digital lifestyle products, digital aficionados have often had their enjoyment interrupted or even curtailed by a simple dilemma: batteries that run low and then take hours to recharge. This is particularly irksome for users of digital cameras, which are high-power, high-drain devices.

Now Rayovac, one of the world's leading suppliers of rechargeable batteries, has unveiled a one-of-a-kind solution to this problem with an innovative system that fully charges batteries in just 15 minutes—at home or even in the car. Rayovac's revolutionary I-C3 (In-Cell Charge Control) technology will not only charge camera batteries in 15 minutes or less, but also inject a charge that will last up to four times longer than for an alkaline battery.

Rayovac's 15-Minute Rechargeable System includes rechargeable nickel metal hydride (NiMH) AA

and AAA-sized batteries and a choice of two-position or four-position chargers. The four-position charger offers a car cord adapter. The technology behind this innovation puts the control of recharging into the batteries themselves, not into the charger. A pressure control mechanism in each battery senses its own internal pressure and then controls its own charge.



Other nickel metal hydride rechargeable batteries can charge in the system overnight, and the I-C3 batteries will work in existing chargers by defaulting to the charge times of those products.

The 15-Minute Rechargeable System is an ideal solution for people with busy lifestyles who can't be bothered with weak batteries and prolonged charge times.

■ *For more information on this ingenious system, click on www.rayovac.com.*

On Display

There's even more great news for digital lifestyle enthusiasts. Though they've been snapping great photos with digital cameras for some time now, many have had a gripe: Camera LCDs are too small to display menus or photos really clearly.

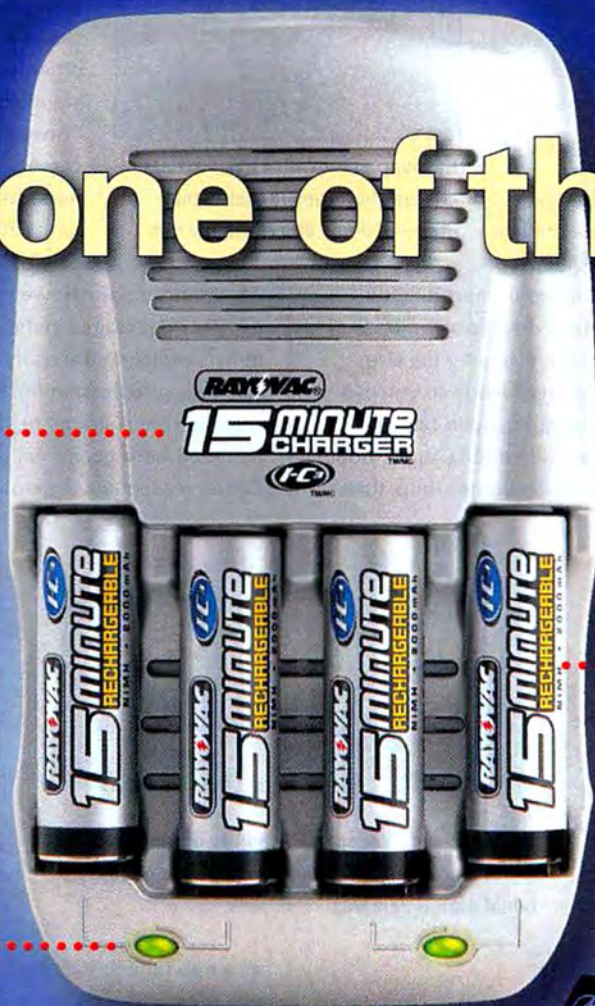
Continued on page 7



Got one of these?

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Introducing the
World's Only
15 Minute
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Up to 4X the Power
of Alkaline in
Digital Cameras

Recharges
up to 1000X



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www.rayovac.com



Continued from page 5

Those days are past, thanks to the technology and intelligence Kyocera (www.kyoceraimaging.com) has brought to market. Though compact and lightweight, the Kyocera L3v and 4v digital cameras sport a super-large 2.5-inch widescreen—more than twice the viewing area of typical digital cameras today. What's more, the LCD features Kyocera's exclusive DayFine LCD technology, which lets users view the screen clearly, even in bright sunlight. This sharpness, clarity, and super-size allows users to more accurately compose their shots before snapping, and then more cleanly review them and share them on-screen with others.

Available with 3.2- or 4.0-Megapixel models, the camera's performance is boosted by a brilliant Kyocera f/2.8 3x zoom lens that produces sharp detail and vibrant color reproduction. A built-in Image Resizing Mode creates a duplicate of any image in the camera, but in a smaller file size that's easy to email to family and friends so you can share your photos without clogging up in-boxes.

In movie mode, users can record AVI (Audio Video Interleaved) movies of up to two minutes long, then play them back on the widescreen LCD or download to a PC. To take full advantage of these and many other superb features, the L3v and 4v have a truly user-friendly menu system, an ergonomic navigational keypad, and convenient dedicated controls to simplify any action.

■ For more information on this exciting breakthrough in digital cameras, click on www.kyoceraimaging.com.

When Content Is King

Whether you buy personal electronic devices to entertain you, to keep you informed, to connect you with friends and colleagues, or maybe all three, ultimately it's the music and the messages that are important. It doesn't matter if you're listening to MP3 tracks, view-



Rayovac's innovative system fully charges batteries in just 15 minutes—at home or even in the car.



The screen of Kyocera's L3v and 4v digital cameras offers more than twice the viewing area of conventional digital cameras.

ing still or motion images, retrieving your e-mail, or talking on the cell phone—you still want easy and reliable access to content. Marginal integration was once a shortcoming of personal electronics, but that's no longer the case, say industry analysts.

"Manufacturers watch consumer behavior. One pattern they clearly see developing is that consumers want smarter connectivity. They no longer want to bother with content-specific devices," says Boyd Peterson, vice president of the Yankee Group's consumer electronics division. Wireless communication is another force driving the change from standalone to integrated devices. The need to physically connect your camera, players, DVD burners, scanners, and speakers together by running cables under carpets, along baseboards, and in the ceiling was

admittedly a pain. However, the humble PC has some distinct advantages in the entertainment arena. Admittedly, predicting trends in any digital market is risky, but it's a sure bet that the PC is undergoing a transformation from a stodgy beige box into a media hub as a result of those consumer demands. Microsoft's Media Center (essentially a media-centric PC on steroids) is an example of that transformation.

The New Face of Entertainment

"Most consumers do not see the PC as an entertainment device," says Peterson, "because it still needs extensive (wired) connectivity with other devices." However, that connectivity is also what makes it ideal for serving

as a hub for sophisticated integrated entertainment and data centers. What's more, says Peterson, compared to other appliances PCs are flexible and cost-effective to update. "Software and hardware upgrades allow consumers to readily reconfigure their PCs, something they can't do with other appliances."

Just as technology has substantially improved

Continued on page 9

Fun shown actual size. Is it a camera with a built-in big screen? Or a big screen with a built-in camera? Either way, the 2.5" DayFine™ LCD on our L3v and L4v digital cameras makes a big difference when it comes to taking and sharing your pictures. It's fun on a larger scale. From the company who believes that even the smallest things can always be improved.



3 or 4 Megapixel Models Available

Wouldn't it be fun to win a free camera? Visit our website and see a demo of our 2.5" DayFine™ backlit LCD, learn about the sharp optics and other things that make this such a cool little camera, and enter to win one. kyocera.com/l3v

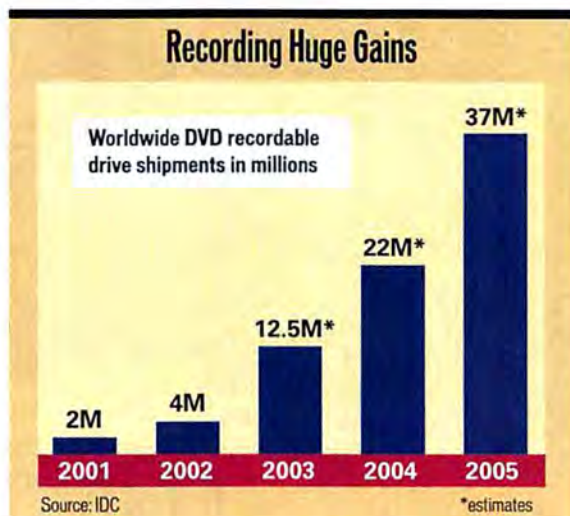
THE NEW VALUE FRONTIER

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Available at these stores and other fine photo specialty retailers:



Continued from page 7 the way we work and communicate over the past decade, it has also changed the definition of entertainment. And while you're thinking about that, consider the following: Not all that long ago, eight-channel televisions were the primary source of home entertainment. On Saturday nights, people went to the movies. Now movies come to you via cable and satellite, and televisions have hundreds of channels. And who could have predicted the ease with which we'd be able to burn our own CDs, film our own movies, and snap our



own digital photos—and then send any of them to our friends and families with the click of a mouse?

As vendors continue to introduce new integrated devices to personalize entertainment and make it easier to access, the transformation of what defines entertainment is sure to continue, and it will be an interesting journey. So, if your world isn't too much with you

already, maybe it's time for you to experience the convenience of getting connected and converged.

Pleasure in a Small Package

iRiver's Digital Music Player Puts It All Together

It goes without saying that music is a central component of the digital lifestyle—arguably the chief component, for many digital enthusiasts. What music lovers want most from their players is the richest set of features possible in a user-friendly, affordable package.

They get all that and more from the latest innovation from iRiver (www.iriveramerica.com): namely, a remarkably small and very lightweight digital music player capable of playing more than 600 hours of digital music.

Like the Apple iPod, the iRiver iHP-120 features a hefty 20-GB storage capacity. But that's where the comparison ends. The iRiver iHP-120's battery life of 16 hours is twice as long as the iPod's. Furthermore, the iHP-120 sports a list of features not found in the iPod, including: an FM tuner; backlit remote with text display; built-in MP3 encoding; optical audio output; built-in voice recording; WMA support; and folder navigation support.

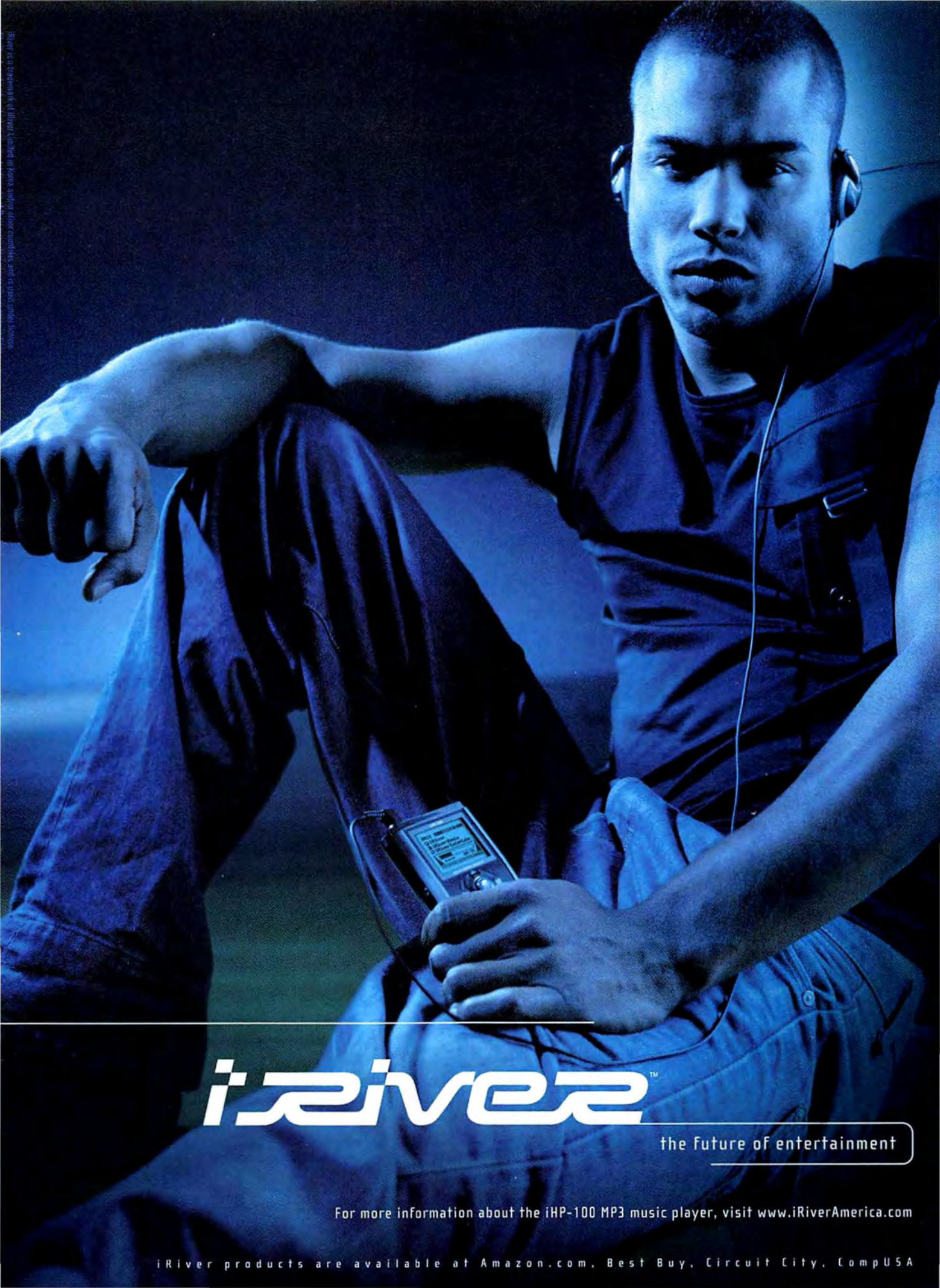
Plus, the iHP-120 just *looks* great. It's encased in a super-sleek magnesium body that houses a USB 2.0 connection—40 times faster than USB 1.0 for ultra-fast transfers—as well as a user-friendly interface that makes finding any song as easy as possible.

Further adding to the pleasure of the digital lifestyle, the iHP-120 comes complete with earphones, a carrying case, an AC adapter, optical input and output, and support for all popular digital music formats. What's more, the iHP-120 is fully upgradeable to future music formats and features.

■ For more information on the iHP-120 and other products tailored for the digital lifestyle, click on www.iriveramerica.com.



The iRiver iHP-120's battery is good for more than 16 hours of audio.



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For more information about the iHP-100 MP3 music player, visit www.iRiverAmerica.com

iRiver products are available at Amazon.com, Best Buy, Circuit City, CompUSA

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Headlining the R-Tools product portfolio is **R-Studio**, a family of data recovery utilities capable of rescuing data on local logical and physical disks as well as remote disks over networks. It doesn't matter whether their partition structures are damaged or deleted. R-Studio also includes support for RAID, dynamic disk for recovering encrypted files, compressed files, and alternative data streams. Flexible parameters give you ab-

solute control over data recovery.

R-Tools' **R-Undelete** is a low-cost, user-friendly, and powerful file undelete solution capable of restoring

R-Studio will rescue your data, no matter how damaged.

deleted files on any valid logical disks visible to the host operating system. Together with R-Studio, R-Undelete can create an image file of any object the two recognize—a very useful capability if there is a risk of total data loss due to hardware malfunction. All data

search, scan, and recovery can be done from this image.

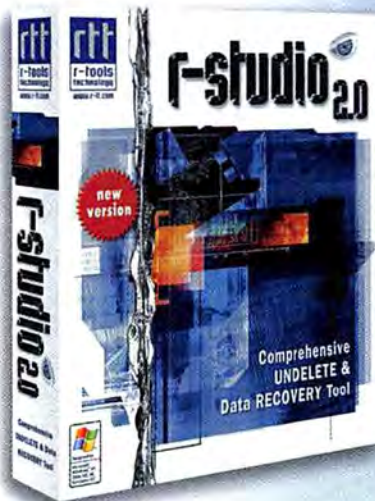
R-Tools' **R-Mail** tool is designed to rescue inadvertently deleted email messages and to recover damaged *.dbx files where folders with email messages are stored.

For users wanting to keep their disks free and clear of unwanted data, R-Tools offers **R-Wipe&Clean**. This highly useful tool, now in the newly-released version 2.0, irretrievably deletes private records of online and offline activities, including temporary Internet files, history, cookies, auto-complete forms, passwords, and other disk-clogging material.

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NEW PRODUCTS

EDITED BY ANNE B. McDONALD

Palm's Power Lineup

Palm takes on beefy Pocket PCs with two new color Tungstens—and throws in an upgraded monochrome Zire to sweeten the pot.



THREE FOR THE ROAD: From left, the Tungsten E, Zire 21, and Tungsten T3.

P D A s

IF YOU'RE wavering between a Palm and a Pocket PC for your next PDA, Palm makes the decision even harder with innovative models that address prior products' weaknesses. I tried out shipping versions of the \$399 **Tungsten T3** and the \$199 **Tungsten E**, as well as the more consumer-oriented, \$99 **Zire 21**. (If you need Wi-Fi and/or phone capability, none of these Palms will be a good fit.)

Palm's business-oriented Tungsten T3—like its predecessors, the Tungsten T and

Tungsten T2—features a case that slides open; but this time, when you pull it down, you get extra display area instead of a dedicated Graffiti input area. With the slider fully extended, the screen resolution is 320 by 480, beating the 240-by-320 displays of Windows

Mobile 2003-based Pocket PCs. Spreadsheet jockeys who use the bundled Documents to Go software will appreciate the extra real estate. If you run older apps that can't use this display, a pop-up Graffiti entry area fills the extra space.

The T3's industrial redesign

puts four program launcher buttons and the central navigation wheel below the display.

Software changes include a small taskbar that sits at the bottom of the collapsed or extended display and contains icons for one-tap access to frequently used functions and features. These include the home screen, the search window, drop-down menus, a simplified Bluetooth configuration screen, input choices (keyboard, the traditional two-pane Graffiti screen, or the newer Graffiti 2 screen with separate input areas for lower-case letters, uppercase letters, and numerals), and—an especially nifty little innovation—a switch that lets you toggle between the traditional portrait display and a new landscape orientation (which shifts the taskbar to the screen's right).

BETTER ORGANIZERS

THE T3 INTRODUCES long-overdue upgrades to Palm's venerable Address and Datebook applications. Renamed Contacts and Calendar, respectively, they're now much

Tungsten E

Palm

★★★★☆

A well-priced lightweight color Palm for users who value a skinny PDA.

Street: \$199

find.pcworld.com/38027

Tungsten T3

Palm

★★★★★

High-resolution Palm display and useful software define this power-user Palm. No Wi-Fi or keyboard.

Street: \$399

find.pcworld.com/38030

Zire 21

Palm

★★★★☆

A budget monochrome Palm suitable for beginners who don't often work in the dark.

Street: \$99

find.pcworld.com/38033

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Palm Tungsten E, Tungsten T3, Zire 21

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Systems

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better suited to the needs of serious business users.

Contacts has new fields for more types of addresses, Web sites, birthdays, and custom entries. Calendar has roomier fields for memos and notes, and a new agenda view shows your next appointment even if it's on the following day. You can color-code appointments, too. Outlook users get new Palm-built software to sync these new fields (which can also sync with a new version of Palm's desktop app).

In addition, the T3 comes with software capable of running Java applets, an enhancement that should expand further the already large universe of Palm-compatible software. And like other recent Tungstens, the T3 ships with music and video playback software, a small but surprisingly decent speaker, and a headset jack (but no headphones).

Outfitted with a powerful 400-MHz Intel XScale CPU and 64MB of RAM, the T3 is a good deal and stands as worthy competition to many of the beefier Pocket PCs on the market, such as the HP IPaq 5150. But for prospective buyers who would be happy with less weight and a little less power in a handheld, Palm introduces the Tungsten E. Measuring less than 0.5 inch thick and weighing only 4.6 ounces, the E competes with

similarly priced thin-and-light Pocket PCs such as HP's IPaq H1945 and ViewSonic's V35.

The noncollapsible E has half as much RAM (32MB) as the T3, and carries a less powerful processor (Texas Instruments' OMAP 311). It hot-syncs via a USB cable instead of Palm's universal charging cradle, and it has a separate charger. The display resolution is 320 by 320 on top of a fixed input area, and you don't

get the new taskbar. The navigation buttons' layout resembles that of older Tungstens. The E does use Palm's new PIM apps, however, and like the T3 it has an SD memory card slot for expandability.

I'd recommend the E to someone who wants a shirt-pocket PDA capable of robust contact and calendar management, as well as multimedia playback. Power users who like a large screen (and don't

care about a keyboard, phone functions, or Wi-Fi) should check out the T3. And for budget-minded beginners, Palm has updated its Zire line with the Zire 21. Like its similarly priced predecessor, the 21 delivers basic PIM functionality on a monochrome screen with no backlight or SD card slot, but the upgraded model has more memory (8MB versus 2MB) and a faster CPU.

—Yardena Arar

Color BlackBerry Wins With Wireless

COMMUNICATIONS

RESEARCH IN Motion's popular BlackBerry communications device is now improved with a color screen and wider global reach for wireless voice mail and e-mail. I tried a shipping **BlackBerry 7230** (available with T-Mobile service plans) and was generally impressed.

In my tests, the quality of phone calls placed within the United States and to Europe was good; RIM says you can use the 900-, 1800-, and 1900-

MHz GSM/GPRS-enabled 7230 as a phone in more than 100 countries. The battery lasted for over 3 hours of talk and data time; sans calls, it survived several days without recharging. Weighing just under 5 ounces, the \$400 7230 totes easily and comes with a pleasant 65,000-color, high-resolution (240-by-160-pixel) screen. But its transreflective display and organizer software can't compare to those of new PDAs such as the color Palms on page 78. And in difficult viewing conditions, its backlight bumps up only a tad.

Using the BlackBerry Web client to sync Outlook e-mail was a snap, but employing it to integrate my business Lotus Notes e-mail took more time. The mail connector software, a separate download, initially

refused to operate; I also had to keep my PC on and Notes open for as long as I wanted to receive e-mail on the 7230, which is not ideal.

Still, if you want to be able to connect almost anywhere your business takes you, this BlackBerry is ripe for picking.

—Aoife M. McEvoy ■

BlackBerry 7230

★★★★★

Research In Motion

Has a phone, multiple-message in-box, calendar, contacts, and Web access; an IT department's setup help is useful.

List: \$400

find.pcworld.com/38036


IN COLOR: RIM's BlackBerry 7230.

Extra-Suite Virus and Spam Protection

SECURITY SUITES

LIKE A SMALL town in a Dashiell Hammett novel, the Internet can be a dirty and dangerous place. The biggest movers in the PC protection business, Symantec and McAfee, sell software to protect your computer from various online thugs. Now, both companies have updated their suites so that one installation routine delivers better anti-virus programs, spam filters, and firewall protection.

Besides saving you money, the suites give you a single, integrated interface for setting up, controlling, and regularly updating the programs. In addition, both suites offer better parental-control tools than you'll find in the also-available stand-alone packages.

I looked at the components of Symantec's \$70 **Norton Internet Security 2004** (Norton AntiVirus, Norton Personal Firewall, and Norton AntiSpam) and of McAfee's \$70 **Internet Security Suite 6** (McAfee VirusScan 8, McAfee Personal Firewall Plus 5, Privacy Service 6, and McAfee SpamKiller Home Edition 5). Neither suite was complete; I assessed a combination of beta and final code in order to evaluate all of the programs.

STOP THE SPAM

THE PROBLEM with spam filters is that so much guesswork is involved, and it's so easy to guess wrong. When first installed, both Norton AntiSpam and McAfee SpamKiller 5 overwhelmed me with a barrage of unfiltered junk. Even worse, they generated a great many false positives—

legitimate mail that they rejected as spam. If you have to scrutinize all your spam every day in search of good messages, why install a filter?

But both proved quick learn-

ers to launch the SpamKiller program to find false positives and then instruct it on handling them. If you have Outlook Express 6 or Outlook with a MAPI e-mail account, you

can teach SpamKiller about missed spam from within your e-mail client, but you have to do it one message at a time.

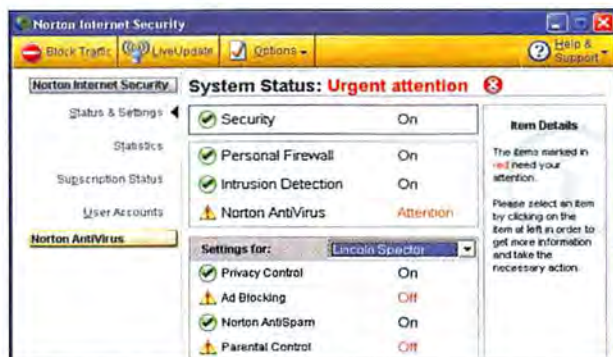
On the other hand, both vendors' firewall and antivirus products are easy to figure out and use. For instance, each company maintains an online database of legitimate programs, and each firewall consults it to see if a program is legitimate and should be allowed free access to the Internet. This reduces the number of times the firewall will interrupt you to ask permission. And both companies' anti-virus programs have clear and pleasing user interfaces. Norton AntiVirus tells you in big red letters when something requires your attention (for instance, if it has been too long since you last scanned for viruses). McAfee VirusScan 8 pops up information about the latest viruses. Each program touts its protection against adware and spyware programs that alter Windows, spy on you, and place advertisements on your screen.

GET ACTIVATED

THIS YEAR Norton has added product activation to its entire 2004 line. When I installed the suite, an applet checked a database on the company's server to make sure that I was not installing the software on too many PCs. This particular activation scheme is far from the worst I've seen. But for users who hate this form of antipiracy protection, it's a point against Norton.

Both suites are likely to protect you against Internet dangers. But Norton gets my nod thanks to its easier and better-integrated spam filtering.

—Lincoln Spector ■



THE ANTIVIRUS SECTION OF Norton Internet Security 2004 uses red letters to alert you to something that needs immediate attention.



SEPARATING THE WHEAT FROM THE SPAM becomes needlessly difficult when McAfee forces you out of your e-mail program.

ers. After I identified incorrect choices, each app took only a few days to reduce false positives to virtually zero.

Norton managed almost as well with reducing the volume of undetected spam, but McAfee never quite got the hang of that. I'm not sure whether it's a slower learner or whether its clumsy design prevented me from properly showing it all of its mistakes.

Whereas Norton AntiSpam integrates well with various versions of Outlook, Outlook Express, and Eudora, McAfee's setup pretty much requires

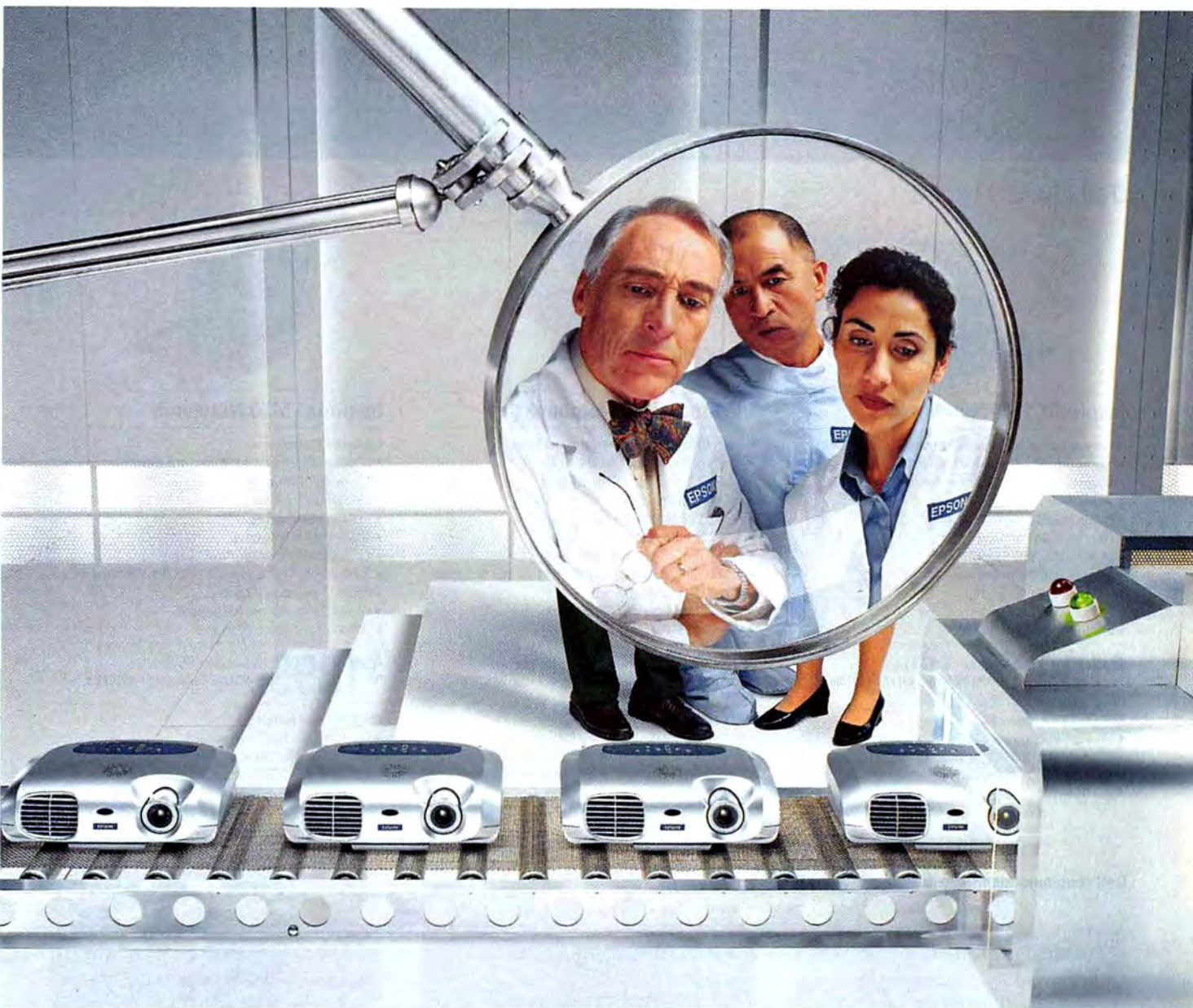
McAfee Internet Security Suite 6

McAfee
Beta software, not rated
Offers good protection, but the spam filter has a clumsy interface.
List: \$70
find.pcworld.com/38042

Norton Internet Security 2004

Symantec
Beta software, not rated
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Groundbreaking Projector Prices

PROJECTORS

IF YOU'VE WAITED for a great deal on a portable projector that you can use at work and at home, get out your wallet now. A clutch of major manufacturers have dropped the price of entry-level projectors to under \$1000—hundreds of dollars below what the lowest-priced starter models cost just months ago. All of these dual-use projectors can display images from a PC or from a video source (such as a DVD player or VCR), which can be useful both in conference rooms and in living rooms.

I tested NEC's \$995 **VT46** and Toshiba's \$999 **TLP-S10U**. Both shipping models have a native SVGA resolution of 800 by 600, but they also can display XGA screens (1024 by 768), after using interpolation to rescale the image.

For the sharpest text screens in a PC presentation, native resolution usually works best. For video display, however, image quality differences between native SVGA and XGA resolutions are less noticeable to average viewers—and that's



THE NEC VT46 (above)
and the Toshiba TLP-S10U.

great news for buyers who might use one of these affordable units to project TV programs or DVD movies.

Both projectors use an LCD instead of a DLP (Data Light Processing) system for their display technology. LCD projectors, including these two, are in many instances pounds heavier than DLP models and generally can't compete with them at displaying bright images with optimum contrast. On the other hand, LCD systems are often less expensive.

The brightness rating on both models is 1200 ANSI lumens, enough illumination to display a presentation in a small conference room with low lighting. But the VT46's \$299 lamp, rated to last 3000 hours, delivers a better cost per hour of usage than the TLP-S10U's \$249 lamp, which is rated at 2000 hours.

Though I found both projectors generally easy to set up and use, the VT46 has several advantages. One is a zoom lens that lets you easily place the projector where you need it and adjust the lens to fit the image to the screen. The TLP-S10U's fixed lens gives you far less flexibility in positioning the projector to get the image size you want. The VT46's inputs (plus an on/off switch)

are conveniently situated on the unit's rear, while the TLP-S10U has its power connection on one side, lacks a switch, and gathers all other inputs on the rear. Both models include remote controls, but the VT46's price also covers a carrying case.

In my tests of each unit at default settings, the VT46 did better at projecting both PC

images (such as PowerPoint slides, digital photos, and test patterns) and video images (from DVD wide-screen movies, cable TV, and an S-Video camcorder). For the most part, the two units displayed SVGA-resolution text and graphics screens similarly, but the VT46 rendered slightly more accurate and more pleasing color.

—Richard Jantz

Microsoft's Tilting Mouse

INPUT DEVICE

HERE'S A MOUSE that takes convenience and comfort to the next level: Microsoft's **Wireless Optical Mouse** with proprietary Tilt Wheel Technology.

The first pointing devices with scroll wheels were revelations, particularly for people who previously had to click through long documents or numerous lengthy Web pages. Now Microsoft has gone beyond that considerable achievement to offer truly smooth vertical scrolling—no more notches with each wheel turn. Even better, the wheel can



MICROSOFT'S tilt-wheel mouse.

now tilt smoothly right and left for horizontal scrolling, making it great for navigating large spreadsheets or other wide documents. Its design is comfortable for both left- and right-handed users.

In addition, battery control has improved over previous versions. The shipping mouse that I tried out worked fine with only one AA battery installed, and it ran even longer with two batteries in place.

—Michael S. Lasky ■

TLP-S10U

Toshiba

★★★★☆

Lighter, but lacks zoom lens and carrying case; can't match the NEC VT46's image quality.

Street: \$999

find.pcworld.com/38048

VT46

NEC

★★★★☆

Low-cost projector with zoom lens delivers good image quality.

Street: \$995

find.pcworld.com/38051

Wireless Optical Mouse

Microsoft

★★★★☆

Smooth-angle scrolling is a worthy mouse enhancement.

List: \$45

find.pcworld.com/38096

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Get Those Business Cards Into Your PC



CARD SCANNERS from
Iris (above) and Alestron.



SCANNERS

I'M AN EFFICIENCY fiend, but I'm also a bit of a cheap-skate—so I wanted to know whether less-expensive business card scanners could digitize a pile of cards as elegantly as the longtime market leader, Corex Technologies' CardScan. To find out, I looked at Iris's \$170 **Business Card Reader II** device (with Cardiris 3 Software) and Alestron's \$160 **PenPower WorldCard Office 5** scanner, as well as at Corex Technologies' \$249 **CardScan Executive** package (with new version 6.0.5 software).

None of these shipping card scanners met all my expectations. It's a tall order, but to really save time, I'd like a unit that recognizes all of the data correctly on its first pass and that automatically launches its software when a card is inserted. Of the three I tested, CardScan came the closest to my ideal, but even it isn't perfect.

THE COMPETITION

THE **WORLD CARD Office 5** scanner reads both sides of a double-sided card, but its software doesn't handle such duplex scanning very gracefully: It shows you the contact information on two screens, not one. Still, you can search for duplicates and merge records. The **WorldCard** scanner was a bit noisy, and you have to press a button to start scanning. Its software's various views of your information are not as clearly labeled as the other programs', but **WorldCard's** OCR gave **CardScan's** a run for its money on accuracy.

The card-editing view in the **WorldCard's** software comes with useful tools such as the option to recognize the image again, and it enables you to highlight sections of the card image and then right-click to

pick the field that each should appear in. Another nifty feature is the **Correction** window, which permits you to click on a field and see the snippet of the card image that the scanner recognized and placed into that particular field.

Iris's **Business Card Reader II** is a lightweight and quite compact scanner that operates quietly. Unfortunately, however, feeding

cards through it correctly is difficult, and it doesn't do duplex scans. In addition, its **Cardiris 3** software doesn't open a card file automatically when you launch the program; you must open the database that you want the card to

automatically recognize it. But in my experience, if **Cardiris** fails to recognize the text accurately on the first attempt, it's unlikely to do any better the second time around.

THE BIG GUN

COREX'S **SCANNER**, the biggest of the three, worked the most smoothly and quietly. Thanks to the feeder's guide, I had no problem with jammed cards, and scans started when I fed a card. The unit's updated **CardScan** software has a cleaner interface than **WorldCard Office 5's**, and it is more elegant than **Cardiris**. **CardScan** also offers more help on scanning two-sided cards.

Of the three products, **CardScan Executive** is the only one that provides online contact storage (on **CardScan.net**); it also includes a service (called **AccuCard**) that assists you with automatic contact updates. All three of the scanners



COREX'S
CardScan Executive.

go to. On the plus side, its search functions are flexible and easy to use. And you can drag and drop text from a card image into the appropriate fields, and the software will

link to your PC via USB 1.1, and all have export features for sending your contacts to Outlook or to Palm Desktop.

Alestron's **PenPower WorldCard Office 5** package is my budget pick on the strength of its OCR accuracy. But I recommend the better-designed and more durable Corex **CardScan** products for office workgroups and for individuals not scared off by the price.

—Rebecca Freed ■

Business Card Reader II

Iris

★★★★☆

Flexible and versatile software, but the OCR doesn't cut it; scanner is a bit frustrating to use. Street: \$170

find.pcworld.com/37910

CardScan Executive

Corex Technologies

★★★★☆

Chunky scanner purrs along; new software creates clean records that are easy to edit and export. Street: \$249

find.pcworld.com/38024

PenPower WorldCard Office 5

Alestron

★★★★☆

Fairly accurate records, though the software is somewhat quirky and the tiny scanner is a bit noisy. Street: \$160

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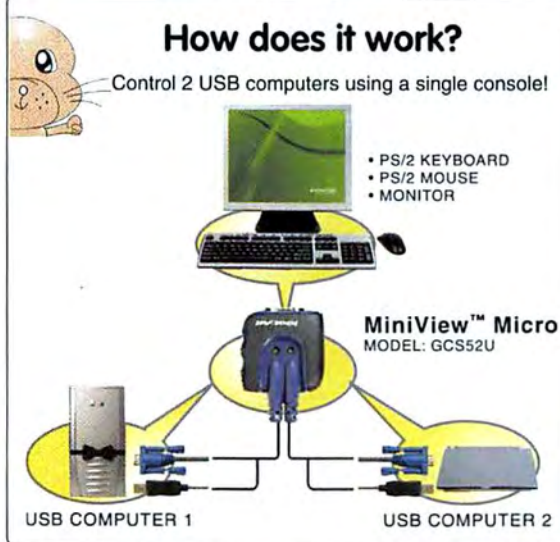
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tion for data archiving due to the media's strong record for error correction. And because some DVD set-top recorders support DVD-RAM, the format's inclusion here may enable you to use discs that you created on your living-room recorder with your PC.

I had practically no trouble switching among all five media types, though the included BHA software sometimes performed sluggishly—especially when I used DVD+RW and DVD-RW media.

If you feel the need for more hand-holding or a better software bundle, you might consider Iomega's \$279 Super DVD Writer All-Format Drive, which uses the same drive mechanism as the LG but adds a DVD Wizard to help you select your media based on the task you want to perform.

The product's minor quirks notwithstanding, I recommend LG's Super-Multi DVD Drive GSA-4040B. It's agile, it can handle various formats, and it's relatively cheap, too.

—Melissa J. Perenson ■

Super-Multi DVD Drive GSA-4040B

LG Electronics

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First Linux Tablet PC

L I N U X

THE FIRST Linux-based tablet, Desktop Evolution's \$1900 **De-Tablet**, is a good effort, but its software needs additional refinements before it will please the tablet-toting masses.



DESKTOP/LX Tablet Edition's clean interface.

The matte-black shipping De-Tablet, better known as the Toshiba Portégé 3500, runs on Lycoris's Linux distribution, Lycoris Desktop/LX Tablet Edition. It comes configured with a 1.33-GHz mobile Pentium III processor, integrated Wi-Fi, ethernet, a V.92 modem, and SD and CompactFlash memory card slots.

The only three tablet-specific adjustments that Lycoris made to the operating system are the virtual keyboard, the battery meter located in the taskbar, and touch-screen functionality. One warning: The De-

Tablet doesn't as yet do some things you'd expect a tablet to do, such as handwriting recognition and portrait mode (those features are expected in the next release).

I found Desktop/LX Tablet Edition relatively easy to configure and use. When I logged in to KDE (K Desktop Environment), a welcome screen offered me the option of starting a video tour or launching the Help Center. For further assistance, audio-visual guides called Viewlets provide animated step-by-step instructions; you can launch these from the main menu's Help and Support section.

After plugging in an ethernet cable and then logging out and back in again, I was able to browse *PC World's* internal

network and the Web. The software at once recognized a thumb-drive storage device and my Minolta Dimage digital camera. But I noticed a definite lag between entering data on the tablet (via stylus) and getting a response from it.

The De-Tablet is certainly usable, but in my opinion the software needs to be beefed up before this package will be fully on a par with Microsoft Windows-based tablets.

—Alexandra Krasne ■

Desktop/LX Tablet Edition (on De-Tablet hardware)

Lycoris

★★★☆☆

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Just press



Secure Instant Messages

SECURITY SOFTWARE

INSTANT MESSAGING is wildly popular but not necessarily secure. For worried messengers, Zone Labs—maker of the reliable ZoneAlarm personal firewall—now offers **IMsecure Pro** software. In my tests of a shipping copy, the \$20 IMsecure Pro kept unwanted and

Blocker, which blocked and logged unsolicited chat messages, was another favorite.

Using IMsecure to look at both incoming and outgoing messages of an IM conversation encrypted the chats I engaged in, even if the other chatter used a different IM program with IMsecure. I en-



IT'S EASY TO FIGURE OUT how to tweak the default settings in Zone Labs' IMsecure Pro software to suit your IM security needs.

dangerous messages at bay, albeit with a few kinks.

IMsecure Pro supports such popular IM clients as AOL Instant Messenger, MSN Messenger, Yahoo Messenger, and my favorite universal client, Trillian—but not ICQ or IRC. (There also is a free basic IMsecure program.)

The downloaded software, which took only four mouse clicks to install, is easy to use. Like ZoneAlarm, IMsecure Pro has an uncluttered layout: tabs along the left, descriptive text on each screen, and a large Stop button at the top to quickly shut down a session.

Along the same lines as a firewall, to work properly IMsecure Pro must be running before you start an IM chat session. I especially liked the software's "ID lock," which blocked me from inadvertently sending any personal information during a chat session; this feature would also stop a Trojan horse from doing the same thing. IMsecure's Spam

joyed being able to allow or deny file transfers, voice, and video to the people who were sending me messages, and to add a password to lock security settings if someone else were to use my computer.

IMsecure Pro's defaults performed well, but when I ratcheted the program up to High for added security, the software repeatedly sent notes to my IM buddies and me saying that potentially harmful content had been removed from each sent and received IM. But none of the IMs struck me as harmful, and the constant reminders got a little tedious. Resetting to Medium put an end to the incessant warnings.

—Victor R. Garza ■

IMsecure Pro

Zone Labs

★★★★☆

A reasonably priced, must-have tool for security-minded IM users; no support for IRC and ICQ chat.

List: \$20

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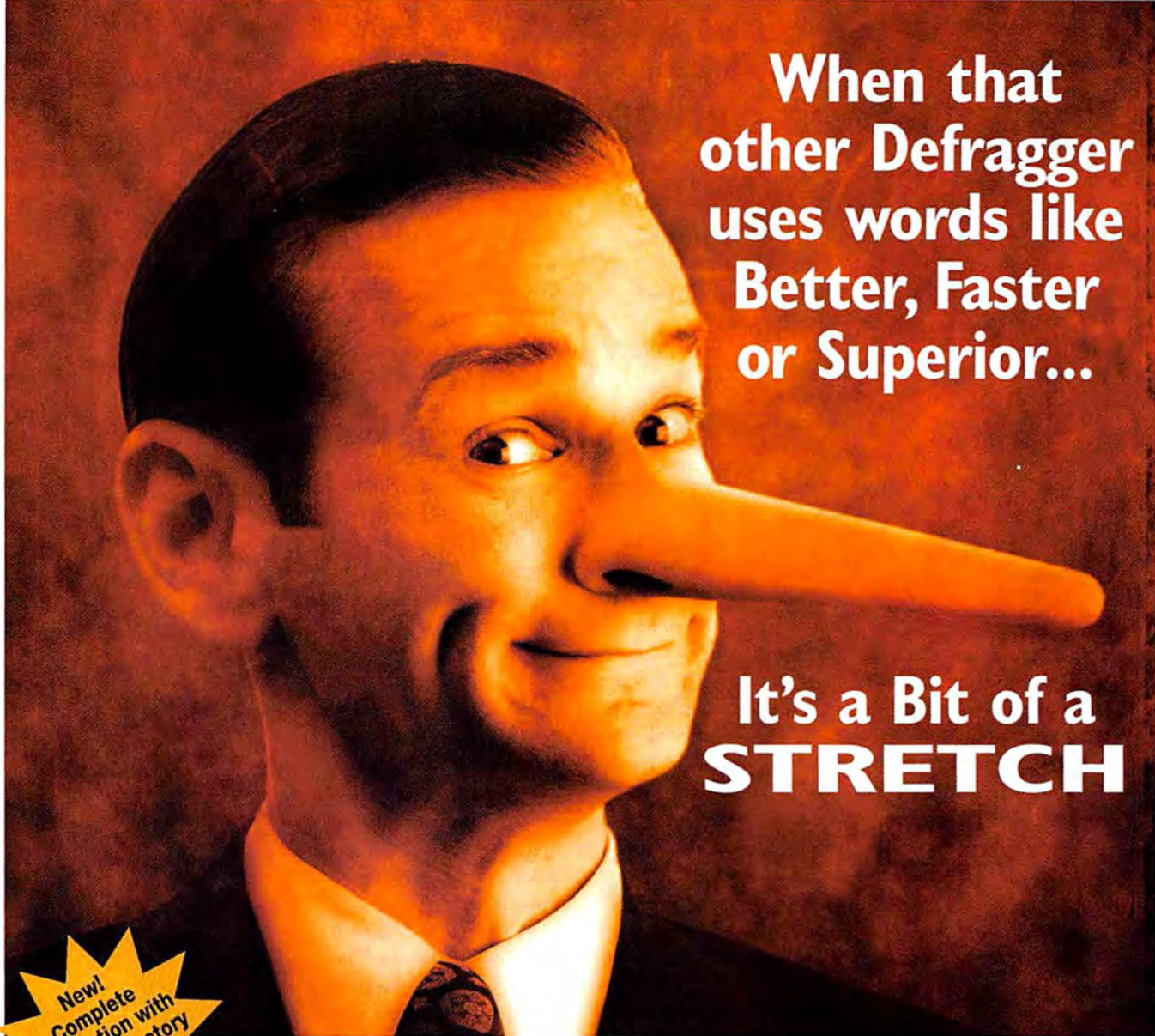
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Expand a Wireless Network's Range



NETWORK RANGE
extenders from
Buffalo (left) and
D-Link.

WIRELESS NETWORKING

IT DIDN'T TAKE long for the wireless network in my home to become a necessity. Still, no matter how I tweaked the settings, the back patio remained a no-browse zone. But a few seconds after plugging in a wireless range extender, I was surfing among the fuchsias at full network speed.

I tested two products: the \$85 **AirStation Wireless Compact Repeater Bridge-g WLA2-G54** from Buffalo Technology, and the \$70 **AirPlus Enhanced 2.4GHz (802.11b) Wireless Range Extender DWL-800AP+** from D-Link. Both shipping units boosted the strength and distance of the signal from my wireless access point by about 50 per-

cent. (The D-Link AirPlus also functions as a wireless access point, but I tested it only as a repeater for my network's existing wireless access device.) The "sweet spot"—defined as the distance from the access point within which you get a network's top wireless speed—increased from about 20 feet to 30 feet, and my network's maximum reach (with speeds dropping to 1 megabit per second on the periphery) grew from about 60 feet to 90 feet. Near the edge of the range, however, Web pages loaded much more slowly than they did inside the sweet spot.

Installing the extenders on an existing wireless network involved using a Web-based

wizard to enter the IP address and other network settings I received from my Internet service provider. And adding an extender was just a little bit more complicated than installing one at the same time as installing a network. My installation went smoothly for the most part; anyone who has ever installed a wireless network should have no problem getting a repeater in place. In fact, the repeater appears as a separate network when your computer's wireless adapter scans for access points.

YOUR SPEED NEEDS?

ALTHOUGH BOTH repeaters are able to extend the range of wireless access points from other vendors, each of them added more signal range and strength when connected to an access device made by their own vendor.

The Buffalo AirStation repeater boosted the signal from the company's AirStation G54 54-mbps wireless access device at the full 802.11g speed of 54 mbps. On the other hand, the repeater topped out at 11 mbps when I used it to extend the signal of a D-Link DI-614+ wireless router, although even this may be more speed than you really need. I could reach the D-Link AirPlus extender's top speed of 22 mbps only when I used a D-Link PC Card adapter that supports the higher speed to connect to a D-Link access point.

The Buffalo AirStation's performance was distinctly a notch above that of the D-Link AirPlus, regardless of the network setup: Its signal was a few kilobits faster, and I found

QUICK TAKES

More Than a Good Gig (of Music)

WANT TO carry 1.5GB of music in an MP3 player about the size of a deck of cards? The \$300 Rio Nitrus from Rio Audio is one of the best units I've tried. I stuffed over 17 CDs' worth of music into the tiny hard drive-based player and got over 13 hours of playback on a charge. And there were no skips or stutters either, whether I was jogging or biking on rough roads. Further, the device's wedge shape helps it slide easily and comfortably into almost any pocket. On the down side, this player uses various combinations of jog dial, menu selector button, and joystick to maneuver through all that music. But the LCD is a bit too small to view all these choices. If you buy this player, be prepared



to spend time on your PC drawing up multiple playlists. find.pcworld.com/38045

—Tracey Capen

AirPlus Enhanced 2.4GHz (802.11b) Wireless Range Extender DWL-800AP+

D-Link Systems

★★★☆☆

Fills in home or small-office wireless gaps, but the increase in signal range and strength is slightly less than that of the AirStation.

Street: \$70

find.pcworld.com/38006

AirStation Wireless Compact Repeater Bridge-g WLA2-G54

Buffalo Technology

★★★★☆

Performs as advertised and is easier to install than the competing D-Link product, although the device may be overkill for smaller spaces.

Street: \$85

find.pcworld.com/38009

that its range extended a couple of feet farther than that of the AirPlus whether linked to a Buffalo access device or to one from another vendor.

If the signal strength of your small-office or home wireless network comes up just a little short, a range extender can make a major difference in coverage—assuming that you are willing to pay \$70 to \$85.

—Dennis O'Reilly ■

Supercharging Productivity: An Essential Guide for Gigabit Ethernet and Hyper-Threading Technology

Brought to you by



◆ By Carol Hildebrand

Although most managers think technology is a competitive advantage for large companies, nowhere is it more important than for the small to medium business. And more than ever, these businesses depend on technology to power their economic engine.

Leveraged wisely, technology can help companies work smarter and be more productive, driving down costs at the same time. Indeed, technology can assist small and medium businesses (SMBs) by providing them the necessary productivity to push their businesses beyond their limits.

How important is the desktop when conducting day-to-day business? Answer — very important as a substantial amount of business data can now be found on the desktop. Being able to quickly create and share that data should be a top priority for businesses of any size. And a key success factor in utilizing and sharing information lies in a business's decision to invest in new desktops that leverage innovative technologies for efficient and enhanced processing of information and applications. Although SMBs constantly juggle the tradeoff between cutting-edge technology and budget constraints, the investment can pay off in terms of productivity gains.

According to "The Corporate Refresh Cycle Grinds into Motion," a 2003 report from IDC, the tough economy has forced some companies to cut costs by delaying desktop and notebook upgrades. The result: lost productivity. "An institution can stretch the replacement cycle only so far and then it starts to cost itself money, in both hard dollars and opportunity costs," states the report.² Not only that, but many small to midsize businesses strug-

gle with IT resources. Many cannot afford a large full-time IT staff and depend on the services of one or two IT professionals for the full gamut of services. As a result, SMBs generally cannot afford — either in terms of budget or manpower — to implement technologies that don't easily work within the framework of their existing infrastructure.

An Intel® PRO Gigabit Ethernet Network Connection can enhance desktop throughput, while an Intel® Pentium® 4 processor with Hyper-Threading Technology¹ can enhance a desktop's ability to get the full use out of a Gigabit link.

All this is playing out in a business climate characterized by even heavier demands on desktop performance. Users are increasingly running multiple applications simultaneously, while demanding network band-

width for shared applications and rich-media content. Based on recent usage trends, desktop and network performance will certainly face increasing demands. According to the IDC report, "If your organization hasn't upgraded its client since before the Millennium, now is the time to get started. From now on, older clients will create more and more of a drag on competitiveness and profits."²

Gigabit Ethernet in Conjunction with Hyper-Threading Technology: An Answer for the SMB Market

Dell desktops and workstations coupled with both Intel® PRO Gigabit Ethernet³ and Intel® Pentium® 4 Processors with Hyper-Threading Technology¹ provide a solution to small and midsize businesses looking for a performance boost. By combining Intel PRO Gigabit Ethernet and Pentium 4 processors with Hyper-Threading Technology — which now come standard on many Dell™ OptiPlex™ business desktops and Dell Precision™ workstations — IT managers at businesses may be able to realize outstanding performance improvements at minimal investment.

"Dell is bringing Gigabit Ethernet to the industry mainstream by taking a relevant technology, providing it with a stable platform and offering great value through our direct model. That's important to our customers when you think about how networks are going to be used in the future."

Frank Muehleman, Senior Vice President and General Manager, Americas Small and Medium Business Division, Dell Inc.

Indeed, 2003 is turning out to be a watershed year for Gigabit Ethernet desktop connections. Prices on the technology have declined, and the technology has matured as companies such as Dell have incorporated Intel's PRO Gigabit Ethernet into many of its standard desktop profiles. Not to mention, Dell also offers Gigabit-enabled PowerConnect switches to complete the connection from the desktop to the server. In the past few months, Gigabit Ethernet to the desktop has moved beyond specialized and high-tech companies to ordinary businesses and applications — a clear sign that the market is maturing. For example, as of 2003 year-to-date (August 2003), Dell has sold over 40% of its desktops in the U.S. with Intel PRO Gigabit Network Connections to small and medium-sized businesses.

According to "Supercharging the Desktop," a special report from Network World, the Dell'Oro Group estimates that the number of Gigabit Ethernet network connections over copper ports installed on network switches will have jumped from 2 million last year to 5 million this year, and will jump again to about 20 million in 2005.⁴ This is a significant number considering desktop connections account for the majority of Gigabit Ethernet over copper ports.

Most often what justifies the upgrade for these users is not a single killer application. Rather, it's the promise of enhanced sys-

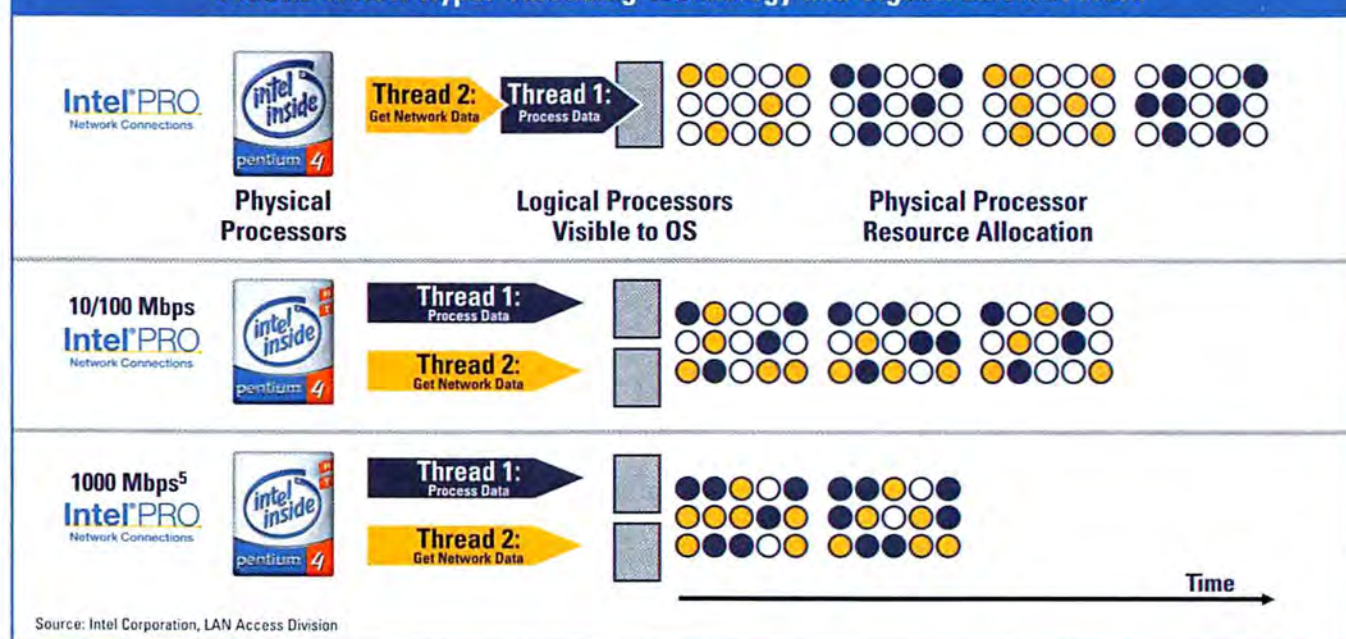
tem performance to meet users' intense multitasking needs as applications become more bandwidth-intensive and users more sophisticated. "Desktop applications used to consist of some e-mail, Web browsing, and Microsoft™ or Lotus™ applications; however, users are now doing real-time virus scanning while real-time network applications are being pushed to the desktop," notes Indraj Gill, Director of Marketing, OptiPlex Desktops, Dell Inc.

Businesses are also leveraging the network to perform such bandwidth-intensive tasks as application and operating system upgrades, as well as hard-disk backups. Meanwhile, applications and files are getting larger, with more graphics and multimedia content. "Put all that together, and the time it takes to get from the desktop through the network to the server gets longer," says Gill. "So Gigabit Ethernet to the desktop in conjunction with the Intel® Pentium® 4 processor with Hyper-Threading Technology¹ can enable users to increase their productivity by getting data faster and doing more simultaneously."

The Need for Speed

How much faster? With Intel® PRO Gigabit Ethernet Network Connections, Dell desktops and workstations can receive throughput between 500 and 800 megabits per second, the same as or faster than hard disk transfer rates, and data gets to end users 5 to 8 times faster than with traditional Fast Ethernet (100 megabits per second) connections.⁵ The Intel Pentium 4 processor with Hyper-Threading Technology further enhances a desktop's ability to get the full use out of a Gigabit Ethernet link. What is Hyper-Threading Technology? Hyper-Threading Technology is an enhancement to the Intel NetBurst™ microarchitecture that allows two threads or instruction streams to run independently and in parallel on a single Intel® Pentium® 4

FIGURE 1: How Hyper-Threading Technology and Gigabit Ethernet Work



processor. The processor allocates its execution resources — including cache memories, execution units and buses — between the two logical processors (See Figure 1).

"Intel® PRO Gigabit Network Connections and Intel® Pentium® 4 Processors with Hyper-Threading Technology" complement one another to maximize desktop network application performance."

John Zanol, Director of LAN Access Division Marketing at Intel.

Recent benchmark test results help support this claim. VeriTest™, an independent technology testing lab, reported testing results from the combination of Gigabit Ethernet and Hyper-Threading technologies in April 2003 after being commissioned to do so by Intel.⁵ In one test, VeriTest tested the technologies on desktops with simultaneous tasks such as downloading files from a network shared drive while converting a PowerPoint presentation to a portable document format (PDF). VeriTest compared a desktop with the Intel® PRO/1000 MT Desktop Adapter and an Intel® 2.8GHz Pentium® 4 processor with Hyper-Threading Technology¹ with a similarly-equipped desktop with the same processor (but no Hyper-Threading capability) and Fast Ethernet (100 Mbps). The results of this test scenario showed that the desktop using both Gigabit Ethernet and Hyper-Threading Technology achieved a performance increase versus the same desktop equipped with Fast Ethernet and no Hyper-Threading. Even more impressive, the desktop equipped with the Pentium 4 2.8GHz processor and Hyper-Threading Technology and a Intel PRO/1000 MT Desktop Adapter converted the PowerPoint presentation to an Adobe PDF format almost 4.90 times faster than a Intel® Pentium® III desktop with Fast Ethernet and no Hyper-Threading, which is a typical configuration for a PC purchased several years ago. However, when today's desktop with Hyper-Threading Technology was coupled with a Fast Ethernet connection at 100 Mbps, the performance improvement was only 2.99 times faster than the Pentium III desktop.⁶ The complete results of VeriTest's networking multi-tasking testing are reproduced from its report in Figure 2.⁷

Gigabit Ethernet and Hyper-Threading Technologies should also boost network performance, helping to enable IT managers at small to midsize businesses to maximize their resources. As more and more tasks — such as updating software, troubleshooting hardware, and performing virus scans — take place on the corporate network, IT managers need to be able to do

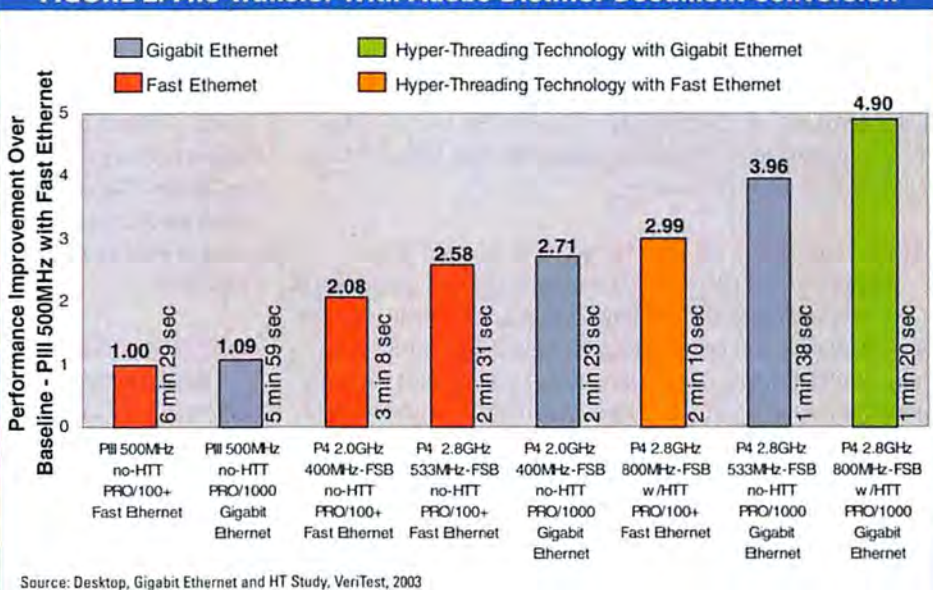
these jobs with minimal impact to user performance. Desktops with an Intel® PRO Gigabit Ethernet Network Connection and a Pentium 4 processor with Hyper-Threading Technology can also help boost servers to top performance across the network by minimizing the amount of processing time for simultaneous tasks. Combine these servers with affordable Gigabit network switches from Dell, and you can help ensure powerful networking speeds.

Counting the Cost

For small to midsize businesses, price is always a determining factor when it comes to technology implementations. With Gigabit Ethernet's interoperability with existing 10/100 technology, businesses can implement this technology at minimal investment and in a staged approach over time.

With the Intel® PRO Gigabit Network Connection now available on most of Dell's OptiPlex business desktops and Dell Precision workstations, implementation can simply be a part of scheduled desktop upgrades. In fact, a full range of Dell products, from switches and servers to storage solutions, support Gigabit Ethernet. Furthermore, many businesses can deploy Gigabit Ethernet to the desktop on a building's existing Category-5 copper cable, simplifying the implementation process. And Category-5 cable is used by more than 85% of current network installations, according to past surveys by Sage Research.⁴ Being able to leverage the same cable for 10 megabit, 100 megabit and up to one gigabit per second connections allows

FIGURE 2: File Transfer with Adobe Distiller Document Conversion



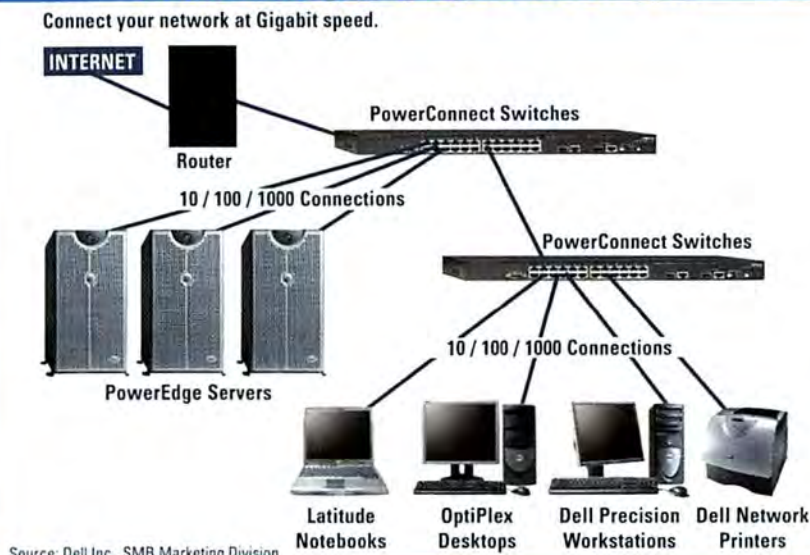
businesses to make a gradual transition while preserving communications for legacy systems. Most important, Gigabit Ethernet's benefits are built to last, providing businesses with plenty of headroom to expand and build on existing technology (See Figure 3).

Why are SMBs well positioned to leverage new technologies? Answer — because SMBs tend to have the visibility and

flexibility to determine what IT products need to be upgraded, the improvements to performance and productivity they'll realize, and what it will cost. In the end, providing headroom for future growth and supplying employees with the technology tools to boost productivity will impact the bottom line. Any technology that can assist small to midsize business in maximizing their productivity while leveraging existing budgets and infrastructure is sure to be a winner.

Carol Hildebrand writes frequently on a variety of business and technology topics. She can be reached at cjhilde@comcast.net.

FIGURE 3: Integrating Gigabit Into Your LAN



The Top Five Things an SMB Should Know About Gigabit Ethernet

Intel[®] PRO Network Connections

MAJOR ADVANTAGE FOR MINIMAL COST.

Gigabit Ethernet technology when implemented across a network and desktop can boost performance as much as eight times that of Fast Ethernet.¹ It can transform the rate of network data flow, supercharge desktop productivity and help reduce bottlenecks; and it can do so at minimal investment. For example, Intel PRO Gigabit Network Connections are standard on a range of competitively-priced Dell IT products.

DEPLOY EVERYWHERE WITH MINIMAL DISRUPTION.

Gigabit Ethernet allows you to migrate to the next generation of networking with standard Category-5 Cabling. For a small business network, Gigabit over copper offers the ideal solution. It's simple and cost-effective to deploy, making use of your existing cabling without any re-wiring. You can improve performance while balancing your budget.

INCREASED PERFORMANCE FROM SERVER TO DESKTOP

The desktop is the premier business tool for small to midsize

businesses today. Workers depend on it to create and share information and collaborate with workers on a daily basis. So it makes sense to boost the performance of both the desktop and the network that supports it.

AN INVESTMENT FOR TODAY AND TOMORROW

Interoperability testing means that you can deploy Gigabit Ethernet anywhere on your network with complete confidence. The auto negotiation feature means that your network components — desktop, switches, and servers — will automatically adjust their transmission speeds when components are upgraded to Gigabit. This makes your transition to a faster network and a more productive office possible in a staged approach. Your investment in your existing structure is maximized — not rendered obsolete.

EASY TO INSTALL AND MANAGE

Gigabit Ethernet is not only backwards compatible with 10/100 Ethernet, but it's easy to install on an incremental basis. For example, it can be deployed as a business upgrades its systems and by adding an all-Gigabit switch to complete the connection from the desktop to the server. Also, Intel's PROSet Utility can provide fast and easy driver maintenance.

For more information on Gigabit Ethernet, check out "Gigabit to the Desktop: All Systems Go!", an informational Web cast at www.dell.com/gigabitwebinar or call 1-888-809-3355.

1. Look for systems with the Intel[®] Pentium[®] 4 Processor with HT Technology logo which your system vendor has verified utilize Hyper-Threading Technology. Performance will vary depending on the specific hardware and software you use. See <<http://www.intel.com/info/hyperthreading>> for more information.
2. "The Corporate Refresh Cycle Grinds into Motion", IDC, Roger L. Kay, Crawford Del Prete, April 2003.
3. This term indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1GB/sec. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.
4. Supercharging the Desktop, Special Report Produced by Network World, Written by Elisabeth Horvitt, 2003.
5. Desktop systems use a 32 bit PCI interface, which limits Gigabit performance to about 500 Megabits per second. Servers and high end workstation systems (such as the Dell Precision 450) with 64 bit PCI interfaces can achieve speeds exceeding 800 megabits per second.
6. "Combining Gigabit Ethernet and Hyper-Threading Technology in the Desktop for Improved Office Productivity, a Test report prepared under contract from Intel Corporation", VeriTest, April 2003.
7. Based on Intel reported results as of April 2003, "Combining Gigabit Ethernet and Hyper-Threading Technology in the Desktop for Improved Office Productivity, a Test report prepared under contract from Intel Corporation", VeriTest, April 2003. These results are provided for information and comparative purposes only. Actual performance results will vary upon application used, system used, configurations, benchmarks, and other variables.
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Dell desktops featuring Intel® PRO Gigabit® Ethernet network connections and Intel® Pentium® 4 processors with HT Technology can help boost the efficiency and productivity of your employees. Deploy system updates, new applications and software images at tremendous speeds when you combine an Intel® PRO Gigabit network connection with a Gigabit network switch. And, you'll enhance system responsiveness and improve productivity in multi-tasking environments when using Intel® Pentium® 4 Processors with HT technology.

By combining these two breakthrough technologies, productivity gains can be huge. Not to mention, Dell's award-winning service and support is always there to help, so you get ultimate peace of mind. So call or go online now and find out how Dell can take your business to a whole new level.



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FOR DEVICES THAT CLAIM TO AID PRODUCTIVITY, PCs certainly waste a lot of our time. Menus of cumbersome click-throughs, frustrating software “features,” and poky photo transfers are just a few of the many tech-related time sinks we’ve all grown used to. But it doesn’t have to be that way. We’ve assembled a team of time-saving experts to help you save hours on your computing chores. ►



SPEED UP WINDOWS

By Scott Dunn

Automate Maintenance

DEEP DOWN, I know I should perform regular disk maintenance to keep my system running at its best. But at least (unlike with real housekeeping) I can make Windows clean up after itself, leaving me time to do other work (or download more tunes). The easiest way to set up basic maintenance in Windows 98 and Me is to choose *Start•Programs•Accessories•System Tools•Maintenance Wizard*. Follow the prompts to make ScanDisk, Disk Defragmenter, and Disk Space Manager run automatically at a scheduled time. The wizard's *Custom* option on the first screen lets you disable some start-up applications, as well. In other Windows versions, you have to add similar utilities to the Scheduled Tasks folder manually: Choose *Start•Programs [All Programs in XP]•Accessories•System Tools•Scheduled Tasks*. Then double-click the *Add Scheduled Task* icon, and let the wizard guide you through automating your chosen utility. Repeat for each additional tool you want. If you need more help, consult our *Windows Tips* for September (find.pcworld.com/37973) and February (find.pcworld.com/37976).

Hibernate to Accelerate

NOW FOR MY FAVORITE time-saving tip: Shutting your PC down every night is a good way to save energy, but it's no way to save time. Windows' hibernation feature avoids the slowdown of exiting and restarting Windows. When you need the PC again, it quickly restores any applications you were running to the way you left them. Unfortunately, not every computer can hibernate. Win 9x PCs with FAT32 hard drives, for example, can't do it. How do you know if your system qualifies?

In Win 2000 and XP, log on as the administrator. In the Address bar of any folder or Internet Explorer window, type **control panel\power options (control panel\power management for Windows 98)**, and press **<Enter>**. If the resulting dialog box has a *Hibernate* tab, you have passed the first hurdle. Click that tab and see whether your machine meets the requirements under *Disk space for hibernation*. Finally, check the *Enable hibernation* box, and make sure that you don't get any error messages. The next time you choose *Start•Shutdown* (in Win 98, Me, or 2000), select the *Hibernate* option in the Shutdown Windows dialog box and click *OK*. In Windows XP, choose *Start•Turn Off Computer*, and then press **<Shift>** to transform the *Stand By* button into the *Hibernate* button. The *Stand By* setting doesn't completely shut down your system, as hibernation does; it's a lower-power mode that's useful when you'll be away from your PC for a while.

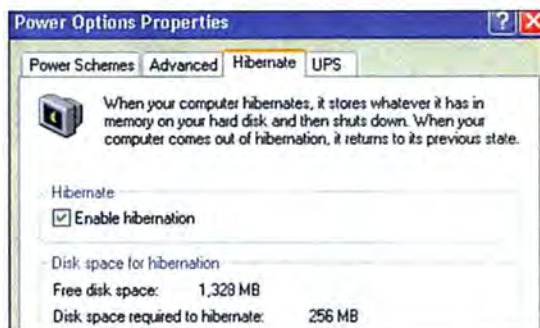
Limber Up Your Log-On

IF YOU CAN'T USE the hibernation feature, the best way to speed up logging on to Windows is to reduce the number of applications your system launches each time you enter your account. In fact, you should do this even if you can use Hibernation mode. There are many ways to discover all the hidden programs that get

launched at start-up, but I prefer Mike Lin's freeware Startup Control Panel (available at find.pcworld.com/37319). Browse the tabs, uncheck unneeded items, and experiment until your PC starts up with just the apps you want.

Have Explorer Made to Order

I SEEM TO LAUNCH and close Windows Explorer a thousand times a day, and I don't have the spare time to dig through the folder tree each time to find the folder I want. So instead, I create custom shortcuts that launch specific Explorer windows set to the folders I use most often. You can customize other attributes, too,



ENABLE HIBERNATE in this box to save time booting your PC. Make sure you have enough disk space to use the feature.

such as whether the shortcut launches a window with the file tree pane. The full scoop is at find.pcworld.com/31913.

Master the Mouse

MOVING A SLOW MOUSE cursor all around the screen can be a drag. So if I'm working on a PC with a poky pointer, I head for the Mouse control panel. In the Address bar of any folder or Internet Explorer window, type **control panel\mouse** and press **<Enter>**. The tab you click depends on your mouse driver: It may be named something like *Pointer Options* or *Motion*. In that tab, look for a control that lets you adjust the pointer speed. Drag the slider toward *Fast* if getting the pointer to its destination takes too much effort. Move the slider back toward *Slow* if you find you're losing accuracy.

Many mice also support an option for moving the pointer disproportionately far-

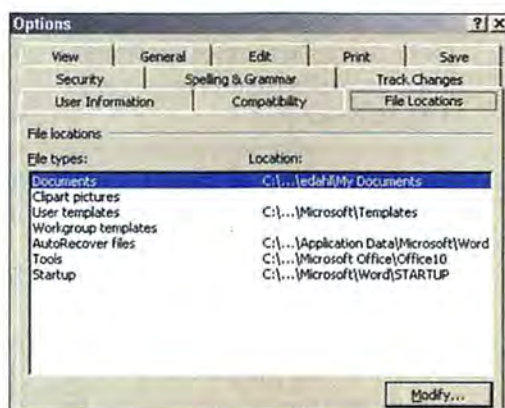
ther as you drag the mouse faster. To activate this feature, look for an *Acceleration* setting; you may have to click an *Advanced* or an *Accelerate* button to see it. For some mouse drivers, this feature is named *Enhance pointer precision*. Check this option (if applicable), and pick a sensitivity level. Experiment until you find speed and acceleration levels that feel comfortable to you.

Set Dialog Box Defaults

IN THE PAST, whenever I needed to open or save a file, I wasted time in Windows dialog boxes. But now I've set them to automatically open to the folder I want, so I don't have to double-click my way through a maze of folders to get there. You can arrange this in a couple of ways. First, you can set your application's shortcut so that it defaults to the folder you want: Click through the Start menu or find the shortcut you want in the Quick Launch toolbar. Then right-click that icon and choose *Properties*. In the *Start in* box, type the path where you keep most of your work files (that is, the folder you're likeliest to want to see when you open a file dialog box). Click OK. You may need to take different steps for Microsoft Office applications. For example, in Word and Excel, choose *Tools*•*Options*. In Word, click the *File Locations* tab, select a file type, and use the *Modify* button to adjust the path; repeat this process for each file type you want to customize. In Excel, click the *General* tab and edit the path listed for *Default file location*.

Save Time Searching

I REGULARLY search for files in the same few destinations. Fortunately, I can make future searches more efficient by saving the parameters that I use most frequently. At the desktop or in any folder window, press **<F3>** to start your search. Enter your search settings,



SAVE TIME SAVING files by using the *Modify* button to change the default location where a file type is stored.

including wild-card characters if desired (for example, **.mp3* to look for music files). Click *Search* or *Find Now* to engage your settings (you can click *Stop* at any time). Then choose *File*•*Save Search*. Windows 98 saves an icon for the search settings on the desktop. Later versions of Windows let you specify where to put the icon. Either way, you can move it to a convenient place (such as the Start menu) if you choose. Just double-click the icon any time you need to perform that same search in the future. If the saved search request has all the parameters you want, you can start the search anew just by pressing **<Enter>** immediately after the *Search* or *Find* window opens. Otherwise, tweak the request parameters as necessary, and then launch your search.

Resize Toolbars Instantly

TO GET THE OPTIMUM FIT for all the toolbars on my taskbar (Quick Launch and so on), I double-click the divider bar to the left of each toolbar, and—*zam!*—the toolbar instantly resizes to show all the icons. You may need to double-click the same divider a couple of times to cycle through the possible arrangements. This tip also works for toolbars that share space on the same line of any folder or Internet Explorer window. If you're using Windows XP, you may have to start by right-clicking the taskbar or toolbar and then deselecting *Lock the Taskbar* or *Lock the Toolbars* to unlock these items before resizing them. To relock the items later, simply reactivate the locking option.

Deal With Details

IF YOU'RE LIKE ME, you prefer Explorer to display files in Details view (select *View*•*Details*). The problem is that futzing with the width of columns for size, file type, date, etc. takes too long. Don't do it. Press **<Ctrl>+<NumPad +>** (use the plus key on the numeric keypad) to instantly resize all columns to the best fit. To resize a single column, double-click the divider line to the right of the column heading.

Contributing Editor Scott Dunn writes the Windows Tips column for PC World. ▶

CORNER WINDOWS SHORTCUTS

OPERATION	Key combination
Open or close the Start menu	<Ctrl>+<Esc> or <Windows>
Switch back to a running program	<Alt>+<Tab>
Switch to another running program	Hold <Alt> , press <Tab> repeatedly
Open My Computer (Windows Explorer)	<Windows>+E
In Explorer, move to the current folder's parent folder	<Backspace>
Rename selected folder or file on the desktop, in an Explorer window, or in a dialog box	<F2>
In Explorer, search for a file	<Ctrl>+F or <F3>
Search for a file in a new window	<Windows>+F
Minimize all open windows (press again to restore them)	<Windows>+D
Open the Run dialog box	<Windows>+R
Open the current window's Control menu	<Alt>+<Spacebar>



ACCELERATE THE INTERNET

By Daniel Tynan

Get Broadband, Bubba

FORGIVE ME for stating the obvious, but the number one Internet time-saver is a fast connection. For \$35 to \$60 a month, a DSL or cable modem hookup offers download speeds up to 30 times faster than dial-up. When you aren't downloading huge files, the real-world speed boost is more modest (around three to five times faster), but it's still enough to potentially save you hours each week. Broadband's not an option? Accelerators like Propel (www.propel.com) and SlipStream (www.slipstreamdata.com) use compression, caching, and other clever tricks to double or triple your dial-up speed. You can subscribe to Propel for \$8 a month in addition to your usual dial-up charges; SlipStream is bundled with Net-Zero HiSpeed, a bare-bones access service that costs just \$15 a month.

Tune Up Your Search Engine

MY INTERNET LIFE falls into two distinct periods: Before Google and After Google. Back in the BG era, I used to hop from AltaVista to HotBot to Lycos, looking for stuff on the Web. But now I use only

Google—it's just faster and better. And I've found ways to save even more time by using Google Preferences (www.google.com/preferences).

First I tell Google to search for results written in English, so I won't have to wade through pages in Esperanto. Then I set it to display 50 results per page instead of the usual 10; loading the page takes a smidgen longer, but I can scan the list quickly without clicking Next five times. If what I'm looking for isn't in the top 50, I fiddle with the search terms and try again. Finally, I tell Google to open all search results in a new browser window. If the first hit is a miss, I don't have to reload the search page and start over; I just close the window to get back to my original results. (FYI, non-Googleites can do all this stuff on AlltheWeb.com, too.)

Change Browsers and Dance

NOBODY BUT Bill Gates says you have to use Internet Explorer. Me, I find Opera (www.opera.com) a tad faster on the draw. When you open a new page, Opera displays it over the previous one, with tabs along the top for fast navigation between them. Plus, you can save a session of tabbed windows and come back to it at any time. (To get tabbed browsing in IE, you have to install an app such as Avant Browser; see www.avantbrowser.com.) Opera also has a built-in pop-up blocker, which saves time you'd otherwise spend closing unwanted windows. The ad-supported version is free; \$39 buys you an ad-free browser with tech support and Web mail. You may encounter occasional glitches (Washingtonpost.com, for example, doesn't render well in Opera), but overall it's a significantly faster ride.

Squash Spam

I USED TO SPEND at least an hour a week deleting spam from my in-box. Then I discovered filters that would do the job for me. The best, like Qurb (www.qurb.com) and IHateSpam (www.sunbeltsoftware.com), plug directly into Outlook and catch 80 to 90 percent of the junk, funneling suspect messages into a folder. (Spamnix

does the same trick for Eudora; and Spam Killer 5.0 works inside Outlook Express.) Of course, they're not perfect—I still have to delete missed spam from my in-box and review the folder for legit mail that's been caught by mistake—but I spend minutes on the job instead of hours.

Feed Me, See More

I AM A NEWS JUNKIE. I subscribe to a dozen e-mail news summaries, in addition to roaming all over CNN.com and Google News. In fact, I really need to get out of the house more. Recently, I discovered NewsGator (www.newsgator.com), a \$29 RSS news aggregator that sends headlines directly into Outlook. (RSS has several different definitions, but the one I

!#@?!!#@?!*!#@*?

TIME WASTERS

Watch Out for Web Time Sinks

Metasearch engines: AskJeeves and Dogpile seem more efficient because they send queries to multiple search sites at once. But such searches take longer and can produce useless results, due to differences in how search engines work.

Portals: Sites like Lycos, MSN, and Yahoo are great for people who have time to dig through the clutter to find the stuff they care about. I don't.

Unmoderated mailing lists: Big public mailing lists—the kind you'll find at Yahoo Groups—fill my in-box with other people's inane conversations and jokes. For every post that's worth reading, there are 99 duds.

Instant messaging: Yes, I know, it's the new e-mail. But mostly it's a way of bringing water-cooler conversations to your desktop. Fine in small doses, but a day-killer when overused.



ALTERNATIVE WEB BROWSERS like Opera (above left) can help speed up your Web surfing with features like tabbed browsing, pop-up blocking, and helpful keyboard shortcuts. Avant Browser (above right) brings many of those features to Microsoft's Internet Explorer.

like is Really Simple Syndication.) Now I can read *The New York Times*, BBC News, various and sundry newsgroups, and *PC World* (of course) from inside my e-mail program. This saves me tons of time surfing and scanning newsletters—though I still need to get out more. Stand-alone newsreaders, like the free FeedReader (feedreader.com), will also do the trick.

Get On the List

A SMALL, well-moderated mailing list (but *not* a big unmoderated list; see "Time Wasters" on page 108) is a great way to keep up on topics that interest me, like spam or Elvis. To avoid spending all day reading the lists instead of doing actual work, I've created rules to funnel mailing list messages into folders, where I can scan them later. To make a rule in Outlook Express 6.x, select **Tools>Message Rules>Mail**, and click **New**. Choose a Condition (like *Where the subject line contains specific words*) and an Action (like *Move it to the specified folder*). As you select conditions, Outlook will add them to the Rule Description. Click the words highlighted in blue,

and fill in the dialog boxes for the specific words and the name of the folder. (If you haven't created the folder yet, you can do so now. Select the folder you want to nest it in, click the **New Folder** button, type the name of the folder, and click **OK**.) Finally, create a name for the rule (like *Elvis Is King*), and click **OK** twice.

Deliver the Goods

TWO THINGS I really hate are waiting in line and shopping. That's why I use the Internet to set up delivery of stuff I'm always running out of, so I don't waste

time at the store. Every month I get coffee (Peets.com), vitamins (Drugstore.com), flea powder (Petmeds.com), and mascara (Gloss.com) delivered to my door. (Okay, the mascara is for my wife—really.)

Online shopping also saves me time in other ways. To avoid standing in line at the movies, I buy my tickets in advance at Fandango.com or at MovieTickets.com. When I'm stumped for a gift at the last minute, Surprise.com always has a raft of good ideas. I even buy my shoes online at Zappos.com. Sure, you pay a little extra for shipping when you shop online, but the time you save is worth it.

Internet expert Daniel Tynan is a contributing editor for *PC World*.

CORNER NET NAVIGATION

OPERATION	Key combination
Open a new window in any browser	<Ctrl>-N
Call up the Open dialog box to go to another Web site in any browser	<Ctrl>-O or <Ctrl>-L
Go to the Address bar	<Alt>-D
Add www. before and .com after any text in the Address bar, and go to that site	<Ctrl>-<Enter>
Refresh the current Web page	<F5> or <Ctrl>-R
Ignore cached version of the current Web page and reload the page from the server	<Ctrl>-<F5>
Stop downloading a Web page	<Esc>
Open the Find dialog box	<Ctrl>-F
Show or hide the History bar	<Ctrl>-H
Toggle full-screen mode on or off	<F11>
Go forward or backward	<Alt>-<Right Arrow> or <Alt>-<Left Arrow>
Select a link in Mozilla	Begin typing the text of the link

Except where specified, all shortcuts are for Internet Explorer.



OPTIMIZE OFFICE

By Woody Leonhard

Get the Latest Version

WHETHER YOU RUN Office 2003, XP, 2000, or even good ol' Office 97, you'll avoid lots of frustration and hassle by making sure you have the latest versions of the programs you paid for. Office updates rarely include any nifty time-saving features, but many patch hundreds or thousands of bugs that can crash your system and leave you prematurely gray.

Office 2003, XP, and 2000 users should run to find.pcworld.com/38180. Microsoft packs this page with lots of news about different patches that may or may not apply to you. To get the latest update for your version of Office, use the *Check for Updates* link. Click it, follow the instructions, download the scanner if need be, select the updates you require, and then click *Start Installation*.

Office 97 users should go to find.pcworld.com/38141 to update to version SR-2b.

Add Folders to the Places Bar

WHENEVER YOU open a file in Office or save a newly minted file, you come face-to-face with the Places Bar: the strip of big icons that runs down the left side of the

Open and Save As dialog boxes. Unfortunately, the default Places Bar icons that ship with Office rarely suffice. Think of how much time you could save if you could put your own icons on the Places Bar and drill down to your most-used folders quickly. Well, you can...if you know the right trick.

In Office 2003 or XP, start by clicking *File•Open*, right-clicking the Places Bar, and choosing *Small Icons*. That gives you room for ten icons. Then navigate to a folder that you want to appear in the Places Bar, and click it. In the upper-right corner of the dialog box, select *Tools•Add to "My Places"*. Once the icon is on the Places Bar, right-click it and choose *Move Up* or *Move Down* to rearrange the list.

Regrettably, Office 2000 doesn't let you use small icons, and none of the versions of Office allow you to delete the five default icons. To perform those operations, you need to use a tool like the WOPR Places Bar Customizer (shareware that's included in my "Woody's Office Power Pack," \$15, www.wopr.com).

Disable Automatic Hyperlinks

SO YOU'RE TYPING along, and you find that you need to put in an e-mail address or a Web address—say, billg@microsoft.com or www.pcworld.com. But the instant you finish typing the address, Office takes over and converts it into a garish blue underlined hyperlink. The link is "hot," so if you're using Office 2000 or 97 and you accidentally click on it, your screen goes blank while Office zones out to never-never land and tries to retrieve something that you don't want.

Best way to save time: Tell Office to keep its paws off the link names you type.

In Office 2003 or XP, if you're quick, you can click the Smart Tag that appears immediately after the address or URL gets converted to a hyperlink and choose *Stop Automatically Creating Hyperlinks*. The application will comply—but you have to repeat the action in Word, Excel, and PowerPoint. Alternatively, in each application of any version of Office, you can click *Tools•AutoCorrect* (or *AutoCorrect*

Options)•*AutoFormat As You Type*, and then uncheck the box that's marked *Internet and network paths with hyperlinks*.

Customize Icons to Work Your Way

I'M CONVINCED that Microsoft chose certain icons for the Office toolbars just so that its marketing folks could run fancy demos. Why else would the standard Word toolbar have an icon that adjusts the number of snaking newspaper-like ▶

!#@?!!#@?!*!#@?*

TIME WASTERS Avoid Outlook's Useless Spam Filters

THE MOST CRUEL Office joke of all is junk mail filtering in Outlook 97, 98, 2000, and XP—it's a waste of time, from beginning to end. All those versions of Outlook compare the text in your incoming messages with a list of "offensive" words found in a file called *filters.txt*; if the message contains a bad word, it gets bounced into the Junk Mail folder. Truth be told, however, such junk mail filtering has been a complete flop. Microsoft hasn't bothered to update the bad-words list in years, even though Outlook has a (nonfunctional) "download updates" button in its Junk E-mail Organizer.

Microsoft has improved the situation substantially with Outlook 2003; and if you get the latest version, you should definitely turn the spam filter on (click *Tools•Options•Junk E-Mail* and choose an appropriate level of filtering). Reasonable people differ over how well spam filtering in Outlook 2003 works—Microsoft keeps most of the details close to its vest, and the only options are for 'Low' and 'High' filtering—but the utility certainly beats its predecessors.

See the Internet section on page 108 for two spam filters that save you time.

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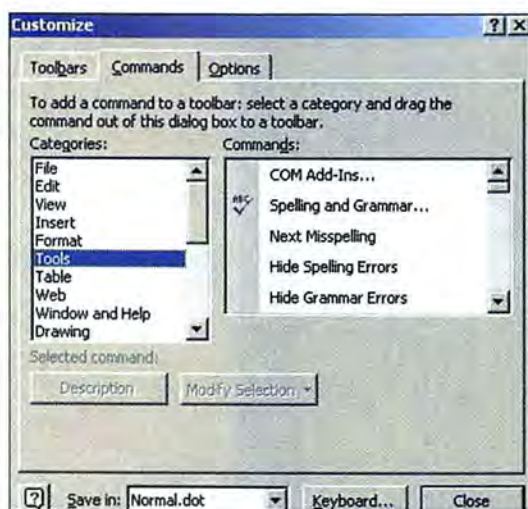


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NEC / MITSUBISHI
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USE THIS SCREEN to tweak your Office toolbars by adding icons for your favorite commands.

columns in a document—an action most people perform once every decade or two—yet omit icons to insert symbols and to bring up the enormously powerful Office Clipboard?

You can take control over the wimpy standard toolbars in all Office applications by clicking **Tools•Customize•Commands**. Make sure the 'Save in' box says 'Normal.dot', so your changed toolbar will appear in any "normal" document. To add an icon to a toolbar, find the one that you want in the Categories and Commands lists (to get the insert symbol icon, for example, click *Insert* in the Categories list, and then click *Symbol* in the Commands list); next, drag the command onto the desired toolbar. Drop it in whatever location you prefer. While you're working in this menu, you can remove an icon you no longer want on a toolbar, by right-clicking it on the toolbar and choosing *Delete*. Click *Close* when you're finished.

Don't worry if you go too far and hopelessly scramble one of your toolbars. You can get the old one back by clicking **Tools•Customize•Toolbars**. Click once on the toolbar that's giving you fits, and click *Reset* to restore the toolbar to its original state.

Show Paragraph Marks and Tabs in Word

COLLECTIVELY, WORD USERS lose thousands of hours every day because their paragraphs don't line up properly, or bullets suddenly appear, or the text turns bold or italic, or some other odd form of formatting crops up in an otherwise normal document. All such formatting sits inside paragraph marks that hide within the document. Whenever you copy, move, or delete a paragraph mark, Word propagates formatting in often-inscrutable ways. Inscrutable, that is, if

you can't see the paragraph marks.

Word has an icon on its standard toolbar that looks like a backward P. If you

click that icon, Word reveals all the paragraph marks (and tab marks) in your document. Unfortunately, Word also insists on putting tiny irritating dots wherever there are character spaces. Though the character-space dots can help you spot double spaces (a common typographical error), they quickly become overwhelming when you just want to look at clean pages of text. Most people click that icon once, gasp, and quickly turn it off.

You can make Word show you paragraph marks and tabs—and not drive you batty with annoying dots—by clicking **Tools•Options•View**, and checking the *Paragraph marks* and *Tab characters* boxes. Reverse the process to turn them off. It's also relatively easy to alter the operation of the backward-P icon so that it doesn't show the dots, by using a few simple macro commands. Point your browser at find.pcworld.com/38144 for details. ►

CORNER OFFICE ORIENTATION

OPERATION	Key combination
In all Office applications	
Launch spelling checker	<F7>
Open Save As dialog box	<F12>
In Word	
Return to default formatting	<Ctrl>-<Space>
Add or remove one line-space above current or selected paragraphs	<Ctrl>-0
Single-space current or selected paragraphs	<Ctrl>-1
Double-space current or selected paragraphs	<Ctrl>-2
Set current or selected paragraphs to 1.5 line-spaces	<Ctrl>-5
Left-align current or selected paragraphs	<Ctrl>-L
Center current or selected paragraphs	<Ctrl>-E
Right-align current or selected paragraphs	<Ctrl>-R
Justify current or selected paragraphs	<Ctrl>-J
Insert date	<Alt>-<Shift>-D
Insert time	<Alt>-<Shift>-T
In Excel	
Recalculate sheets in open workbooks	<F9>
Copy formula of cell above	<Ctrl>-'
Copy value of cell above	<Ctrl>-<Shift>-'; (<Ctrl>-")
Open Format Cells dialog box	<Ctrl>-I
Insert date	<Ctrl>-;
Insert time	<Ctrl>-<Shift>-; (<Ctrl>-:)
Select current column	<Ctrl>-<Space>
Select current row	<Shift>-<Space>

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PC Magazine 16th Annual Reader Survey — Service and Reliability: Rated "A"

1. Battery life may vary depending on product model, configuration, applications, power management settings and features utilized. Recharge time varies depending on usage. Battery may not charge while computer is consuming full power. After a period of time, the battery will lose its ability to perform at maximum capacity and will need to be replaced. This is normal for all batteries. To purchase a new battery pack, see the accessories information that shipped with your computer or visit the Toshiba web site at www.accessories.toshiba.com. The 9 hours were achieved via additional SelectBay™ battery.
2. Wireless connectivity and some features may require you to purchase additional software, services or external hardware. Availability of public wireless LAN access points limited. 3. 1 GB means 1 billion bytes. 4. Three months of AOL membership included with the purchase of a Toshiba Satellite or Satellite Pro PC. Availability may be limited, especially during peak times. TO AVOID BEING CHARGED A MONTHLY MEMBERSHIP FEE, SIMPLY CANCEL BEFORE THREE MONTH PROMOTIONAL PERIOD ENDS. Premium services carry surcharges, and communication surcharges may apply, including in Alaska, even during promotional period. Members may incur telephone charges on their phone bill, depending on their location and calling plan, even during promotional period. Available to new AOL members in the United States, age 18 or older; a major credit card or checking account is required. Satellite Pro and SelectBay are registered trademarks of Toshiba America Information Systems, Inc. and/or Toshiba Corporation. Intel, Centrino, Intel Inside, the Intel Centrino logo, and the Intel Inside logo are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. All specifications, pricing subject to change without notice. Reseller pricing may vary. © 2003 Toshiba America Information Systems, Inc. All rights reserved.

Stop Flip-Flopping Menus

IF YOU HAVEN'T done this already, prevent Office's spring-loaded "adaptive" menus (which conceal infrequently used commands) from flopping around like catfish on a hot Mississippi River bank. To turn off that feature, click **Tools•Customize•Options**. Then in Office 2003 or XP, check the *Always show full menus* box. In Office 2000, clear the box marked *Menus show recently used commands first*.

Override Outlook's Draconian E-Mail Security Update

MICROSOFT has decreed that certain versions of Outlook will hide specific kinds of files attached to e-mail messages. The edict came down shortly after the Love-Letter virus hit and (according to legend, anyway) so many "Softies double-clicked on the "ILOVEYOU" attachments that the virus brought down Microsoft's mighty internal e-mail system.

Microsoft's draconian approach to solving the problem? Don't let people see or touch certain kinds of files attached to incoming messages. Of course, Microsoft doesn't block Word documents or Excel spreadsheets, even though both of those kinds of files can contain viruses, too. Instead, the focus is on programs and other files (such as .exe, .com, .vbs, .scr, and .pif files) that will run immediately if you double-click them.

The time-gobbling problem arises when someone sends you a file that you're expecting, and you can't see it. You can work around the problem by sending a message back to the original sender and asking that person simply to rename the file (from, *aprogram.exe* to *aprogram.exe.stupidoutlook*, say) and resend it. But that's a hassle. For a much better solution, download Ken Slovak's free Attachment Options utility (find.pcworld.com/38147); it will force Outlook to show you all the files attached to your e-mail messages.

Woody Leonhard writes several Office tips newsletters for his Web site, wopr.com. His latest book is *Windows XP Timesaving Techniques for Dummies* (For Dummies, 2003).



HURRY-UP HARDWARE

By Michael Desmond

Speed Up CD Burns

A CD-REWRITABLE drive lets you back up files, make your own audio CDs, and even produce video discs for playback on many DVD players. But if you're working with an old drive, you're wasting a lot of time. The PC World Test Center has proved what we already knew: An old 12X CD-RW drive takes ages (7 minutes, 10 seconds) to burn a 650MB disc. A newer 48X model can do the job in 2 minutes, 37 seconds. Available for under \$100, a fast new rewritable drive is an outstanding time-saver.

Bullet-Speed Boot Times

EVERY TIME you press the power button, your PC makes you wait. In the Windows section of this story (starting on page 106), Scott Dunn discusses how to accelerate your start-up on the software side, but I'm a hardware guy. To get your hardware into fighting trim fast, shave redundant tasks from the boot process. Start the PC and while it's

booting up, press the key (indicated on screen) that launches the PC Setup program; it's often the <Delete> key, but your system may specify a different key.

Start by bypassing the system memory check, which is the part of the Power-On Self-Test routine that counts the RAM in your PC. Go to the Boot area and look for a setting called Set Quick POST or the like. Change it to *Enabled*.

Next, to prevent your PC from looking for and spinning the floppy drive, remove the floppy drive from the top of your boot drive list. In the Boot section, look for an area called Set Boot Device Order or something similar. Use the keyboard arrow keys to select the IDE Hard Drive entry and promote it to the top of the list by pressing <Shift>+. If you want to boot from a floppy later, you can always restore the floppy drive to the top of the list.

Exit and save your settings (many systems tell you to use the <F10> key for this); the boot process will resume. If you encounter any problems, simply reenter your PC Setup program and retrace your steps to return to the original settings.

Weather Blackouts With a UPS

EVEN A FLICKER of the electricity in your workplace can deep-six your data. So get a small universal power supply from a

vendor like American Power Conversion or Tripp Lite. If the power goes out, the battery in one of these bread-box-size units kicks in and keeps your PC going. With about 15 minutes of offline juice on tap, you can save all your work before shutting down. My UPS can shut my system down safely even when it's about to run out of power and I'm away from it.

How is this a time-saver?

Simple: Every time the power cuts out and back in, I save 10 to 15 minutes that I would have spent scraping together half-saved files. Of course, the toll would have run into hours and even days if vital data had been lost. ►



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Put Quick Access at Your Fingertips

THE INTERNET has brought us password pandemonium: Every other Web site seems to want you to log in, but searching through my long list of secure passwords is a nuisance. I'm surprised that more people don't let their fingers do the walking, using simple fingerprint scanners like the Sony FIU-710 (\$200) and FIU-600 (\$140). You can install these tiny scanners in minutes, and they plug into any USB port. The lengthiest step involves entering the passwords for all of your Web sites in advance so that the device can send the appropriate information when you press your finger to the scanner. One nice feature: The Sony FIU models store your fingerprint and authentication data on the device itself—not on the PC's hard drive. As a result, you can take the scanner with you to log on to Web sites from remote locations. Very slick, and very quick.

Boost Disk Performance With RAID

IN A WORLD of gigahertz processors and quadruple data rate memory, hard disks are a huge bottleneck. One solution is to

!#@?!!#@?!*!#*?

TIME WASTERS Serial ATA Won't Save You Time Yet

ONE HARD-DRIVE option that I won't jump for is a Serial ATA hard disk or controller. Serial ATA's 150 megabytes-per-second data rate is slightly higher than that of widely deployed ATA-133 drives (133 MBps). But let's be realistic. No mainstream drive comes close to flooding even an older ATA-100 connection: The bottleneck is in the disk heads and platters. Serial ATA certainly offers a more compact, manageable, and flexible connection between the drive and the controller, but from a time-saving standpoint, you'll never recoup the effort you expend installing a Serial ATA card.

install two hard drives as a redundant array of independent disks. RAID controllers like the \$109 Promise FastTrack TX2000 use a process called *disk striping* to spread files across multiple drives, resulting in higher data transfer rates.

The PC World Test Center found that a RAID setup can shave up to 40 percent off the time needed to complete a 1.3GB file transfer, depending on the drive model. But other operations—such as finding a file in Windows—ran slightly slower.

To make RAID work, you'll likely need a PC add-in card (some newer systems have RAID functionality built in) and a pair of identical hard drives. You may also need to set jumpers on the drives and on the RAID controller card or motherboard. Once installed, a pair of 80GB drives will appear in Windows Explorer as a single 160GB drive. While adding a second drive may increase the odds of a disk failure (simply because you've added another drive that might fail), today's drives are reliable enough that mainstream PC makers are adopting RAID in their systems. A sensible data backup routine should ensure that you don't lose critical data.

Duo-ing Monitors Make Fast Work

AT WORK, I open two Word documents, an Excel spreadsheet, three Web browser windows, and my e-mail software—on a slow day. But my dual-monitor setup lets me juggle those applications with ease.

I've been running dual monitors since 1997, and I can say that no single system upgrade has improved my personal productivity as much as adding that second screen. And with many graphics cards now offering dual outputs, side-by-side displays are a cinch to set up and use. Plug an extra monitor into the second output, and use the graphics card's software (often found in the Windows Display Properties dialog box) to activate the second display. A 17-inch CRT runs about \$120 today, but you'll save desk space and reduce eyestrain with a 15-inch LCD that offers similar screen area for about \$280.

Just make sure that you've matched your graphics card and your monitors.



SONY'S
FIU-600
fingerprint scanner.

Most dual-output cards feature a standard 15-pin analog VGA output, which all CRT displays use, and a second digital output (usually the DVI format) tailored to digital flat-panel monitors. If you plan to buy a second monitor for your dual-output graphics card, be certain that your monitors match the available ports. Some LCD monitors offer both analog and digital connections, giving you extra flexibility.

Auto Document Feeders for Scanners

I REFINANCED my house recently and found myself scanning scores of pages to fax to the lender. Feeding every page into the scanner was a tiresome process that took me most of the afternoon. An automatic document feeder like the one found on the HP Scanjet 8250c can be a huge help. Integrated into the scanner top, the feeder acts like the paper tray of a printer, placing a new document or photo on the glass after the current scan is finished. Pair the feeder with scanning software that intelligently names each image, and you have truly hands-free scanning. Just be ready to clear the occasional paper jam.

Of course, feeders aren't cheap. HP charges \$900 for the Scanjet 8250c with its 15-pages-per-minute feeder. By contrast, the baseline Scanjet 8200c—the same-quality scanner without the feeder—runs \$500. Fortunately some models, such as the Scanjet 7400c, accept document feeder upgrades priced at a more reasonable \$200. If you scan multipage documents on a regular basis, an automatic document feeder can be a blessing.

Michael Desmond is a freelance writer based in Colchester, Vermont.

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FASTER DIGITAL PHOTOS

By Dave Johnson

Transfer Files Faster

MOST DIGITAL CAMERAS connect to your PC via the achingly slow USB 1.1 port. That's why I avoid the connection cable and use a USB 2.0 memory card reader instead. USB 2.0 transfers images up to 40 times faster than USB 1.1, which translates into seconds of waiting instead of minutes. What do you need? A USB 2.0 memory card reader (such as the San-



SANDISK'S
ImageMate 8 in 1
USB 2.0 reader.

Disk ImageMate 8 in 1 or the Lexar USB 2.0 Multi-Card Reader, which handle nearly every common memory card format) and a USB 2.0 port on your computer. New PCs have USB 2.0 ports; if yours is still chugging along with USB 1.1, you can add a USB 2.0 PCI card to your machine for less than \$30.

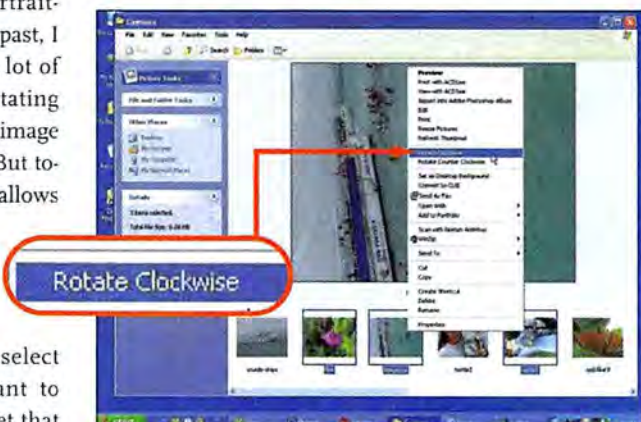
Improve Photos With a Single Click

EVEN GREAT photographers take bad pictures. But they know how to improve their photos. Learn from the pros: You can fix your so-so

images by using color correction, contrast and brightness, saturation enhancement, and sharpening—automatically. My favorite image editor, Jasc's \$99 Paint Shop Pro 8, has a feature called One Step Photo Fix, found under the Enhance Photo button in the toolbar at the top of the screen. Photoshop Elements has a few automatic adjustments, too, like Auto Levels and Auto Contrast, in the Enhance menu. Next, use the Enhance-Variations menu to adjust your color balance. With each enhancement, you click the image that looks slightly better. When you're done, you'll have a color-corrected image.

Rotate Images Quickly and Easily

I FREQUENTLY turn my camera sideways so I can take portrait-style shots. In the past, I had to sacrifice a lot of time afterward rotating the pictures in an image editing program. But today Windows XP allows users to do this quickly and easily. Just open a folder containing pictures and select the ones you want to rotate. Don't forget that you can select multiple images by holding down the <Ctrl> key while you click the files. Right-click one of the selected files and choose *Rotate Clockwise* or *Rotate Counter Clockwise* from the menu to spin the pictures to their proper orientation. While you're there, choose *Rename* from the menu; it lets you give all of your files the same name (with a number at the end of each), so you can label all 100 of your vacation pictures *Grand Canyon* at once, making them easier to find. If you don't have Windows XP, try the next tip.



TO ROTATE PHOTOS in Windows XP, first select the photos, and then right-click one and choose which direction to rotate it.

Batch-Process Your Photos

WHEN I GET HOME with my digital camera, it often contains a veritable mountain of images that need to be resized, color-corrected, sharpened, rotated, and per-

haps converted to other file formats (like TIFF). I certainly don't do all this by hand—it would take all day. Instead, I rely on batch-processing software. Programs like ACDSee 5, Adobe Photoshop Elements 2, and Paint Shop Pro 8 all include powerful batch-processing tools. Just select a batch of photos, choose the operations you'd like to perform, and click the Go button; then pop out for lunch while the program works without you.

Print Without a PC

WHEN I TAKE a picture I like, I want to print it fast. I don't want to mess with transferring images to the PC and fiddling with an image editor—I just want one print, pronto. So I often print directly

from the camera. Many photo printers from Canon and Epson support direct printing: Just connect your camera to a port on the printer, and print using the camera's controls. I use my old Epson's Stylus Photo 785EPX, which has a card slot built in. I insert the camera's memory card, pick the photo I want, and press a button, and out comes my print. A Kodak digital camera, on the other hand, slips into a desktop docking port that doubles as a 4-by-6-inch dye-sublimation printer; you simply touch one button, and 90 seconds later you have a print. ■

Dave Johnson writes the "Digital Focus" e-mail newsletter for PCWorld.com.

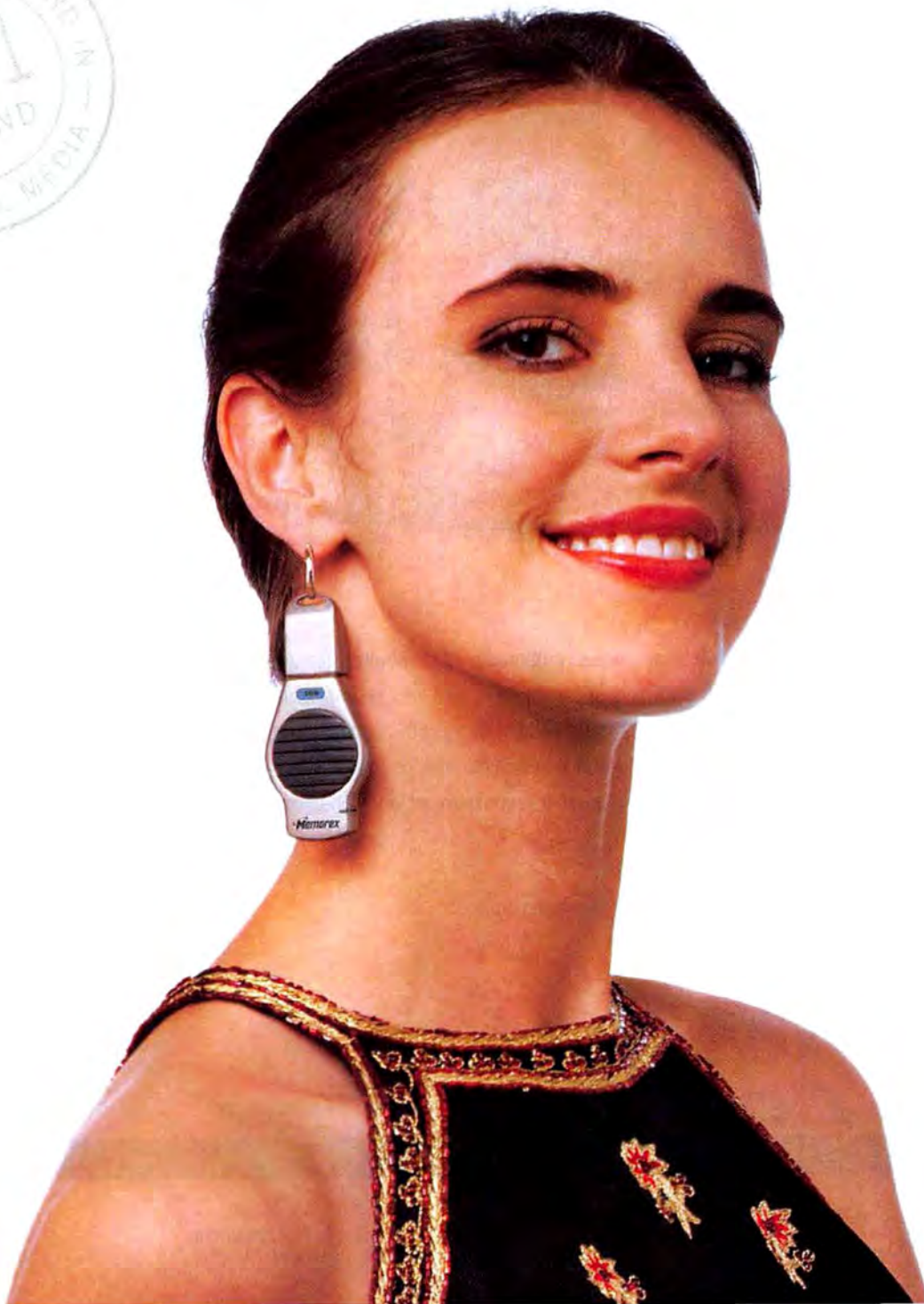
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WARP-SPEED WIRELESS



New 802.11g networks are fast, flexible, and more secure, but setup glitches remain. We test **nine Wi-Fi kits** to find the best gear for today's applications—and tomorrow's.

SPACE: the final frontier of networking. For two decades, users have linked PCs with ethernet cables, but sending data through the open spaces of offices and homes without wires is still relatively new. Last year's most widely used networking standard—802.11b—allows transfers at a maxi-

mum speed of 11 megabits per second under ideal conditions. That pales next to wired speeds, which now reach 1 gigabit per second.

However, the new wireless standard, 802.11g, promises 54-mbps speed while running in the same 2.4-GHz range as 802.11b and remaining ►

BY SEÁN CAPTAIN

PHOTO-ILLUSTRATION BY JEFF BERLIN

compatible with the older hardware (unlike 802.11a, which offers 54 mbps but has a shorter range and no compatibility with 802.11b). The anticipation for 11g products was so great that vendors began releasing them months before the Institute of Electrical and Electronics Engineers ratified the 802.11g specification in June. This is our first review since IEEE certification, and it kicks off the PC World Test Center's regular evaluation of wireless kits for reviews that will appear several times per year.

The 802.11g products we saw were certainly faster than the 802.11b models in this review. And the products using proprietary technologies were even swifter—though you'll get those speeds only if all your hardware is from the same vendor.

The new speeds allow 11g networks to boldly go where no wireless has gone before. While even 11b is faster than your broadband connection to the Internet,



Best Buy

NETGEAR'S diminutive yet powerful WGR614 router was easy to set up, thanks to detailed help files built right in to the interface screen. And it consistently connected to our test broadband lines without a hiccup. The notebook and desktop cards were also a cinch to install.

11g's extra throughput lets you more easily transfer large files across office and home networks and even stream video from computer to computer (though not yet flawlessly, as we explain in "Still Waiting for 11g-Rated Movies" on page 136).

The new products also provide better shields against intruders, by supplementing the weak Wired Equivalent Privacy security system with Wi-Fi Protected

Access—the first chunk of a developing wireless security standard called 802.11i. In September, WPA capability became a requirement for any new product seeking certification from the Wi-Fi Alliance industry group. (Already-certified 802.11b products don't have to support WPA.) Wireless products that carry the Wi-Fi logo—even ones manufactured by different companies, such as a router from one

PHOTOGRAPH: RICK RIZNER

FEATURES COMPARISON

Netgear Zooms Ahead

THE BEST BUY KIT PROVED FAST and reliable in our tests. We were also impressed with the easy installation and advanced security of the

	WIRELESS NETWORKING KIT	Overall rating ¹	STREET PRICE (8/25/03)				Performance/Features	Ease of installation/Support quality
			Gateway	PC Card	PCI card	USB adapter ²		
1	Best Buy Netgear WGR614 router, WG511 PC Card, WG311 PCI card find.pcworld.com/37895	89	\$110	\$70	\$75	n/a	Very good/ Fair	Very good/ Very good
2	Linksys Wireless-G WRT54G router, WPC54G PC Card, WMP54G PCI card find.pcworld.com/37886	88	\$115	\$70	\$70	n/a	Good/ Outstanding	Good/ Very good
3	Belkin F5D7230-4 router, F5D7010 PC Card, F5D7000 PCI card find.pcworld.com/37874	87	\$120	\$75	\$75	n/a	Good/ Good	Very good/ Very good
4	Buffalo Technology AirStation WBR-G54 router, WLI-CB-G54A PC Card, WLI-PCI-G54 PCI card find.pcworld.com/37877	83	\$100	\$70	\$80	n/a	Good/ Outstanding	Poor/ Very good
5	D-Link AirPlus Xtreme G DI-624 router, DWL-G650 PC Card, DWL-G520 PCI card find.pcworld.com/37883	80	\$110	\$65	\$70	n/a	Fair/ Good	Good/ Very good
6	U.S. Robotics Wireless Turbo USR8054 router, USR5410 PC Card, USR5416 PCI card find.pcworld.com/37898	77	\$110	\$70	\$80	n/a	Outstanding/ Fair	Fair/ Fair
7	D-Link AirPlus DI-714P+ router, DWL-650+ PC Card, DWL-520+ PCI card, DWL-120+ USB adapter find.pcworld.com/37880	77	\$90	\$50	\$50	\$55	Poor/ Good	Good/ Very good
8	Netgear MR814 router, MA401 PC Card, MA311 PCI card, MA111 USB adapter find.pcworld.com/37892	73	\$65	\$55	\$70	\$55	Poor/ Fair	Very good/ Very good
9	Linksys Wireless A+G WRT55AG router, WPC55AG PC Card, WMP55AG PCI card find.pcworld.com/37889	72	\$260	\$90	\$90	n/a	Good/ Good	Good/ Very good

n/a = Not applicable.

¹ Overall rating is based on performance (25 percent), features (20 percent), installation (20 percent), support (20 percent), and price (15 percent).

² No USB adapters for 802.11g kits were available in time for our testing, though a few vendors had models planned.

vendor and a PC Card from another—are supposed to work together.

The Wi-Fi Alliance's efforts to ensure compatibility seem to be succeeding. We mixed and matched several routers and cards, and connected reliably with all the products we tried, though not always at top speeds. For our performance tests, however, we put together wireless "kits" all of whose components—a combination router/access point, a PC Card for notebooks, and a PCI card for desktops—came from the same company. We also tested USB adapters in the two cases in which they were available (both for 11b kits); some 11g USB adapters will be out on the market by the time you read this.

One note arising from our compatibility findings: A product first and foremost had to work with its own kit. In our tests, that didn't always happen.

We also encountered some chronic problems with Wi-Fi networking—from

buggy software to finicky Internet connections. For those reasons, we put a high value on kits that were easy to install, had helpful documentation, and came from companies with friendly, easy-to-reach tech support. Performance and price were still important, of course. On the basis of overall scores, we chose Netgear's 802.11g kit—consisting of the WGR614 router, the WG511 PC Card notebook card, and the WG311 PCI card—as our Best Buy.

WI-FI FASTER

AFTER WEEDING OUT glitchy products, we ended up with six 802.11g kits, from Belkin, Buffalo Technology, D-Link Systems, Linksys, Netgear, and U.S. Robotics; a combo 11g/11a kit from Linksys; a standard 11b kit from Netgear; and an 11b kit with speed enhancements from D-Link.

Our tests confirmed that 802.11g products are dramatically faster than 11b ones. As our test report on page 128 indicates,

the 11g kits from Belkin, Buffalo, D-Link, and Linksys posted similar throughput scores that were roughly four and a half times higher than those for Netgear's 11b kit—close to the 11g spec's theoretical five-fold advantage over 11b. Also in accordance with the specs, in our tests most of the 11g kits performed at a level similar to that of the 11a kit from Linksys.

We measured speed not only in terms of the wireless connection but in terms of moving data over a network. We could not, however, measure the effect of distance and interference—from devices such as 2.4-GHz cordless phones, microwave ovens, and other wireless networks—because interference conditions change so often. To eliminate the background radiation for the tests we did, we sealed the kits in an enclosure that insulated them from all interference. (For details on our testing, see "Lab Notes: Wireless, Wireless Everywhere" on page 135.) ▶

number two Linksys and number three Belkin products, and the breakneck speed of the sixth-place U.S. Robotics Wireless Turbo kit.

	Features ¹	Comments
	802.11g standard, 64- and 128-bit WEP encryption, four 10/100 ethernet ports, SPI and NAT firewall, three-year warranty, free 24-hour daily support	Netgear's 11g kit takes top honors for great performance, an intuitive interface, and bulletproof reliability in our tests. Pending WPA capability and full Wi-Fi certification will complete the picture. (★★★★☆)
	802.11g standard, 64- and 128-bit WEP encryption, WPA security, four 10/100 ethernet ports, SPI and NAT firewall, three-year warranty, free 24-hour daily support	Though only a middling performer, this Linksys kit gets kudos for being one of the few products certified for 802.11g and WPA compatibility at the time of our review. (★★★★☆)
	802.11g standard, 64- and 128-bit WEP encryption, WPA security, four 10/100 ethernet ports, SPI and NAT firewall, lifetime warranty, free 24-hour daily support	Solid kit's components come with handy installation CDs and generous printed documentation. But reader reports about Belkin's reliability give us pause. (★★★★☆)
	802.11g standard, 64- and 128-bit WEP encryption, WPA security, four 10/100 ethernet ports, SPI and NAT firewall, two-year warranty, free 24-hour daily support	Good performer with full Wi-Fi certification is hindered by weak documentation and confusing configuration screens, though that shouldn't be a problem for advanced users. (★★★★☆)
	802.11g standard, 64- and 128-bit WEP encryption, WPA security, four 10/100 ethernet ports, SPI and NAT firewall, three-year warranty, free 24-hour daily support	Merely an adequate performer among the 11g kits, this router has slightly confusing configuration pages, but context-sensitive help menus make tasks easier. The router and PC Card support WPA. (★★★★☆)
	802.11g standard, 64-, 128-, and 256-bit WEP encryption, four 10/100 ethernet ports, NAT firewall, two-year warranty, free 12-hour weekday support	A good choice for geeks, the U.S. Robotics kit offers great performance thanks to proprietary speed enhancement, but it provides little hand-holding. (★★★★☆)
	802.11b standard, 64-, 128-, and 256-bit WEP encryption, four 10/100 ethernet ports, SPI and NAT firewall, three-year warranty, free 24-hour daily support	Proprietary technology provides above-average performance for an 802.11b kit. The router's print server with parallel port is a nice extra. (★★★★☆)
	802.11b standard, 64- and 128-bit WEP encryption, four 10/100 ethernet ports, SPI and NAT firewall, three-year warranty, free 24-hour daily support	Basic 11b kit has a good interface and comes at a bargain price. You should upgrade the firmware to at least version 4.13 to keep the router from launching accidental attacks on Internet time servers. (★★★☆☆)
	802.11a and 802.11g standards, 64-, 128-, and 152-bit WEP encryption, four 10/100 ethernet ports, SPI and NAT firewall, three-year warranty, free 24-hour daily support	In addition to offering Linksys's clear install wizard and configuration screens, this kit supports all Wi-Fi standards—but its doing so adds substantially to the price. (★★★★☆)

¹ By hiding local-network IP addresses behind a single Internet address, all NAT (Network Address Translation) routers provide a primitive firewall. Some add SPI (Stateful Packet Inspection) for more-sophisticated protection that tracks the source and destination of all packets passing through the router.

Because you will likely encounter the environmental variables we eliminated, your real-world performance with any of these kits will probably be lower. But the difference in throughput we measured among the kits still indicates how they may perform relative to each other.

In our Internet tests, we measured throughput by downloading and uploading a 50MB file. (We eliminated the variability of Internet performance by creating a faux Internet in the form of a local Linux server.) For each product, the upload and download performance was roughly the same, because there was no cap on speed. In the real world, however, DSL and cable broadband services usually offer slower maximum rates for uploads than for downloads. Home broadband connections top out around 1500 kilobits per second for downloads, less than half of what even the slowest kit in this review, the Netgear MR814 router and accompanying cards, delivered.

In addition, we measured throughput across a local area network, to simulate

file transfer performance in an office. We moved the same 50MB file between two PCs, one connected to the router via wireless and the other attached via an ethernet cable. In most cases, the local-network throughput exceeded the Internet throughput—hardly surprising, since LAN traffic is not slowed down by having to go through the router and its firewall. The U.S. Robotics 11g kit posted nearly identical performance for Internet and local-network traffic, as did the D-Link 11b kit; the vendors say that the routers' use of powerful ARM9 processors is responsible for the results we obtained.

Those two kits were also the top performers in their respective wireless technology classes. For this success, the vendors credit the use of Texas Instruments



THE WI-FI ALLIANCE label specifies WPA capability, as well as compatibility at 2.4 GHz (802.11b and 802.11g) and at 5 GHz (802.11a).

wireless chips that contain some performance-enhancement technologies not incorporated in the 802.11g and 802.11b specs. The U.S. Robotics products, for example, employ a TI technology called packet aggregation to combine small data packets into one large packet, thereby reducing transmission overhead. This performance boost happens only when all products in the kit use the same TI chip set.

Netgear's 802.11g kit also performed above the average for the 11g kits. Company reps attributed this to close cooperation between Netgear and the wireless chip maker Intersil.

In our informal tests, we could easily get routers and cards from different vendors to connect, but not all pairings hit full 11g speed and some managed only 11b rates. Most of the 802.11g kits were not yet certified for 11g interoperability and may require firmware upgrades; vendors are pursuing certification for all kits.

To make clear in the future what functions of a specific wireless product are certified, the Wi-Fi Alliance has introduced a new label that presents separate check boxes for 802.11a, 802.11b, 802.11g, and WPA capabilities. If a product doesn't have the label, you can look up the product's certifications on the Wi-Fi Alliance's Web site (www.wi-fi.org).

DECRYPTING WPA SECURITY

LIKE 802.11g certification, WPA capability is currently at varying stages of implementation. Only four of the routers we tested had firmware support for it: Belkin's F5D7230-4, Buffalo's WBR-G54, D-Link's Xtreme G DI-624, and Linksys's Wireless-G WRT54G. Only the Buffalo and Linksys routers were Wi-Fi-certified for WPA, and only Buffalo posted directions on its Web site for enabling WPA. All the vendors are planning WPA ►

TEST REPORT

U.S. Robotics and Netgear Outpace the Field

THOUGH THE 11g KITS we tested definitely outperformed the 11b kits we saw, standard wired ethernet is still over three times faster for local networks than the speediest kit.

WIRELESS KIT	Average download throughput (kbps)	Faster
U.S. Robotics Wireless Turbo USR8054 (802.11g)	Internet download 27,166 Local area network download 27,309	
Netgear WGR614 (802.11g)	22,331 23,964	
Belkin F5D7230-4 (802.11g)	14,161 22,217	
Linksys Wireless A+G WRT55AG (tested 802.11a)	15,493 20,849	
Buffalo Technology AirStation WBR-G54 (802.11g)	13,940 22,310	
D-Link AirPlus Xtreme G DI-624 (802.11g)	14,809 17,802	
Linksys Wireless-G WRT54G (802.11g)	14,074 17,302	
D-Link AirPlus DI-714P+ (802.11b)	6256 5882	
Netgear MR814 (802.11b)	3498 4853	
Typical high-speed residential cable	1500	
Top business DSL	8000	

TEST CENTER Kits listed under router name. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

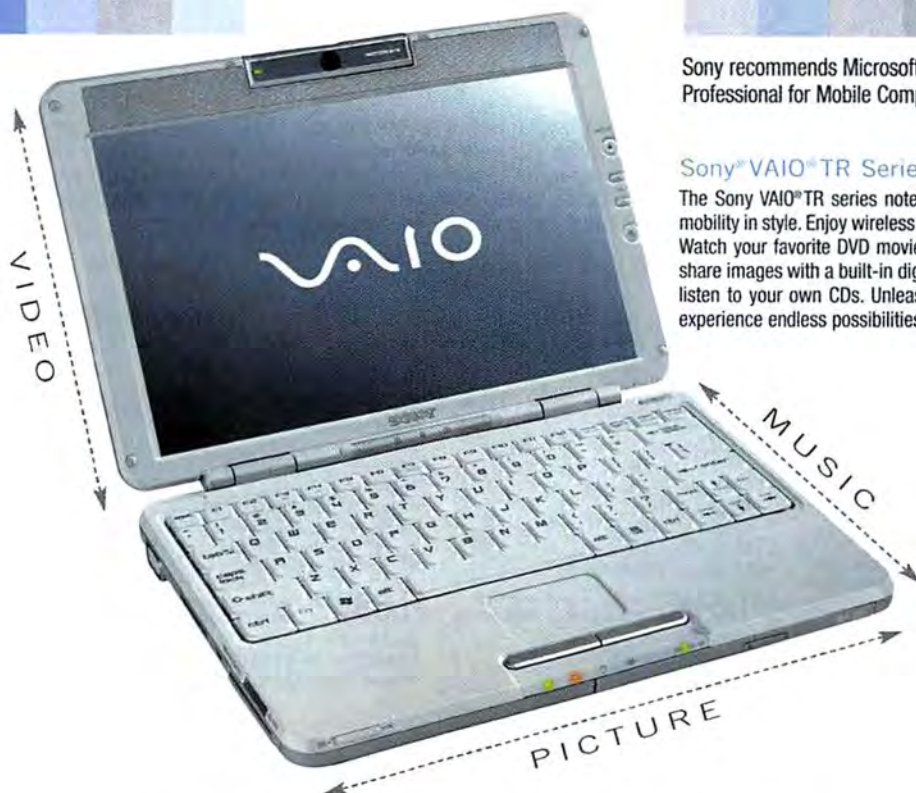
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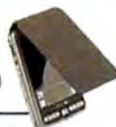
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firmware upgrades for their entire lines of 11g routers, and for some 11b products.

Especially confusing was figuring out how to enable WPA on the PCs in which we installed the vendors' wireless cards. Windows XP is the only version of Windows that has built-in wireless support. Installing a wireless product on other versions requires a driver from the manufacturer, which will also have to provide WPA upgrades. For XP, which we ran on our test systems, you must install Microsoft's Service Pack 1 and patch Q815485 (available at find.pcworld.com/38066). All of the wireless vendors say that they are developing WPA software for Windows 98 SE, Me, and 2000 on their 11g products. WPA works only if every component in the network supports it; for backward compatibility with older devices, WPA-enabled products will retain WEP as an encryption option for some time.

With the advent of WPA, we gladly bid adieu to the 10- or 26-character (depending on encryption strength) keys we had to enter on the router and the client cards to identify the user and to encrypt all data using WEP. Some kits that we looked at—those using Belkin's F5D7230-4, Linksys's WRT54G and WRT55AG, and Netgear's MR814 and WGR614 routers—



BELKIN'S 802.11g kit comes with an easy-to-understand setup wizard for the router, and very thorough printed manuals.

made WEP setup easier by generating keys for us based on a short pass phrase.

Though WPA looks to be merely WEP with a pass phrase, it's much more secure. You enter the pass phrase to get on the network, but once the connection is made, the router continually generates and distributes new encryption keys via TKIP (Temporal Key Integrity Protocol). Thus, WPA is far harder to crack than WEP, which uses the same encryption key over and over again. With WEP en-

ryption, a hacker needs only a wireless card and software (freely available on the Internet) that analyzes your wireless traffic and can quickly extract the static key.

WIRELESS NOT WORKING?

BESIDES MEASURING the performance of the wireless products, we learned a lot about how often they fail. Of the 13 kits we intended to review, only 9 made it through our testing, and even some of those passed only because we ordered replacements from the vendors (after first trying to install driver or firmware upgrades on the originals). Between the original submissions and the replacements we were able to get during our testing period, eight kits failed because at least one of their components couldn't reliably connect or consistently transfer data.

When we mentioned our difficulties to Frank Hanzlik, the Wi-Fi Alliance's managing director, he agreed that some faulty product is in circulation. "We certainly do see problems, especially with the [inexpensive] products," he said. Most of the defective kits we encountered were not Wi-Fi-certified models, but one was.

The failures we experienced don't seem unique. In our most recent Reliability and Service survey of *PC World* readers, ►

Lab Notes: Wireless, Wireless Everywhere

TEST Center

ONE MEASURE of Wi-Fi's overwhelming success is that you run into it almost everywhere. Its ubiquity is good news for people who are seeking an available network, but it posed a serious challenge for our performance testing. Using a Pocket PC equipped with a wireless card and Wi-Fi-sniffing software called AirMagnet (www.airmagnet.com), we searched high and low (including in the basement of our building) for a suitable testing location that was free of interference from other Wi-Fi networks, as well as from the noise of common appliances such as cordless phones and microwave ovens. But in San Francisco, at least, that mission proved impossible.

Our next step was to see if we could get relatively consistent



ELLIOTT KIRSCHLING with test enclosure for Wi-Fi wireless kits. Inset: The router being tested.

performance in spite of external interference; but we saw performance variation as high as 40 percent from the same wireless kit in the same location, depending on the day and time.

In the end, we decided that the best solution was to purchase a Ramsey Electronics STE5000 Shielded Test Enclosure to eliminate electromagnetic interference. This equipment prevented us from testing wireless performance over a distance of more than about a foot, but it did guarantee reliable results for every kit, every time we conducted the test. And our results, though obtained under ideal conditions, still indicate how well one kit performs in comparison with another.

—Elliott Kirschling and Seán Captain



THE LINKSYS Wireless-G WRT54G router comes with a great CD-based setup wizard, and the entire kit has full Wi-Fi certification.

many participants reported mysterious problems with their wireless kits. (The complete results of the survey, covering

wireless and five other product categories, will appear in our December issue.)

One Linksys owner's story was typical of the complaints we received regarding many vendors: "The wireless functionality stopped working for some reason or another.... All of a sudden it came back again, without [my] doing anything." And an exasperated D-Link customer said, "It's difficult to avoid feeling like an unpaid beta tester. Frequent firmware/driver updates make the products seem rushed to market." In our survey, readers gave Belkin poor ratings for the reliability of its routers; other vendors scored better.

The most dramatic bug, however, afflicted several models manufactured by Netgear, including the MR814. Netgear says that its customers should upgrade the MR814's firmware to at least version 4.13; otherwise the router may send a

crippling flood of requests to Internet time servers while updating its internal clock. According to Netgear, this problem doesn't affect its 11g router, the WGR614.

SETUP HIGHS AND LOWS

OTHER READERS REPORTED problems with the setup process. For example, one U.S. Robotics customer said: "I had trouble configuring the router. I had to return it to the store because tech support...said it was a defective router. The store put it on their system, and it worked OK. I will try to configure it again."

In fact, though the U.S. Robotics Wireless Turbo kit took top honors for performance in this review, we rated it near the bottom for usability. Each component came with a thin installation pamphlet that didn't cover all of the setup possibilities. For example, the DSL account we ▶

Still Waiting for 11g-Rated Movies

ABOUT A YEAR AGO, PC makers began selling systems that offer TV tuning and recording functions, in addition to the PC's standard ability to play music and display photos. But in many households, the PC lives in a different room from the TV, so getting the content stored on the PC over to the TV is difficult. In response, companies such as HP and Linksys have introduced wireless devices that pull content from a PC in another room and deliver it to a television. The first generation of such products has been limited mostly to retrieving music or photos, as 802.11b networking is too slow for delivering full-motion video and 802.11a is too limited in range for a large house.

Promising the speed of 802.11a and the range of 802.11b, 802.11g networking brings users much closer to wireless video streaming, but it still can't rival the quality of a wired connection. We tested our Best Buy 802.11g kit from Netgear with the \$250 Prismiq MediaPlayer—a set-top receiver with an ethernet port for wired connections and a PC Card slot for wireless adapters. (The Netgear WG511 is one of the wireless cards that Prismiq recommends for the MediaPlayer.) We connected the device to a television via an S-Video port and RCA stereo jacks.

We first attached both the MediaPlayer and a PC to the Netgear router via ethernet cables; in the video window of the Prismiq interface, we saw a perfect reproduction of our video clip, a medium-

quality MPEG-4-encoded trailer from *The Lord of the Rings: The Two Towers*. (We would have used the actual DVD of the movie, but the Prismiq doesn't support DVD streaming; doing so over ethernet is illegal.) The quality was almost as good when we switched the Prismiq to a wireless connection (with the PC still connected by wire), though we noticed a few jumpy video frames and an occasional gurgling sound in the audio. When we

also switched the PC to a wireless connection, the audio glitches increased and the video occasionally broke down into a jumble of colored blocks. The video was barely viewable when we dropped to 11b speeds by switching to the D-Link DI-714P+ router.

We certainly saw an improvement with 802.11g as opposed to 802.11b, but not enough to make us believers in wireless video streaming (even for video of less-than-DVD quality). However, video streaming may improve with the introduction in mid-2004 of 802.11e, a so-called quality-of-

service wireless standard intended especially to ensure a smoother flow of data for streaming audio and video.

The extra capacity of today's 802.11g did completely eliminate the glitches we occasionally heard when streaming music to the Prismiq over 802.11b. So if you're happy with the video offerings in your living room but you'd like to pipe in music from PCs farther afield, 11g hits the right note.

—Sean Captain



THE PRISMIQ MediaPlayer (with remote control and optional \$50 wireless keyboard) streams audio, video, photos, and Web pages.

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used for testing utilizes Point-to-Point Protocol over Ethernet technology that requires a log-in to establish a connection to the Internet service provider. The U.S. Robotics pamphlet mentioned PPPoE as a possible connection type and referred the user to an appendix on the bundled documentation CD-ROM. That appendix referred to yet another part of the CD manual, which finally recommended contacting the ISP for assistance.

Still, this setup approach was better than the one for the Buffalo Technology router, which we could not set to automatically dial the PPPoE connection; we had to log in to the router and manually enable it every time. The Buffalo equipment also suffered from confusing instructions, often with awkward translations. The thin setup booklet first advised users not to perform the initial configuration of the router by logging in from a wireless connection. It then dedicated the next few pages to explaining how to log in wirelessly, *before* discussing how to make a wired connection and how to configure the router. On the plus side, both the U.S. Robotics and the Buffalo routers pack many advanced features, such as sophisticated firewalls and event-logging capabilities, that should appeal to power users.

In contrast, the Belkin, D-Link, Linksys, and Netgear kits provided a lot more help

for non-geeks. Three routers—the Belkin F5D7230-4, the Linksys WRT54G, and the Netgear WGR614—for instance, came with setup wizards that could detect a PPPoE account and step the user through setting the router to negotiate the connection automatically. The Netgear WGR614 was the most reliable model for establishing a PPPoE connection. Other units, such as the Linksys WRT54G, required some prodding.

We appreciated the CD-based wizards from Belkin and Linksys that walked us through the setup operation. (Belkin was also the only vendor that provided a full printed manual for easy reference; the other companies supplied them on CD only.) Each of the remaining kits required us to log in to the router by typing its IP address in a Web browser (though like the others, the Belkin and Linksys routers insisted on a log-in for further adjustments after initial setup). The kits from D-Link, Netgear, and U.S. Robotics made operations easier by providing context-sensitive



BUFFALO Technology's PCI card has a tethered antenna that you can position to obtain the optimum signal.

help menus to explain topics such as DHCP (which assigns local IP addresses to computers on the network) and filters (to restrict access to the network).

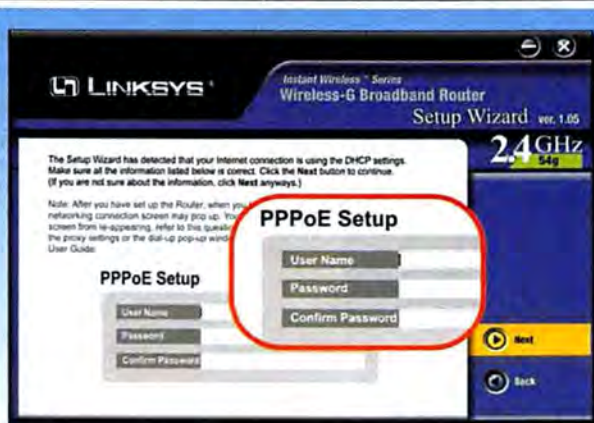
SHAKY SUPPORT

EVEN THE BEST kits might leave users confused, so reliable tech support is key. We evaluated vendor support by calling and asking for help with setting up wireless encryption.

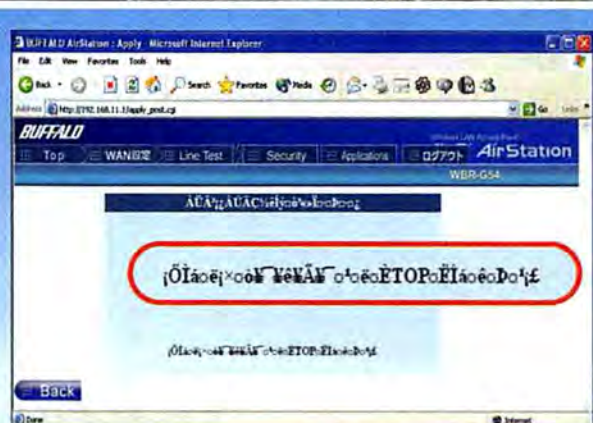
Just getting through to most of the companies was a challenge. We called in the early evening on weeknights and often spent a long time on hold. Only Buffalo Technologies answered our call immediately. A few vendors said that they had been inundated with calls during the first week of September as a result of higher-than-expected sales. However, all of the companies in our review offer toll-free support lines, and all of them except U.S. Robotics provide 24-hour, daily access. (U.S. Robotics offers support for 12 hours per day, Monday through Friday.)

Once we got through, we were pleased to find that each company's support

Router Interfaces: The Slick and the Sloppy



BOTH LINKSYS KITS include an intuitive disc-based setup wizard to walk you through tricky steps like setting up a PPPoE log-in.



BUFFALO'S WEB-BASED router interface can be difficult to navigate and sometimes literally impossible to decipher.

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staffers were generally polite, though their knowledge varied. The Belkin representative, for example, did a good job explaining WPA, but he also told us that it was impossible to use the router with a PPPoE DSL account. The very friendly rep from Buffalo failed to mention the need to install Windows XP Service Pack 1 and the additional patch in order to enable WPA. The Linksys representative told us that the Microsoft WPA patch was faulty. (Spokespeople for Microsoft, Linksys, and other wireless companies subsequently told us that they were not aware of any problems with the patch.)

Many of our tech support requests were routed to overseas call centers. While the reps all seemed to have a good command of English, some were difficult to under-

stand. Many respondents to our Reliability and Service survey also reported problems understanding support personnel.

WIRELESS—WELL WORTH IT

WHILE 802.11b is good for Web surfing from the couch, 11g provides extra muscle to local networks for power home users and small offices. And WPA not only will make home networks safer but will also appeal to businesses that have shied away from wireless because of security concerns. Going wireless is still far from painless, so we advise you to stick with vendors that provide the easiest setup routines and the best tech support.

None of the kits we reviewed was perfect, but we recommend Netgear's 11g ensemble as our Best Buy. It had the second-

best performance of all the kits, a relatively simple setup routine, and one of the most intuitive user interfaces. Our biggest concerns were about its lack of WPA security and full Wi-Fi certification. But only a few products had these items at the time of our review, and Netgear was working on both as we went to press.

We will keep an eye on these and other developments with a new Top 5 chart of wireless kits that will appear several times a year in the *Top 100*. Stay tuned. ■

Seán Captain is a senior associate editor and Yarden Arar is a senior editor for PC World. Elliott Kirschling, senior performance analyst, designed and conducted all performance tests. Freelance writer Yael Li-Ron contributed to this story.

Five Reasons Not to Go Wireless

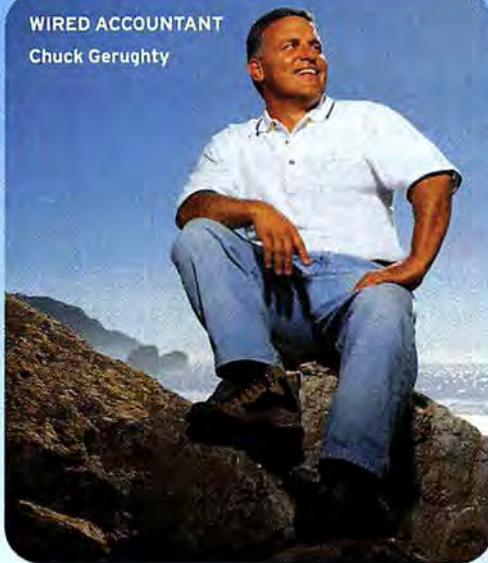
WIRELESS MAKES networking simpler and less cumbersome for many people, but it's not the right choice for every PC user. If you don't mind stringing some cable and you don't care about Internet surfing from the couch, hooking up your computers in the traditional style may make more sense.

For example, accountant Chuck Gerughty, of Pacifica, California, learned the pitfalls of wireless the hard way. For years he had relied on carrying disks by hand to exchange files with the employees in his ten-person office. But when he learned that a wireless network would allow all seven PCs in his office to access files on his computer—and that it would avoid the hassle and expense of drilling holes and running cables in his leased office space—he decided to install 802.11b Wi-Fi technology.

But Gerughty soured on Wi-Fi when he noticed that opening a large, complicated tax file over the network took a good 30 seconds—an eternity during the busy tax season. "It was a nightmare," Gerughty recalls. He wound up dismantling his wireless network and paying a contractor \$1250 to install a much faster wired network.

Gerughty's experience is just one example of why wireless isn't always the best choice for networking a small office or home. Here are five reasons to stay cabled.

WIRED ACCOUNTANT
Chuck Gerughty



Usability: As reader feedback and our own testing confirms, setting up Wi-Fi can be tricky and annoying.

Price: Most PCs these days come with built-in ethernet ports, and if you don't need to rip out walls, running cable is cheaper.

Security: The new Wi-Fi Protected Access security is better than the original Wired Equivalent Privacy, but WPA availability remains spotty, especially for PCs not running Windows XP. Even an unencrypted wired connection has a measure of security in that a would-be hacker has to gain physical access to the network.

Consistency: Interference can slow down or even kill a Wi-Fi signal, especially in areas where several Wi-Fi networks overlap. This is less of a problem for 802.11a products than for 802.11b and 802.11g networks, which share the 2.4-GHz portion of the spectrum with other devices such as Bluetooth products, cordless phones, and microwave ovens.

Bandwidth: Though more than adequate for browsing the Internet on a shared DSL connection or for occasional file transfers, wireless throughput may not suffice for people who, like Gerughty, must frequently move large files between PCs. There's a reason that gigabit ethernet is gaining popularity—it's up to 90 times faster than an 802.11g connection.

—Yarden Arar

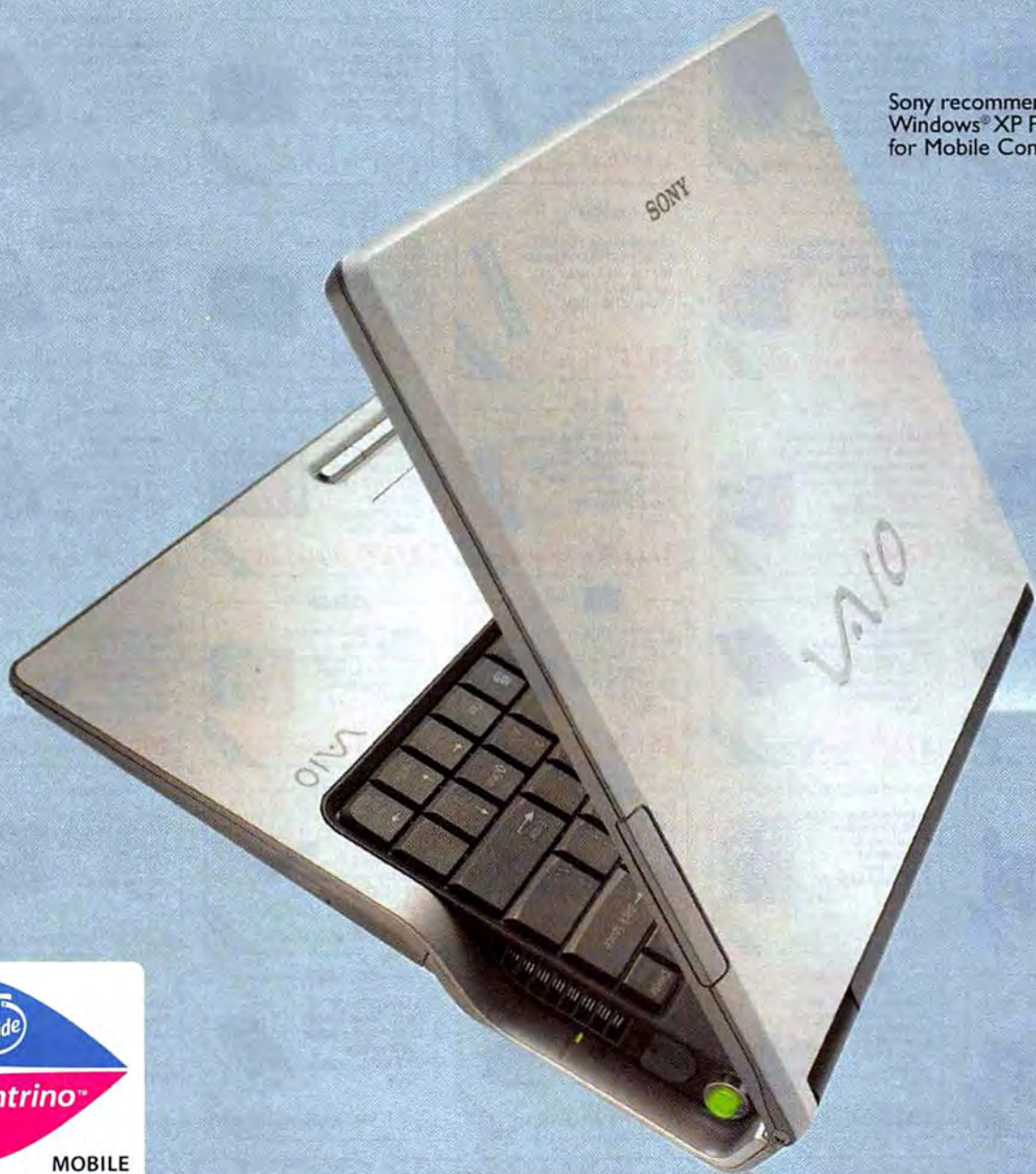
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An exclusive PC World survey

THE

reveals that even savvy Web users

GREAT

can do more to safeguard their

AMERICAN

privacy and data. Take the quiz

PRIVACY

and find out how vulnerable you

MAKEOVER

are; then use our tips

BY ANNE KANDRA & ANDREW BRANDT
ILLUSTRATIONS BY JOE ZEFF

to improve your score. ►

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IT STARTS OUT INNOCENTLY ENOUGH. You're browsing the Web, dreaming of the weekend and your next golf game, and you happen across a great-looking site that promises to drop your handicap in three easy lessons. Sounds good, but you've got a meeting in 5 minutes, so you hastily sign up for the site's weekly newsletter and dash off.

When the newsletter arrives several days later, however, it's not alone. Every day, more and more new spam crams your mailbox, hawking *Caviar Quarterly* subscriptions or pitching wild weekends in Las Vegas.

Who knew one newsletter would have so many pushy friends—and who invited them in the first place?

Companies that collect facts about you often have obscure data-handling practices, so your name, address, and account numbers could end up spreading across the Web faster than a cold at a corporate retreat. Your problems don't stop there—you also have to guard against ever more sophisticated scammers and hackers who are out to steal your identity or your company's data. And studies show that these problems keep getting worse both for individuals and for businesses.

But how do you know what information is really necessary to complete a transaction and what's collected for marketing? Which utilities can safeguard your PC from prying eyes and invading worms? Once you've given out your credit card number or your mother's maiden name, how can you tell where the information is going, or who is watching it?

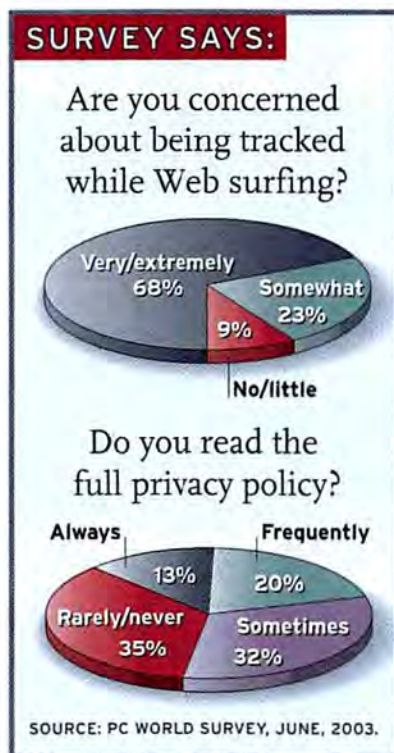
No wonder even savvy Internet users are confused. We at *PC World* wanted to find out how deep the problem ran, so we put together a survey and gave it to 1500 Internet users: 500 *PC World* subscribers, 500 *PCWorld.com* visitors, and 500 AOL or *OpinionPlace.com* users. We asked questions about their habits and concerns, as well as what they do to protect themselves online, and then we rated the answers to come up with a Privacy Quotient (PQ) score. (Take a condensed version of the test on page 148, or go to find.pcworld.com/38099 for the full survey.)

Our goal? To use what we learned about the vulnerabilities in users' security prac-

tices and offer practical, easy-to-follow advice to help you keep your personal information private and lead a safer life online.

SMART USERS, RISKY CHOICES

OUR SURVEY GROUP WAS an advanced bunch, with about 87 percent rating themselves intermediate or higher in PC profi-



ciency. They're serious Web geeks, too: Up to 70 percent spend 10 or more hours a week online. Despite this experience, the group had a PQ average of 56 (out of 100). Our own *PC World* editors also took the survey and did only slightly better, with an average of 60—which clearly shows that

there's a big gap between knowing about privacy risks and precautions, and acting on them. All of us could do much better.

We quickly noticed discrepancies between respondents' concerns about online dangers and their practices. For example, 88 percent of the group worried about sites sharing or selling e-mail addresses, but only 33 percent frequently read privacy policies, and only 7 percent complain about a policy they disagree with.

Overall, we discovered that privacy slips occur most often in three key areas: password management, use of security tools such as antivirus software and firewalls, and habitual online behavior.

Unfortunately, "there are lots of ways to violate security, and there's no way to close up all the holes," observes Jay Foley, co-executive director of the Identity Theft Resource Center (ITRC) in San Diego. But you can greatly improve your chances with a little more care and just a bit of trouble.

Take Control of Passwords

NO QUESTION: Passwords are a pain.

Managing them safely means cooking up dozens of cryptic letter and number combinations—following each site's arbitrary character count—and committing each to memory, along with the site it corresponds to. And when you've done all that, it's time to change them and start over. With every financial, shopping, and news site hounding you for log-in info, it's tempting to throw security out the window and just plug in your dog's name.

Don't do it. Passwords are one of the most obvious entry points for online account break-ins, say security experts. And hackers have perfected tools that do nothing but scour the Web, trying to match passwords with dictionary listings.

Managing passwords was a definite problem for our survey group: More than half of our respondents said they use letter and number combinations in their passwords, but about a quarter admitted to using the name of a person or pet. And

34 percent said they never change their passwords—a whopping 27 percent of whom describe themselves as advanced users or PC professionals. Worse, some unchanging passwords are written down: 40 percent keep passwords either on sticky notes or in daybooks, where others

can see them or where they can be lost.

While good password management will never be effortless, you can simplify it.

Our suggestions:

- **Use memory tricks to craft better passwords.** Start with, say, the title of a favorite book or movie. Take the first let-

ter of each word and stick a meaningful number, such as the year you started your current job, in the middle. You can update your passwords with each new book or movie. For less-critical accounts like news and movie sites, you might use a scheme with a number—perhaps ►

MAKEOVER

The Consultant With 50 Accounts

Name: E. Webb Bassick IV, CEO of Compensation Strategies, an executive compensation consulting firm based in Bannockburn, Illinois.

I met Bassick at his office in a suburban village surrounded by forests and neatly trimmed lawns about 30 minutes north of Chicago. Most of the PCs he and his eight employees use contain sensitive information about the compensation programs of some of America's largest companies. The nature of his business requires Bassick to run a corporate firewall to keep hackers out; nevertheless, he still could use a little help with internal security.

PC use: Two laptops, one of which travels between home and office; a home LAN with several PCs, a wireless access point, and a server.

Frequent tasks: Conducts business, sends files to clients, surfs the Web for business and entertainment.

What he does right: Bassick's IT consultant helped him set up a firewall and file server for his home LAN. He updates his antivirus definition files and does not open e-mail attachments he doesn't expect.

Biggest problem: Password management. "I have 50 accounts, for everything from my e-mail to my utility bills that I pay online, and one password that I use for all of them," he says. He also has one other password to an Excel spreadsheet that contains all the details of his online accounts. Moreover, Bassick e-mails drafts of the compensation plans as PDF file attachments to his clients in advance of face-to-face presentations, but he rarely password-protects them.

Solutions: To help Bassick build up a stable of different, strong passwords, I directed him to the WinGuides Network site. There, he could use the site's secure password generator tool (find.pcworld.com/38291) to create strong passwords on the spot for his various accounts. Run by a company called GuideWorks (unaffiliated with Microsoft), the WinGuides Network site publishes downloadable guides with security tips and system tweaks for Windows.

I also gave Bassick a Fellowes SecureTouch biometric mouse (find.pcworld.com/38168), which puts a variety of functions literally at the tip of his finger: The mouse will let him log in to his laptop or desktop using just a finger press on the mouse's scanning pad. It also

Hands-on Help: We contacted three survey respondents who wanted help on improving their privacy practices. Andrew Brandt, our *Privacy Watch* columnist and security expert, made house calls to help diagnose their problems and offer tailored solutions.

keeps track of his new passwords in an encrypted file and enters them into the file automatically after the first time he uses the passwords. The software included with the mouse can encrypt files he keeps on his PC or sends out as e-mail attachments, too (though the recipient needs to use the same software for decryption). —Andrew Brandt

Privacy Quotient: 49



"With so many passwords sprinkled all over the place, just keeping track of them all is a handful."

—E. Webb Bassick IV

the month and year you graduated from college—followed by the site's initials: 051982wp for the Washington Post. Don't use the same password at every site.

- **Try a password-management tool to reduce hassles.** Choose one that encrypts and stores your data on your PC (I like

Roman Lab's free Any Password at www.romanlab.com and Siber Systems' free AI Roboform at www.roboform.com).

- **Be careful about letting Windows store passwords.** Don't do it at all if your PC could be used by others. And always enter passwords at sites with sensitive

information, such as banks and retailers.

- **Change your passwords frequently.** Revise your news and entertainment site passwords once a year, but change your passwords for sensitive sites monthly.

For more password tips, see October's *Internet Tips* (find.pcworld.com/38102). ►

QUIZ

WHAT'S YOUR PRIVACY QUOTIENT?

YOU MAY BE AWARE of online privacy pitfalls, but how well are you guarding yourself against them? Take this abbreviated version of our survey to find out. For the full test, go to find.pcworld.com/38099. Scoring details are on page 160.

1 (a) How many of your Internet accounts (for e-mail, chat rooms, banking sites, and so on) require passwords?
(b) How many unique passwords do you have in total?

2 How often do you change your most commonly used password(s)? (Choose one answer.)

- A. More often than once a month
- B. About once a month
- C. About four times a year
- D. About twice a year
- E. Once a year or longer
- F. Never

3 Which of the following choices describe the passwords you use? (Choose all that apply.)

- A. Important date or birthday
- B. Name of person or pet you know
- C. Mother's maiden name
- D. Personal interest (hobby, TV, or movie title; favorite food or drink)
- E. Random word that can be found in the dictionary
- F. Combination of letters and numbers
- G. Other

4 How do you track your passwords? (Choose all that apply.)

- A. Write them down on paper—for example, in a datebook or journal
- B. Write them on sticky notes
- C. Store them in password manager software on a PC
- D. Store them in password manager software on a PDA
- E. Store them in a spreadsheet or a text file
- F. Store them on removable media or USB drive
- G. Memorize them
- H. Tape them to keyboard, drawer, or desk
- I. I don't keep track of passwords
- J. Allow browser or Windows to save them

5 Which computer-related activities have you done in the past year? (Choose all that apply.)

- A. Posted messages to Usenet groups
- B. Used chat rooms
- C. Sent and received e-mail
- D. Shopped or made travel plans online
- E. Banked online
- F. Conducted Web research
- G. Used instant messaging
- H. Applied for credit card or loan online
- I. Paid bills online
- J. Responded to spammers to complain or unsubscribe
- K. Purchased goods or services advertised through spam
- L. Filed your income tax online
- M. Posted your résumé on a job site
- N. Played online games
- O. Swapped files using a file sharing service
- P. Other

6 Typically, how often do you read most or all of the privacy policy of a Web site or online service when you sign up? (Choose one.)

- A. Always
- B. Frequently
- C. Sometimes
- D. Rarely
- E. Never

7 How do you usually respond if you dislike a site's privacy policy? (Choose one.)

- A. Provide the site with valid information
- B. Provide the site with valid information, but complain to the company
- C. Provide the site with false information
- D. Provide the site with false information, and complain to the company
- E. Decline to use the site
- F. Decline to use the site and complain to the company

8 Which of the following activities do you regularly perform on your PC(s) at work or home? (Choose all that apply.)

- A. Install patches for applications
- B. Install security patches for OS
- C. Delete stored cookies
- D. Clear Web browser history
- E. Delete Web browser cache/temp files
- F. Update virus definition files
- G. Run an adware removal program like Ad-aware or Spybot Search & Destroy
- H. Run antivirus software
- I. Use a firewall
- J. Encrypt files stored on hard drive
- K. Encrypt e-mail
- L. Report security problems to ISP

SCORING ON
PAGE 160



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Lock Down Your PC

FORTUNATELY, there's no lack of products to help you surf safely. But those defenses won't help much if you don't use them properly, and our results suggest that most people need to look critically at how they use the tools in their arsenal.

Nobody with an Internet connection should be without virus protection. Besides preventing potential catastrophe to your PC and network, an antivirus pack-

age can protect your system from worms and security holes that let intruders reach in and pilfer sensitive information such as passwords and financial data.

But antivirus software is only as good as its latest update. While 83 percent of our survey group said they use an antivirus application, only 73 percent update their definition files regularly. You wouldn't pay for a home security system and never turn it on; why run an antivirus app that can't recognize the intruders that it's sup-

posed to protect you from? The number of users taking action against viruses is encouraging; but still, more than one in four of our respondents are ripe for attack.

Also make sure to run a beefy spam filter. Not surprisingly, 98 percent of users say that sending and receiving e-mail is their top activity online (60 percent also use instant messaging), so it's essential to purge the junk. Nor is it just junk: You can eliminate many attempted virus attacks and potential security breaches ►

MAKEOVER

The Family With Budding Browsers

Names: Kevin and Jennifer Watts, and their children, Natalie, 7, and Travis, 6. Kevin is a technical sales representative based in Indianapolis for Braden Sutphin Ink Company; Jennifer is the treasurer for an elementary school parent-student group.

Kevin, whose cramped home office holds loads of memorabilia from the many years he's attended the Indianapolis 500 and Brickyard 400 auto races, takes his online computing hobbies as seriously as his offline ones. He plays in an online gaming league on a fast, custom-built PC. This office is also where the kids got their first taste of computing, and where they will soon start surfing the Web.

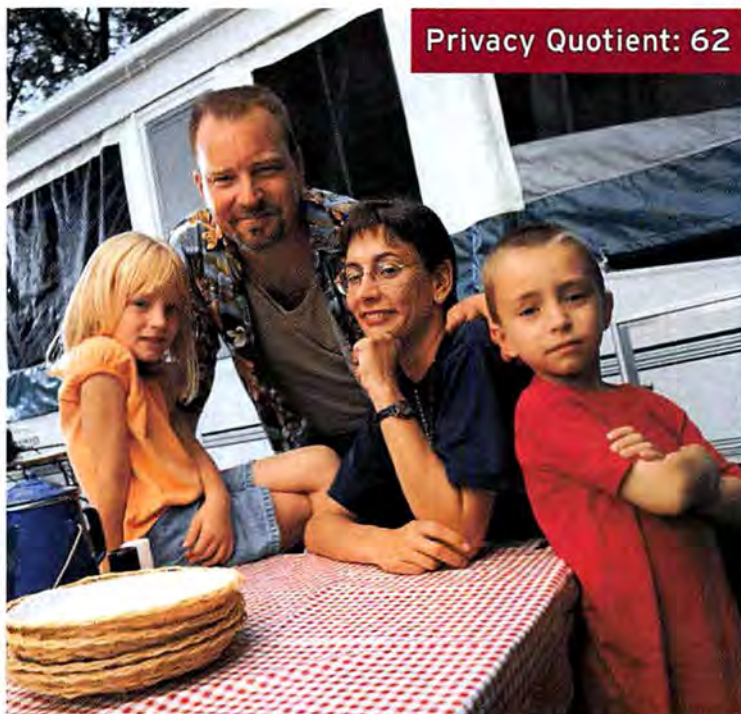
PC use: Two PCs in their home office, one with a broadband connection, the other with no Net access.

Frequent tasks: Kevin e-mails contracts, sales, and paperwork; maps his trips online; and plays games on the Web. Jennifer does Web research, accounting and budgeting spreadsheets, and e-mail correspondence.

What they do right: The Wattses do a great job of keeping up with patches and antivirus updates. He updates each PC's OS and most apps regularly, blocks pop-up ads, and lets the kids use the computer only when at least one parent is there with them.

Biggest problem: Network security and kid safety in the home office. The Wattses' two kids are about to take their first unsupervised steps onto the Internet, and Kevin had no software to protect them from the hazards that await children online. His passwords for his router and online accounts also needed improvement, and his PCs and printers weren't networked.

Solutions: I hooked up a Linksys 802.11b wireless router, which includes a hardware firewall, to their cable modem and added a wireless card to the second PC so it can share the broadband connection. With the router set up to give each PC a private, internal IP address,



Privacy Quotient: 62

"Our littlest one, Travis, got scared while watching *Aladdin*. We want to make sure the Internet is safe for him."

—Jennifer Watts

and with the ports that the Blaster worm uses to penetrate unprotected PCs blocked, the home LAN was safe. With Net Nanny Web filtering software in the PC that the kids will use, the little ones can surf without constant supervision. Finally, I set the Wattses up with a sub-\$70 Ebp Lite password manager keychain from Mandylionlabs.com, so they can better safeguard their PCs.

—Andrew Brandt



Out of Space

The right management can increase the storage capacity of your existing infrastructure.

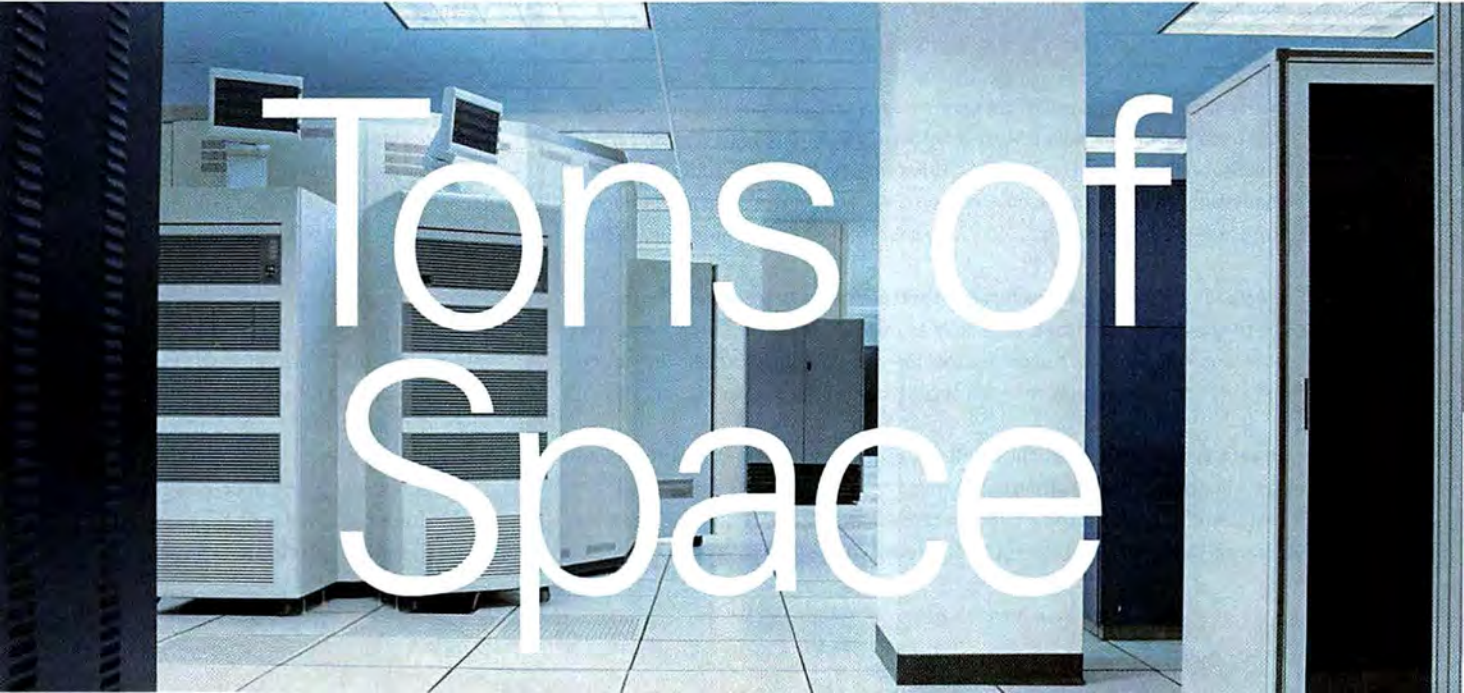
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Tons of Space

by letting a trusty e-mail bouncer deflect spam at the door. Check out "Top Utilities for Your Toolbox" for good filters. (AOL users may have to use the company's own spam-filtering software; most third-party tools don't work with AOL.)

It's also crucial to keep up with new software versions and install security patches—a task only about 63 percent of survey takers perform. "Fyodor," a self-described hacker whose Web site, www.insecure.org, contains a wealth of useful security-related information, says keeping software current is one of the best ways to lock intruders out. Go beyond the OS: "Internet-enabled applications like mail readers and Web browsers should also be

upgraded on a regular basis," he advises.

Sure, it's bothersome to keep up with Microsoft's patches, but you can simplify the process: In Windows XP, for example, right-click *My Computer*, select *Properties* • *Automatic Updates*, and then check *Keep My Computer Up to Date* to have Windows grab updates automatically from the Redmond mothership. (For more on patches, see this month's *Bugs and Fixes*, page 65.)

Automatic OS updates bring their own headaches, though. Take last year's Service Pack 2 for Windows XP: SP2 created an instability in Outlook that persisted until another patch was released. Under the Automatic Updates tab listed above, you can customize this feature so you just

get notified when a new patch is available, for example. For more, see April's "Internet Fixes" (find.pcworld.com/38105).

Another essential tool to keep the bad guys at bay—especially if you're running always-on broadband—is a firewall, used by just 58 percent of those surveyed. Windows XP has a built-in firewall, but third-party apps offer stronger security, better customization, and other worthwhile extras such as cookie managers. Check "Top Utilities" for our favorite firewall.

The fourth cornerstone of online protection is an anti-spyware/-adware app, which 44 percent of respondents use. Spyware and adware programs often slither undetected onto your PC as you surf; and besides serving up annoying pop-up ads, they may report your browsing habits (and who knows what else) back to the source (and who knows where else). You'll notice if you're getting extra ads, but you may never know spyware is there unless it visibly slows your PC's performance. See "Top Utilities" for recommended apps.

Additional suggestions:

- **Set automatic updates for your sentinel apps.** If you have a weekly meeting, for example, set your antivirus or firewall software to grab updates then. If your schedule is less predictable, have the software check for updates first thing in the morning, while you get your coffee.
- **Customize your Windows security settings.** (Go to *Tools* • *Internet Options* and select the *Security*, *Privacy* or *Advanced* tab, depending on what you want to set.) This step isn't a replacement for the tools discussed above, but you can beef up the basics by disabling file downloads (a good idea if others—especially kids—can access your PC), setting passwords, blocking cookies, and the like. It's generally a good idea to raise your Privacy settings to High, which will block cookies that use personally identifiable information without your consent, among other things. For more customization hints, see September's *Internet Tips* (find.pcworld.com/38108).
- **Periodically purge your Web history.** Don't forget to clear cookies and stored temp files from your browser's cache, ►

SOFTWARE

Top Utilities for Your Toolbox

TO KEEP YOUR ONLINE security simple and low-cost, check out this list of tried-and-true products that can help you cover your bases.

1 Antivirus: Everyone should have an up-to-date antivirus application—period. Symantec's Norton AntiVirus Pro 2004 (\$70) is a consistently good performer, and the 2003 version was a Best Buy in July. If you object to Symantec's product activation, try McAfee Security VirusScan 8 Home Edition (\$50). (See *New Products*, page 80, for more details on these and other parts of the companies' security suites.)



2 Spam fighter: Keep yourself out of harm's way by culling e-mail that may try to infiltrate your PC or your wallet. Sunbelt Software's \$20 IHateSpam is a good choice for Outlook users (find.pcworld.com/31556). Other options for people with Outlook and other e-mail clients: Symantec's Norton AntiSpam (\$40) and McAfee's SpamKiller Home 5 (also \$40), or the Mailblocks service (\$10 yearly subscription; find.pcworld.com/37280).

3 Firewall: For anyone with a broadband connection, firewalls are a must. For the rest of us, they're a very good idea, especially as worms and spyware proliferate. Zone Labs' ZoneAlarm 4 remains our top choice; the free version supplies a basic firewall, but the \$50 Pro version adds a comprehensive security tool kit (find.pcworld.com/36527).

4 Adware/spyware remover: These utilities can help keep pop-up ads from multiplying and prevent your surfing habits from becoming public knowledge. PepiMK's free Spybot Search & Destroy does a terrific job (find.pcworld.com/37325); the free Lavasoft Ad-aware 6.1 has fewer features but is also a good choice (find.pcworld.com/37322).

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Mr. Green's view

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The twins' view

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too. Not only will that keep you more secure, it will keep your PC running more smoothly. (Open IE, select *Tools>Internet Options*, and use the buttons on the General tab.) Some utilities, such as Webroot's Window Washer (find.pcworld.com/37979) make this cleanup a snap. Try to make these periodic purges part of your PC maintenance routine; perform them whenever you back up data or run a virus sweep, for example.

- **Configure your firewall to start automatically.** Most firewalls also let you select a protection level; we advise setting yours

to High, though you may need to flag benign apps so you don't get constant alerts. For more on configuration, see August's *Step-By-Step* (find.pcworld.com/38111).

SECURING YOUR NET

BOLSTERING your security is all the more critical if you're running a home or small-business network, particularly if it's wireless. When you don't have an IS department, it's easy to fall behind or make mistakes in implementing security.

Suites such as McAfee's Internet Security Suite 6 (\$70) and Symantec's Norton

Internet Security 2004 (\$80) are good options if you want something that is easy to maintain (see our review of both in this month's *New Products*). These packages typically include automation features and a full set of tools, from software firewalls to antivirus apps, spam killers, and pop-up blockers. See find.pcworld.com/38114 for pointers on securing your LAN.

Further suggestions:

- **Change all default administrative and network passwords.** Also encourage (or require) users who share the network to change their passwords every 6 or 12 ▶

MAKEOVER

The Team With a Vulnerable Network



Privacy Quotient: 38

“About 20 percent of the staff don't change their [default, blank] passwords.”

—Mario Sanon

Name: Mario Sanon (pictured, center), New York-based IT staff member for Strive, a nationwide job-readiness training organization.

At Strive's East Harlem center, classes of up to 45 students spend 8 hours a day learning everything from résumé-writing to computer fundamentals such as how to perform basic spreadsheet tasks. Sanon, a self-taught PC technician; his supervisor, Nobukiyo Sato (pictured, left); and computer skills instructor LaShanti Jenkins (pictured, right) maintain an aging phalanx of donated PCs, answer student questions, and field support requests from employees.

PC use: Two PCs in Sanon's office, wireless networking components, hardware firewall, plus servers.

Frequent tasks: Checks several e-mail accounts, including Strive's general mailbox; supports the 130 PCs on Strive's network.

What he does right: Patches his own operating system and uses the Bigfix service, which lets him know when patches are available for the applications he uses; keeps his antivirus definitions up-to-date.

Biggest problem: Passwords and online safety. Mario uses just two passwords for all his online accounts, including bill-paying services. He lets employees use the default passwords for the network, and he does not require them to change those passwords periodically. Safe surfing has also become a problem: Kids have started visiting unsavory Web sites in the computer lab.

Solutions: I talked to Sanon and Sato about techniques they could use, and teach to others, that would help them learn to create and remember strong passwords (see our tips on page 146), and I advised them to require that users' network passwords be changed periodically. I gave Jenkins specific notes to help her teach her students why computer privacy and security are important, and offered some password creation and privacy tips to pass along. Finally, I provided them with several copies of Net Nanny to install in the computer lab used by the neighborhood kids.

—Andrew Brandt



BIG SHOTS

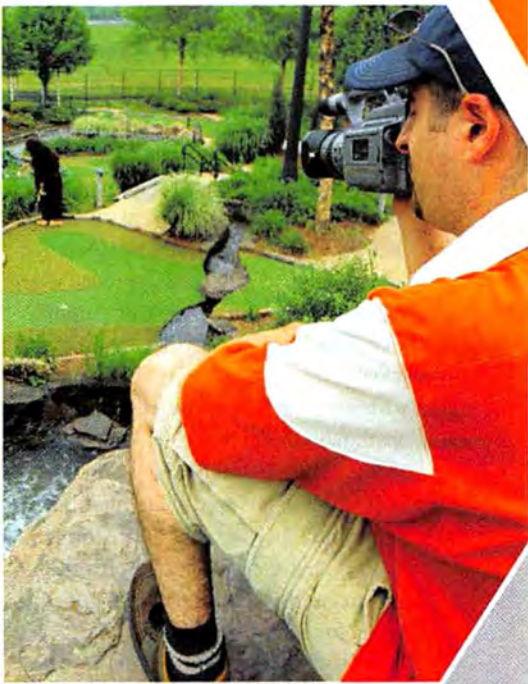
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months, by setting passwords to expire.

- **Upgrade your wireless network security.** Recently the Wi-Fi Alliance introduced Wi-Fi Protected Access (WPA), a security standard that addresses some holes in the Wired Equivalent Privacy (WEP) protocol. To get WPA, go to your vendor's site and download the new firmware—make sure to upgrade all the parts, from the routers and access points to the cards.

- **Test your network's security.** You can use free tools with limited functions, such as those at McAfee's HackerWatch.org/checkup, or more robust ones, like GFI LANguard's Network Security Scanner 3 (starts at \$295 for LANs with up to 25 IP addresses; www.gfi.com/lannetscan), that provide in-depth network analysis, from missing patches to weak passwords. See www.insecure.org/tools.html for more.

- **Watch out for disgruntled employees.** It's unfortunately true that most network breaches—over 70 percent, according to the ITRC's Foley—come from within. Go to Foley's site for a worksheet (find.pcworld.com/38117) that helps companies assess and address this problem.

Day-to-Day Discretion

STRENGTHENING your hardware and software defenses against online criminals is the first step to staying safe. But a truly savvy surfer must also be able to recognize the bad guys and approach even the good guys with a degree of caution.

Obviously, some activities are inherently risky: conducting financial transactions without proper security, responding to spammers, and most things involving file sharing. Interestingly, less than 28 percent of those surveyed share files, but 39 percent say they've replied to spammers.

Many people do financial chores online: 51 percent pay bills, and 32 percent e-file taxes, for example. With such sensitive data flying around, you need to think twice about what you divulge—and when.

A good way to start controlling the distribution of your information is to ►

TIPS FOR PARENTS

Who's Watching Your Kids?

IF THE WEB can be a dangerous place for responsible, savvy adults, imagine the risks for children. However, some of the most troubling responses to *PC World's* survey came from parents. Surprisingly, the survey indicated that respondents with children who go online are significantly *less* concerned about invasive and insecure practices than those without kids. Moreover, only 51 percent of parents said they talk to their kids about using the Net, and just 55 percent set limits on their kids' Internet use. Finally, a mere 8 percent use software to monitor their kids' online travels.

Although there are laws on the books that help protect the Internet's youngest users, parents are ultimately the ones responsible for safeguarding their children online. Here are several tips to ensure that your kids surf safely.



1 Set limits. Restrict your child's time online, and be familiar with sites they visit. Consider using a tool—such as BioNet's Net Nanny, Solid Oak Software's CyberSitter, or Webroot's ChildSafe—that filters or monitors your child's Internet use, especially if you have younger children. Many ISPs let you set parameters for online activity; AOL, for example, lets parents specify filtering settings depending on the child's age, so younger browsers might be allowed to visit only a few select sites, while teens browse more freely.

2 Talk to your kids about the Internet's dangers. If they are old enough to surf the Web on their own, explain that people online aren't necessarily who they say they are. Never allow them to arrange a personal meeting with someone they meet online.

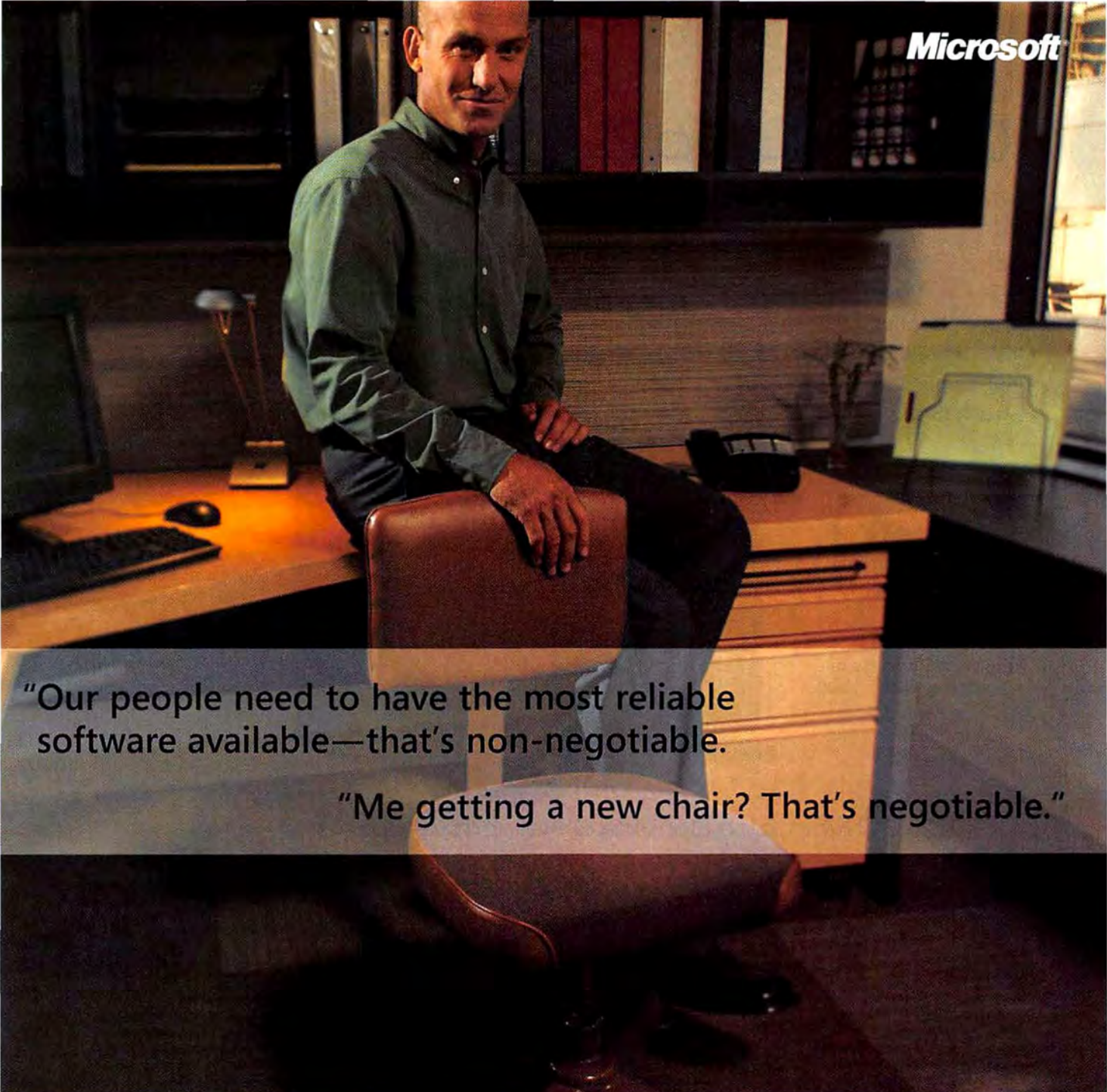
3 Teach them not to share personally identifiable information. Tell children never to give out their last name, address, or phone number, or the name of their school, for example. Also, never allow them to e-mail or post a photograph of themselves online.

4 Teach kids never to open e-mail file attachments. Most viruses and worms propagate that way and may be sent inadvertently by people you know. If you expect something via e-mail, scan it for viruses before opening it, to be safe. Instruct kids to tell you or a teacher if they receive a file or a Web page that they're uncomfortable with.

5 Monitor instant messaging and chat rooms. Know who your kids are IMing with. If they use a cell phone to IM, for example, check the statement for unfamiliar numbers. Limit or monitor the chat rooms they can access; tools such as Net Nanny can help.

6 Regularly check your children's PC for new programs. Popular file-sharing applications and the like often come with adware or spyware, which may collect and then report information about your kids' surfing habits. A program such as Ad-aware or Spybot Search & Destroy can eliminate these unwanted apps.

7 Skim the privacy policies of sites your children often visit. Glance through the text to see what information the site collects, and with whom it shares that data.



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"Me getting a new chair? That's negotiable."

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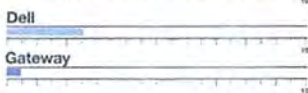


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read a site's privacy policy before you sign on. A very encouraging 72 percent of respondents say they'd decline to use a site if they didn't like its policy, while 12 percent provide false data if they are uncomfortable with the policy. Unfortunately, over 35 percent say they rarely or never

read such policies, and the vast majority never complain if they dislike the policy.

Don't expect online companies to safeguard your privacy for you—at least, not yet. Today, companies don't have to post privacy policies (but don't even consider doing business at a site without one).

PENDING LAWS

Capitol Hill on the Case

THOUGH CONGRESS IS FOCUSING primarily on spam issues, other privacy and security concerns still hold a place on the legislative calendar.

California recently set a new standard for online security with its passage of Senate Bill 1386, which became law on July 1. The law requires any company doing business in California to notify its customers in the state of any attempted security breach into non-encrypted, personally identifiable data. Whether or not Congress passes a similar federal rule, the law will probably have a national impact because a company is likely to streamline its operations by adopting a single information gathering and notification process for all its customers nationwide. Some pending bills aim to close other privacy holes. Visit thomas.loc.gov for updates on each bill's status.

1 Online Privacy Protection Act of 2003/H.R. 69. Sponsored by Representative Rodney P. Frelinghuysen (R-New Jersey), this bill empowers the FTC to regulate and police the collection, use, and disclosure of personal information about individuals on the Net by Web site operators and online services. It also gives people greater control over their data, letting them consent to or limit any disclosures, especially to third parties.

2 Consumer Privacy Protection Act of 2003/H.R. 1636. The bill, sponsored by Representative Cliff Stearns (R-Florida), covers buyers who make interstate purchases—online or offline (via mail-order catalogs and the like). It requires companies that collect personally identifiable data to disclose to customers when the data may be used for marketing or other unrelated purposes, and gives enforcement responsibility to the FTC.

3 Privacy Act of 2003/S.B. 745. Sponsored by Senator Dianne Feinstein (D-California), this bill requires companies to obtain a customer's consent before selling or disclosing that customer's personally identifiable information (such as a driver's license number, and health and financial data).

4 Identity Theft Prevention Act/S.B. 223. Sponsored by Senator Feinstein, this bill requires banks and other financial agencies to make more aggressive efforts to prevent criminal access to sensitive data. For example, it bans companies from printing full credit card numbers on receipts.

5 Social Security Number Misuse Prevention Act/S.B. 228. This bill, also from Senator Feinstein, restricts the sale or display of a person's Social Security number, such as on a government check, without consent. It also bars companies from requiring a Social Security number when consumers make purchases.

Even the ones that do, however, don't always make it clear that your data will be passed around to others like chips at a birthday party. And they certainly don't warn against actions their affiliates might take or notify you when criminals have breached their security (a recent California law has begun to address this—see "Capitol Hill on the Case" for details).

More bad news: Plenty of malicious elements online are actively seeking to defraud you, and they're getting sneakier.

OUT TO GET YOU

IDENTITY THEFT is the worst-case scenario for people whose personal information has been compromised. According to a study conducted for the Federal Trade Commission (FTC) this spring, the number of identity theft victims rose over the past six years to a staggering 9.9 million in the United States in the last 12 months (3 percent of our group are among such victims). What's more, thieves are hard to catch: Law enforcement statistics show less than 5 percent of cases end in arrest.

You may have run into an increasingly common hoax called "phishing"—a scam in which a thief sends convincing e-mail messages asking for sensitive data to confirm or reactivate an account, with links to a phony site where you fill it in.

Becky Roberts, an account executive and avid eBay seller in Ventura, California, took the bait in one such e-mail. It was disguised as an eBay request for updated information, complete with logos. Though she canceled her credit cards and placed fraud alerts on her accounts, she still lives in fear of the fallout. "Someone out there knows everything about me,"

Roberts says. (Similar recent scams have involved Citibank and PayPal, among others.) Also, she says, it took eBay a week to respond when she wrote to ask if the request was legit.

Credit card thieves are stepping up attacks with automated tools that may make crimes easier to perpetrate, according to a study by the Honeynet Project, a nonprofit research group of information security pros. ▶





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² For a free copy of the standard limited warranty see a reseller where Acer products are sold or write to Acer America Corporation,
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Empowering People

SURVEY SAYS: Do you regularly...



SOURCE: PC WORLD SURVEY, JUNE, 2003.

Our survey takers are familiar with this peril: 18 percent said that their credit card numbers had been stolen, or that mysterious charges had appeared on their bills.

For better security, try the following:

- **At least skim privacy policies.** Scan for words such as *use*, *distribute*, or *share*, which should refer to how the site will use the data it collects. Look for references to those with whom it shares information: *internally*, with *affiliates*, or with *third parties*. And check whether the policy can change without notice to you—and if it does, whether you'll have the chance to delete your data. AT&T's Privacy Bird, a browser add-in, monitors some privacy policies for you; go to www.privacybird.com to download it or to get more details.
- **Complain if you don't like a privacy policy.** If they're ever going to change, companies need to know when their practices are unacceptable to customers.
- **Be wary of e-mail asking for account information.** Contact the company via phone or e-mail (but not by reply) to confirm it sent the request. If you get a fraudulent e-mail or are targeted by identity thieves, notify the legitimate company the crooks are hiding behind, alert police, and visit www.idtheftcenter.org for more info.
- **Create different online identities.** For example, reserve one e-mail address for friends and family, another for business associates, and a third (perhaps a free account, like one from Yahoo or Hotmail) for activities like shopping and chatting, which can make you a spam target.
- **Don't automatically give a site everything it asks for.** Aside from a shipping address, most online transactions don't need

more data than a brick-and-mortar store.

- **Perform due-diligence checks on companies.** Check the site's policies and security features: Is there an *s* following the *http* in the URL, or an SSL Secured lock icon to ensure safe transmissions? Does it store your data on its servers; if so, is it encrypted? Does it display a Truste or BBB (Better Business Bureau) Online logo (which indicates the company has agreed to specific standards of practice)? Check sites like the BBB's (www.bbb.org) for complaints.
- **Review your financial statements monthly.** Look for unauthorized charges and money transfers. Have credit bureaus (www.experian.com, www.equifax.com, or www.transunion.com) contact you

when there's an inquiry or activity on your credit, to get early warning of potential trouble. This service costs \$80 a year and includes three credit reports.

- **Check for warnings about scams and other threats.** Sites like www.consumer.gov/idtheft and www.privacyrights.org often have such information.

YOUR PRIVACY POLICY

THE GUIDELINES above are a start, but they're by no means exhaustive. See find.pcworld.com/38120 for more privacy tips, information, and top downloads.

It's inconvenient to be a good privacy consumer, says Jennifer Granick, executive director of the Center for Internet and Society at Stanford Law School. "But you've got to make security a key issue in every decision you make."

That starts with more effectively using the tools that you already own, avoiding shortcuts such as no-brainer passwords that leave you vulnerable, and surfing smarter and more skeptically. ■

Anne Kandra is PC World's Consumer Watch columnist and a contributing editor; Andrew Brandt is a senior associate editor.

SCORING

CALCULATE YOUR PQ

Your key to the quiz on page 148:

Question 1: Divide the number of passwords (a) by the number of accounts (b), and multiply by 20. Choices over 100 for either answer count as 100 for scoring.

Award points for each answer as follows: **Q2:** a: 10; b: 8; c: 5; d: 3; e: 1; f: -5. **Q3:** a, b: -1; c: -3; d, e: -2; f: 10; g: 1. **Q4:** a: -5; b, h: -10; c, d, g: 8; e: -2; f: 2; i: 0; j: -1. **Q5:** a, h: -5; b, d, j: -2; c, i, l, p: 0; e: -3; f, g, n: -1; k, m, o: -10. **Q6:** a: 10; b: 7; c: 5; d: 4; e: 0. **Q7:** a: -5; b: -1; c: 0; d, e: 2; f: 5. **Q8:** a, b, f, i: 5; c, d, e: 2; g: 7; h, j, k: 10.

Total your points, add 75, and then divide by 2 to get your Privacy Quotient.

1-25: YOU'RE AT RISK: Your personal information could be open to marketers,

hackers, and other snoops. Consider tightening up your handling of passwords and improving your PC's security system.

26-50: YOU'VE COVERED THE BASICS: You've taken some steps to guard yourself, but there are still holes in your defenses.

51-75: YOU'RE CAUTIOUS: You're practicing many of the most important strategies for protecting your information, but there's still room for improvement.

76-100: YOU'RE A CLOSED BOOK: You're very cautious about what you reveal online, and today that's a good thing.

**AVERAGE SURVEY
SCORE = 56**

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179 19-INCH CRT MONITORS

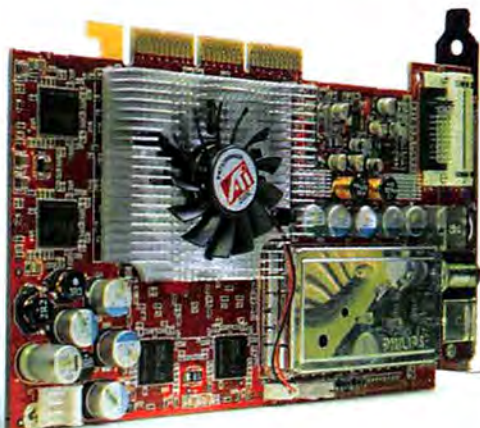
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TOP 100

EDITED BY THE REVIEWS STAFF

**Spot
LIGHT** ATI's All-In-Wonder 9800 Pro (left) and BFG Technologies' Asylum GeForce FX 5900 Ultra do more than let you play games—though they ace that task, too.



SPOTLIGHT: GRAPHICS BOARDS

Cinematic Graphics on Your PC

Yes, actually, you can have it all. In this Spotlight illuminating today's latest and hottest graphics boards, ATI's All-In-Wonder 9800 Pro stands out, delivering awesome graphics and speed when you want your entertainment fast and furious, and television and radio on your PC when you need to relax. Somewhat less adaptable, but no less adept in performance, our group of five power graphics boards produced impressive speed and image quality when

running our Test Center's suite of games. ATI's Radeon 9800 Pro led that pack in overall speed. With faster processors, more memory, and support for Microsoft's DirectX 9, all of these boards are well-equipped to run the next generation of PC games.

Thanks to innovative new 3D technologies that can handle such graphically demanding visuals in new PC games as crackling fire, rustling blades of grass, the glimmer of stained glass, and real-time shad- ▶



Digital Cameras

Top 10 CHART Toshiba's PDR-M700 has a 10X optical zoom lens for bringing your subjects in close and an oversize 2.5-inch LCD display for seeing just exactly what you've got.

181



Printers

Top 10 CHART Think you've seen this one? Dell's M5200n laser printer is a clone of the Lexmark T630n. Both make the chart, but the Dell costs \$100 less, so it earns the Best Buy.

177

Desktop PCs

Top 15 CHART The HP Compaq Business Desktop D325 rises high on the value desktops chart by offering perky performance and a 15-inch LCD for \$833.



INSIDE THE TOP 100

See find.pcworld.com/15720 for details on how we compile charts for the Top 100. Freelance writers Dan Littman, Mick Lockey, and Carla Thornton and PC World editors Richard Baguley, Eric Butterfield,

Tracey Capen, Rebecca Freed, Kalpana Ettenson, Alexandra Krasne, Melissa J. Perenson, and Alan Stafford all contributed to the Top 100 section this month. Ulrike Diehlmann, Julio Giannobile, Elliott

Kirschling, Jeff Kuta, Tony K. Leung, and Thomas Luong of the PC World Test Center performed testing on the products reviewed in this section, with logistical support provided by Julian Weatherby.

ows and lighting effects, cinematic realism is no longer a distant promise. Of course, the detailed textures and dramatic lighting effects in new games require some heavy lifting from your graphics card. Though new games will run on older hardware, the more memory and processing power your system and your graphics card have, the smoother the game will play and the better the visuals will look.

THE FAST AND THE FASTER

IN THE TWO-HORSE chip-set competition between ATI's Radeon 9800 Pro and NVIDIA's GeForce FX 5900 Ultra, gaming performance is a sure winner. Running Epic Game's Unreal Tournament 2003



HALF LIFE 2 (right) uses advanced DirectX 9 effects to create more realistic graphics than the original game.

and Croteam's Serious Sam 2, boards equipped with these processors produced frame rates well above 100 frames per second, even at a demanding resolution of 1600 by 1200. (The magic number is 60 fps; when frame rates drop below that, you may notice jumps and pauses.)

Only antialiasing (AA) seemed to separate ATI-based boards from NVIDIA-powered models. At lower screen resolutions—1024 by 768 or less—turning on antialiasing will smooth rough, pixelated edges commonly seen on diagonal or curved surfaces. (These edges look smoother at higher resolutions, so you probably won't need to use antialiasing.)

Another feature, anisotropic filtering, alleviates the distortion that occurs when a textured image (such as a tiled floor in a long hallway) extends from the foreground into the background. But the price you pay for a better-looking game is lower frame rates. In our Unreal Tournament 2003 tests, last year's top boards

TOP 100



Powerful Cards for Multimedia and Games

Visit find.pcworld.com/31961 for more information on products ranked in this chart.

	POWER GRAPHICS BOARD	Street price (9/5/03)	Overall speed	Unreal Tournament 2003 at 1024 by 768 with/without antialiasing	Antialiasing image quality score ¹	Comments
1	Best Buy BFG Technologies Asylum GeForce FX 5900 Ultra find.pcworld.com/38084	\$500	Very good	76/164	Good	FEATURES: NVIDIA GeForce FX 5900 Ultra chip, 256MB of DDR SDRAM, DVI-out, S-Video-in and -out, composite-in and -out, dual display support. SUMMARY: Generous 24-hour daily support and a heap of extra features help propel this card to the top of the list. (★★★★☆)
2	MSI Nbox N5900 Ultra-VTD256 find.pcworld.com/38078	\$570	Very good	130/166	Good	FEATURES: NVIDIA GeForce FX 5900 Ultra chip, 256MB of DDR SDRAM, DVI-out, S-Video-in and -out, composite-in and -out, dual display support. SUMMARY: Feature-rich card is the priciest on the chart, but it was also the fastest NVIDIA-based model we reviewed this month. (★★★★☆)
3	Crucial Technology Radeon 9800 Pro find.pcworld.com/38075	\$370	Outstanding	138/174	Outstanding	FEATURES: ATI Radeon 9800 Pro chip, 128MB of DDR SDRAM, DVI-out, S-Video-out, dual display support. SUMMARY: Light on the extras, this card tied the other two Radeon-based cards on our speed tests. Crucial's 10-year warranty is better than most. (★★★★☆)
4	ATI Radeon 9800 Pro find.pcworld.com/38081	\$400	Outstanding	138/175	Outstanding	FEATURES: ATI Radeon 9800 Pro chip, 256MB of DDR2 SDRAM, DVI-out, S-Video-out, composite-out, dual display support. SUMMARY: Excellent gaming card offers fewer extras than its All-in-Wonder cousin, but its performance was virtually identical. (★★★★☆)
5	Aopen Aeolus FX5600S-DV0256 find.pcworld.com/38090	\$200	Good	73/164	Good	FEATURES: NVIDIA GeForce FX 5600 chip, 256MB of DDR SDRAM, DVI-out, S-Video-out, composite-out, dual display support. SUMMARY: A fine card for gamers on a budget, but it might not have the power to handle new DirectX 9 games at high resolutions. (★★★★☆)
MULTIMEDIA GRAPHICS BOARD						
1	Best Buy ATI All-in-Wonder 9800 Pro find.pcworld.com/38081	\$449	Outstanding	139/175	Outstanding	FEATURES: ATI Radeon 9800 Pro chip, 128MB of DDR SDRAM, DVI-out, TV tuner, S-Video-in and -out, composite-in and -out, audio-in and -out. SUMMARY: This board includes three games and plenty of extras, including an FM tuner. It can output to a high-definition TV. (★★★★☆)
2	EVGA Personal Cinema E-GeForce FX 5200 find.pcworld.com/38087	\$200	Average	23/56	Good	FEATURES: NVIDIA GeForce FX 5200 chip, 128MB of DDR SDRAM, TV tuner, S-Video-in and -out, composite-in and -out, audio-in and -out, dual display support. SUMMARY: Budget home theater card offers an easy-to-use interface that could stand some minor improvements. (★★★☆☆)

FOOTNOTE: ¹ In frames per second (average frames per second at 1024 by 768 and 32-bit color). ² All cards set to 4X antialiasing with 8X anisotropic filtering. **HOW WE TEST:** We use Epic's Unreal Tournament 2003 and NovaLogic's Comanche 4 (DirectX 8 games) and Croteam's Serious Sam 2 and Id's Return to Castle Wolfenstein (OpenGL games). We also use 3ds Max, a 3D modeling application. For performance tests, we run each card at several resolutions: 1024 by 768 with 16- and 32-bit color, and 1280 by 1024 and 1600 by 1200 with 32-bit color. We perform antialiasing tests using Unreal Tournament at 1024 by 768 resolution with 32-bit color at the manufacturer-recommended settings. The chart ranks price (5 percent), performance (60 percent), features (25 percent), and vendor service and support policies (10 percent). **CHART NOTES:** See find.pcworld.com/10860 for details on PC World's Star Ratings.

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all dropped below 60 fps with AA turned on. Not so with this year's models: With AA switched on, the Radeon 9800 Pro-based cards yielded frame rates at or above 130 fps, and most of the boards with NVidia's FX 5900 chips hovered at around 75 fps. (Those carrying less-expensive NVidia FX 5200 and FX 5600 chips fell below 50 fps.)

With antialiasing on, the ATI-based boards were faster than their competitors and displayed a better-looking game, virtually eliminating jaggies and rough textures. NVidia-based cards showed relatively minor improvements. Of course, both ATI and NVidia are already looking to the next generation. New graphics boards from ATI with faster processors and memory speeds will begin shipping in early October, while cards equipped with NVidia's latest chips should be on store shelves by the end of October.

Graphics cards supporting DirectX 9 have existed for more than a year now. But games that take advantage of the standard's new graphics tricks are just arriving. Valve Software's *Half Life 2* wasn't available at the time of this writing, but it should be in stores by the time you read this. If you live for *Doom*, however, you'll just have to be patient: Id Software's long-awaited upgrade, *Doom III: The Legacy* (based on OpenGL, not DirectX 9), won't be ready until early next year.

Game developers' erratic release schedules make upgrading our graphics boards test suite difficult. For this review, we



EVGA'S PERSONAL Cinema FX 5200 card comes with an RF remote and breakout box.

relied on the same suite of games we put together a year ago. See the How We Test information below our chart on page 166.

COUCH COMPUTING

THE RECENT TREND toward using PCs as home theaters leans very heavily on the graphics card. For several years, ATI's All-In-Wonder boards have offered multimedia functions. Last year saw the launch of Microsoft's Windows XP Media Center Edition, and this year NVidia board manufacturers are selling updated Personal Cinema packages. (Visit find.pcworld.com/38123 for more information.)

For our head-to-head comparison, we reviewed ATI's \$449 All-In-Wonder 9800 Pro and EVGA's \$200 Personal Cinema E-GeForce FX 5200. Both require you to connect an extensive set of components (infrared remote, VGA or DVI, cable, audio, and breakout boxes), plus install a plethora of drivers.

Much like Windows XP Media Center, the EVGA Personal Cinema's large blue menu (left) provides options for watching or creating a DVD, viewing photos, editing a movie, playing music, or watching TV. The viewing quality of TV on an LCD was okay, but when we used the EVGA to display Win-

dows on a TV (via an S-Video cable), the desktop was difficult to read. If you have a TV or an LCD with a DVI port, ATI's card may be a better choice: In our tests, its digital interface created a clearer picture.

Though pricey, ATI's All-In-Wonder 9800 Pro affords a bonanza of features for home theater aficionados. (It also blew EVGA's card off the track in our gaming tests.) And the All-In-Wonder is the only board we've seen to date that includes an FM tuner and has the ability to record and play back radio.

While its remote control is functionally similar to the EVGA's, ATI's software is better in some respects. For example, if you press the DVD button on the remote while viewing TV, a dialog box pops up and asks you whether you want to quit your current task. ATI's TV-On-Demand has TiVo-like functionality, which lets you record and pause live TV. A helpful status bar at the bottom of the screen tracks your progress as you advance or rewind.

ATI's Multimedia Center software provides a library where you can see listings of recorded TV shows, movies, music, and pictures. But unlike EVGA's large centralized interface, ATI's Library—as well as the individual DVD and television apps—must be launched from a panel on the desktop. (ATI says you can manually set the Library to launch at boot.)

We like the concept of a multimedia PC and found the functionality to be a nice add-on. Nevertheless, we're not ready to replace our existing home theater setups with these products just yet.

—Alexandra Krasne ■



THE EVGA PERSONAL Cinema E-GeForce FX 5200 offers a large, centralized menu that launches at boot.



LAUNCHED FROM the desktop, ATI's Library displays movies, recorded TV, and other content on your PC.

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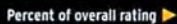

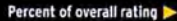


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TOP 15 DESKTOP PCs

POWER SYSTEM		Overall rating	Street price (8/25/03)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY ABS Ultimate M5 find.pcworld.com/36536	93	Average \$2739	Windows XP Home Outstanding 140	Powerful PC is the fastest we've tested and has outstanding gaming scores, great speakers, and a good monitor. (★★★★★ Sept 03)
2	Dell Dimension 8300 find.pcworld.com/37289	90	Expensive \$3119	Windows XP Home Good 127	Pricy machine offers a beautiful LCD monitor and good speed. The case interior can be accessed easily, sans tools. (★★★★★ Oct 03)
3	Micro Express MicroFlex 30A find.pcworld.com/34742	86	Inexpensive \$1999	Windows XP Professional Good 131	Fairly quick and quite reasonably priced, this system comes with a large LCD monitor and a graphics card with a TV tuner. (★★★★★ June 03)
4	Amax AMD Max 3200+ NEW find.pcworld.com/37823	86	Inexpensive \$2399	Windows XP Professional Very good 134	Stylish unit includes two 80GB hard drives striped together using RAID; LCD monitor was fine for text but mediocre on graphics. (★★★★★)
5	Sys Technology Performance 3200+ find.pcworld.com/37517	85	Average \$2696	Windows XP Professional Outstanding 136	Impressive speed and surround-sound speakers highlight this unit; the LCD produced fine text but lackluster colors. (★★★★★ Oct 03)
6	PC Power & Cooling SleekLine 3000MX NEW find.pcworld.com/37838	84	Very expensive \$3699	Windows XP Professional Outstanding 136	In its standard configuration, this model's CPU is overclocked by 2 percent; also comes with a quiet power supply. (★★★★★)
7	MPC Millennia 920i Professional NEW find.pcworld.com/37835	83	Average \$2831	Windows XP Home Good 127	Roomy interior; unit includes a dual-format DVD burner and Pinnacle's Studio 8.5 for video editing and DVD authoring. (★★★★★)
Percent of overall rating 			10 percent	25 percent	
VALUE SYSTEM		Overall rating	Street price (8/25/03)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY Dell Dimension 4600 find.pcworld.com/37328	83	Expensive \$1713	Windows XP Home Very good 122	This system's graphics card produced solid frame rates in our tests, making it ideal for gaming. The LCD was stellar, too. (★★★★★ Oct 03)
2	HP Compaq Business Desktop D325 NEW find.pcworld.com/37829	82	Inexpensive \$833	Windows XP Professional Very good 122	Business system has room for expansion and dual VGA inputs, but it has only a relatively small hard drive and no CD-RW drive. (★★★★★)
3	Polywell Poly 880NF2-2700 find.pcworld.com/32900	81	Expensive \$1599	Windows XP Home Very good 128	Though this Poly earned high marks on 3D graphics tests, graphics and text on our review unit's monitor weren't great. (★★★★★ Mar 03)
4	Micro Express MicroFlex 32A find.pcworld.com/37331	81	Average \$1399	Windows XP Professional Outstanding 130	A strong performer, the 32A blazed through our 3D graphics tests, pumping out fast frame rates at 1280 by 1024 resolution. (★★★★★ Oct 03)
5	HP Pavilion A250n NEW find.pcworld.com/37832	81	Average \$1329	Windows XP Home Good 116	Well-designed chassis features clear labels and easy-to-access ports. The 15-inch LCD showed crisp text and vibrant graphics. (★★★★★)
6	NuTrend Mega 2 find.pcworld.com/34121	80	Inexpensive \$889	Windows XP Home Very good 129	One of the fastest value PCs on the chart; its neat, spacious interior makes expansion easy. (★★★★★ May 03)
7	Polywell Poly 880NF2-2800 find.pcworld.com/37334	79	Inexpensive \$993	Windows XP Home Very good 127	A see-through window on the side of this commendable performer's case allows you to see the interior. (★★★★★ Oct 03)
8	IBuyPower Value XP Pro find.pcworld.com/35684	77	Inexpensive \$868	Windows XP Home Good 119	Budget PC comes with a notably good 19-inch CRT monitor and a media card reader. (★★★★★ Aug 03)
Percent of overall rating 			20 percent	20 percent	

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. See find.pcworld.com/15720 for more details.

² Total capacity in gigabytes (may represent multiple drives).

TEST
Center

DVD BURNERS HAVE BECOME increasingly common on top-flight desktops. And if the power side of the chart is any indication, rewritable DVD drives have now achieved the status of a mainstream feature on heavy-duty PCs. Six of the seven power units come with a DVD burner—including all three new entries, Amax's AMD

Max 3200+, PC Power & Cooling's SleekLine 3000MX, and MPC's Millennia 920i Professional. The dual-format burners on these three models can handle DVD-R/RW and DVD+R/RW, reflecting the current industry trend toward supporting the two leading DVD recording formats.

Visit find.pcworld.com/37850 for reviews of all products tested this month and ranked in this chart.

BASE CONFIGURATION						Extra features ⁴	Graphics quality	Setup and ease of use	Vendor's reliability/service
CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³				
2.2-GHz Athlon XP 3200+	1024/DDR400 SDRAM	160	19-inch CRT	128MB ATI Radeon 9800 Pro	Midsize tower	Good: DVD+R/RW drive, 16X DVD-ROM drive, Microsoft Works Suite 2003	Outstanding	Very good	Fair/Good
3.2-GHz Pentium 4	1024/DDR400 SDRAM	200	18-inch LCD	128MB ATI Radeon 9800 Pro	Midsize tower	Very good: DVD+R/RW drive, 16X DVD-ROM drive, Microsoft Office XP Small Business Edition	Outstanding	Good	Good/Fair
2.167-GHz Athlon XP 3000+	512/DDR333 SDRAM	120	19-inch LCD	128MB ATI All-In-Wonder Radeon 9700 Pro	Midsize tower	Good: DVD-R/RW drive, 52X/24X/52X CD-RW drive, Pinnacle Studio 8	Outstanding	Good	*/
2.2-GHz Athlon XP 3200+	512/DDR400 SDRAM	160	17-inch LCD	128MB ATI Radeon 9800 Pro	Midsize tower	Very good: DVD-R/RW/+R/RW drive, memory card reader (CF I/II, MS, SD/MMC, SM) ⁵	Very good	Good	*/
2.2-GHz Athlon XP 3200+	1024/DDR400 SDRAM	180	17-inch LCD	128MB Gigabyte GV-R98P128D	Midsize tower	Good: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, memory card reader (CF I/II, SM), ⁵ wireless keyboard/mouse, Corel WordPerfect Productivity Pack	Very good	Good	*/
3.2-GHz Pentium 4	1024/DDR400 SDRAM	240	17-inch LCD	128MB ATI Radeon 9700 Pro	Desktop	Very good: DVD-R/RW/+R/RW drive	Very good	Very good	*/
3.2-GHz Pentium 4	1024/DDR400 SDRAM	250	19-inch CRT	128MB ATI Radeon 9800 Pro	Midsize tower	Outstanding: DVD-R/RW/+R/RW drive, 48X/24X/48X CD-RW/DVD-ROM combo drive, Symantec Norton AntiVirus 2003, Pinnacle Studio 8.5	Very good	Good	*/
10 percent						10 percent	15 percent	5 percent	25 percent

BASE CONFIGURATION						Extra features ⁴	Graphics quality	Setup and ease of use	Vendor's reliability/service
CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³				
2.8-GHz Pentium 4	512/DDR400 SDRAM	120	17-inch LCD	64MB ATI All-In-Wonder 9000 Pro	Minitower	Good: 16X DVD-ROM drive, 48X/24X/48X CD-RW drive, Microsoft Works 2003	Very good	Fair	Good/Fair
2.13-GHz Athlon XP 2600+	256/DDR333 SDRAM	40	15-inch LCD	Integrated NVIDIA GeForce4 graphics using main memory	Minitower	Fair: 24X-48X CD-ROM drive, Microsoft Works 7.0	Good	Very good	Fair/Poor
2.167-GHz Athlon XP 3000+	512/DDR333 SDRAM	160	19-inch CRT	128MB NVIDIA GeForce4 Ti 4600-based	Midsize tower	Outstanding: 2X/1X/6X DVD-R/RW drive, 52X/24X/52X CD-RW drive, Lotus SmartSuite 9.7	Very good	Good	*/
2.2-GHz Athlon XP 3200+	512/DDR433 SDRAM	120	19-inch CRT	128MB ATI All-In-Wonder 9700 Pro	Midsize tower	Good: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, memory card reader (CF I/II, MS, SD/MMC, SM) ⁵	Very good	Good	*/
2.6-GHz Pentium 4	512/DDR333 SDRAM	120	15-inch LCD	64MB GeForce4 MX 440-based	Minitower	Outstanding: DVD+R/RW drive, 24X-48X CD-ROM drive, memory card reader (CF I/II, MS, SD/MMC, SM), ⁵ WordPerfect Productivity Pack	Good	Good	Fair/Poor
2-GHz Athlon XP 2400+	512/DDR400 SDRAM	60	17-inch CRT	64MB Asus V9180TD (GeForce MX 440-based)	Midsize tower	Good: 16X DVD-ROM drive, 48X/24X/48X CD-RW drive, Corel WordPerfect Office 11	Fair	Very good	*/
2.08-GHz Athlon XP 2800+	512/DDR333 SDRAM	80	17-inch CRT	Integrated NVIDIA nForce2 graphics using main memory	Midsize tower	Good: 16X DVD-ROM drive, 52X/24X/52X CD-RW drive, Lotus SmartSuite 9.7, Symantec Norton AntiVirus 2003	Fair	Good	*/
2.67-GHz Pentium 4	512/DDR400 SDRAM	80	19-inch CRT	64MB GeForce4 MX 440	Midsize tower	Fair: 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, V.90 modem, network adapter, Ulead VideoStudio 6.0	Fair	Good	*/
10 percent						10 percent	10 percent	5 percent	25 percent

¹ Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches).

⁴ Unless otherwise stated, systems come with a modem and network adapter.

⁵ CF = CompactFlash, MMC = MultiMediaCard, MS = Memory Stick, SD = SD memory card, SM = SmartMedia.

⁶ Insufficient data to give a rating.

At number four, the Amax AMD Max 3200+ we tested came with a 2.2-GHz Athlon XP 3200+ CPU (with a 400-MHz frontside bus) and 512MB of DDR400 SDRAM. This system earned a very respectable PC WorldBench 4 score of 134—just two points less than the Sys

Technology Performance 3200+, which has the same CPU and operating system with double the memory. We particularly liked the look of the Amax's chassis, with its stainless steel door covering the drive bays. Unfortunately, the LCD monitor we received with it displayed dark, too- ▶



MPC'S VIDEO dream system, the Millennia 9201, has a 250GB hard drive and three FireWire ports.

saturated colors, and the integrated speakers produced weak, muddy bass tones. For good sound, you might want to order this model with a separate speaker set.

At number six, PC Power & Cooling's SleekLine 3000MX comes with what is easily the slimmest case—4 inches—on our chart. Though its price is stratospheric at \$3699, this unit is packed with performance-oriented components, such as a 3.2-GHz Pentium 4 that posted an outstanding PC WorldBench score of 136.

The SleekLine 3000MX outperformed the similarly equipped Dell Dimension 8300 and MPC Millennium 920i by 9 points (or about 8 percent) each. Some of that extra oomph can be attributed to the system's slightly overclocked processor (it's cranked up by 2 percent, which is within Intel's spec for the chip and, according to PC Power & Cooling, won't affect the system's durability). Inside the black chassis is a quiet power supply.

MPC's Millennium 920i debuts in seventh place and is primed for graphics- and storage-intensive applications such as video editing. Our test unit was outfitted with a gargantuan 250GB hard drive, three FireWire 400 ports, a dual-format DVD burner, and (like half of its power chart peers) a high-performing, 128MB ATI Radeon 9800 Pro graphics card that delivered bright, smooth images for games and DVD movies.

We also tested Polywell's Poly 865RF-3200 this month, but this model, despite carrying a 3.2-GHz Pentium 4 CPU and 1024MB of DDR400 SDRAM, missed our power list due to surprisingly mediocre performance. Our test system mustered a score of just 118 on PC WorldBench 4, a poor showing for a power system.

The Dell Dimension 8300's price drops \$688 this month; it remains in second place on the power section.

Meanwhile, our value list has a new

Best Buy, Dell's Dimension 4600, and two new entries from Hewlett-Packard. Placing second, the Compaq Business Desktop D325 is a no-frills system that delivers good performance at a bargain price of \$833. Our test unit packed a 2.13-GHz Athlon XP 2600+ CPU and scored a solid 122 on PC WorldBench 4. We liked this model's expandability (it has three open PCI slots, an AGP slot, two 5.25-inch drive bays, and one internally accessible 3.5-inch drive) and dual VGA ports for two analog monitor inputs.

In fifth place on the value section, the HP Pavilion A250n replaces the better-performing (but now retired) A250e. Our evaluation unit—equipped with a 2.6-GHz Pentium 4 CPU and 512MB of DDR333 SDRAM—turned in a good score of 116 on PC WorldBench 4. This system impressed us with both its thoughtfully constructed chassis and its excellent 15-inch LCD monitor. ■

TECH TREND

PC Vendors Start to Make Multimedia Easy

AIMING TO HELP NEW USERS get over the hurdle of learning to work with digital media, Dell and HP this fall are shipping some desktops and notebooks with proprietary software that will walk you through common multimedia tasks.

HP's photography software suite, called Image Zone, adds new features to the same software that the company already ships with its scanners, printers, and digital cameras. The enhanced software will be installed on all of the company's new Pavilion and Media Center PCs this fall, as well as on its notebooks.

Dell expects to include its Media Experience software on all Dimension desktops, though not on the company's Media Center PC. Neither vendor is charging extra for its software, but Dell will offer a remote control for an additional \$30.

As its name implies, HP's Image Zone focuses on digital imaging tasks. The software hooks into the operating system's My Pictures folder and automatically launches when you click My Pictures. According to HP, which showed us an early beta of the software, Image Zone will offer a simplified interface for organizing photos, performing quick edits (such as cropping or removing red-eye), and



THE PICTURE viewer in Dell's Media Experience software.

adding photos to projects such as a photo album or a CD using HP Memories Disc Creator. In addition, you can rename images (though you can't perform batch renaming), and you can restore images that you've edited to their original form.

Whereas HP's suite sticks to still images, Dell's ambitious Media Experience covers all digital media, including DVD. Media Experience consolidates access to and playback of media under a single roof, replacing the disparate apps (such as Windows Media

Player and a DVD software player such as Cyberlink's Power DVD) that you might otherwise have turned to. The opening screen has links for music, pictures, videos, and DVD. The DVD link launches Dell's own software player for viewing DVD movies.

The other three media links tap into Windows XP's My Music, My Pictures, and My Videos folders, respectively, and also enable you to organize and run the media content they contain. For example, you can sort music by album, artist, or playlist; and you can have Media Experience show all songs or just recently played songs. The picture viewer has tools for such tasks as rotating images, displaying thumbnails, and creating slide shows with music.



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Crucial Micron 512MB PC2700 Dual Channel DDR Memory
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TOP 15 NOTEBOOK PCs

POWER NOTEBOOK		Overall rating	Street price (8/26/03)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY IBM ThinkPad T40 find.pcworld.com/34817	90	Expensive \$2799	Windows XP Professional Outstanding 124	This lightweight laptop provides numerous wireless-networking options and long battery life. Price falls \$300 this month. (★★★★★ June 03)
2	Dell Latitude D600 find.pcworld.com/36077	87	Inexpensive \$1986	Windows XP Professional Outstanding 122	Midweight machine has legacy ports, but unappealing sound and a springy keyboard, as well. (★★★★☆ Aug 03)
3	HP Nx7000 find.pcworld.com/37664 NEW	86	Inexpensive \$1999	Windows XP Professional Outstanding 123	This wide-screen notebook offers many attractive design touches, but the keyboard feels flimsy. (★★★★☆)
4	Gateway 200XL find.pcworld.com/37655 NEW	85	Inexpensive \$2200	Windows XP Professional Outstanding 125	This thin, elegant, wireless-ready system is lightning-fast but strikes out in battery life. (★★★★☆)
5	Amax Elite 6053M find.pcworld.com/37025	84	Inexpensive \$1929	Windows XP Professional Outstanding 123	Powerful notebook squeezes plentiful ports, both modern and legacy, into a slim profile. (★★★★☆ Oct 03)
6	Toshiba Tecra M1 find.pcworld.com/37022	84	Very expensive \$3049	Windows XP Professional Good 113	Stylish notebook in black and silver boasts phenomenal battery life, loud-sounding speakers, and many upgrade options. (★★★★★ Oct 03)
7	Acer TravelMate 803LCi find.pcworld.com/37652 NEW	83	Average \$2550	Windows XP Professional Outstanding 125	Lightweight business portable offers 15-inch screen, Smart Card reader, and swappable hard drive for security. (★★★★★)
Percent of overall rating ▶			15 percent	20 percent	
VALUE NOTEBOOK		Overall rating	Street price (8/26/03)	PC WorldBench 4 performance score ¹ 	Comments
1	Best BUY IBM ThinkPad R40 find.pcworld.com/37667 NEW	84	Average \$1573	Windows XP Professional Very good 118	Basic, midweight ThinkPad packs plenty of useful features into an easy-to-configure unit. (★★★★★)
2	Chem USA ChemBook 2300 find.pcworld.com/37031	82	Inexpensive \$1349	Windows XP Home Outstanding 122	Low-cost notebook is ready for the road with modest weight, long battery life, and built-in Wi-Fi. (★★★★☆ Oct 03)
3	Acer TravelMate 290LMi find.pcworld.com/37661 NEW	81	Average \$1499	Windows XP Professional Outstanding 121	This fast, fully featured model has exceptional battery life, but the sound is weak and no docking station is available. (★★★★★)
4	Gateway 450X find.pcworld.com/35312	80	Expensive \$1700	Windows XP Professional Very good 117	Plain-looking one-bay notebook offers a great keyboard and has legacy connections. (★★★★☆ July 03)
5	Toshiba Satellite A15-S127 find.pcworld.com/37658 NEW	80	Very inexpensive \$1050	Windows XP Home Average 99	Solid performance, comfortable typing, a big screen, and high-quality sound make this an excellent choice for first-time notebook buyers. (★★★★☆)
6	Averatec 3150P find.pcworld.com/36197	76	Very inexpensive \$1025	Windows XP Professional Average 94	Thin, light, and wireless ready, this bargain portable is good for the road. It's relatively slow, but fine for basic computing and e-mail. (★★★★☆ Sept 03)
7	IBM ThinkPad G40 find.pcworld.com/36206	75	Very inexpensive \$1079	Windows XP Professional Poor 84	Basic desktop replacement offers great IBM keyboard, but meek sound and few frills. (★★★★☆ Sept 03)
8	Dell Inspiron 5100 find.pcworld.com/36083	75	Expensive \$1724	Windows XP Home Very good 117	Distinctive blue-and-silver laptop's hard drive and memory slots are easy to access. (★★★★☆ Aug 03)
Percent of overall rating ▶			20 percent	15 percent	

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value). For more details, see "Your Guide to the Top 100" at find.pcworld.com/15720.

² Except where noted, all Intel CPUs are SpeedStep chips, which run at a slower speed on battery power. (We performance-test all notebooks plugged in.)

³ Word score reflects both listed and unlisted features. Unless otherwise noted, all notebooks have a built-in modem and network adapter.

TEST
Center

IBM STRIKES TWICE THIS MONTH, taking the top spot on both the power and the value sides of the chart. Its ThinkPad T40 has been the power Best Buy almost every month since June, while the new, modestly priced, and speedy ThinkPad R40 earned top honors on the value side. The R40 had a battery life of just over 4 hours.

Also new to the value list this month, Acer's TravelMate 290LMi delivered nearly 5 hours of battery life and turned in impressive performance: Its PC WorldBench score of 121 is a mere point behind that of the fastest value system, Chem USA's ChemBook 2300. Significantly

Visit find.pcworld.com/37844 for reviews of all products tested this month and ranked in this chart.

BASE CONFIGURATION							Extra features ¹	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Multi-purpose bays						
1.6-GHz Pentium M	14.1	512	80	Touchpad, eraserhead	1	Very good: 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, built-in 802.11a/b Wi-Fi and Bluetooth	Outstanding	Outstanding/ 6:23	Light/ 6.2	Good/ Good	
1.6-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	1	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in 802.11b Wi-Fi, Smart Card reader	Good	Good/ 3:26	Average/ 6.5	Fair/ Fair	
1.6-GHz Pentium M	15.4 (wide)	512	60	Touchpad	0	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, FireWire port	Good	Good/ 3:00	Average/ 7.6	Good/ Poor	
1.6-GHz Pentium M	14.1	512	60	Touchpad	0	Very good: DVD-R/RW drive, built-in 802.11b Wi-Fi, FireWire port, Microsoft Works 2003, Pinnacle Expression	Average	Limited/ 1:00	Light/ 5.9	Good/ Fair	
1.6-GHz Pentium M	15	512	40	Touchpad	1	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in 802.11b Wi-Fi, SD memory card slot, FireWire port	Good	Good/ 3:15	Average/ 7.1	*/	
1.6-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	1	Very good: DVD-R/RW/RAM drive, built-in 802.11b Wi-Fi, SD memory card slot, FireWire port, gigabit ethernet	Very good	Outstanding/ 6:29 ⁷	Average/ 7.1	Good/ Fair	
1.6-GHz Pentium M	15	512	60	Touchpad	1	Good: 8X DVD-ROM drive, Smart Card reader, FireWire port, built-in 802.11b Wi-Fi	Very good	Outstanding/ 4:57	Average/ 7.3	*/	
	5 percent					10 percent		10 percent	5 percent	10 percent	25 percent

	BASE CONFIGURATION						Extra features ¹	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/ service
	CPU ²	Screen (inches)	RAM (MB)	Hard drive	Pointing device	Multi-purpose bays					
	1.3-GHz Pentium M	15	512	40	Touchpad, eraserhead	1	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, FireWire port	Excellent	Very good/ 4:02	Average/ 7.3	Good/ Good
	1.4-GHz Pentium M	14.1	512	40	Touchpad	1	Good: 8X DVD-ROM and 16X/8X/24X CD-RW combo drive, built-in 802.11b Wi-Fi, FireWire port	Fair	Outstanding/ 4:49	Light/ 6.3	*/
	1.3-GHz Pentium M	15	512	40	Touchpad	1	Very good: DVD-R/RW drive, built-in 802.11b Wi-Fi, FireWire port	Very good	Outstanding/ 4:50	Average/ 7.2	*/
	1.5-GHz Pentium M	15	256	40	Touchpad	1	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, FireWire port, Microsoft Works 2003	Very good	Very good/ 3:49	Average/ 7.4	Good/ Fair
	2-GHz Celeron [*]	15	256	30	Touchpad	0	Good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, Microsoft Works 2003	Average	Fair/ 2:45	Average/ 7.1	Good/ Fair
	1.4-GHz Mobile Athlon XP-M 1600+	12.1	256	30	Touchpad	0	Good: 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, built-in 802.11b Wi-Fi	Fair	Fair/ 2:50	Very light/ 5.3	*/
	2-GHz Celeron [*]	14.1	256	20	Eraserhead	0	Fair: 8X DVD-ROM drive, Lotus SmartSuite Millennium	Fair	Very good/ 3:59	Very heavy/ 9.7	Good/ Good
	2.67-GHz Pentium 4 [*]	15	512	40	Touchpad	0	Very good: 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, 802.11b Wi-Fi, FireWire port, WordPerfect Productivity Pack	Fair	Limited/ 1:48	Very heavy/ 9.5	Fair/ Fair
	5 percent						10 percent	10 percent	5 percent	10 percent	25 percent

^{*} Unless otherwise noted, all notebooks come with a lithium ion battery.

² Includes computer, AC adapter, power cord, optical drive, and floppy drive (if offered).

¹ Insufficient data to give a rating.

⁷ We typically test at a notebook's highest power-conserving setting, but this model's "Super Long Life" and "Long Life" options resulted in an acceptably dim screen. Instead, we tested at the default "Normal" power setting.

^{*} Single-speed desktop CPU.

slower but nearly \$450 less, the Toshiba Satellite A15-S127 has a 15-inch screen and is a good fit for students who want a system for both work and play.

Hewlett-Packard goes wide-screen with its new Nx7000, in third place on the power side. This business portable has a

15.4-inch display and built-in wireless networking, but we were put off by the keyboard's slightly flimsy feel. The super-thin Gateway 200XL tied with the Acer TravelMate 803LCi as the new speed champions on the chart, but the Gateway's 1-hour battery life was dismal. ■

THE IBM R40 hits the top spot on the value list.



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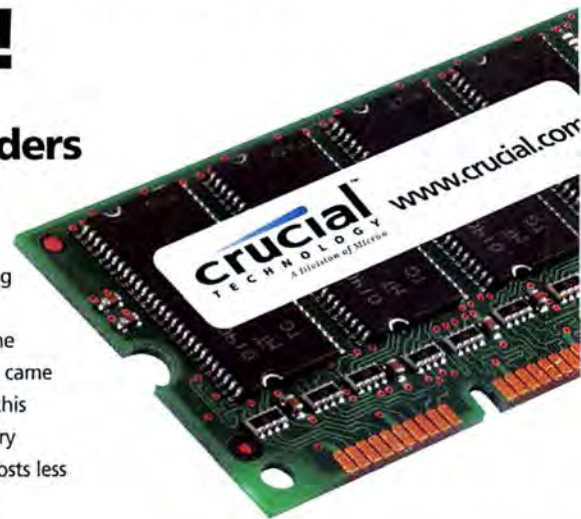
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TOP 10 PRINTERS

TOP 100

TEST
Center

Visit find.pcworld.com/37847 for reviews of all products tested this month and ranked in this chart.

THE NEW HP LASERJET 1300 churned out text at a pace rivaling that of some big-office printers, though at \$399 it was too expensive to knock Minolta-QMS's PagePro 1250W off its Best Buy perch on the small-office part of the chart.

Topping our corporate chart, the new \$999 Dell M5200n printed very sharp text and line art, as well as impressive gray-scale images. The Xerox Phaser 4400/N dropped \$300 to leapfrog over the Lexmark T630n, our previous Best Buy.

	SMALL-OFFICE LASER	Street price (9/05/03)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/graphics	Comments
1	Best Buy Minolta-QMS PagePro 1250W find.pcworld.com/32414	\$199	91	12.0/6.0	Outstanding/ Fair	FEATURES: Rated 17 ppm. Standard 8MB of RAM, 1200-by-1200-dpi maximum resolution, 150 sheets input, 100 output. Parallel and USB 1.1 ports. SUMMARY: This inexpensive model produced dark, clean text, but gray-scale images looked too dark and lacked detail. Minolta offers a 20-sheet output tray for \$20 to reduce thick-paper curling. (★★★★☆ Feb 03)
2	HP LaserJet 1300 find.pcworld.com/37646 NEW	\$399	89	15.2/5.7	Outstanding/ Fair	FEATURES: Rated 20 ppm. Standard 16MB of RAM, 1200-by-1200-dpi maximum resolution, 250 sheets input, 125 output. Parallel and USB 1.1 ports. SUMMARY: The LaserJet 1300 printed dark, sharp text and very detailed line art. Gray-scale images were detailed but grainy overall. Has manual duplexing capability. Print server (\$200) is optional. (★★★★☆)
3	Brother HL-5040 find.pcworld.com/34802	\$299	88	13.1/6.7	Outstanding/ Fair	FEATURES: Rated 17 ppm. Standard 8MB of RAM, 2400-by-600-dpi maximum resolution, 250 sheets input, 150 output. Parallel and USB 2.0 ports. SUMMARY: This model produced crisp text and rendered precise line art, but gray-scale graphics were dark. Manual duplexing capability is included; an ethernet print server is optional. (★★★★☆ June 03)
4	Dell Personal Laser P1500 find.pcworld.com/34799	\$289	79	14.7/7.3	Good/ Fair	FEATURES: Rated 19 ppm. Standard 16MB of RAM, 1200-by-1200-dpi maximum resolution, 150 sheets input, 101 output. Parallel and USB 2.0 ports. SUMMARY: Dell's first laser printer compares favorably with more established models. It was very fast at text, and its image quality was reasonably good across the board. No ethernet option. (★★★★☆ June 03)
5	Oki Data Oki B4300 find.pcworld.com/34796	\$349	74	8.1/4.7	Very good/ Fair	FEATURES: Rated 19 ppm. Standard 16MB of RAM, 1200-by-600-dpi maximum resolution, 250 sheets input, 150 output. Parallel and USB 1.1 ports. SUMMARY: Text output looked smooth, but the B4300 was sluggish. An ethernet print server (\$232) and additional 250-sheet paper tray (\$312) are optional. Price has dropped \$70. (★★★★☆ June 03)

	CORPORATE LASER	Street price (9/05/03)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/graphics	Comments
1	Best Buy Dell M5200n find.pcworld.com/37643 NEW	\$999	93	22.9/11.2	Outstanding/ Good	FEATURES: Rated 35 ppm. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution, 600 sheets input, 250 output. Ethernet and USB 1.1 ports. SUMMARY: The M5200n printed extremely sharp text at a fast pace. Print-outs of line art looked crisp and showed very little banding. This model is a twin of the Lexmark T630n, but costs \$100 less. (★★★★☆)
2	Xerox Phaser 4400/N find.pcworld.com/32405	\$1099	91	17.8/6.5	Outstanding/ Good	FEATURES: Rated 26 ppm. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution, 550 sheets input, 100 output. Ethernet, parallel, and USB 1.1 ports. SUMMARY: The Xerox printed near-perfect text, and gray-scale graphics looked attractive. Price has dropped \$300. Options include additional RAM (up to 256MB total) and a 10GB hard drive. (★★★★☆ Feb 03)
3	Lexmark T630n find.pcworld.com/34790	\$1099	90	22.3/11.0	Outstanding/ Good	FEATURES: Rated 35 ppm. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution, 350 sheets input, 250 output. Ethernet and USB 1.1 ports. SUMMARY: This model prints quickly for a reasonable price, but the nearly identical Dell M5200n costs even less. Text looked sharp; line art looked crisp. Gray-scale images showed subtle shading. (★★★★☆ June 03)
4	Oki Data Oki B8300n find.pcworld.com/32399	\$1879	81	28.2/4.8	Outstanding/ Fair	FEATURES: Rated 45 ppm. Standard 32MB of RAM, 600-by-600-dpi maximum resolution, 500 sheets input and output. Ethernet, parallel, and USB 1.1 ports. SUMMARY: The B8300n printed very sharp text. Gray-scale images appeared dark and blocky. Optional \$1199, 1500-sheet tray can hold tabloid-size paper. Price has fallen \$321. (★★★★☆ Feb 03)
5	Brother HL-2460N find.pcworld.com/30103	\$950	78	16.1/6.9	Very good/ Fair	FEATURES: Rated 25 ppm. Standard 16MB of RAM, 2400-by-600-dpi maximum resolution, 600 sheets input, 500 output. Parallel, serial, and USB 1.1 ports. SUMMARY: Versatile workgroup model accommodates many paper-handling options, including a \$400 duplex and up to three additional paper trays. Text looked attractive, but a little light. (★★★★☆ Oct 02)

CHART NOTES: The overall rating for laser printers is based on print quality (25 percent), price (25 percent), features (15 percent), ease of use (15 percent), speed (10 percent), and service and support (10 percent). Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings.



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- Nikon Coolpix 4300 Digital Camera Part#: NIKCPX4300



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- Shuttle SN41G2 Barebone PC Part#: MB-SN41G2



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- Maxtor 6Y120LO 120GB Ultra ATA133 Hard Drive Part#: HD-MX120AY



CORSAIR

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TOP 10 MONITORS

Visit find.pcworld.com/37904 for reviews of all products tested this month and ranked in this chart.

IN A CATEGORY WHERE IMAGE COUNTS, the MultiSync FP912SB from NEC-Mitsubishi is second to none. It received high scores for text quality and the top score we've given recently for graphics, as our test photos looked particularly vivid and lifelike. Hansol's \$170 920A, not far behind the

MultiSync in image quality, is one of the least-expensive 19-inch CRTs we've seen. On the other hand, BenQ's V991 is very cheap, but performed poorly in our tests. Lastly, the KDS VS-190is missed the chart due to lackluster image quality. Look for reviews of all these monitors on PCWorld.com.

	19-INCH CRT MONITOR	Street price (8/29/03)	Overall rating	Quality of text/graphics	Comments
1	Best BUY NEC MultiSync FP912SB find.pcworld.com/37856 NEW	\$290	90	Very good/ Outstanding	FEATURES: 18-inch viewable area, .24mm-pitch flat Diamondtron aperture grille tube, up to 102-Hz refresh rate, 1920 by 1440 maximum resolution at 70 Hz, TCO '95-compliant, three-year warranty, 24-hour daily toll-free support. SUMMARY: The top performer in our graphics tests displayed sharp, easy-to-read text, too. Superbright mode brought out detail in movies, pictures, and games. (★★★★☆)
2	Best BUY Hansol 920A find.pcworld.com/37865 NEW	\$170	87	Very good/ Outstanding	FEATURES: 18-inch viewable area, .26mm-pitch shadow mask tube, up to 75-Hz refresh rate, 1280 by 1024 maximum resolution at 70 Hz, three-year warranty, 9-hour weekday toll-free support. SUMMARY: Strong performance with both text and graphics and a bargain price make the 920A a fine general-purpose monitor, but it cannot reach the higher resolutions that most other 19-inch models are capable of. (★★★★☆)
3	Samsung SyncMaster 957mb find.pcworld.com/35177	\$319	85	Very good/ Very good	FEATURES: 18-inch viewable area, .24mm-pitch flat shadow mask tube, up to 89-Hz refresh rate, 1756 by 1317 maximum resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. SUMMARY: A good choice for sharp text and vivid graphics at a midrange price. One button offers three color-temperature settings. Adjustable highlight box lets you brighten selected screen areas. (★★★★☆ July 03)
4	IBM C190 find.pcworld.com/37868 NEW	\$250	85	Good/ Very good	FEATURES: 18-inch viewable area, .25mm-pitch flat shadow mask tube, up to 85-Hz refresh rate, 1600 by 1200 maximum resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. SUMMARY: Model with easy-to-use on-screen controls displayed photos and graphics nicely, but text at smaller font sizes looked a little fuzzy and was somewhat difficult to read. (★★★★☆)
5	Compaq S9500 find.pcworld.com/35171	\$210	83	Good/ Good	FEATURES: 18-inch viewable area, .26mm-pitch shadow mask tube, up to 85-Hz refresh rate, 1600 by 1200 maximum resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. SUMMARY: Display offered vivid and accurate photographic screens, plus easy-to-use on-screen controls that earned high marks. Image adjustment software isn't included. (★★★★☆ July 03)
6	ViewSonic G90fb find.pcworld.com/37859 NEW	\$240	81	Good/ Good	FEATURES: 18-inch viewable area, .25mm-pitch PerfectFlat shadow mask tube, up to 90-Hz refresh rate, 1600 by 1200 maximum resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. SUMMARY: Though the G90fb generated rich, vibrant colors on photographs, the smallest fonts were a little blurry and difficult to read. The image adjustment controls were easy to use. (★★★★☆)
7	Dell M992 find.pcworld.com/35192	\$249	80	Good/ Good	FEATURES: 18-inch viewable area, .24mm-pitch flat shadow mask tube, up to 75-Hz refresh rate, 1600 by 1200 maximum resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. SUMMARY: Crisp text, even at small font sizes, makes this a natural choice for users who do a lot of reading. The accompanying CD includes a color-mapping profile, and the controls are well organized. (★★★★☆ July 03)
8	Hitachi CM721F find.pcworld.com/35195	\$266	79	Good/ Good	FEATURES: 18-inch viewable area, .24mm-pitch flat shadow mask tube, up to 85-Hz refresh rate, 1600 by 1200 maximum resolution at 70 Hz, five-year warranty, 9-hour weekday toll-free support. SUMMARY: Better on graphics than text, this monitor offers a fair number of features, good on-screen controls, and a thorough manual, though troubleshooting information is scant. (★★★★☆ July 03)
9	NEC MultiSync FE991SB-SK find.pcworld.com/35180	\$270	78	Fair/ Good	FEATURES: 18-inch viewable area, .25mm- to .27mm-pitch flat Diamondtron aperture grille tube, up to 89-Hz refresh rate, 1792 by 1344 maximum resolution at 70 Hz, TCO '95-compliant, three-year warranty, 24-hour daily toll-free support. SUMMARY: Graphics looked detailed, but text at smaller font sizes wasn't razor-sharp. This unit's strengths include an easy-to-use menu and advanced features. (★★★★☆ July 03)
10	BenQ V991 find.pcworld.com/37853 NEW	\$160	74	Poor/ Fair	FEATURES: 18-inch viewable area, .25mm-pitch shadow mask tube, up to 91-Hz refresh rate, 1600 by 1200 maximum resolution at 70 Hz, three-year warranty, 12-hour weekday toll-free support. SUMMARY: This monitor is the cheapest on the chart, but it produced lackluster graphics and fuzzy, difficult-to-read text. The on-screen controls were awkward to use. (★★★☆☆)

FOOTNOTE: ¹ Refresh rate is the maximum at 1280 by 1024 resolution (the tested resolution for this size monitor). **HOW WE TEST:** Color and gray-scale screens are from the DisplayMate for Windows utility (www.displaymate.com). See find.pcworld.com/34613 for testing details. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Overall rating is based on text and graphics quality (25 percent each), price (25 percent), features and ease of use (20 percent), and service and support (5 percent); best possible rating is 100. All monitors are TCO '99-compliant unless otherwise noted. Pitch specification represents diagonal dot pitch for shadow mask monitors and stripe or varying stripe pitch for aperture grille monitors. Aperture grille displays have parallel wires that are farther apart at the sides of the screen than at the middle. See find.pcworld.com/10860 for details on PC World's Star Ratings.



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TOP 10 DIGITAL CAMERAS

Visit find.pcworld.com/37523 for reviews of all products tested this month and ranked in this chart.

SMALLNESS HAS ALWAYS BEEN a desirable trait for point-and-shoot digital cameras; but this month, big is in—big LCD displays, that is. Three of the six new models we tested have 2-inch or larger LCDs (measured diagonally), simplifying the tasks of framing shots and adjusting settings. Toshiba's PDR-

M700 and Kyocera's Finecam L3v have the largest LCD display we've seen, at 2.5 inches; Casio's Exilim EX-Z3 crams a 2-inch display onto a camera the size of a small cell phone. Alas, from this month's group of newcomers, only the Toshiba manages to slip onto the chart, at number ten.

	CAMERA: UNDER \$500	Street price (9/5/03)	Overall rating	Image quality	Ease of use	Battery life/ shots	Comments
1	Best BUY Canon PowerShot A70 find.pcworld.com/36512	\$300	81	Very good	Good	Good/ 319	FEATURES: 3.2-megapixel resolution, 16MB CompactFlash media, 35mm to 105mm focal range, video recording with audio, 11.1 ounces. SUMMARY: Bargain price for a relatively advanced point-and-shoot model; has an extensive complement of manual controls and takes optional add-on lenses. (★★★★☆ Sept 03)
2	Best BUY Olympus C-4000 Zoom find.pcworld.com/30476	\$450	81	Outstanding	Good	Outstanding/ 700	FEATURES: 4-megapixel resolution, 16MB SmartMedia card, 32mm to 96mm focal range, video recording (no audio), 14 ounces. SUMMARY: Inexpensive for an advanced camera, the C-4000 Zoom blends great image quality, manual exposure settings, and long battery life. Its menus can be confusing. (★★★★☆ Nov 02)
3	Kodak EasyShare DX6340 find.pcworld.com/36089	\$299	81	Good	Very good	Outstanding/ 911	FEATURES: 3.1-megapixel resolution, 16MB internal memory and SD card slot, 36mm to 144mm focal range, video recording with audio, 9.7 ounces. SUMMARY: The 4X optical zoom on this stylish model is longer than most. The camera docks directly onto a small, optional Kodak printer. (★★★★☆ Aug 03)
4	Nikon Coolpix 3100 find.pcworld.com/36065	\$350	81	Good	Very good	Very good/ 480	FEATURES: 3.2-megapixel resolution, 16MB CompactFlash media, 38mm to 115mm focal range, video recording (no audio), 6.9 ounces. SUMMARY: One of the smallest, lightest Nikons is also one of the easiest to operate; it has a huge selection of shooting aids for the casual photographer. (★★★★☆ Aug 03)
5	Olympus C-740 Ultra Zoom find.pcworld.com/36059	\$499	80	Very good	Good	Outstanding/ 1219	FEATURES: 3.2-megapixel resolution, 16MB XD-Picture Card media, 38mm to 380mm focal range, video recording (no audio), 14.3 ounces. SUMMARY: The C-740 Ultra Zoom cleverly packs a 10X optical zoom lens in a relatively compact camera. Its images were among the best we've seen from a sub-\$500 model. (★★★★☆ Aug 03)
6	Nikon Coolpix 4300 find.pcworld.com/32000	\$400	79	Outstanding	Fair	Fair/ 277	FEATURES: 4-megapixel resolution, 16MB CompactFlash media, 38mm to 114mm focal range, video recording (no audio), 10.1 ounces. SUMMARY: The fairly lightweight Coolpix 4300 takes wonderful shots and is easy to hold with one hand, but its multilayered menus make using its advanced features difficult. (★★★★☆ Jan 03)
7	Samsung Digimax V4 find.pcworld.com/36593	\$400	78	Good	Good	Very good/ 439	FEATURES: 4-megapixel resolution, 32MB SD card media, 38mm to 114mm focal range, video recording with audio, 7.6 ounces. SUMMARY: The compact Digimax V4 has few programmed scene modes (they're useful for casual photographers) but many controls for taking creative shots. Price drops by \$50 this month. (★★★★☆ Sept 03)
8	Canon PowerShot S400 Digital Elph find.pcworld.com/35324	\$499	78	Very good	Very good	Fair/ 214	FEATURES: 4-megapixel resolution, 32MB CompactFlash media, 36mm to 108mm focal range, video recording with audio, 7.8 ounces. SUMMARY: This elegantly designed, ultracompact model takes fine shots and sports a sturdy stainless-steel body, but it lacks manual controls and has relatively short battery life. (★★★★☆ Jul 03)
9	Fujifilm FinePix 3800 find.pcworld.com/32450	\$400	78	Good	Good	Very good/ 546	FEATURES: 3.24-megapixel resolution, 16MB XD-Picture Card media, 38mm to 228mm focal range, video recording with audio, 13.8 ounces. SUMMARY: The FinePix 3800 has a longer optical zoom and better battery life than most models on the chart; styled to look like a single-lens reflex camera, it's rather bulky. (★★★★☆ Feb 03)
10	Toshiba PDR-M700 NEW find.pcworld.com/38060	\$450	77	Fair	Good	Fair/ 264	FEATURES: 3.2-megapixel resolution, 16MB SD card media, 37mm to 370mm focal range, video recording with audio, 13.8 ounces. SUMMARY: One of the few models with a 10X zoom lens, and the only 10X unit we know of with a 2.5-inch LCD display. But the Olympus C-740 Ultra Zoom does most things better for just a bit more. (★★★★☆)

HOW WE TEST: To gauge picture quality, we take a series of shots, with and without flash, at 640 by 480 resolution and at the camera's highest resolution. We photograph a complex still life and a mannequin to see how well each camera captures details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores; we then average those scores. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** Overall ratings are based on price (25 percent), picture quality (20 percent), ease of use (15 percent), features (20 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better. Resolutions are expressed in effective pixels, focal range is identified as 35mm equivalent, and camera weights include batteries. See find.pcworld.com/10860 for details on PC World's Star Ratings.

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URL at the top of each chart. Next month, watch for our special hardware guide issue, which will cover our usual wide range of *Top 100* topics, plus several others, but with a slightly different spin than we usually take.



CANON'S POWERSHOT G5 exudes photographic sophistication, with 5-megapixel resolution, many manual controls, and the ability to accept wide-angle and telephoto adapters. But if you want a camera that fits in a shirt pocket, keep looking.

PLEXTOR'S PX-504UF quickly burns CDs and CD-RWs, and it can work with almost any system—desktop or notebook—thanks to its portable external design and provision of USB 2.0 and FireWire ports. To save space, you can mount it on an included vertical holder.



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HERE'S HOW

EDITED BY MICHAEL S. LASKY, DENNIS O'REILLY, AND ERIC DAHL



WINDOWS TIPS

SCOTT DUNN

Fast Windows Navigation Is a Command Performance

Windows ME 98 XP 2K SOME PEOPLE are happy to point and click their way through Windows; many of us, however, find that typing commands and Web addresses is a faster and more efficient way to launch applications, open documents, navigate to Web pages, and perform other routine PC tasks.

Address for success: One place where you can type commands is the ubiquitous Address bar in both Explorer folder windows and the Internet Explorer browser.

If you don't see it, choose **View•Toolbars•Address Bar**. With Explorer or Internet Explorer active, press **<Alt>-D** to highlight the current entry, and then begin typing.

To put the Address bar on your taskbar, right-click an empty area of the taskbar and choose **Toolbars•Address**. If the entry field isn't big enough, drag the bar—with the pointer at the left edge of its name—to the left to enlarge it (if the bar is not there, right-click the toolbar and uncheck **Lock the Taskbar**). Rearrange the Address

bar and your toolbars until the taskbar looks juuuust right (see **FIGURE 1**).

To resize and reposition the Address bar, drag the name—'Address'—from your taskbar onto your desktop. You can also drag it to any screen edge to dock it there; the top and bottom screen edges give you the most typing room.

Right-click the Address bar and choose **Always on Top** to make it always visible (see **FIGURE 2**). If the Address bar is docked in the taskbar or on a screen edge, you can right-click it and uncheck **Show Title** to hide the Address label. If the Address bar is docked but separate from the taskbar, right-click it and choose **Auto-Hide** to make it invisible until the pointer moves to that screen edge.

To access your desktop Address bar from your keyboard, press **<Ctrl>-<Esc>**, **<Esc>** to activate the taskbar (opening and closing the Start menu in the process); then press **<Tab>** as many times as necessary until the Address bar is active. If any toolbars on your taskbar show the double-chevron (**>>**) symbol indicating a pop-up menu, you may also have to press **<Esc>** at one or more points (to close such menus) as you tab your way to the Address bar. Once the Address bar is active, scroll through your last several entries by pressing **<Up Arrow>** or **<Down Arrow>**.

Run wild: An even more accessible (if not always visible) place to enter commands and Web addresses is Windows' Run box. Choose **Start•Run** to view this box, or simply press **<Windows>-R** if you have a keyboard with the **<Windows>** key.

If you'd rather launch the Run box from a Quick Launch or desktop icon, or if you have a mouse with a programmable button for launching apps, you can make a simple JavaScript file that will open the

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Improve your Windows efficiency by typing commands instead of clicking mouse buttons; smarter file copying.

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Create an emergency boot floppy for Windows XP and 2000; keep XP's Start menu from blocking your Control Panel and My Documents options.



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FIGURE 1: PUMP UP YOUR TASKBAR so the Address bar can have a line of its own.

Run box. Open Notepad and type the line: (new ActiveXObject("Shell.Application")). FileRun(). Choose *File>Save As*, navigate to a convenient folder, and type a file name with the .js extension—for example, *run.js*. To make a shortcut to this file on your desktop or Quick Launch toolbar, use the right mouse button to drag the file to one of these locations and choose *Create Shortcut(s) Here*. Click or double-click the icon (or the original script file) to display the Run box (see FIGURE 3).

If your computer associates JavaScripts with Notepad or another text editor, it won't run the script. To fix that, create a shortcut to the .js file as described above, right-click the shortcut, and choose *Properties*. With the Shortcut tab in front, click the beginning of the Target text box. Type *wscript.exe* and a space. Click *OK*.



FIGURE 2: THE ADDRESS BAR is ever visible with the 'Always on Top' feature.

Keyboard launches: Both the Address bar and the Run box let you open any folder, file, application, Web address (URL), shortcut, or batch file by typing in its name. If the item isn't in a place Windows normally checks (such as the Windows folder), you

may need to type a complete path, such as *c:\Program Files\opera\opera.exe* to launch the Opera browser or *\\network\docs\report.doc* to open this network document in Word. If you're in the habit of placing quotation marks around paths that use long names or spaces, the Run box won't mind, but the Address bar will think you're looking for a Web address; so avoid using such marks with that tool.

The Address bar lets you open Control Panel items by entering *Control Panel* followed by the item's name (for instance, *Control Panel\Display*), or to open items in the Printers or Dial-Up Networking folders (*Printers\LaserJet*, say). The Run dialog box's commands are not as simple (an example: *control main.cpl keyboard*).

Give orders: You can use the Address bar or Run box to issue what were once considered "external" DOS commands, such as *attrib*, *move*, or *xcopy*. In other words, you can type any command that exists as an independent application file in the Windows\Command folder (in Windows 9x and Me) or the Windows\System32 folder (in Windows 2000 and XP). For instance, to copy all the text files in your Documents folder to a folder called My Text Files, type *xcopy c:\documents*.txt "c:\My Text Files"* and press *<Enter>* (quotation marks are required if any folder or file name contains spaces). Windows runs the command through a window

that closes upon completion. (If the window doesn't close, see the next tip.)

Life's a batch: To run so-called internal DOS-style commands in the Address bar or Run box, type *command /c* before typing the command (or *command /k* to keep the command-prompt window open after executing the command). In Windows 2000 and XP, you can save a little typing by using 'cmd' instead of 'command'.

Here's a quick way to make a batch file that renames groups of files automatical-



FIGURE 3: THE RUN BOX is just a click away when you create a Quick Launch icon for it.

ly: Open Notepad, type *rename %1 %2*, and press *<Enter>*. Save the file in the Windows folder as *rn.bat*. To convert all the .txt files in a folder to Word documents (with the .doc extension), just use the Address bar or Run box to type something like *rn "c:\My Documents*.txt" *.doc* (your path is likely to differ, of course).

If the command-prompt window that runs your batch file stays open after the batch file is done, click the icon on the left end of the window's title bar and choose *Properties*. Under the Program tab, check *Close on exit* and click *OK*. The next time you run that batch file, the window will close automatically when it's done.

Commands in batch files saved with the .cmd extension (instead of .bat) in Windows 2000 or XP will be interpreted as Web addresses, so either rename your batch files using the .bat extension, or launch them only via the Run box.

Send e-mail: To use the Address bar or Run box to drop someone a line, just ▶

WINDOWS TOOLBOX

Improve Your Moves With Total Copy

IF YOUR SYSTEM is interrupted while copying a large number of files and folders, it can be tough to tell the folders whose contents were completely copied from those that are incomplete.

You have to either start over or open each folder manually to figure it out.

Fortunately, a solution may be just a download away. Total Copy adds two extra commands (*Total Copy Here* and *Total Move Here*) to the menu you see when you drag and drop files with your right mouse button. The program



automatically pauses when a problem occurs and then resumes later. It has manual pause and resume, as well as controls for adjusting the transfer speed (handy for

any quirky network connections). The program's creator, Bjørn Gulliksen, claims that Total Copy works faster

than Windows' own copy function. Though it's designed for Windows 9x and 2000, I've found no problems using the program in Windows Me and XP. Go to find.pcworld.com/37259 to download your free copy.

type **mailto:** followed by the e-mail address of your desired recipient (for example, **mailto:wintips@pcworld.com**) and press **<Enter>**. Your default e-mail application will then open a blank new message with

the shortcut's address in the 'To:' field.

Start a search: To search for text on the Web using IE's Auto-Search feature, click the Address bar; type **find**, **search**, **go**, or even just **?** followed by the text to search

for; and press **<Enter>**. You can customize how the search results are displayed by choosing **Tools • Internet Options • Advanced**. Scroll to the 'Search from the Address bar' heading. Some options may not work as expected because Microsoft occasionally changes the site that this feature is linked to. Also note that you can't search this way from the Run box.

Let Windows do the typing: As you type a folder path or URL in the Address bar or Run box, AutoComplete supplies the first folder or Web address that matches the characters as you type. To reopen folders or revisit sites, type just enough letters to get the correct path or URL to pop up. To add to this text, press **<Down Arrow>** to select the nearest match; continue typing if you need to add more to the path. Repeat as needed until you get the entire path that you want; then press **<Enter>**.

Shorten shortcuts: Instead of typing paths in the Run box or Address bar, create shortcuts in the folders Windows ►

NOTICE TO PERSONS WHO OWNED A PALM m500 or m505 AFTER JANUARY 23, 1998

This notice is to inform you about a proposed settlement of a class action lawsuit entitled *Eley v. Palm, Inc.* (the "Action"), the Court's certification of a settlement class in that Action, and of a hearing to consider the settlement San Francisco Superior Court Case No. 403768. The Action concerns certain handheld computers (models m500 and m505) manufactured by Palm, Inc. which plaintiff claims may be defective in that they sometimes do not properly perform the HotSync® operation to transfer data to and from a primary computer, as a result of an event involving electro-static discharge ("ESD"). Palm denies the claims made in this Action, and denies that anyone has been harmed or deserves compensation in relation to the claims. The Court has not made a decision on the merits.

If, on or after January 23, 1998, you owned a Palm personal digital assistant model m500 or m505 for your own use (and not for resale), you are a member of the settlement class the Court has certified. Under the terms of the settlement, Settlement Class Members may make claims for relief, including a replacement USB cradle, a preprogrammed SD card to reset the Palm handheld computer, and/or a replacement Palm handheld viewer of the same model type. Which claim you can make depends, among other things, on your individual situation, whether you previously exchanged your cradle, whether your Palm handheld does not perform the HotSync® function as a result of ESD, and your ability to document your claim. *Please see the complete notice and claim form at www.Eleysettlement.com for details regarding the settlement, the requirements for different kinds of claims and how to submit a claim. If you wish to submit a claim, you must do so by February 23, 2005 (subject to change by the Court).* Palm has also agreed to maintain on its customer service telephone lines a level of service that will reasonably meet the demands anticipated in connection with implementation of the settlement.

If the settlement is approved, the settlement class representative and plaintiff's counsel will apply for awards, the payment of which will not affect the relief available to Settlement Class Members. All claims of the Settlement Class Members which were or could have been asserted in the Action, related in any way to the subject matter of the Action, will be released.

If you wish to remain in the settlement class, you need not do anything. However, if you wish to receive any of the remedies afforded class members, you must submit a claim. If you do not wish to remain in the class, you must exclude yourself by mailing an exclusion request to: Ex Kano Sams II, Milberg Weiss Bershad Hynes & Lerach LLP, 100 Pine Street, Suite 2600, San Francisco, California 94111. If you wish to object to the settlement, you must file your objection with the Court. To properly exclude yourself or object, you must follow all of the detailed instructions and formats set forth in the full notice on the website. All objections and requests for exclusion must be received by December 1, 2003. The Court has scheduled a hearing to consider the settlement to be held on December 22, 2003 at 1:30 p.m. before Judge Richard A. Kramer, Department 304 of the Superior Court of the State of California, San Francisco County.

DO NOT CONTACT THE COURT OR PALM CONCERNING THIS NOTICE OR THE LAWSUIT. If you would like more information about this notice or this case, you may view the complete Notice, the Settlement Agreement, complaint and claim form at www.Eleysettlement.com. If you do not have internet access and you desire printed copies, contact plaintiff's counsel at the above address.

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looks in by default. In Windows 9x and Me, try the Windows\Command folder. In Windows 2000 and XP, put the shortcuts in the Windows\System folder (not Windows\System32), since the System folder is relatively uncrowded.

To create the shortcuts, open Explorer and select the applications, folders, and files you use most often. Right-click and drag them to one of the aforementioned Windows folders, release the mouse button, and choose *Create Shortcut(s) Here*. (You can also create shortcuts to Web pages this way.) Give each a short name

so you can launch it with little typing; you could name your word-processor shortcut **wp**, for example. Don't use the name of an existing folder, since doing so could confuse the Address bar or the Run box.

When using this tip with the Address bar, include **.lnk** (the hidden extension for shortcuts) when you type the name of a non-Web shortcut—**wp.lnk**, say. And in both the Run box and the Address bar, add **.url** when launching Web shortcuts—for example, **pcw.url**. If you store batch files in one of these folders, omit the **.bat** extension when entering file names.

Bypass paths: To cut down on typing even more, choose *Start>Run*, type **regedit**, and press **<Enter>**. Select this folder in the left pane: **HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\App Paths**. Right-click **App Paths** in the right pane and choose *New>Key*. Type the shorthand name in the Address bar followed by **.exe**—regardless of

whether you plan to launch an application or a file. For instance, type **r.exe** to launch a report file in a desktop publishing app. Press **<Enter>** to complete the naming.

Select your new shorthand key in the left pane and double-click (*Default*) in the right pane. In the 'Value data' box, type the path and name of the program, data file, or shortcut you want to launch. (Add **.lnk** to the name of shortcut paths, and **.url** to the end of Web shortcuts.) For example, type **c:\My Documents\Quarterly Report.indd** (see **FIGURE 4**). Click **OK** and exit the Registry Editor. Now when you enter your shorthand text (minus the **.exe**) in the Address bar or the Run box—such as **r**, to continue the example above—Windows will open the specified file.

Send Windows-related questions and tips to scott_dunn@pcworld.com. We pay \$50 for published items. Visit find.pcworld.com/31607 for more Windows Tips. Scott Dunn is a contributing editor for PC World.



FIGURE 4: REDUCE TYPED COMMANDS to one letter by entering often-used paths in the Registry.

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HARDWARE TIPS

KIRK STEERS

Is There an LCD Flat Screen in Your Future?

WHETHER ON THE beach at Waikiki or on the desktop, thin is in. Flat-panel displays are more affordable than ever, but is an LCD the best display for you? And if so, what features should you shop for?

The most obvious benefits of LCDs over CRTs are size and weight: A 15-inch LCD weighs less than 10 pounds, while a typical 17-inch CRT monitor (whose viewable screen area approximates that of a 15-inch LCD) tips the scales at about 40 pounds.

LCDs generally show brighter images than CRTs, and their brightness doesn't dim as quickly with age. Likewise, LCDs usually have better *contrast*—the difference between the brightest and darkest parts of an image on the screen. And the flat panel's high brightness means that reflections from room lights or the sun are less of a bother than with a CRT.

An LCD can reduce your utility bill, too. A 15-inch model typically uses 30 watts of power, while a standard 17-inch CRT unit consumes two or even three times that

amount. If you run your CRT monitor 24/7 and pay 15 cents per kilowatt-hour, an LCD could save you around \$60 a year.

But what about the disadvantages of flat panels? LCDs can't match CRTs for displaying fast-motion video and animation. The pixels on a CRT are tiny phosphorescent dots that illuminate instantly when struck by an electron beam. The slow rotation of an LCD's crystals in liquid can cause fast-changing images to blur.

High-end LCDs handle demanding graphics much better than budget units do. Most PC users will not be bothered by the jittery animation of a slow LCD, but hard-core 3D gamers will need a more expensive LCD or a conventional CRT.

Screen resolution is another drawback: LCDs work best at a single resolution. Setting a unit designed for 1024 by 768 to either 1280 by 1024 or 800 by 600 produces indistinct lines, unreadable text, and blurry edges. Web developers and others who frequently change their screen resolution may want to stick with a CRT.

FLAT FACTS

FLAT-PANEL DISPLAYS accept an analog signal, a digital signal, or both. Digital signals produce better graphics, but they require a graphics card that provides digital output. Since CRT monitors use analog signals, most graphics cards offer only analog output. High-end graphics cards sometimes supply both types, however.

To get the best possible graphics, you

may need to upgrade your graphics card. And if you do, make sure your motherboard has an AGP slot to accept the new card. (Many budget systems have integrated AGP chips but no AGP expansion slot, so their graphics can't be upgraded.)

Your graphics card must have connectors that are compatible with your LCD. Some flat-panel displays come with standard VGA connectors like those found on a CRT, but many others use the new DVI connectors, which are available in three types: DVI-A, for analog only; DVI-D, for digital only; and DVI-I, for integrated, which is both analog and digital. PC users will typically see only DVI-I, though some people might con-

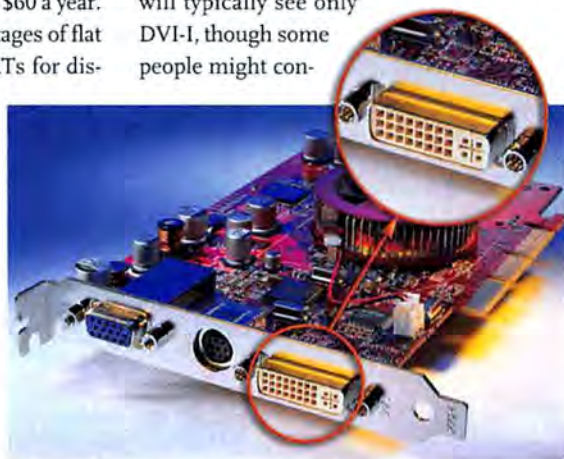


FIGURE 1: YOUR GRAPHICS CARD must have a DVI connector for you to see your LCD's highest-quality images.

nect their plasma TVs with one of the other digital connectors (see **FIGURE 1**).

Before spending your money, give your candidates the eyeball test. There's simply no substitute for looking at images on an LCD. And don't make the mistake of relying solely on specifications. For example, a high contrast ratio generally translates to a higher-quality image. A ratio of 200:1 is considered the minimum for an LCD, and a ratio over 400:1 is high-end. PC World Test Center research shows, however, that vendor's contrast-ratio claims can't always be trusted. Visit find.pcworld.com/37292 for the whole story. ■

Go to find.pcworld.com/31511 for past Hardware Tips columns. Send your tips and questions to kirk_steers@pcworld.com. We pay \$50 for published items. Kirk Steers is a PC World contributing editor.

OPTIMIZE YOUR AUDIO

ARE YOUR SPEAKERS and sound card cranking out the sound quality you expect from them? Find out with SoundCheck 2 from PassMark Software. This handy utility lets you unleash your inner audiophile with all kinds of tests. Discover what frequency ranges your speaker can produce and where your sound card creates distortion. Go to find.pcworld.com/37298 to download the free 30-day trial version; the program costs \$18 to keep. And check out this month's *Step-By-Step* column on page 192 for more on tweaking your PC's sound.

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STEP BY STEP

STAN MIASTKOWSKI

Surround Yourself With PC Sound

WE'VE COME a long way from the days when a basic sound card and a couple of cheap speakers were all your PC needed. With DVDs and games packing support for immersive, 360-degree audio, high-quality surround-sound support is more popular (and more necessary) than ever.

The newest computers often come with decent-quality multichannel sound hardware built into the motherboard. But if you want to get the best audio quality, you'll need to upgrade to either a high-quality internal sound card (\$50 to \$200) or one of the new generation of external sound processors (\$100 to \$150) that plug into your machine's USB port.

If you're serious about audio, figure on spending at least \$150 to \$400 for a top-

quality set of surround speakers with subwoofer. Alternatively, you can plug the output of that new sound hardware into your existing home theater system. And if you work in an office or you don't want to disturb the household at night while you hold off alien invaders, consider investing in a good pair of headphones.

Sound systems are designated as 2.1, 4.1, 5.1, 6.1, and 7.1 (see the illustration on the next page for tips on setting them up). And games and DVD source material come with different types of surround support, with names such as Dolby Digital 5.1, DTS, and Dolby Digital EX. Most sound cards have the ability to convert standard stereo CDs or MP3 files to surround sound, letting you take advantage

THE TOP DOWN

Benefits: Add high-fidelity digital surround sound for DVD video and audio playback, use 3D sound for compatible games, interface with portable digital audio players and stereo components.

Costs: Sound card \$50 to \$200, speakers \$150 to \$400

Expertise level: Beginner to intermediate

Time required: 45 to 60 minutes

Tools required: Phillips screwdriver, anti-static wrist strap (recommended)

Sound-card vendors: Creative (www.soundblaster.com), Hercules (www.hercules.com), M-Audio (www.m-audio.com), Philips (www.philips.com), Turtle Beach (www.tbeach.com)

Speaker vendors: Altec Lansing (www.alteclansing.com), Cambridge SoundWorks (www.cambridgesoundworks.com), Harman Multimedia (www.harman-multimedia.com), Klipsch (www.klipsch.com), Midland (www.midland.com), Sonigistix (www.monsoonpower.com), Yamaha (www.yamaha.com)

of your new speakers more often.

The Shopping List below shows examples of products you might want to have in a first-rate PC audio setup. ■

Stan Miastkowski is a PC World contributing editor. Contact him at stan_miastkowski@pcworld.com. Visit find.pcworld.com/31676 for past Step-By-Step columns.

SHOPPING LIST: SOME HIGH-END OPTIONS



Sound Blaster Audigy 2 Platinum (\$200)

This Creative card comes with a full selection of advanced audio features and software; its connection box, which you install in an external drive bay, lets you hook up practically any kind of audio accessories.



Philips PCS805 Aurilium Sound Processor (\$100)

External sound cards like the Philips PCS805 Aurilium Sound Processor are an easy-to-install alternative to internal upgrades. This unit plugs into a USB port and can upgrade the sound on your laptop, too.



Klipsch ProMedia Ultra 5.1 Speakers (\$400)

The best sound card in the world won't do you much good without top-notch speakers. A high-quality 5.1 surround set such as this one is a better choice than some of the mid-range 6.1 and 7.1 systems.



Sennheiser RS 65 Wireless Headphones (\$190)

www.sennheiserusa.com
Listen to PC audio without being tethered by a cord. Some headphones, like the Sennheiser RS 65, include circuitry for synthesizing surround sound from a standard stereo source.

1 Uninstall the existing audio software. To avoid problems with your new sound hardware, you should remove your existing sound drivers and support software first. To do so, launch Control Panel's *Add/Remove Programs* applet, select the entry for the existing sound card software, and click *Remove* in XP or *Add/Remove* in 98 or Me. For most motherboards that have built-in sound support, the PCI Audio Driver is the essential component to remove.

Most sound card software will uninstall all files, drivers, and applications related to the sound card, but check carefully; you might need to uninstall several components from the *Add/Remove Programs* list.



2 Change the sound card. It's best to disable any built-in sound support on your motherboard before you install the new card. You usually do this through the PC Setup utility (watch as your PC boots for the key to enter Setup), but on older PCs you might need to set a jumper (see your manual).



If you're installing an external sound processor and you don't need to remove an old card, just plug it into a free USB port.

Otherwise, power down your PC, unplug it from the wall, and open the case. If you're removing an old card, disconnect any cables attached to it, remove the screw holding it down, and extract the card. Insert the new card in the slot and fasten it down with the screw you removed.



3 Hook up the equipment. Hook up all the internal and external cables to your new sound hardware, as well as the external peripherals such as speakers.

Every sound card and sound processor has a different configuration, so check the installation chart or manual to make sure that you connect it all correctly. And then double-check your work.



4 Install the software. If you installed a new card, replace the cover on your PC, plug it into the wall, and power it up. Windows should automatically detect the new sound hardware and ask for the driver software, which is usually included on a CD-ROM. For details on installing the drivers, refer to the instructions that came with your sound hardware.

Once you're done, you'll usually need to restart your PC. If you don't hear anything from the speakers, turn them off and recheck your connections. Many surround speaker sets have multiple inputs, so make sure the correct one is selected.

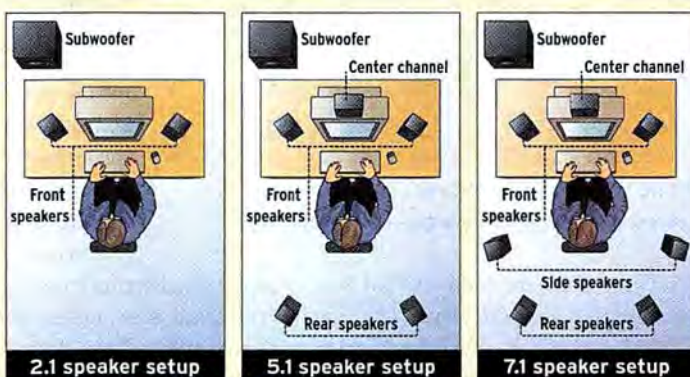
If your computer doesn't detect a sound card or you still don't hear anything from your speakers, power down your system, recheck all your connections, and make sure the card is seated firmly in its slot. If it still doesn't work when you power up your PC again, it's time to pick up your phone and call tech support.

SURROUND SOUND SETUP

THE VARIOUS FLAVORS of PC surround sound can be confusing. All speaker configurations have similar labels that begin with a numeral denoting the number of regular speakers in the set, followed by a ".1" referring to the subwoofer that is almost always present these days. Some common speaker configurations include:

- 2.1**—Standard stereo with a pair of front speakers.
- 4.1**—Adds a pair of rear speakers to a 2.1 setup.
- 5.1**—The most common surround setup: pairs of front and rear speakers, plus a front center "dialog" speaker. Look for Dolby Digital or DTS in games and DVDs.
- 6.1**—All the speakers of 5.1, with the addition of a rear center speaker. Supported by Dolby Digital Surround EX.
- 7.1**—All the speakers of 5.1, with an additional pair of side surround speakers.

Not all sound cards, game software, and DVD movies support the more advanced modes, although games using DirectSound 3D can send audio to however many speakers your sound card supports.



Speaker placement is both an art and a science. Spend some time experimenting with speaker positions to find a setup that offers the best compromise between sounds that are clearly located at specific points and audio that spans a wide area to either side. Rotate the front speakers inward toward the listener and try moving them farther apart, or position the rear speakers closer or farther away. Subwoofer placement isn't critical, though it should be on the floor. And the closer it is to a room corner, the stronger the bass will be.

INTERNET TIPS

SCOTT SPANBAUER

Purge Unwanted Spam the 18th-Century Way

IN FEBRUARY, I recommended Cloudmark's free SpamNet spam-blocking add-in for Outlook and Outlook Express (find.pcworld.com/37373). But when the company began charging a premium fee of \$4 per month (\$48 per year) for its still-worthwhile service, I began seeking a free spam fighter. I got lucky. And so can you.

turned out to be a winner. If you use Outlook, drop everything and go to find.pcworld.com/36953 to get SpamBayes.

After I installed the 3.2MB download and set it up to toss spam, it began learning pretty much on its own what I consider to be spam, and what I know is not spam (see **FIGURE 1**). Other antispam techniques

rely on centralized databases of known spam messages, or on static rules that scan messages for words or attributes often contained in spam. Bayesian filtering differs by scanning the message's content, then computing the probability that it is spam compared to other messages already identified as spam or nonspam.

Messages that have a spam probability of, say, 90 or higher on a scale of 0 to 100 are moved over to the Spam folder. Messages that score 15 or lower stay in the in-box. Messages that fall in between go to an Unsure Spam folder

where you determine their fate manually. (You create these folders in Outlook and then configure SpamBayes to use them.)

After I used SpamBayes for a week or so, the program's database could detect about 99 percent of my incoming spam, with very few messages ending up in the Unsure Spam folder. And using the default settings, it never once mistakenly moved good mail to the Spam folder.

I have yet to discover a free Bayesian-filtering antispam tool that integrates into

Outlook Express the way SpamBayes does with Outlook. If you want an antispam plug-in for OE, a commercial program like Sunbelt Software's IHateSpam may be your best option for now (go to find.pcworld.com/33233 for more about IHateSpam). But you can still use one of several free Bayesian proxy filters that scan incoming mail for spam before it reaches your e-mail program. The drawback of a proxy is that it requires more configuration and manual training than an integrated tool. On the plus side, proxies work with lots of different e-mail clients.

Stata Labs' free 1.53MB SAproxy download (find.pcworld.com/36956) is based on the open-source SpamAssassin spam-filter engine. It works with any POP3 mail account and e-mail application. More important, it came out on top in *Consumer Reports'* August 2003 antispam software tests (find.pcworld.com/37121), outperforming eight commercial spam filters.

Another antispam proxy I tried, Michel Krämer's free, open-source Spamihilator (find.pcworld.com/36959), simplifies training its Bayesian filters by allowing you to pop up a list of received mail and click Spam and Non-Spam buttons.

And both Mozilla 1.4 and Netscape 7.1 mail programs come with their own integrated Bayesian antispam settings. ■

Send your questions and tips to nettips@spanbauer.com. We pay \$50 for published items. Go to find.pcworld.com/31523 for more Internet Tips. Scott Spanbauer is a contributing editor for PC World.



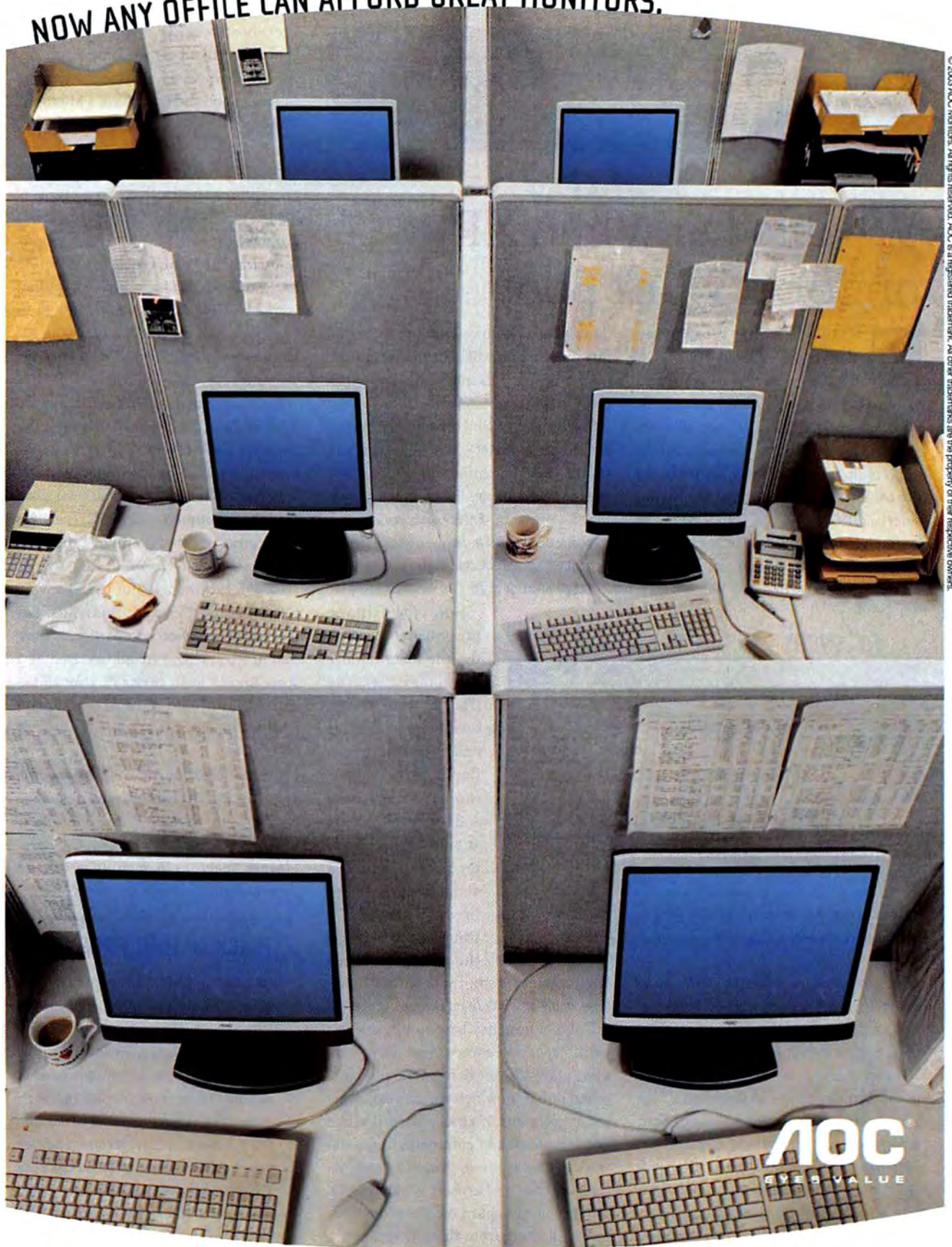
FIGURE 1: FILTER SPAM FOR FREE in Microsoft Outlook using the SpamBayes plug-in's Bayesian techniques.

Last year, software designer Paul Graham described a superior spam-blocking method based on the probability theorem of 18th-century mathematician Thomas Bayes (find.pcworld.com/37361). This technique uses observations of known outcomes to update estimates of the likelihood of a hypothesis. Lots of spam-hating programmers are now creating their own Bayesian spam filters. The first one I tried was the free, open-source SpamBayes plug-in for Outlook 2000 and 2002, and it

FREE POWERPOINT VIEWER

I'VE NEVER CREATED a PowerPoint presentation in my life, and I don't have the program on my PC even though it has been in most of the editions of Microsoft Office I've bought. Nevertheless, someone occasionally asks that I review an important piece of information in the form of a PowerPoint file (either as an e-mail attachment or embedded in a Web page). Instead of installing a huge program I'll seldom use, I open the file with Microsoft's free 2.72MB PowerPoint viewer (find.pcworld.com/39962).

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ANSWER LINE

LINCOLN SPECTOR

What to Do When XP or 2000 Won't Boot



WINDOWS XP won't load on my computer. What should I do?

Ernest Kaufman, Los Angeles

IF WINDOWS XP (or 2000) refuses to start, press **<F8>** right after you turn on your PC but before the Windows log-on appears (it may take a few attempts to get the timing right). At the resulting menu, select *Last Known Good Configuration* to restore your Registry to an earlier date.

If this doesn't get your PC working, reboot and press **<F8>** again, but this time

dows XP or Windows 2000, but there's no guarantee that it will boot your machine.

To make one, insert a blank floppy disk into drive A:, select *Start•All Programs•Accessories•Command Prompt*, type **format a:**, and press **<Enter>**. When asked if you want to format another disk, type **n** and press **<Enter>**. Type the following commands, pressing **<Enter>** after each one.

```
xcopy c:\boot.ini a: /h
```

```
xcopy c:\ntdetect.com a: /h
```

```
xcopy c:\ntldr a: /h
```

Now type **exit** and press **<Enter>** to close the window. Remove the floppy disk and label it "Windows XP boot floppy." Put this emergency disk in the floppy drive of your inoperable machine and boot up. Windows should run with no problems. You could simply keep the floppy in the drive all the time, but to truly fix the problem, launch

the command prompt as described above, type **xcopy a:.* c:\ /h**, and press **<Enter>**.

If the emergency boot floppy doesn't work, try the Recovery Console, a Windows utility that provides a DOS-like command line from which you can run some repair programs. It's tricky to use if you're not accustomed to command lines, and you can damage your data, so be careful.

If you have a Microsoft Windows CD-ROM, you can get to the Recovery Console by booting from that CD and pressing any key when you're told to 'Press any

key to boot from CD'. At the 'Welcome to Setup' screen, press **r** for Repair.

If Windows XP or 2000 came with your computer and you don't have a Microsoft Windows CD-ROM, the Recovery Console might be on one of the CDs the vendor bundled with your PC. But it might not. Fortunately, the Recovery Console is hidden in a free, downloadable Microsoft program called Setup Disks for Floppy Boot Install. Visit find.pcworld.com/37967 to download the setup-disk file that works with XP Professional, and go to find.pcworld.com/37316 to grab the XP Home version, which will also work for Windows 2000, Me, and 98.

When you run the download, it puts the XP installation program, including the Recovery Console, onto a set of six floppy disks. To get to the Recovery Console, boot from the first floppy, and then swap disks as prompted until you reach the 'Welcome to Setup' screen. Press **r** to open the Recovery Console.

FIGURE 1 shows a list of the Recovery Console's most useful commands. For detailed information on a particular command, type the command followed by a space and **/?**, as in **chkdsk /?**. (Not all the commands will be available if you don't have a Windows CD-ROM.) ■

Send your questions to answer@pcworld.com. We pay \$50 for published items. See find.pcworld.com/31577 for more Answer Line columns. You'll find Contributing Editor Lincoln Spector's humorous writing at www.thelinkinspector.com.

RECOVERY CONSOLE COMMANDS

COMMAND	Function
Chkdsk ¹	Checks disks for errors.
Diskpart	Creates and deletes partitions.
Extract ²	Extracts files from compressed .cab archives.
Fixboot	Writes a new boot sector.
Fixmbr	Writes a new master boot record.
Help	Lists the Recovery Console commands.

FOOTNOTES: ¹ If you load the Recovery Console from floppy disks, chkdsk may complain that it can't locate autochk.exe. When it asks for that file's location, point it to **c:\windows\system32**.
² Extract is not available if you load the Recovery Console from floppy disks.

FIGURE 1: ONE APPROACH TO fixing Windows XP and 2000 is to use these commands inside the Recovery Console utility.

select *Safe Mode*, and then choose *Start•All Programs•Accessories•System Tools•System Restore*. Follow the wizard's instructions and pick an appropriate backup.

If that approach doesn't work either, or if you can't even get to this menu, use your emergency boot floppy. If your hard drive's boot sector or Windows' basic boot files have been corrupted, this disk will circumvent the problem and boot you into Windows. If you don't have an emergency boot floppy, you may be able to use one created on another PC running Win-

TEACH XP SOME PATIENCE

GERARD J. SKIBINSKI of Indianapolis asks if there's a way to make Windows XP's *Start•All Programs* menu wait for a click before popping up and obscuring the Control Panel and My Documents options. There is. Right-click the *Start* button and select *Properties* to bring up the Taskbar and Start Menu Properties dialog box. On the Start Menu tab, click *Customize*. In the Customize Start Menu dialog box, click the *Advanced* tab. Uncheck *Open submenus when I pause on them with my mouse*. Click *OK* twice.

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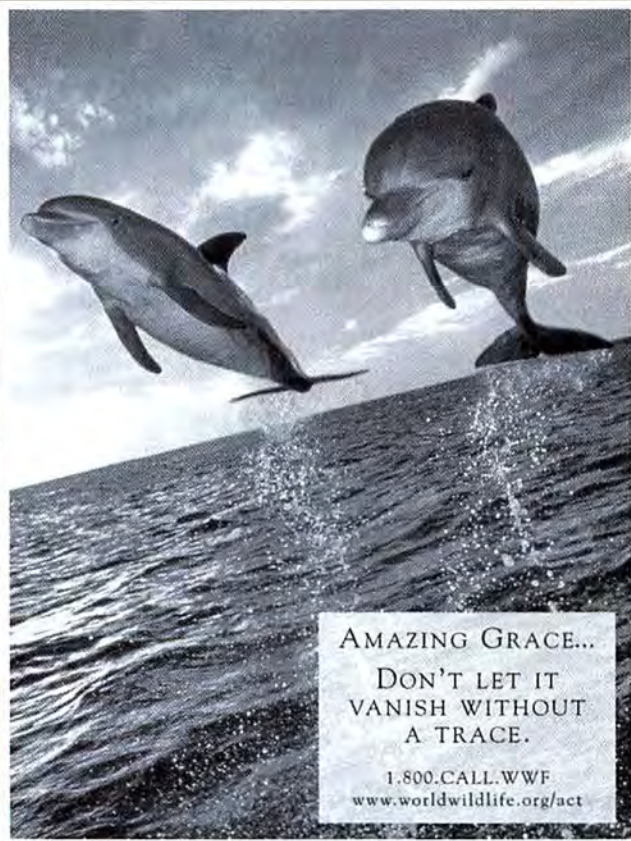


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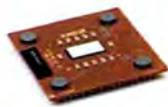
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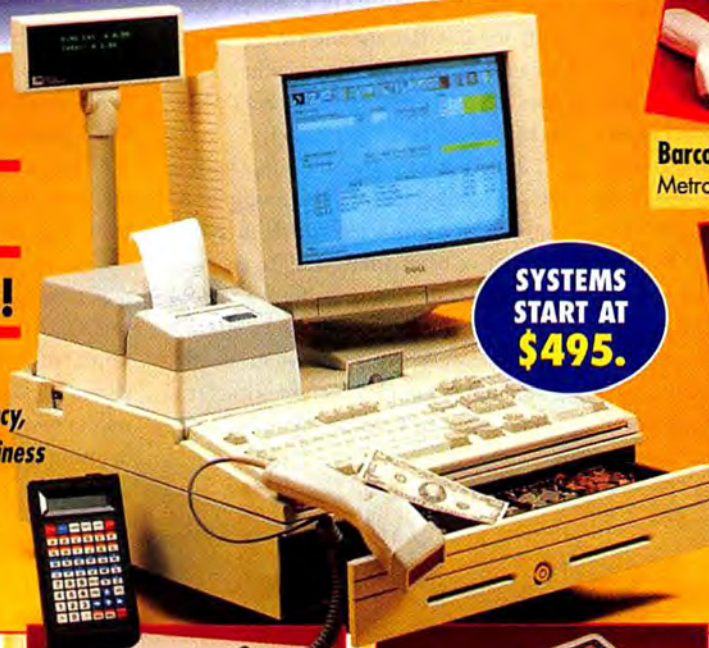


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Rules of the Tech Road: Drivers Beware!

DAD'S 85TH BIRTHDAY IS coming soon. My sister and I keep debating whether to buy him and Mom their first PC. By now we should be deciding which machine to pick and where to buy it. Instead, we can't get past the subject of whether Dad can handle it—and whether we can.

It's a lot like what he must have gone through when we were learning to drive. Presenting a couple of PC virgins with a system and an Internet connection and then letting them go is almost as risky as handing a nondriver the car keys and wishing him good luck. Even for those of us who've been around the block and pretend to know what we're doing, PCs are increasingly hard; for people who come in late, they must be a total nightmare.

Dad's a smart guy, a scientist. He used mainframes back when BASIC was sexy. Mom has two advanced degrees. Yet in the past when we suggested that they get a PC, they didn't want to bother. The critical mass of tantalizing Web content has given them a reason.

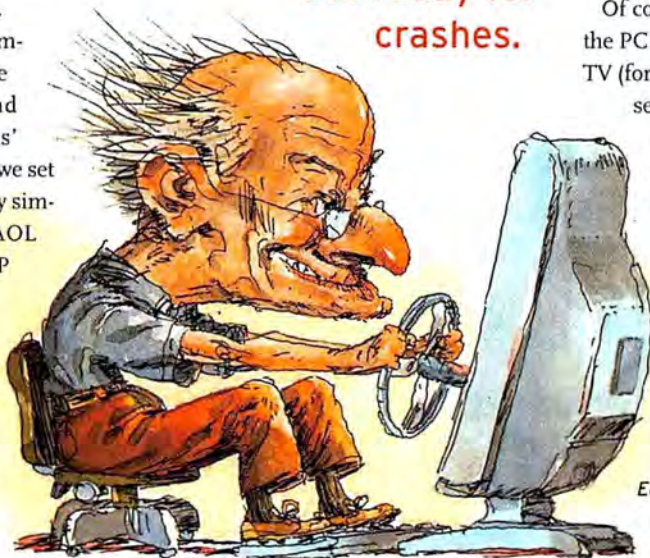
But even seemingly uncomplicated decisions often prove problematic. No broadband provider serves my parents' apartment. So for dial-up, do we set them up with the theoretically simple but ever-more-baffling AOL or do we turn to a pure ISP like EarthLink that's actually simpler but offers less hand-holding?

My Mac-loyalist sister offers to be my parents' help desk if we put them in the "Think Different" fold. She uses Mac OS 9. The trouble is that new

machines come with OS X, which has a different interface she's never tried—and the next revision will have another one. I use OS X Macs now and then, but I'd hate to have to support one remotely.

I'd be more comfortable supporting a PC—if I hadn't recently had multiple lessons in how much effort that involves. Lately I've been attempting to set up a new notebook and reconfigure my old one for my wife. But Windows Update refuses to work on my old system, and the new laptop's bundled McAfee VirusScan software seems confused about whether

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or not it has updated itself properly.

At least I finally whacked that elusive virus I complained about recently (find.pcworld.com/37931). Turns out that my machine wasn't sending it to my e-mail acquaintances. Instead the source was my wife's current hand-me-down PC, for which I hadn't bought antivirus updates. The virus used an old Windows Address Book of mine that I hadn't deleted. Problem solved—after months of mystery.

All that is bad enough. But how do you teach neophytes the sheer volume of knowledge they need to fend off bad guys who cruise the Net hoping to take advantage of programmers' errors and users' misplaced trust? How do you explain documentation that's often flat-out wrong when it exists at all? Who sends the memo when the rule changes from not opening attachments from anyone you don't know to being wary of attachments from even your closest friends?

Of course, my sister and I could dump the PC idea altogether and buy Dad MSN TV (formerly known as WebTV). But that set-top box's severe limitations make it the browsing equivalent of a tricycle, and its limited screen resolution is likely to emphasize Web ads instead of Web content. Unless my sister and I have a sudden epiphany, Dad may be getting a really nice, really low-maintenance tie. ■

Visit find.pcworld.com/31595 to see more columns by Contributing Editor Stephen Manes. He has been writing about technology for the past two decades.



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Home Desktops & Notebooks

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Essential Technology, Affordable Price

- Intel® Pentium® 4 Processor at 2.20GHz with 400MHz Front Side Bus
- Microsoft® Windows® XP Home Edition
- 128MB Shared® DDR SDRAM at 333MHz
- 40GB Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., 27dp) E773 Monitor
- Integrated Intel® 3D Extreme Graphics
- 48x CD-ROM Drive
- Integrated Audio
- Ahtec Lansing® ADA215 Speakers
- 56K® Data Fax Modem; Integrated 10/100 Ethernet
- WordPerfect® Productivity Pack with Quicken® New User Edition
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- 1-Yr Limited Warranty; 1-Yr At-Home Service*

\$599 Ask about No Payments for 90 Days for well-qualified customers
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- 64MB DDR NVIDIA® GeForce4 MX® Graphics Card with TV-Out
- 48x CD Burner (CD-RW Drive)
- Integrated 5.1 Audio with Dolby® Digital Capability*
- Speakers Not Included
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- 48x CD Burner (CD-RW Drive)
- Sound Blaster Live! 5.1 Digital Sound Card with Dolby® Digital 5.1 Capability
- Herman Kardon HK-395 Speakers with Subwoofer
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- Integrated Intel® Extreme Graphics
- 65Whr Li-Ion Battery (8-Cell)
- Internal Fax Modem and NIC Included
- WordPerfect® Productivity Pack with Quicken® New User Edition
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- 14.1" XGA TFT Display
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- 30GB Ultra ATA Hard Drive
- 24x CD Burner/DVD Combo Drive
- 16MB DDR ATI® MOBILITY™ RADEON™ 7500 AGP 4X Graphics
- 96Whr Li-Ion Battery (12-Cell)
- Internal Fax Modem and NIC Included
- WordPerfect® Productivity Pack with Quicken® New User Edition
- 6 Months of America Online® Membership Included
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\$1249 Ask about No Payments for 90 Days for well-qualified customers
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Enhanced Performance

- Mobile Intel® Pentium® 4 Processor at 3.06GHz
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- 30GB Ultra ATA Hard Drive
- 24x CD Burner/DVD Combo Drive
- 32MB DDR NVIDIA® GeForce® Go5200 AGP 4X Graphics
- 96Whr Li-Ion Battery (12-Cell)
- Internal Fax Modem and NIC Included
- WordPerfect® Productivity Pack with Quicken® New User Edition
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- 1-Yr Limited Warranty; 1-Yr Mail-In Service

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- 40GB (7200 RPM) Ultra ATA/100 Hard Drive
- Integrated Intel® 3D Extreme Graphics
- 48x CD Burner
- Integrated Audio
- Integrated 10/100 Ethernet
- 1-Yr Limited Warranty; 1-Yr On-Site Service*
- Monitor Not Included

\$599 as low as **\$16/mo.**, (46 pmts*)
E-VALUE Code: 19186-S51005y

Recommended upgrades:

- 80GB (7200 RPM) Ultra ATA/100 Hard Drive, add \$60
- NEW 15" E151FPb Flat Panel Display, add \$280

NEW OPTIPLEX™ 160L DESKTOP

Network-Optimized, Value Business Desktop

- Intel® Pentium® 4 Processor at 2.20GHz with 400MHz Front Side Bus
- Windows® XP Professional
- 512MB Shared® DDR SDRAM
- 40GB (7200 RPM) Hard Drive
- Integrated Intel® Extreme Graphics
- 48x CD Burner
- Integrated 10/100 NIC
- 1-Yr Next Business Day On-Site Service*
- Monitor Not Included

\$699 as low as **\$19/mo.**, (46 pmts*)
E-VALUE Code: 19186-S31006a

Recommended upgrades:

- 3-Yr Next Business Day On-Site Service*, add \$99
- Dell UltraSharp 17" E171 Flat Panel Monitor, add \$399

NEW DIMENSION™ 4600 DESKTOP

Exceptional Performance Desktop

- Intel® Pentium® 4 Processor at 2.66GHz
- Windows® XP Home Edition, WordPerfect® Productivity Pack
- 256MB Dual-Channel DDR SDRAM
- 80GB (7200 RPM) Ultra ATA/100 Hard Drive
- 128MB CDR ATI Radeon® 9800 Graphics Card
- 48x CD Burner
- Integrated Audio
- Integrated Intel® PRO 10/100 Ethernet
- 1-Yr Limited Warranty; 1-Yr On-Site Service*
- Monitor Not Included

\$799 as low as **\$22/mo.**, (46 pmts*)
E-VALUE Code: 19186-S51007y

Recommended upgrades:

- 3-Yr Limited Warranty; 3-Yr On-Site Service*, add \$149
- NEW 17" 1703FP HAS Flat Panel Display, add \$470



Small Business Notebooks

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Mobility and Performance

- Intel® Pentium® 4 Processor at 2.40GHz
- Windows® XP Home Edition, WordPerfect® Productivity Pack with Quicken® New User Edition
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- 256MB DDR PC2100 SDRAM
- 30GB Ultra ATA Hard Drive
- 16MB DDR ATI® MOBILITY™ RADEON™ 7500 AGP 4X Graphics
- Fixed Internal 8x DVD Drive
- Internal Modem and NIC Included
- 1-Yr Mail-In Service

\$1069 as low as **\$29/mo.**, (46 pmts*)
E-VALUE Code: 19186-S81010

Recommended upgrades:

- USB 2.0e Port Replicator with Ethernet, add \$119
- 2-Yr On-Site Service* plus CompleteCare®, add \$158

LATITUDE™ D500 NOTEBOOK

Small Business Value Notebook

- Featuring Intel® Centrino™ mobile technology
- Intel® Pentium® M Processor at 1.30GHz
- Intel® PRO Wireless 2100 802.11b 11Mbps Mini-PCI Wireless Card
- Windows® XP Home Edition
- 14.1" XGA TFT Display
- 128MB Shared® DDR PC2100 SDRAM
- 20GB Ultra ATA Hard Drive
- Integrated Intel® Extreme Graphics Up to 64MB Shared® System Memory
- Internal Modem and NIC Included; 1-Yr Mail-In Service

\$1099 as low as **\$30/mo.**, (46 pmts*)
E-VALUE Code: 19186-S71010

Recommended upgrades:

- Windows® XP Professional, add \$60
- 3-Yr Next Business Day On-Site Service*, add \$298

INSPIRON™ 600M NOTEBOOK

Thin and Light

- Featuring Intel® Centrino™ mobile technology
- Intel® Pentium® M Processor at 1.30GHz
- Intel® PRO Wireless 2100 802.11b 11Mbps Mini-PCI Wireless Card
- Windows® XP Home Edition, WordPerfect® Productivity Pack with Quicken® New User Edition
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM, 30GB Ultra ATA Hard Drive
- 32MB DDR ATI® MOBILITY™ RADEON™ 9000 AGP 4X Graphics
- Modular 8x DVD ROM Drive
- Internal Modem and NIC Included
- 1-Yr Mail-In Service

\$1299 as low as **\$35/mo.**, (46 pmts*)
E-VALUE Code: 19186-S81012

Recommended upgrade:

- Dell™ TrueMobile™ 300 Bluetooth Internal Card, add \$49



Small Business Servers & Workstations

NEW POWEREDGE™ 400SC SERVER

Small Business Value Server

- Intel® Celeron® Processor at 2GHz
- Upgradable to Intel® Pentium® 4 Processor at 3.20GHz with 800MHz Front Side Bus*
- 128MB 333MHz ECC DDR SDRAM (Up to 4GB)
- 40GB (7200 RPM) IDE Hard Drive
- Upgradable to 240GB of Internal Hard Drive Storage
- Embedded Intel® PRO Gigabit® NIC
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service*
- Small Business Pricing

\$399 E-VALUE Code: 19186-S21003

Recommended upgrades:

- PowerConnect™ 2016 16-Port Ethernet Switch, add \$89
- System Including Windows® Server 2003, now \$1199

NEW POWEREDGE™ 1600SC SERVER

High-Performance Small Business Server

- Intel® Xeon® Processor at 2GHz
- Dual Intel® Xeon® Processor Capable (Up to 3.06GHz)
- 128MB DDR SDRAM (Up to 4GB)
- 36GB (10K RPM) SCSI Ultra320 Hard Drive
- Upgradable to 876GB of Internal SCSI Hard Drive Storage
- Embedded Intel® PRO Gigabit® NIC
- Six PCI Slots (2-64/100MHz, 2-64/66MHz, 2-32/33MHz)
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service*
- Small Business Pricing

\$699 as low as **\$19/mo.**, (46 pmts*)
E-VALUE Code: 19186-S21006

Recommended upgrade:

- PowerConnect™ 2124 24-Port + 1GB Ethernet Switch, add \$299

DELL™ PRECISION™ 360 WORKSTATION

Maximum Performance, Single Processor Workstation

- Intel® Pentium® 4 Processor at 2.40GHz with 800MHz Front Side Bus
- Windows® XP Professional, Mini-Tower Chassis
- 512MB Dual-Channel DDR SDRAM
- 40GB ATA-100 IDE (7200 RPM) Hard Drive; 48x CD Burner
- 64MB NVIDIA® Quadro NVS 260 AGP 8X Graphics
- Integrated Intel® PRO 1000MT Gigabit® NIC
- Lifetime 24x7 Dell Precision™ Dedicated Tech Support
- 3-Yr Next Business Day On-Site Service*
- Monitor Not Included

\$1099 as low as **\$30/mo.**, (46 pmts*)
E-VALUE Code: 19186-S41010a

Recommended upgrades:

- 3-Yr Same-Day 4-Hour (5x10) On-Site Service, add \$199
- 17" Dell UltraSharp™ 1703FP Flat Panel Monitor, add \$499

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DIMENSION™ 4600 DESKTOP

Exceptional Performance

- Intel® Pentium® 4 Processor at 2.40GHz with 533MHz Front Side Bus
- Microsoft® Windows® XP Home Edition
- 256MB Dual Channel DDR SDRAM at 333MHz
- 40GB Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., 27dpi) E773 Monitor
- 64MB DDR NVIDIA® GeForce4 MX® Graphics Card with TV-Out
- 48x CD-ROM Drive
- Integrated 5.1 Audio with Dolby® Digital 5.1 Capability*
- Speakers Not Included
- 56K Data Fax Modem; Integrated Intel® PRO 10/100 Ethernet
- WordPerfect® Productivity Pack with Quicken® New User Edition
- 6 Months of America Online® Membership Included
- 1-Yr Limited Warranty; 1-Yr At-Home Service*

\$799

Ask about our financing plans for qualified customers
E-VALUE Code: 19184-D51007m

Recommended upgrade:

- 17" Dell UltraSharp® Digital Flat Panel Display (1703FP), add \$370

The NEW Dell Dimension 4600 desktop: Exceptional performance, incredible value. With options like an Intel® Pentium® 4 processor with HT Technology at up to 3.20GHz and loaded with dual-channel memory, the Dimension 4600 delivers the enhanced performance you need for high-end graphics and multimedia applications. Eight USB 2.0 ports ensure that you can add a wide variety of peripherals and upgrades as well. And every machine is backed by Dell's award-winning service and support. Choose the system that gives you the power you want, at a price you can't resist – the NEW Dell Dimension 4600.

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