

PCDEFENSE! Smart New Ways to Lock Out Hackers

BONUS
COVER FOLD-OUT
Instant Search Guide

PCWORLD



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Cost of **PRINTER INK**



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FAST DRIVES FROM \$140,
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FAST
ON THE WEB



News
Bargains
Advice
Travel
Tools
People
& More

132 Search
Secrets

+



"Editors' Hot Pick for Hardware—Color LaserJet 9500."
-The Seybold Report, October 2003



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PC WORLD

Instant Reference Guide to Smart Searches

Save time when you look for information on the Internet by going to sources with a specialized focus. These sites offer reliable data on everything from PC support to travel bargains.

The Best Web Info Resources

SOMETIMES, THE BIG-NAME search engines aren't the best places to unearth the nuggets of information you seek on the Internet. You might find them faster if you skip the engine and try plugging one of these sites into your browser's Address bar.



Hardware Helpers

PC support: Computing.net's forums cover all hardware and software topics.

Tutorials: Take a quick course in PC basics at HowStuffWorks' computer section (computer.howstuffworks.com).

IT info: Search specialized tech sites for tips and tricks of the pros at TechTarget (find.pcworld.com/40592).

Tech terms: Internet.com's Webopedia defines geek-speak and offers links to tech resources (www.webopedia.com).



Reference and News

Directories: Get news updates, almanacs, and an encyclopedia full of useful facts and figures at RefDesk.com.

Homework: The volunteer staff at the Wikipedia hunt down the best scholastic links on the planet (en.wikipedia.org).

News: Dig up the latest scoop fast by searching over 59,000 news sites and Web logs at Daypop (www.daypop.com).



Business & Professional

Small business: Find tools and information for do-it-yourself marketing at MelissaData (find.pcworld.com/40616).

Industry/market intelligence: Gary Price's List of Lists covers banking, electronics, insurance, and other industries (find.pcworld.com/40622).

Professional services: Check the listings at B2BYellowPages.com to find all types of service providers in your vicinity.

Global data: Get the lowdown on companies all over the world at The Scannery (www.thescannery.com).

Business law: Practicing attorneys provide insights into their areas of expertise at Doug Isenberg's GigaLaw.com.

SEARCH TIP

Who Can You Trust?

Site IDs: BetterWhois.com helps you find the name (and perhaps the physical address) behind a U.S.-based site.

Info quality: The tools and resources at The Virtual Chase let you gauge a site's veracity (www.virtualchase.com).



Government Records

Agencies: Whether the data you need is from local, state, or federal government, your first stop should be FirstGov.gov.

See other side for more Web resources.

Public records: Find information on state and national records at Search Systems (www.searchsystems.net).

Statistics: The White House Economic Statistics Briefing Room lists data on economics (find.pcworld.com/40637).

County data: The Census Bureau's County Business Patterns helps local marketing (find.pcworld.com/40643).

Demographics: Get social-science stats at The Population Reference Bureau's AmeriStat (www.ameristat.org).



Food and Drink

Recipes: Cook up a storm with the latest concoctions from *Bon Appetit* and *Gourmet* magazines listed at Epicurious (www.epicurious.com). Search by food type, occasion, or technique at the Recipe Power Search (find.pcworld.com/40649).

Wine: The Wine Spectator makes it easy to find news articles and tasting reports (www.winespectator.com).



Health Matters

Physicians: Find doctors in your area at the American Medical Association Physician Select (find.pcworld.com/40655).

SEARCH TIP

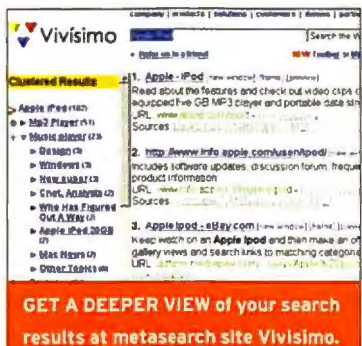
Discover the Hidden Web

USE THESE resources to gain access to a multitude of resources that the giant search engines simply don't reach.

Invisible Web Directory: The site's lists cover everything from business to academics (www.invisible-web.net).

Direct Search: Submit your search to engines and facts databases simultaneously (find.pcworld.com/40682).

Vivisimo: This metasearch site presents your search results in clusters, by subject (www.vivisimo.com; see below).



Medical conditions and drugs: The Mayo Clinic offers sound medical advice (www.mayoclinic.com). Compare prescription, over-the-counter, and discontinued drugs at the FDA's Center for Drug Evaluation and Research (find.pcworld.com/40661).

Medical research: Search the Medline database and other sources of up-to-date health information at Citeline.com.



Great Getaways

Travel: USA Today's travel page includes city guides, hotel bargains, and flight trackers (www.usatoday.com/travel). For great deals on spur-of-the-moment adventures, try About.com's last-minute travel guide (find.pcworld.com/40676).

Airlines: Get the latest on frequent-flyer and other travel-reward programs at Inside Flyer (www.insideflyer.com). Visit First Class Flyer for tips on discount seating upgrades and other travel bargains (www.firstclassflyer.com; fee required).



Shopping Bargains

Comparison shopping: Shopping.com combines product ratings from Epinions.com with price comparisons and store reviews. The store ratings at BizRate are gleaned from surveys of online buyers (www.bizrate.com).

Discounts: The advanced search option at Google's Froogle.com shopping site helps you find a product when you're not sure of its name. You'll find plenty of suggestions (particularly for technology products) at MySimon.com. And a great place to browse for bargains on clothing and gifts—especially if you're unsure what you want—is Overstock.com. ■

SEARCH TIP

Browserless Search Is Here

ONE OF THE BEST WAYS to save time when conducting a Web search is to start looking without even having to open your browser. That's the idea behind the new Google Deskbar.

Simply download the freebie at find.pcworld.com/40772 and follow the instructions to place it on your Quick

Launch toolbar. Once it's in place, you need only click the chevron next to the goggles icon on the right to be presented with options that include searching the Web, retrieving stock quotes, or looking up a word in a dictionary or thesaurus.

Or skip the pop-up menu's options and click the goggles icon to open a mini-



Google search page that contains all the search features you've come to expect. The only thing missing is the browser.

We carry more technology from
more top brands than anyone else.

In other words, everything you need.



Sun Fire V250 Server

- > 1.06 GHz Sun UltraSPARC IIIi processor
- > Memory: 512MB
- > 36GB hard drive
- > 10/100/1000 Ethernet



\$2,995.00 CDW 532249

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- > Easily access data, transform it into interactive content, and integrate it into applications for high quality viewing, printing and exporting
- > Flexible SDKs give you the control you need to tightly integrate reporting interactivity into web and windows applications
- > Five named user license of Crystal Enterprise Express; an information delivery system is included in the box - a \$2000 value



\$629.75
CDW 573419



Logitech Cordless Desktop MX for Bluetooth

- > Bluetooth wireless: gives you a big 30-ft. wireless range
- > Synchronize your Bluetooth PDA or cell phone with your PC
- > MX900: Expert level accuracy you won't find anywhere else
- > Media center: expertly control and navigate your movies, music and video



\$159.23
CDW 521865



Intuit QuickBooks Premier 2004

- > QuickBooks: Premier Edition 2004 has comprehensive tools for fast and easy financial management, with tools to help your business achieve better results
- > Quickly create budgets and forecasts with existing QuickBooks data
- > Easily create a business plan with 3-year projected statements for loan applications



\$499.95
CDW 553719



Targus Platinum Deluxe Notebook Case

- > Accommodates notebooks up to 17 inches
- > Constructed of rugged nylon with rubber-tread durability
- > Easy access front section for necessities
- > Reinforced heavy-duty steel fittings with detachable shoulder strap
- > Expandable file section with full-length exterior pockets for magazines



\$51.31
CDW 467802



SimpleTech SimpleDrive External

- > Automatic Backups with Free StorageSync Backup Software
- > 160GB USB/FireWire
- > SimpleTech 7200 RPM HDD Technology
- > MAC and PC compatible



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AMD 64



The ONLY Windows®-compatible 64-bit PC processor
Up to 1600MHz system bus using HyperTransport™ technology



Athlon 64 3400+
1MB L2 Cache
64-bit Processor
Model# ADA3400BOX

\$416.00



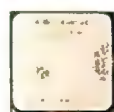
Athlon 64 3200+
1MB L2 Cache
64-bit Processor
Model# ADA3200BOX

\$282.00



Athlon 64 3000+
512KB L2 Cache
64-bit Processor
Model# ADA3000BOX

\$223.00



Athlon 64 3400+
1MB L2 Cache
64-bit Processor
Model# ADA3400AEP5AP
OEM

\$404.00



Athlon 64 3200+
1MB L2 Cache
64-bit Processor
Model# ADA3200AEP5AP
OEM

\$270.00



Athlon 64 3000+
512KB L2 Cache
64-bit Processor
Model# ADA3000AEP4AP
OEM

\$211.00

Motherboards

ASUS®



K8V Deluxe
K8T800 for Socket 754
AMD Athlon 64-bit Processor

\$159.99



GIGABYTE

GA-K8VT800M
K8T800 Chipset for
AMD Socket 754 Athlon
64-bit Processor

\$95.99



Shuttle

AN50R nForce3
150 Chipset for AMD
Socket 754 Athlon
64-bit Processor

\$132.99

Video Cards



Radeon 9800 Pro 128MB
DDR 256-bit DVI/TV-Out 8x AGP
OEM

\$215.00



XFX

PV-T31K-RA
nVidia GeForce FX 5600
128MB DDR 8x AGP

\$97.00



GIGABYTE

GV-R92128DH
ATI Radeon 9200
128MB DDR 128-bit

\$67.00

Sound Cards

CREATIVE



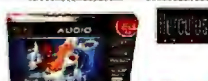
SB0350 Sound Blaster Audigy 2 ZS
PCI Dolby Digital EX 24-bit Audio

\$89.00



\$49.00

Santa Cruz
6-Channel PCI 2.1
Dolby Digital - OEM



\$45.00

GameSurround
Fortissimo III
7.1 Channel PCI 2.1
Dolby Digital EX

CD ROMs / Floppy Drives

LITEON



LTR-52327S 52x32x52
CD-RW ATAPI/E-IDE Drive
2MB Buffer - OEM

\$33.00

SONY



CRX230E
52x32x52 IDE Internal
CD-RW Drive - OEM

\$32.99



MPF920 Black
1.44MB 3.5" Floppy
Disk Drive - OEM

\$10.99



Shoppers' Choice Award 2003 Best Place To Buy Components

AMD FX

AMD Athlon™ 64 FX Processor

- The first 64-bit PC Processor in a class by itself designed specifically for cinematic computing
- Only AMD 64 technology runs today's 32-bit and tomorrow's 64-bit software
- Full throttle technology for immersive gaming and amazing digital media



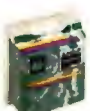
Athlon 64 FX-51
1MB L2 Cache
64-bit Processor
Model# ADAFX51BOX

\$742.00

Athlon™ XP Processor



Designed to run home and office productivity software flawlessly



\$215.00

Athlon XP 3200+
400MHz FSB 512K Cache
Model# AXDA3200BOX



\$166.00

Athlon XP 3000+
333MHz FSB 512K Cache
Model# AXDA3000BOX



\$121.00

Athlon XP 2800+
333MHz FSB 512K Cache
Model# AXDA2800BOX



\$733.00

Athlon 64 FX-51
1MB L2 Cache
64-bit Processor
Model# ADAFX51CEP5AK
OEM



\$214.00

Opteron™ Model 240
1MB L2 Cache 64-bit
Model# OSA240CC05AH



\$207.00

Athlon XP 3200+
400MHz FSB 512K Cache
Model# AXDA3200D
OEM



\$158.00

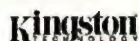
Athlon XP 3000+
400MHz FSB 512K Cache
Model# AXDA3000DKV4E
OEM



\$113.00

Athlon XP 2800+
333MHz FSB 512K Cache
Model# AXDA2800DKV4D
OEM

Memory



\$81.00

512MB PC-2700
184 Pin DDR333 SDRAM
Unbuffered - OEM



\$84.00

512MB PC-3200
184 Pin DDR400 SDRAM
Unbuffered - OEM



\$80.00

512MB PC-3200
Value Series 184 Pin
DDR400 SDRAM
Unbuffered - OEM

Hard Drives



\$70.50

Special Edition
80GB 7200RPM IDE Ultra
ATA 100 Model# WD800JB



\$60.00

6E040LO
40GB 7200RPM IDE
Ultra ATA 133



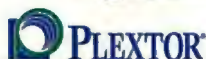
\$80.00

HDS722580VLSA80
80GB 7200RPM
Serial ATA

CD/DVD RWs



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PX-708A/SW
8x DVD±RW Drive
Internal IDE 2MB Buffer



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ND-2500A BLK
8x DVD±RW Drive
2MB Buffer - OEM



\$121.99

DWU14A
4x DVD±RW Drive
Internal 8MB Buffer
OEM



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4x 4.7G
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DRD-47-4X-RDSM
OEM



\$39.00

52x 700MB
100 Pack CD-R
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STI-USB2FD/128
128MB USB 2.0
Flash Pen Drive



\$104.00

750MB External
USB Zip Drive
Model# 32324



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Get more done, have more fun.

You can quickly run multiple applications at once, thanks to the Intel® Pentium® 4 Processor with HT Technology.

The ZT PRO System based on the Intel® Pentium® 4 Processor with HT Technology lets you play a game or movie while you're converting music without being slowed down. Let the fun begin today.



ZT recommends Microsoft® Windows® XP

ZT PRO GAMING X6276

Intel® Pentium® 4 Processor with HT Technology
 Microsoft® Windows® XP Professional Edition
 Intel® 875PBZLK (875 Chipset) 800MHz FSB
 Crucial 512MB (400MHz) PC3200 Dual Channel DDR RAM
 Seagate® 240GB 7200rpm Serial ATA/150 (8MB Cache) Hard Drive
 (2 x 120GB SATA Hard Drive in RAID 0 Configuration)
 7 in 1 Universal Smart Media Reader & 1.44MB Floppy Combo Drive
 Sony 8X DVD±RW & CD-RW Universal Combo Drive
 16X DVD ROM
 256MB ATI RADEON™ 9800 XT Ultimate w/DVI & TV Out
 Integrated Intel® Gigabit 10/100/1000 LAN
 Creative® Labs Sound Blaster® Audigy 2™ ZS Gamer Edition
 Cooler Master TACT01 Aluminum MID Tower Chassis w/450Watt
 Logitech® Cordless MX Duo Keyboard & Rechargeable Mouse
 Logitech® Z-880 THX Certified 8 Piece Speakers w/Sub-woofer (Add \$279.00)
 3 Years Limited Warranty
 1 Year On-Site Service (Add \$55.00)
 17" NEC 1280x1240 Flat Panel LCD (Add \$429.00)



Intel® Pentium® 4 Processor with HT Technology 3.0 GHz..... **\$1,999**

Intel® Pentium® 4 Processor with HT Technology 3.40 GHz..... **\$2,249**



ZT PRO GAMING X6274

Intel® Pentium® 4 Processor with HT Technology
 Microsoft® Windows® XP Home Edition
 Intel® 865G Chipset XPC 800MHz FSB (SB81G2)
 Crucial 512MB PC3200 (400MHz) Dual Channel DDR RAM
 Seagate® 120GB Serial ATA/150 (8MB Cache) Hard Drive
 7 in 1 Universal Media Reader & 1.44MB Floppy Combo
 16X DVD & 52X24X52 CD-RW Combo
 128MB ATI RADEON™ 9600 XT w/TV Out & DVI
 Integrated 6 Channel 5.1 Audio & Realtek 10/100 LAN
 Firewire 1394, Front and Back USB
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 3 Years Limited Warranty
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Intel® Pentium® 4 Processor with
 HT Technology 2.80 GHz..... **\$1,069**
 Intel® Pentium® 4 Processor with
 HT Technology 3.0 GHz..... **\$1,119**



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Intel® Pentium® 4 Processor with HT Technology
 Microsoft® Windows® XP Home Edition
 Intel® 865PE Chipset XPC 800MHz FSB (SB85G2)
 Crucial 512MB PC3200 (400MHz) Dual Channel DDR RAM
 Seagate® 160GB Serial ATA/150 (8MB Cache) Hard Drive
 7 in 1 Universal Media Reader & 1.44MB Floppy Combo
 Plextor 8X DVD±RW & CD-RW Universal Combo Drive
 256MB ATI RADEON™ 9600 XT w/TV Out & DVI
 Integrated 6 Channel 5.1 Audio & Realtek 10/100 LAN
 Onboard Wireless 802.11B LAN
 SPDIF-IN & OUT, Firewire 1394, Front and Back USB
 Logitech® Internet Keyboard & Optical Wheel Mouse
 Logitech® Z-340 3 Piece Speakers w/Sub-woofer
 3 Years Limited Warranty
 NEC 17" 1280x1024 Flat Panel LCD (Add: \$429.00)

Intel® Pentium® 4 Processor with
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 Intel® Pentium® 4 Processor with
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WEB SITES

74 Beyond Google

The big search engines—Google, Lycos, Yahoo, and others—are fine when you want to research pop culture or when you just feel lucky. But sometimes it's wiser to put your effort where the answers you need are concentrated: on specialty Web sites. Here are dozens of great resources that focus on subjects from hardware help to government data to health concerns to travel getaways.

Cover photo-illustration by Diego Aguirre



90

PCWORLD

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FEATURES

DVD BURNING

90 Fast-Lane DVD Burning

It's a great time to take the DVD plunge. New drives burn discs faster, yet often cost less. And software packages for making data backups and video and audio files are better, too. We look at 12 drives and seven suites.

PC SECURITY

103 Lock Down Your PC

Threats to your system take many forms, so your security measures should, too. Follow our advice to protect your machine physically, tighten up Windows and applications, and guard your network connections.

PENNY-WISE PRINTING

115 The Cheapskate's Guide to Printing

The cost of feeding your printer can quickly outpace its purchase price. Our penny-pinching tips cover everything from choosing the right printer to saving on supplies.



ON THE COVER



Cars have horsepower. Printers have

nozzles.

And the i960 has 3,072, making it
one of the fastest printers in its class.

Fasten your seatbelts. The Canon i960 Photo Printer is here, and it's fast. Real fast. Need a 4" X 6" borderless print? The i960 can crank one out in about 37 seconds.* Want something a little bit bigger – say, 8.5" x 11" or 5" x 7"? The i960 can do that, too. With printers, you see, speed is a matter of ink nozzles. The i960? It happens to have more than any comparable printer. A lot more. "Sure," you say. "But what about quality?" Gee, we thought you'd never ask. Thanks to our Microfine Droplet Technology,** the i960 produces tiny ink droplets that are just two picoliters in size, and lets you achieve a resolution up to 4800 x 1200 dpi.** Interested in learning more? Visit www.usa.canon.com/consumer. Or call 1-800-OK-CANON. But don't delay. We're expecting the i960 to go pretty darn fast.



The i960 Photo Printer

*Up to 4800 x 1200 dpi** - Borderless Printing*

MicroFine Droplet Technology™ - 6 Individual Ink Tanks

2-Picoliter Ink Droplets - 3,072 Nozzles

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When you want vibrant color and vivid detail, get the FP951 from BenQ. Featuring an ultra-high 700:1 contrast ratio, a superior A+ LCD panel, and super-wide 170° viewing angle, you'll enjoy crystal clear, recognizable images from multiple viewpoints. An ultra-slim (0.7 inch) bezel design includes analog/DVI input signal. For color that rivals reality, call 1-866-700-2367 or go to www.BenQ.com.

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TOP 100

- 136 Spotlight: Slide Scanners**
Five models to take your transparencies digital.
- 142 Top 15 Desktop PCs**
- 146 Top 15 Notebook PCs**
- 148 Top 5 Photo Printers**
- 149 Top 5 Audio Players**
- 151 Top 10 Digital Cameras**
- 153 More Reviews**



136

DEPARTMENTS

- 23 Up Front**
- 45 Letters**
- 51 Plugged In**
Google and Amazon put book content on the Web.
- 53 Consumer Watch**
Learning to live with off-shore tech support.
- 57 Home Office**
Clean a messy desktop.
- 59 Bugs and Fixes**
How to get hold of Microsoft assistance.
- 180 Full Disclosure**
Networked entertainment: lots of effort, little reward.



57

RESOURCES

- 21 How to Contact PC World**
- 169 PC World Marketplace**
- 178 Advertiser Index**

TELL US WHAT YOU THINK

Visit www.pcworld.com/pcwinput and rate this issue—you could win a 20GB Apple iPod digital audio player, which currently sells for approximately \$395. 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 March 13 through April 9, 2004.

COMING UP IN MAY

PC Troubleshooting Guide: Our advice helps you diagnose and cure hardware and software ills.

New Color Lasers: They promise to print graphics as fast as text. We put 13 of them to the test.

Wireless Network Blues: Going wireless is rarely as easy as vendors claim. Here's real-world help.

Are Internet Phones Ready for Prime Time? We examine the leading services to find out.



70, 151

NEWS & TRENDS

- 24 Spam Wars Rage**
Despite rosy predictions from its sponsors, the CAN-SPAM Act hasn't made much of a dent in unsolicited junk e-mail. What's the next step?
- 28 Bye-Bye, Pop-Ups. Hello...?**
Blocking techniques and a new wave of rich-media advertisements have pop-ups in decline.
- 30 A New Pair of Palm OSs**
Garnet and Cobalt will bring stronger feature sets to Palm's current OS versions 5.4 and 6.
- 37 DVD Players Anchor New Home Nets**
The familiar living-room product is the focus of efforts to link digital home entertainment devices.

NEW PRODUCTS

- 60 Large LCDs**
HP L2035, NEC MultiSync LCD2080UX+
- 62 Accounting Software**
Intuit QuickBooks 2004, ACCPAC International Simply Accounting 2004
- 70 Digital Camera**
Sony Cyber-shot DSC-F828
- 72 Multifunction Printer**
Canon MultiPass MP390
- 73 Speaker System**
Aiwa UZ-US201
See page 61 for a complete list of new products reviewed.

NEXT GEAR

- 127 Beyond the Dial Tone**
Cell phone carriers offer a slew of data services.
- 131 Media Center PC**
Gateway FMC-901 X Family Media Center PC
- 131 Wireless Adapter**
Microsoft Xbox Wireless Adapter MN-740
- 132 Gadget Freak**
New audio formats—amazing but superpricey.

HERE'S HOW

- 156 Windows Tips**
Get your OS to look and work the way you prefer.
- 160 Internet Tips**
Detect and eliminate keylogger spy software.
- 162 Step-By-Step**
Tricks to conquer your media PC's cable clutter.
- 164 Hardware Tips**
To buy or not to buy a new PC; MP3s in your car.
- 167 Answer Line**
ID your PC's innards; print wide Web pages.

POWER TOOL



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—Susan Moyse, InfoTrends Research Group

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Even Bigger LCDs, Swift DVD Burning Suites, and Superb Scanners

FLAT PANELS JUST KEEP GROWING, as we detail in this month's *New Products* section. Meanwhile, rewritable DVD drives and DVD burning software capture our attention in a two-part feature, and

scanners—flatbed and slide/film models—shine in our *Top 100 Spotlight*. Other special charts rank photo printers and digital audio players, and our *Next Gear* section compares cell phone service providers.



60 20-Inch LCDs

Handsome monitors from NEC (the MultiSync LCD2080UX+, left) and HP (the L2035) mark the emergence of huge yet affordable flat panels.



96 DVD Burning Suites

You won't have much time to fiddle while Nero 6 burns a DVD-ROM for you. We look at this and other packages, plus rewritable DVD drives.



136 Scanners

Epson's Perfection 4870 Pro earned high marks among transparency-friendly flatbeds; we also examine dedicated slide and film scanners.

THIS MONTH'S CROP OF TOP PRODUCTS

DESKTOP PCs

- 142 Compaq X09 Gaming PC ★★★★★
- 142 Dell Dimension 8300 ★★★★★
- 142 Sony VAIO PCV-RS530G ★★★★★
- 142 Sys Technology Performance 64 3400+ ★★★★★

NOTEBOOK PCs

- 146 Acer Aspire AS2003LMI ★★★★★
- 146 Acer TravelMate C300 ★★★★★
- 146 Micro Express NP5015A ★★★★★
- 146 Toshiba Satellite M35 ★★★★★

SCANNERS

- 136 Epson Perfection 4870 Pro ★★★★★
- 64 Xerox DocuMate 510 ★★★★★

PHOTO PRINTERS

- 148 Canon i960 Photo Printer ★★★★★
- 148 Epson Stylus Photo R300M ★★★★★
- 148 HP Photosmart 7760 Photo Printer ★★★★★
- 148 HP Photosmart 7960 Photo Printer ★★★★★

DIGITAL CAMERAS

- 151 Fujifilm FinePix S7000 ★★★★★
- 151 Minolta DiMAGE A1 ★★★★★
- 70 Sony Cyber-shot DSC-F828 ★★★★★

LCD MONITORS

- 60 HP L2035 ★★★★★
- 60 NEC MultiSync LCD2080UX+ ★★★★★
- 61 Samsung SyncMaster 172x ★★★★★

DIGITAL AUDIO PLAYERS

- 149 Archos Gmini 220 ★★★★★
- 149 Creative Nomad Jukebox Zen Xtra ★★★★★
- 149 Rio Karma ★★★★★

REWITABLE DVD DRIVES

- 92 Kano Technologies K8Xtreme ★★★★★
- 92 Lite-On LDW-811S ★★★★★
- 92 Memorex True BX Dual Format DVD Recorder ★★★★★
- 92 TDK External Indl DVD 840G 8x Multiformat ★★★★★

DIGITAL PROJECTOR

- 63 NEC LT10 ★★★★★

WIRELESS ADAPTER

- 131 Microsoft Xbox Wireless Adapter MN-740 ★★★★★

SPEAKER SYSTEM

- 73 Aiwa UZ-US201 USB One-Point Stereo Speaker System

DVD BURNING SOFTWARE

- 96 Ahead Software Nero 6 Ultra Edition ★★★★★
- 96 Pinnacle Instant CD/DVD 8 ★★★★★

FINANCIAL SOFTWARE

- 62 ACCPAC International Simply Accounting 2004 ★★★★★
- 62 Intuit QuickBooks 2004 ★★★★★

BUSINESS SOFTWARE

- 64 Infomersion Xcelsius ★★★★★

WEB SITE DESIGN SOFTWARE

- 70 Adobe Atmosphere ★★★★★

THE HIGHEST-RANKING new products reviewed in this issue of *PC World* are listed above, together with the page number where

each product is reviewed and the star rating it received. See find.pcworld.com/10860 for more about *PC World's* Star Ratings.



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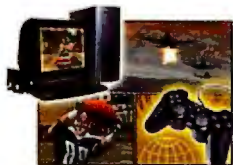
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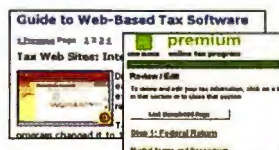
ONLINE FEATURES



Online Games Take Off

find.pcworld.com/40994

The Internet can connect you to a wide world of potential competitors in online contests—here's how you can get in the game.



Guide to Tax-Prep Web Sites

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We review five leading Web-based tax programs and help you figure out which is best suited to your needs.

FEATURED NEWSLETTER



Digital Focus Weekly

find.pcworld.com/37595

These tips from our expert Dave Johnson will enhance your own expertise with your digital camera, scanner, printer, and image-editing software.

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Award winners from our *Top 100*.

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HIGHLIGHTS



Opinion Leaders

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TOP 10 DOWNLOADS

Head to find.pcworld.com/41033 to locate and download these popular files.

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| 1. Ad-aware 6.181 | 1460KB |
| 2. Spybot Search and Destroy 1.2 | 3510KB |
| 3. Pop-Up Stopper Free 3.1.101 | 477KB |
| 4. RegClean 4.1a | 800KB |
| 5. Clean System Directory 1.7 | 70KB |
| 6. Tweak UI 1.33 | 113KB |
| 7. ZoneAlarm 4.5.538 | 3666KB |
| 8. Motherboard Monitor 5.3 | 1910KB |
| 9. Sygate Personal Firewall 5.5 | 8240KB |
| 10. CacheMan 5.50 | 927KB |

MOST POPULAR PRODUCTS

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

- **Projection TV**
Panasonic PT-50LC13
find.pcworld.com/41049
- **Digital Camera**
Olympus Camedia C-750
find.pcworld.com/41055
- **Graphics Software**
Microsoft FrontPage 2003
find.pcworld.com/41168
- **Keyboard**
Logitech Cordless MX Duo
find.pcworld.com/41066
- **Communications Software**
PC Anywhere 11.0
find.pcworld.com/41057
- **Notebook PC**
Sony VAIO FRV37
find.pcworld.com/41060



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PC Accessories

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- Dell 128MB* USB Memory Key, \$49
- Veo Velocity Connect Web Camera, \$79
- Linksys Wireless G Broadband Router, \$89
- Dazzle 10-in-1 Digital Media Reader/Writer, \$39

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- - 5150, 9100, \$149

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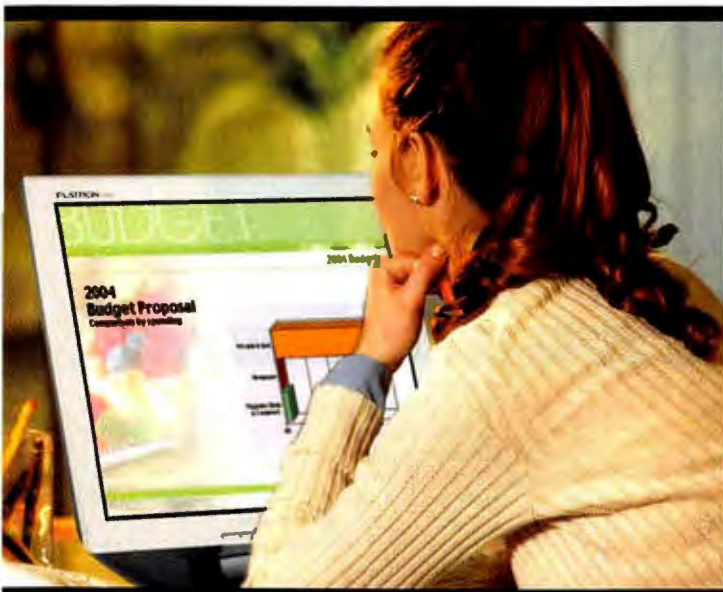
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DVD: Hot Today, Hassles Tomorrow?

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"WHICH PRODUCT SHOULD I BUY?" As editor of this magazine, I get asked that question...well, incessantly. But I also ask it myself. And—since I spend my days surrounded by a small army of savvy tech journalists and lab analysts—an expert answer is rarely far away.

So when I finally decided to get a rewritable DVD drive, I knew where to go for advice: directly to the cube of Associate Editor Melissa J. Perenson, *PC World's* resident optical-storage guru. My timing was perfect—she was putting the final editing touches on "Fast-Lane DVD Burning," this issue's roundup of the latest DVD drives and software (page 90).

The timing is also spot-on for the review, which was written by storage authority Jon L. Jacobi, a veteran contributor. Says Melissa, "This is a great time to get into DVD. The software's gotten easier, solid drives are available for under \$200, and you won't kill as much time burning data."

Until fairly recently, one reason *not* to buy a DVD burner was the ongoing standards skirmish between the DVD+RW and DVD-RW formats. Today, an uneasy truce prevails: Almost every PC drive worth considering supports both flavors.

FORMAT FREE-FOR-ALL

THE STANDARDS wars aren't winding down, though. DVD-based devices—in your PC and in your living room—are about to get even more capacious and versatile. But for every improvement, competing formats threaten to complicate buying decisions. Consider the following developments on the horizon:

Even more data: Later this year, dual-layer burners and discs will appear, bumping capacity to 8.5GB. Drives that can do



DVD DIVA Melissa J. Perenson, at home amongst a demi-terabyte or so of recordable optical media.

dual-layer DVD+R will likely arrive first, followed by dual-layer DVD-R ones.

Current DVD technology employs red lasers; the next really big thing in DVD will be blue lasers, which can cram up to 50GB of data on a disc. Deep-pocketed Japanese consumers can buy a \$3777 Sony blue-laser DVD recorder right now.

Most of us won't see blue-laser products until at least late 2005. We may then need to pick from burners based on two new, incompatible formats: Hewlett-Packard, Samsung, Sony, and other tech titans are backing one called Blu-ray Disc, while NEC and Toshiba are behind HD DVD.

High-definition video: Once you have a disc that can hold dozens of gigabytes, you've got space for hours of razor-sharp high-def video. Here again, everybody seems to

be hopping on different bandwagons: The Blu-ray and HD-DVD groups are each developing their own proprietary approaches, and others are proposing still more formats using blue or red lasers.

Most of these formats won't matter until 2006, if ever. But there are a handful of already-available DVDs that use Microsoft's Windows Media Video High Definition format. These are designed for viewing on PCs and aren't compatible (imagine that!) with other high-def DVD standards.

More multimedia savvy: HighMAT, a new standard designed to ease sharing of photos, music, and video on DVD and other media, has the backing of Microsoft and Panasonic, among others. Meanwhile, a mostly different consortium is supporting MPV, another standard for—drum roll—easy sharing of photos, music, and video on DVD and other media.

Confused yet? I sure am.

New technology doesn't have to be this way. And maybe DVD won't be, ultimately. "Particularly with blue laser, there may be a shakeout," Melissa believes. "For the masses, the format that Hollywood backs will probably win. By the time blue-laser drives reach a price you'll want to pay, the mess may be sorted out."

Let's hope so. Otherwise, we're headed for an era in which it will be a total crapshoot whether the DVD you burn on your PC will be compatible with any particular piece of hardware. That would be a crummy development for consumers—and for the companies that hope to persuade us to buy all this stuff. ■

Contact PC World Editor Harry McCracken at mageditor@pcworld.com.

NEWS & TRENDS

EDITED BY RAMON G. MCLEOD

- 26 ISPs TRAIN TECH GUNS ON SPAM
- 28 BYE-BYE, POP-UPS. HELLO...?
- 30 TWO NEW PALM OSs
- 37 DVD PLAYERS ANCHOR NEW HOME NETWORKS
- 38 LIVING-ROOM WISH LIST
- 40 MIGHTY MEDIA MOVING MACHINES

SPAM WARS RAGE

THE NEW FEDERAL ANTISPAM LAW DOESN'T SEEM TO BE WORKING. WILL ANYTHING STOP THE E-MAIL ONSLAUGHT?

BY TOM SPRING

ON JANUARY 1, 2004, the most sweeping federal anti-spam law ever enacted took effect. Coauthor Senator Conrad Burns (R-Montana) said that CAN-SPAM (Controlling the Assault of Non-Solicited Pornography and Marketing, the bill's full name) was supposed to "put an end to the bothersome e-mail [people] see each day in their in-boxes" by imposing harsh penalties against "kingpin" spammers and by allowing people to opt out of marketing mailing lists with a simple mouse click.

But if you're receiving less junk e-mail now, you are in the minority. By all accounts, CAN-SPAM has failed to restrain the inundation of spam



SENATOR CONRAD BURNS said CAN-SPAM was supposed to "put an end to the bothersome e-mail [people] see each day in their in-boxes."

that is slowly drowning the Internet. Brightmail, which filters spam for some 300 million user accounts worldwide, reports that in January 60 percent of incoming e-mail mes-

sages worldwide was spam—up 2 percent from the levels observed in December, just before the law took effect.

Perhaps the most striking consequence of the law is that

it may have driven a number of spammers offshore. America Online, whose 33 million customers have long been a major target for spammers, says that immediately after the law took effect, it saw a 10 percent jump in spam originating overseas—beyond the reach of U.S. antispam laws.

IT'S THE LAW

CAN-SPAM REQUIRES commercial e-mail messages to include an opt-out mechanism so you can tell senders to remove you from their mailing list. Also outlawed are false and deceptive headers and subject lines. Companies must include a postal address in their marketing e-mail.

MX Logic, a self-described "commercial e-mail defense company," determined that of 40,000 unsolicited commercial e-mail messages it reviewed in a four-week survey, 97 percent violated the CAN-SPAM law. The most common violations, MX Logic offi-

cials say, involved failing to include a valid postal address or a clear opt-out mechanism.

The law also bans popular spamming techniques such as employing software to harvest e-mail addresses from Web sites. Prohibited, as well, is "dictionary attack" software, which randomly generates e-mail addresses in an effort to come up with at least some real recipients.

The toughest penalties under CAN-SPAM include jail time for spammers who falsify the header information in e-mail messages or who hack into someone else's computer to send bulk e-mail. Convicted spammers are also subject to jail time for registering five or more e-mail accounts, for giving false information when signing up for those accounts, or for using the accounts to send unsolicited bulk e-mail.

Burns and various CAN-SPAM supporters—among them Microsoft, Yahoo, and the telecom consumer advocacy group Telecommunications Research and Action Center—say that the law's steep fines and jail terms will, in time, weed out the worst offenders. They say that CAN-SPAM will make junk e-mail easier to spot and filter. But spammers seem to be paying little attention to the law.

STRONG FIRST STEP?

EVEN THOUGH spam is as rampant as ever, Burns remains optimistic about the new law. He says federal legislation is a strong first step in curbing spam. But he also points out that CAN-SPAM wasn't meant to be a spam-slaying silver bullet. "The in-

dustry now has a way to legitimize and put integrity into the practice of sending commercial e-mail," he says.

"CAN-SPAM is great for companies like ours that play by the rules," contends Paul McDonnell, cofounder of di-



By all accounts, CAN-SPAM has failed to stop the e-mail inundation.

rect e-mail marketer IMarket Offers. He and many other e-mail marketers appreciate that CAN-SPAM presents a single set of rules to an industry previously struggling to navigate the shoals of 34 existing state antispam laws. "This makes compliance much easier," McDonnell says.

But what is good for the e-marketing industry may not be great for the eternally spammed. The CAN-SPAM law does not proscribe unsolicited e-mail, so long as it's CAN-SPAM-compliant. Crit-

ics view this as a major flaw, while known spammers see it as a loophole that will keep them in business.

Scott Richter, whose name regularly appears on the Register of Known Spam Operations list of top spammers (see find.pcworld.com/40988),

says his mail had mostly complied with CAN-SPAM already. "All I have to do is add my postal address to outbound e-mail messages, and it is business as usual."

California state senator Debra Bowen, a Democrat who supported a more stringent California law that the federal law superseded, says the situation has deteriorated. "CAN-SPAM does not can spam at all; it gives it the congressional seal of approval," she asserts.

California's antispam law mandated an opt-in approach that prohibited sending unsolicited commercial e-mail without the recipients' prior consent or without an established business relationship. Bowen argues that marketing e-mail should be prohibited unless it is requested by users.

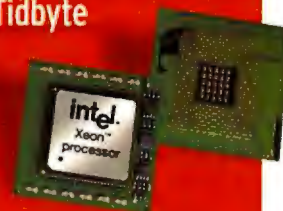
WAIT AND SEE

"CAN-SPAM'S IMPACT on consumer in-boxes will take time," says J. Howard Beales III, director of the FTC's Bureau of Consumer Protection, which is among the federal agencies charged with enforcing the CAN-SPAM Act.

The FTC has other obligations under CAN-SPAM. One is that the agency must write regulations governing the labeling of pornographic messages. It must consider mandatory labels for unsolicited e-mail in general. The FTC ►

IN BRIEF

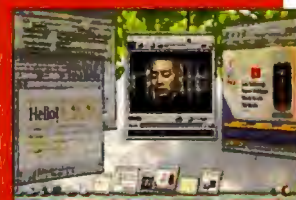
Tidbyte



INTEL EXTENDS ITS BITS:

Following the lead of competitor Advanced Micro Devices, Intel will add 64-bit extensions to its 32-bit server and workstation processors as soon as the second quarter. Like AMD's Athlon 64 desktop CPU and Opteron server and workstation chips, Intel's technology will support 32- and 64-bit applications. Microsoft confirms its Windows XP 64-Bit Edition and Windows Server 2003 for 64-Bit Systems, planned for release in the second half of 2004, will run with CPUs from both chip makers.

Product Pipeline



THE DESKTOP OF THE FUTURE?

Soon you may be able to add another dimension to your desktop. Sun Microsystems is now testing a 3D environment—no glasses required. Called Project Looking Glass, the Java-based technology lets you push browser windows or documents off to the side or place them behind other objects. It could be used with Sun's Linux-based Java Desktop System. find.pcworld.com/40964

must also investigate the feasibility of a do-not-spam registry similar to the telemarketing do-not-call registry.

The FTC has proposed requiring adult-related e-mail to have the phrase "SEXUALLY-EXPLICIT-CONTENT" at the beginning of message subject lines, making them easy for recipients to filter out.

The problem with this and other CAN-SPAM mandates, from Beales's point of view, involves enforcement. "I have expressed some doubts about the enforceability of CAN-SPAM," Beales says. Spammers are difficult to locate, and if they're found outside the United States, enforcement becomes even more difficult.

"Without strict enforcement, I don't see how any antispam law can work," says Sam Simon, chair of the Telecommunications Research and Action Center, a supporter of CAN-SPAM. According to Beales, the FTC has filed near-



"CAN-SPAM'S IMPACT ON consumer in-boxes will take time," says J. Howard Beales III, director of the FTC's Bureau of Consumer Protection.

ly 60 antispam cases under antifraud laws, yet the volume of spam has continued to rise.

EXISTING LAWS

ONE EXAMPLE of antispam efforts in the courts: In December, New York's state at-

torney general Eliot Spitzer and Microsoft sued Scott Richter and his company OptIn-RealBig.com in New York and Washington states, respectively, alleging that they had violated each state's consumer protection laws by sending bil-

lions of illegal and deceptive unsolicited e-mail messages.

Richter, who insists that the charges are false, says he lost some business initially but now sends as many e-mail messages as he did before the suits were filed.

Many observers view laws as just one element in fighting spam. "We feel that the CAN-SPAM law will, when combined with other tools and weapons, have a positive impact," says America Online spokesperson Nicholas Graham.

Analysts agree better spam-fighting technology (see "Tech Weapons of Spam Destruction") is needed. The research firm IDC estimates that by 2007 messaging security will be a \$1.1 billion business, up from \$236 million in 2002.

"Spam laws on their own mean nothing," says Rich Jennings, e-mail analyst with Ferris Research. "Any solution will have to go hand in hand with technology." ■

E-MAIL

TECH WEAPONS OF SPAM DESTRUCTION

BIG INTERNET PROVIDERS, their servers clogged with junk e-mail, are trying to use technology to fight the spam onslaught.

MessageLabs, an e-mail security firm, estimates that two-thirds of all spam is routed through insecure computers that allow senders to mask the true source of e-mail messages. Since identifying spammers is key to stopping them, America Online and Yahoo are working on e-mail equivalents to caller ID: Each message would include information on the actual sender. This would help authorities track down offenders and allow ISPs to block e-mail that incorrectly states its source.

America Online is testing technology called Sender Permitted From that works at the recipient's end, checking whether

the point-of-origin IP address—embedded in all e-mail messages—corresponds to the domain name of the purported sender. If the two don't match, the recipient could discard the message.

Yahoo's DomainKeys plan would place an unforgeable encrypted signature on outbound Yahoo e-mail. When the message reached its destination, the recipient's mail server would check the signature with a Yahoo public key and then deliver only messages verified as coming from Yahoo.

Microsoft, meanwhile, is researching ways to curb junk e-mail by making it cost-prohibitive. A scheme called Penny Black would block mail until the sender's computer solved a complex math equation that would tie up the PC for about 10 seconds—

a delay that would not inconvenience most people, but that would force bulk e-mailers to use supercomputers as servers.

Goodmail Systems is one of several companies developing technology that would impose a small charge for each unsolicited e-mail message, thereby motivating marketers to trim their mailing lists. Right now, there's no financial disincentive to send out as many e-mail pitches as possible.

Goodmail's e-mail postage stamps would be free to individuals and discounted to nonprofits. Richard Gingras, Goodmail's president and CEO, says that ISPs could use fees from volume senders to fight spam.

Don't ditch your spam filter just yet, however. All of these technologies are still just being researched or tested.



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INTERNET

BYE-BYE, POP-UPS. HELLO...?

USE OF POP-UPS WANES, BUT WORSE INTRUSIONS MAY BE COMING.

POP-UP ADS, THOSE reviled windows that intrude on your Web surfing, seem to be on the decline. But don't celebrate yet: New forms of advertising that may be just as annoying and even more intrusive are likely to replace them.

Thwarted by both ISPs and blocking utilities, use of pop-ups has waned over the past year. Internet advertising analysts say Microsoft's decision to put a pop-up stopper into the next version of Internet Explorer hastens their demise, but no one expects them to disappear soon. And new styles of ads, including screen-grabbing full-motion videos and rich media that overwrite the screen, are starting to appear.

"All these technologies will contribute to the downfall of pop-ups," says Jupiter Research associate analyst Nate Elliott. But decline isn't the same as imminent death: "Pop-ups will be a viable advertising medium for several years to come," he adds.

Pop-up ads originated with adult-content Web sites, but have become prevalent at mainstream sites (including PCWorld.com). In December 2001, according to data from Nielsen//NetRatings' AdRelevance service, 1.4 percent of all Web ads were pop-ups or pop-under. By July 2003, pop-up and pop-under ads hit their peak at 8.7 percent of all on-

line ads. Six months later, during the height of the holiday shopping season, their use had plummeted by nearly 30 percent, accounting for about 6.3 percent of all online ads.

DOING THE JOB

WHY DID POP-UPS become so pervasive? They are 13 times more effective at generating clicks than standard banners, according to 2003 research by



ad firm Advertising.com.

"Everyone hates advertising, but it works," says Jim Nail, a senior analyst with Forrester Research.

Jupiter's Elliott agrees with Nail: "Pop-ups work well for the same reasons people hate them in the first place: They get in your face and force you to read the message." As pop-ups did their job, advertisers and Web site publishers began running more of them. And users reacted by seeking ways to block them.

"If I were an average user, I probably wouldn't want [pop-ups] either," says Chris Vanderhook, chief operating officer of SpecificMedia, an online advertising firm that operates two networks of pop-under ads. "There are too many on the Web—way too many," he contends. "When we first started, it was supposed to be one per user per day."

ENTER THE BLOCKERS

TODAY, ABOUT 20 percent of surfers use pop-up blocker software, which prevents sites from serving ads in new browser windows, according to Forrester's Consumer Technographics Survey. That's higher than last year, when 13 percent of Internet users ran a pop-up blocker. But such blockers can't stop advertising delivered by adware (ad-supported software that installs on your PC, often with another application, such as Kazaa).

The battle has accelerated. In August 2002, EarthLink was the first major ISP to give its customers a pop-up blocker. AOL imposed pop-up controls last year, and Microsoft put Pop-Up Guard into MSN Premium in January. No-cost toolbars from Google, Dogpile, MSN, and Yahoo block pop-ups. But the biggest blow may come from the built-in IE pop-up blocker in Windows XP Service Pack 2, ship- ►

IN BRIEF

Product Pipeline



TALK-BACK CLOCK: Upon awakening, you may want to hear a weather forecast or a traffic report. Don't turn on the TV—just ask your IClock, an Internet-connected alarm clock. The device accepts voice commands, so when you request the late-night sports scores, it gets the answer from your PC via your wired or wireless home network. The IClock reads information to you and also displays it on its screen. Personica Intelligence expects to ship the gadget later this year priced at around \$249.

Tidbyte

GATEWAY GOES SHOPPING: Gateway has been reinventing itself as a consumer electronics company, but recently it returned to its PC roots in acquiring budget PC maker EMachines. The estimated \$200 million deal, expected to become final by early April, will create the United States' third-largest PC vendor. Gateway expects to keep selling products under both brands for the foreseeable future. Gateway also plans to offer its consumer electronics devices through the same retailers that currently sell EMachines PCs. Company representatives say no decisions have been made about how Gateway will handle support for existing and new customers.



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Enjoyment Matters

ping in the first half of 2004.

More than 95 percent of Internet users surf with IE, says site-tracking service WebSide-Story, so a built-in pop-up blocker could be devastating, if it's activated. The pop-up blocker in XP SP2's beta version is switched off by default, but when the browser first encounters a pop-up ad, IE asks whether the user wants to turn it on, says Matt Pilla, a senior product manager.

Microsoft has not decided whether to activate SP2's pop-up blocker, but analysts expect it to stay off by default—and be less effective. "Users will have to...go in and change the settings," says Jupiter's Elliott. "And people, in general, don't tend to change their settings."

But Internet ad firms will be ready. They're already developing technology that evades the pop-up blockers. Vander-

hook says that SpecificMedia isn't doing this, but instead is designing new types of ads.

NEXT DESIGNS

THE NEW ADS—rather than the blockers—may eventually doom pop-ups. Some firms al-

ready offer rich-media ads that stream audio and video or scroll text and images across the screen. Online ad maker Unicast promotes full-screen video that shows television-quality ads in 15- or 30-second spots. Unicast's ads download a 2MB video file to a temporary cache and play only between Web pages or at a "log-

ical break period," much like a TV ad, says Allie Savarino, Unicast senior vice president. The file won't affect PC performance, and users can always close it, Savarino adds.

She predicts that people will find these ads less intrusive

Pop-ups work well for the same reason people hate them: They get in your face.

than pop-ups. "The creative flexibility that this format gives advertisers allows them to deliver messages that consumers will tolerate," she says. Whatever their form, online ads are here to stay. "We have to find a way to coexist with advertising," argues Charles Buchwalter, vice president of client analytics for Nielsen//

NetRatings. That's because advertising pays the bills.

SpecificMedia's Vanderhook takes a more hostile view of ad avoidance: "Blocking pop-ups is almost like ripping off music online," he says. "When you go to ESPN.com every day, you enjoy its content for free. But it's not free; it's paid for by advertising."

Still, the pop-up wars continue. New technology will surely block new kinds of ads. EarthLink already lets customers block rich-media ads, and AOL plans to do the same by the time you read this.

According to some analysts, technological evolution should lead to better advertising, delivered in less intrusive, more manageable formats. In an environment where survival depends on adaptability, pop-ups may be headed for extinction.

—Liane Cassavoy ■

HANDHELDS

A PAIR OF NEW PALM OSs

TWO RENAMED, UPDATED VERSIONS SHOULD APPEAR THIS YEAR.

PALM'S OPERATING system is moving forward in two directions. These next-generation versions, slated to appear on devices that will ship later this year, should make the popular OS more powerful than ever and capable of supporting a wider range of hardware.

The upcoming releases—the mainstream Palm OS Garnet and enterprise-oriented Palm OS Cobalt—will correspond to versions 5.4 and 6, respectively, of the Palm OS. PalmSource, corporate steward of the operating system, hopes that avoiding version numbers will prevent prospec-

tive Garnet customers from thinking they're getting an old or outdated product; still, the bulk of the innovation clearly is going into Palm OS Cobalt.

New features appearing in Cobalt will include improved graphics and multimedia support; a customizable status bar that owners of recent Tungsten PDAs should find familiar; a more robust contact manager that has room for more data and for a tabbed layout; and improved support for various types of connectivity, including simultaneous voice and data sessions.

Under the hood, Cobalt will

support much more memory—up to a total of 256MB each in RAM and ROM—and better security features. Cobalt's features are intended to encourage the development of new Palm-based devices, too, such as smartphones, tablets, book readers, and handheld game players.

Palm OS Garnet adds support for higher screen resolutions (including 240 by 320), a software-based Graffiti input area that can vanish as required (a feature also seen in Tungsten T3s), and enhanced tools for finding and using



OWNERS OF DEVICES with the Palm Cobalt OS will be able to customize their status bar.

Bluetooth wireless networks. Garnet retains OS 5.4's memory limits of 128MB in RAM and 16MB in ROM.

—Yardena Arar ■



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Results vary based on PC specifications and does not include the transfer. 19. Requires compatible IEEE 1394a wireless access point, some of which may require a fee and/or ISP. This product has been tested and certified to be interoperable by the Wireless Ethernet Compatibility Alliance and is authorized to carry the WPA logo. 21. Actual usable capacity may vary. 22. While supplies last. 23. 220MB of actual usable capacity. 24. 40GB of actual usable capacity. 25. 220MB of actual usable capacity. 26. Offer valid with purchase of PCV-V1055 direct from www.sonystyle.com. While supplies last. 27. L240 is a trademark of Sony. Sony will not be responsible for a product camera an IEEE 1394 connector. All products with an IEEE 1394 connector may not communicate with each other. 28. Purchase must be made by 6/30/04. For rebate mail-in coupon and Terms and Conditions, please visit www.sonystyle.com. 29. MP3 music playback requires Memory Stick media. 30. Sony recommends. 31. Memory Stick PRO features vary by and are dependent upon the design of host hardware devices.

DIGITAL HOME

DVD PLAYERS ANCHOR HOME NETS

NEW, SMARTER DVD PLAYERS MAKE MOVING AND ENJOYING YOUR DIGITAL MEDIA EASIER.

AS PC AND consumer electronics vendors work to move digital media off your PC and into your living room, they're calling on a familiar favorite to lead the way: the DVD player.

DVD players and recorders have a great advantage over many other approaches to creating a digital home: They are well-established living room products that connect to a TV, the traditional centerpiece of a home entertainment system.

Add high-speed wireless networking to distribute content, and you have a product set that many vendors believe will appeal to people likely to avoid seemingly complex media center PCs, media servers, and similar products.

"A DVD player is a model that people already recognize; it's not a mystery box," says Walt Dreschler, product manager of digital solutions for Gateway. And that familiarity is essential, since many users still have trouble programming VCRs—never mind understanding how stand-alone networking components might fit into their home theater setup.

The timing may be right, as well. For one thing, the content is there: Users now have hard drives bulging with ripped MP3 files, music from services like iTunes, and digi-

tal photos. Meanwhile, streaming services (video on demand, Internet radio, and the like), are picking up steam. And networking in the home continues to grow: In 2003, 17 percent of U.S. households with a PC also had a network (40 percent of these were wireless); that number should grow to 29 percent by 2006, according to research firm IDC.

NETWORKING DVD

THE EMERGENCE of the DVD player as a hub in a digital home network began last year when Gateway and GoVideo were among the first to release connected DVD players.

Gateway's first-generation



APEX (bottom) and GoVideo's networked DVD players can stream media wirelessly from a PC either via 802.11b (Apex) or .11g (GoVideo).

\$250 Connected DVD player streamed digital music, video, and still images from a PC to a TV via ethernet, and it could be upgraded to 802.11b or .11g wireless with a PC Card and new firmware. Gateway is planning its third-generation unit (slated to ship by the middle of 2004), which should support streaming audio services and sport an improved interface.

Many more players are getting aboard the connected DVD bandwagon this year. Just in April alone, Apex should release its \$200 AD-8000N, which offers 802.11b networking, while Linksys and GoVideo plan to debut products that opt for integrated 802.11g; the Linksys will also support Internet radio. The same month, Philips will ship its MX6000i Streamium

Home Theater System, a \$799 product that includes a five-disc DVD/SACD changer designed to use 802.11g.

Kiss Technology's \$649 DP-1504 adds a 40GB hard drive to its connected DVD player. Later this year, the company will enhance its player with DVD recording capability, HDTV and analog TV tuners, an 80GB hard disk, Internet radio, and 802.11g connectivity. The likely price: \$1300.

All of these units come with software for turning your PC into a server that can stream a slew of audio and video formats—including MP3, WMA, JPEG, and MPEG-4—from your PC to the DVD player.

The user interface and networking setup remain knotty problems for connected DVD players, however. The shipping models we looked at—Gateway's Wireless Connected DVD player and GoVideo's D2730 equipped with version 2 software—proved equally challenging to configure and to navigate. For example, ►



PHILIPS'S MX6000i Streamium Home Theater system has a DVD/SACD changer and 802.11g.

to set up 802.11g networking, we had to enter our WEP key; before running the devices, we had to disable our PC's firewall. And the server software (an applet by Digital 5) makes importing digital media files counterintuitive.

Luckily, some of these problems will be fixed in newer models. We tried Apex's pre-production AD-8000N, which uses a new version of Digital 5's applet. The software improves media imports, and it now supports thumbnails (so you can identify your pictures) and image rotation (so you can see them properly)—features that were previously missing.

SERVER FOR THE DEN

ANOTHER APPROACH that's gaining momentum is the all-in-one-server model, which similarly places a DVD player/recorder at the center of the action, but which doesn't rely heavily on a PC. Both Toshiba and Hewlett-Packard will have offerings by early 2005.

Shipping in early 2005, Toshiba's Advanced Digital Media Server will start with a connected DVD recorder, but it will also simultaneously—and wirelessly, of course—stream three TV signals (including an HDTV signal) and digital audio to at least two devices,

without signal loss. The package will also include a PVR to perform TiVo-style recording and a 250GB hard drive for storing your digital content. In addition, it will provide software that lets users see and access all of the multimedia content stored on the network from any properly connected device. The data will travel over 802.11a, but you'll also be able to stream signals over ethernet or coaxial cable (see the diagram on page 40 for details).

Toshiba plans to offer IPTV modules to convert the IP signals from the primary server into component or composite sig-

nals that your TV can accept. Pricing is not yet set.

Details about HP's Entertainment Hub—including its name—are tentative, but the product is due by year's end. The Hub should have all the video and audio connectors you'd expect from any entertainment-component device, along with a DVD burner, a TV tuner, an FM tuner, and a large hard disk capable of storing at least 100 hours of TV. Since the Hub will also have integrated wired and wire-

NEW LIVING ROOM WISH LIST

ALONG WITH DVD'S increasingly central role in the entertainment network, several trends are emerging this year: hardware that combines two or more functions for greater convenience, and products that aim to unclutter your home theater setup.

DVD/VHS recorders in one: Units from GoVideo and LG Electronics that let you record onto VHS tape and DVD (and dub one to the other easily) are here; others—from companies like Panasonic, Phillips, and Samsung—should follow. Prices range from \$399 to \$600.

Printer/TV: In its first foray into big-screen TVs, Epson (best known for printers) has combined \$3499 47-inch and \$3999 57-inch LCD projection TVs with a dye-sublimation printer that prints 4-by-6-inch photos, plus a CD-RW drive (to read and record to photo CDs). You also get a built-in flash media reader (which handles five formats). The TVs should be out around the time you read this.

Home projector/DVD player: Pixa has released the first home theater in

a box to combine an 800-by-600-pixel DLP projector with a DVD player. It includes tuners for standard NTSC signals and HDTV, as well as for PAL. The \$1999 unit also integrates a flash memory card reader.

Wireless TVs: Several vendors are using integrated Wi-Fi in TVs to keep the

unsightly snag of wires out of view; instead, the wires connect to a separate base station that transmits audio and video streams to the TV. Sharp's 15-inch Aquos LC-15L1U-S LCD (\$1800) uses 802.11b, while Samsung's 50-inch plasma (\$13,000), due this summer, will use 802.11a. Sony's cable-free TVs, dubbed Location-Free, should appear by year's end and will support 802.11a, .11b, and .11g. Expect more home theater setups, like the ones from Sony and Pixa, to offer wireless audio connections between rear speakers and other stereo components.

Skinny DLP TVs: At just 7 inches deep, new 61-inch rear-projection TVs from InFocus and Thomson's RCA will streamline your den. The units are half the depth of today's slimmest DLP TVs, and vendors say they're light enough (about 130 pounds) to hang on a wall. Models ship in the second half of 2004 and should cost about \$10,000.

—Anush Yeghazarian



SHARP'S wireless Aquos LC-15L1U-S integrates an 802.11b connectivity.



GOVIDEO'S unit (left) offers DVD and VHS recording; Pixa's home theater system combines a DVD player and a projector.

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By designing a wireless network for Johnsonville's warehouse, we helped them increase productivity and decrease errors in the distribution process. Now forklifts talk to pallets and pallets talk to loading docks, which gives employees real-time access to inventory data as opposed to the twice-daily updates they were used to getting. All of which transforms a humble, family-owned company into a lean, mean, sausage-selling machine. To learn more about networking solutions for small and growing businesses, visit cisco.com/grownow.



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less connectivity, however, you'll be able to stream content from the PC—as well as from the Hub—to receivers across your home. Pricing should fall between \$1000 and \$1500 for the Hub itself, and between \$250 and \$300 for the receivers, which may also be integrated into devices such as LCD or plasma TVs.

TVs with built-in Wi-Fi are on the way, ready to talk with your PC and possibly to media servers like the ones just described. For example, Sharp's Aquos LC-20PX1U, a 20-inch LCD TV due in May, has two PC Card slots that can accept 802.11b adapters to let you stream media files from a PC. The TV itself incorporates a menu interface to handle on-the-fly viewing of photo slide shows (stored on flash media

cards) and recording TV to the bundled 5GB PC Card hard drive (which can store up to 4 hours in the ASF format used by Windows Media Player).

Later in 2004, Philips should ship the 23PF9976i Streamium FlatTV, a 23-inch 1280 by 768 LCD with 802.11g built in. The unit will rely on the PC to act as a server, streaming audio and video files back to it. In addition, it will be able to play streamed Internet media from such partners as iFilm, Musicmatch, and Yahoo. (See "New Living Room Wish List" for other wireless goodies.)

CHALLENGES AHOY!

FEW INDUSTRY experts expect one type of connected device to dominate in the near term; but all speak of a networked nirvana where media

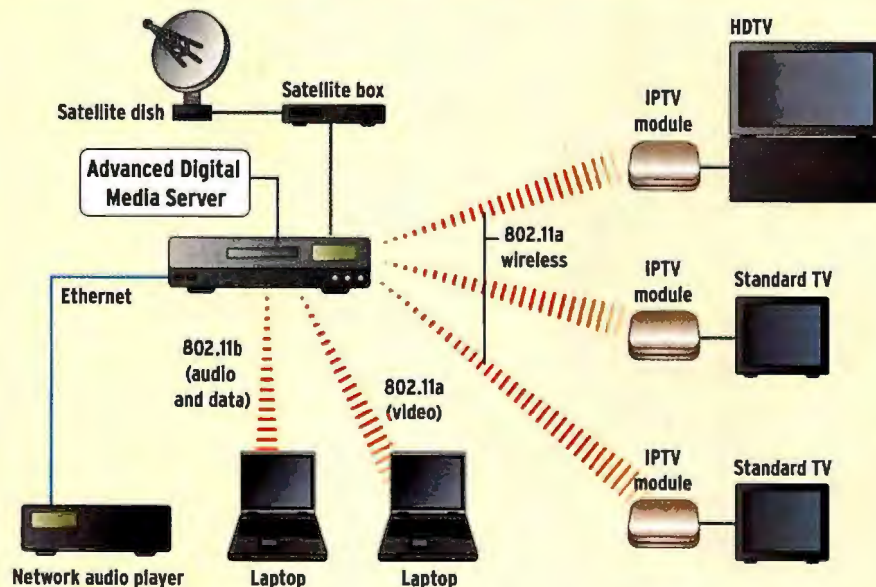
servers feed content wirelessly throughout the home, to every TV, DVD player, and stereo. Today, however, interoperability is a bit of a hodge-podge.

Should you buy now? Last year, when some of the first devices designed to shuttle media from your PC to your living room debuted (see find.pcworld.com/41000), we advised holding off. This year's devices offer you more than a means to connect your PC to your home theater system—they promise key components of that theater system, such as a TV or DVD player/recorder. Because their connectivity features add little to the price (often less than \$100), members of this year's crop deserve a closer look.

—Melissa Perenson, with reporting by Ramon G. McLeod ■

HOW IT WORKS

MIGHTY MEDIA MOVING MACHINE



TOSHIBA'S ADVANCED DIGITAL Media Server (ADMS) offers a peek at how a home media distribution system—for video, music, and photos—could work with a DVD recorder/player at the cen-

ter. It will both store and direct media around the home, allowing users to access the content they want, on any properly connected device, regardless of where that content is actually saved.

IN BRIEF

Product Pipeline



SHOWER SING-ALONG: If you can't leave your digital audio player behind even when you step into the shower, Aiwa has a device for you. Part of the company's new Pavit series of digital audio players, the AZ-BS32 is a water-resistant MP3 player, featuring a 32MB version of the company's proprietary Pavit USB flash drive. The removable drive lets you transfer music between Aiwa's Pavit players and any USB-enabled PC. The \$150 device also features an FM tuner and a built-in speaker.

Tidbyte

AN OFFICE UPDATE:



Microsoft is planning to release its first service pack for its Microsoft Office 2003 editions in late June. Service packs typically include product updates and bug fixes, but Microsoft has yet to disclose any details about what the new pack will include. The company says it has been gathering technical data and customer feedback since Office launched last October, and promises to include necessary updates in the upcoming service pack.

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Sender's Email
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Recipient's Name
Lisa

Recipient's E-Mail
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Message
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Invitation to: Gallery Opening
June 14, 2004

Photo Exhibit
Sculpted by: Susan Howard
Where: Impressions Gallery
Where: 293 Oregon Avenue, Denver, CO 80218

Your Name
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Email Address
bradshaw@myhost.com

Will You Attend?

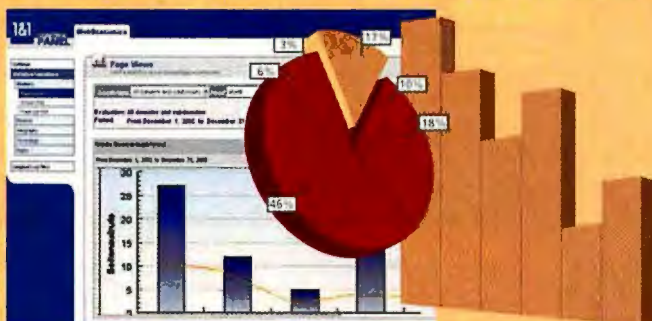
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APPLICATIONS

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- Full version software worth \$550
- 1&1 Control Panel

EMAIL

- 150 POP3 email accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 3 POP3 accounts

WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- Own CGI programming
- FrontPage 2002 extensions
- Advanced password protection
- Perl, PHP3 and PHP4
- 1x MySQL database (100MB)
- SSH shell access
- SSI (Server side includes)
- Cron Jobs

CRM/E-COMMERCE

- 1&1 WebStatistics
- 5 chat channels
- Customizable forums
- in2site one-on-one dialogue
- Newsletter Tool
- 1&1 WebDatabase
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- Handling of unlimited domain names
- Point 200 external domains to 1&1
- 200 sub domains

WEBSITE/CONNECTIVITY

- 2,000 MB of Web space
- 25 FTP accounts, unlimited access
- 30,000 MB/Month bandwidth
- Protected by up-to-date firewall
- No limits on simultaneous hits/bandwidth
- Server priority
- Daily backups

APPLICATIONS

- WebsiteCreator for 25 pages
- Full version software worth \$550
- 1&1 Control Panel

EMAIL

- 300 POP3 email accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 6 POP3 accounts

WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- Own CGI programming
- FrontPage 2002 extensions
- Advanced password protection
- Perl, PHP3 and PHP4
- 3x MySQL databases (100 MB each)
- Cron jobs
- SSH shell access
- Advanced developer tools
- SSI (Server side includes)
- Dedicated SSL Certificate

CRM/E-COMMERCE

- 1&1 WebStatistics
- 10 chat channels
- Customizable forums
- in2site one-on-one dialogue
- Newsletter Tool
- 1&1 WebDatabase
- 1&1 WebElements - Sophisticated Form Editor

EXPRESS SUPPORT

- 24/7 support by phone and email

HOME PACKAGE

\$ 4.99 PER MONTH

1 FREE DOMAIN

DOMAIN NAMES

- 1 domain name included free
- Handling of unlimited domain names
- Point 50 external domains to 1&1
- 5 sub domains

WEBSITE/CONNECTIVITY

- 500 MB of Web space
- 1 FTP account, unlimited access
- 5,000 MB/Month bandwidth
- Protected by up-to-date firewall
- Daily backups

APPLICATIONS

- WebsiteCreator for 12 pages
- Full version software worth \$550
- 1&1 Control Panel

EMAIL

- 50 POP3 email accounts
- Aliases, auto-responders, forwarding
- 1&1 WebMail
- Virus scanner for 1 POP3 account

WEBSITE FEATURES

- Logfiles
- CGI library (counter, guestbook, etc...)
- FrontPage 2002 extensions
- Password protection

CRM/E-COMMERCE

- 1&1 WebStatistics
- 1 chat channel
- Customizable forums

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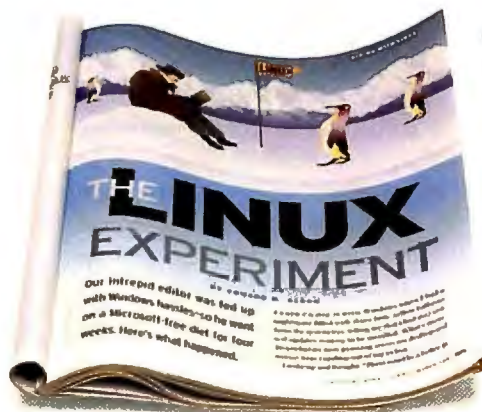
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EASES PC TASKS**

**SEARCHES CAN'T
FIND SOME PEOPLE**

**REASONS TO KEEP
A WIRED PHONE**



HOT AND COLD ON LINUX

LINUX VERSUS Windows XP ["The Linux Experiment," February]? Don't make me laugh! Like your writer, I took a long look at one of the latest versions of Linux (Red Hat Linux 9 in my case). The OS installed nicely, but it took me no less than 1.5 hours to get online with my dial-up connection—after 2 hours of getting my modem configured. Installing software? Don't look for the .zip files you may be used to, and once you get downloaded files unpacked, don't expect them to set up painlessly the way Windows apps do.

After two weeks of this nonsense, I went back to Windows XP. I'll take its ease of use and hardware compatibility any time.

Jeff Hansman, Carmel Valley, California

AS A LINUX user, I know most hackers are looking for the most clueless Windows users, but not for me. I yawn every time the latest Microsoft-targeting worm makes its rounds: I know my PC will not be turned into a zombie spammer, and spyware and adware don't work on my system. Applications aren't bloatware and are in general better designed; I can run a bleeding-edge OS on a PC old enough to remember the first Bush administration; I can upgrade when I'm ready; I

don't have to buy a lot of expensive software; I'm not bound by restrictive user agreements; and I never, ever see the dreaded Blue Screen of Death.

*Nicole Chardenet
Wethersfield, Connecticut*

IT'S NICE TO SEE articles on Linux. The more people read about it, the more they realize there is an alternative OS. That in turn motivates more and better Linux programs and might also inspire more software companies to write Linux versions of their products.

Pearu Tamm, via the Internet

TROUBLE-FREE PC?

DESPITE THE promise of "The Trouble-Free PC" [February], such a critter unfortunately does not exist in this universe.

A year and a half ago, my PC and I had a joint and complete meltdown. Over the years, I had added a CD-ROM drive, a Zip drive, a CD-RW drive, printers, a flatbed

scanner, a slide scanner, network cards, multiple disk drives, video and audio cards, and a ton of software. Each addition seemed more difficult. Trying to get the PC to be the control point for my home theater system was the last straw.

I realized I was trying to get one machine to do far too much. Given the low cost of basic computing power, the answer was separation of labor. I now have five PCs—one for my home theater, one for business apps, one for my wife, a laptop for mobile business and digital camera downloads, and one more desktop for office and Net stuff plus scanning and image processing.

Mutual backup over my wired LAN minimizes damage if one unit dies. I also save my older PCs from the dump.

Ed Boesch, via the Internet

ONE THING TO NOTE about your [utility suite] Best Buy, V Communications' SystemSuite 5. I was blown away by its ►

LETTER OF THE MONTH

E-Voting: Not Ready for Prime Time?

REGARDING "E-Ballots: Will Your Vote Count?" [News and Trends, February]: I served as an election judge for the 2000 and the 2002 elections in Prince George's County, Maryland. In the 2000 elections we used cranky old lever machines made way back in 1957.

In the 2002 elections we used the shiny new Diebold touch-screen computers. They were brand new but quite cranky, too. The PCMCIA memory cards had to be reseated in many of our machines or they would not boot up. If these electronic machines were this cranky when new, how about a few years down the line?

During the primary election, one of the

machines locked up. A technician worked on the machine and declared that the last voter's vote had been counted. Yes, but then why were there 30 paper Voter Authorization Cards whereas the machine had recorded 29 votes? Every other unit tallied according to votes cast and VACs collected. The only proper conclusion was that the vote had not been counted. The only way we knew was by the paper VACs. Hard copy makes a good backup.

For a site that discusses problems with computerized voting, your readers can go to www.blackboxvoting.org.

*Paul D. Motzenbecker Jr.
University Park, Maryland*

many features until I found out that it is incompatible with the new SATA drives. Every time I tried to have it scan my hard drives, it would just shut down. On the plus side, V Communications' tech support people were very helpful, and I received my refund quickly.

Mark Mitchell, Austin, Texas

THE HARDEST SEARCH TASK

STEVE BASS's column "Learn (Almost) Anything About Anybody" [*Home Office*, February] did not treat one almost impossible search task. Try finding an old female friend who has married. For years I have been searching various directories for a friend under her maiden name (all I have for her) with no luck.

Joe Zimmerman, via the Internet

NET PHONE CAUTIONS

THANKS FOR THE article on switching from standard landline phones to Internet or VoIP phone services ["Time to

Switch to a Net Phone?" *News and Trends*, February]. This change may be good for some people in some instances, but we need to know the downsides.

For example:

1) For security it is always good to keep at least one wired phone. In case of a power failure, you will still have phone service. While cell phones are less susceptible to such failure (usually some cell towers will remain live), they too could be dead in your area.

2) The land phone line is often used for other, less obvious purposes with which the VoIP system may not be compatible—most important, emergency contact monitoring services (911) and security and alarm systems, but also cable and satellite TV boxes.

Eugene Wright, via the Internet

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 MARCH'S "Flat Panel Face-Off," a percentage number was not fully visible on page 101; the sentence should have read, "In normal lighting, the contrast ratio may drop by about 50 percent, according to Bruce Berkoff, vice president of LCD panel maker L.G. Phillips."

In February's *News and Trends*, the article on Internet phone services should have said Dialpad has a separate prepaid plan that includes international calls at 2.9 cents per minute (and up).

In "The Trouble-Free PC" (February), the chart on page 77 should have said that Symantec's Norton SystemWorks 2004 does have file shredding.

In February's "Web Stars," the site for Microsoft Office updates should have been identified as officeupdate.microsoft.com.

PC World regrets the errors.

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IOGEAR's ultra fast Wireless-G 802.11g USB 2.0 adapter can help you connect to a wireless network with "higher power." It bends and twists to ensure optimal reception so you can work at up to 54Mbps at home or anywhere a hotspot is available.

Installation takes just moments. All IOGEAR Wireless-G products offer the latest security and are backward compatible with 802.11b.

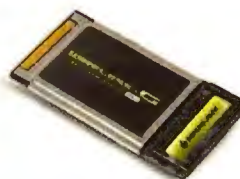
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DIGIC
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Mini DV



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

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



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1 All the Text That's Fit to Search

The Buzz: No longer content with simply cataloging content, Google is now expanding the Web itself, bringing reams of book excerpts, descriptions, and other once-unavailable printed materials online. Publishers submit the text to Google Print, and the results show up in the search rankings. Add in Amazon's program to expose a full-text archive of its gazillion books and Google's mail-order catalog search (catalog.google.com), and the Web is becoming bookworm central.

Bottom Line: A fine start. And if there's truth to the rumor that Google is digitizing Stanford Library's pre-1923 collection, well, say good-bye to overdue-book fines.

2 A Bit Part in the Movies

The Buzz: Hollywood has a new reason to be nervous: It's called BitTorrent, a peer-to-peer technology that uses a bit of technical wizardry to speed up downloads. The app breaks large files (like giant game demos or, say, the latest movie hit) into tiny chunks, which can be stored on users' machines

across a network. When someone requests a file, BitTorrent identifies the constituent parts—on hard drives across the network—and sends them speedily to the downloader's machine.

Bottom Line: Better than the original Napster...unless you're a movie exec.

3 Part PC, Part Console

The Buzz: It's surprising no one has tried this before: Take off-the-shelf PC parts, slap them into a DVD player-type case, and call it a gaming console. The ApeXtreme is built on Via's 1.4-GHz C3 processor and the S3 Graphics Delta-Chrome graphics processor. In addition to playing virtually all PC games, it han-

dles DVDs, MP3s, CDs, and more. ApeXtreme turns on instantly, connects to any monitor or TV screen, and has a network port, modem, wireless keyboard, and drivers that map to game controllers. Slated for a spring release, it should retail for \$299, or \$399 for a souped-up model.

Bottom Line: PC gamers already have faster machines, and console fans like their PlayStation 2s, GameCubes, and Xboxes. Everyone else will love this device.

4 In-Your-Pocket PC

The Buzz: Meet the "ultra-personal computer"—a full-blown PC just barely bigger than a CD case. The wireless OQO—available next fall—comes bearing a 5-inch color screen that slides up, a keyboard, and other goodies, and will cost less than



\$2000. Antelope's Modular Computing Core eval kit (with desktop cradle, network card, and a shell that includes a color screen, keyboard, and mouse) is available now for \$3970. Both run Windows XP Home or Pro on Transmeta's 1-GHz Crusoe chip and pack a 20GB hard drive. The real gimmick: Plug either of these sub-1-pounders into a docking station and, presto, you've got a real PC.

Bottom Line: The market tends to resist new form factors for a generation or two. Remember the Newton, anyone? ■

NAGGING QUESTION

Why Do Windows PCs Crash?

ACCORDING TO professional bug squasher Dirk Smith, president of Alexander LAN (maker of the Alexander System Protection Kit), the main culprit is driver bugs. Buggy third-party drivers can bring on the Blue Screen of Death faster than you can say <Control>-<Alt>-<Delete>. The prime offenders, he says, are drivers



for graphics cards and USB ports, and bugs in antivirus and firewall software. Rounding out the suspect list are bad memory and overheating. And here's an amazing stat: According to a memo from Microsoft's Steve Ballmer, "one percent of bugs cause half of all errors." Now if we could just find that 1 percent, we'd all be much happier.

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.



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ANNE KANDRA

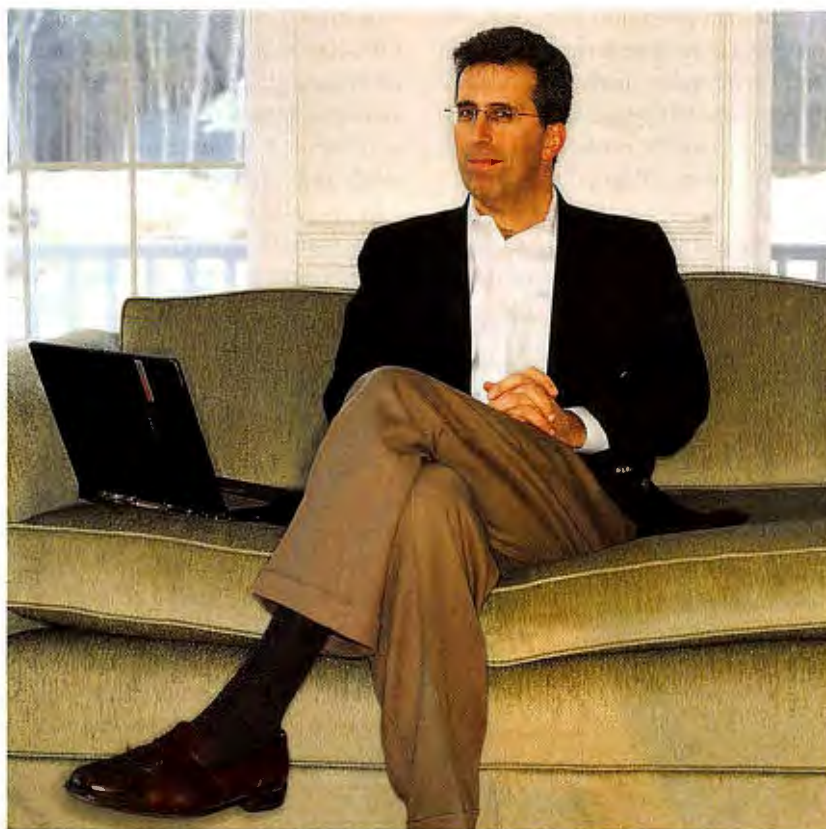
**DEALING WITH OFFSHORE
SUPPORT TECHNICIANS**

**PRIVACY WATCH: CELL
PHONE TRACKING**

**ON YOUR SIDE: FATAL
FIRMWARE UPGRADE**

When Help Is Half a World Away

Some PC users complain about overseas tech support representatives.



WHEN JOE DIAMOND had trouble installing a Zip drive on his Compaq Armada laptop, he called Hewlett-Packard's tech support line. A rep told him that he could avoid the problem by installing a second copy of Windows 2000. When he called HP again for help in getting rid of the second operating system, another rep told him he was on his own—HP doesn't support machines with two OSs.

How could an HP employee have told him to do something that violates HP's own policies? A frustrated Diamond believes it happened because he wasn't talk-

ing to true HP employees at all. Instead, his calls went to a company in Ottawa, Canada, that contracts with HP. That arrangement didn't just stick Diamond with some bad advice. He also had several dead-end conversations in which both sides frequently had to ask the other to repeat what they had just said because their accents made it hard to understand each other. The reps, who told Diamond they were located in Canada, had accents that Diamond says sounded Indian.

Diamond, the executive director of a Boston-based nonprofit, doesn't blame

the support technicians. Rather, he faults HP for shirking its customer service obligations: "Having support functions handled from so far away dilutes customer service and insulates the company from its responsibilities to its customers."

Monica Sarkar, HP's director of international media relations, disagrees. "I don't feel that there's a difference in calling a customer support center in Canada, in the United States, or in India, for that matter," she says. "Even if a call center is operated by a third party, it's common for them to be located at an HP site in order to facilitate a high level of teamwork."

After I called HP, the company offered to reimburse Diamond for the cost (about \$200) he had incurred to remove the second operating system from his notebook.

LONG-DISTANCE SUPPORT

DIAMOND ISN'T THE ONLY customer of a U.S. corporation who has called a tech support line and talked to someone in Canada, India, or elsewhere around the globe. Outsourcing tech support—either to another U.S. company or to representatives abroad ("offshoring")—appeals to many companies trying to trim overhead.

I've heard from a multitude of readers annoyed by language difficulties when their calls go to offshore service reps. They say that offshore techs often seem to be reading from a script instead of listening to details, or that they seem ill-informed about products or company policies. And many complain that calls to far-flung tech support centers often get disconnected.

Certainly not all service snafus can be blamed on offshore tech support. Most of us have encountered American-born ►

support reps who read from a script and have little knowledge of a product.

But once a company removes tech support from its core business, it's legitimate to ask whether the quality of the service will suffer. And of course language difficulties can be a significant barrier; describing over the phone what's happening to your computer and understanding the recommended fixes is tricky even with no accent problems in the way.

Like it or not, outsourcing is clearly here to stay. Forrester Research projects that by 2005, nearly 600,000 U.S. jobs—including many customer service and tech support positions—will move offshore; by 2015, that figure could reach 3.3 million.

Major players such as Microsoft, AOL, and Oracle already depend on offshore companies and workers for customer support. EarthLink recently announced plans to lay off 1300 U.S. employees—

representing 40 percent of its workforce and the majority of its customer support staff—and send some of those jobs to offshore companies. And outsourcing isn't limited to support tasks: IBM reportedly plans to move several thousand software coding, help desk, and back-office administrative jobs overseas in coming months.

CUSTOMER BACKLASH

OCCASIONALLY, COMPANIES decide that the savings aren't worth the potential loss in customer goodwill. Last year, Dell, facing a flood of complaints from corporate customers about poor service from a call center in Bangalore, India, responded by shifting some tech support for those customers to domestic centers. Calls from Dell home users still go to Bangalore.

Some companies are finding that even outsourcing to domestic firms isn't worth the money it saves. After more than seven

years, Visioneer, an imaging equipment maker based in Pleasanton, California, recently replaced the Oregon firm that had been handling its support calls with a combined Web-based help system and in-house telephone support team. By bringing support back in-house, Visioneer can better train its support reps, President and CEO Murray Dennis says. "They are right next to the engineering department, so we can do constant training."

If language problems are torpedoing your next support call, here are some ways to keep communication flowing.

- **Organize** your thoughts before you call. Jot down such details as error messages and other symptoms, and keep your descriptions and explanations simple. Speak slowly and clearly, and avoid using slang.
- **Ask to speak** to a supervisor if the language barrier between you and a particular rep seems insurmountable. Or hang

PRIVACY WATCH

Soon, Your Cell Phone May Be Tracking You

IT'S BEEN TEN YEARS SINCE ENGINEERS, innovating by the seat of their pants, triangulated the signal of O. J. Simpson's cell phone to his Bronco, rolling down a Los Angeles freeway. But now, tracking a cell phone is becoming as easy as point and click.

Services just beginning to appear will allow people to keep track of the location, within a few dozen feet, of a mobile phone handset. For now, the technology works on only a few models of cell phones, including several units sold by Sprint, Verizon, and Nextel, that have built-in Global Positioning System capability. (Handset makers are starting to include GPS chips to help emergency workers find people who dial 911 on their cell phones.) But more and more new phones will include this tracking technology.

ULocate (www.ulocate.com) is among the first of the new cell phone tracking services. Once you sign up (ULocate works only with a few Motorola phones that use Nextel's service), you can find a phone's last known location, see the path it has traveled, and get the average speed at which it moved from one place to another. As long as the phone has a view of the sky—so it can communicate with GPS satellites—it will send ULocate a location update every 2 minutes.

ULocate's policy states that you can use the service only on your own phone or on phones used by your family members or by employees of your company. Software must be loaded onto the phone

itself before the company can start following the handset. The phone displays an icon on its screen when tracking is working.

I can certainly see the benefits of the technology. Nervous parents could gain some peace of mind by being able to see where their cell phone-equipped teenager is. And businesses that dispatched workers off-site to a job could see their locations at a glance.

But even with all the safeguards ULocate has put in place, it's not hard to imagine ways in which cell phone tracking could invade your privacy. A jealous husband could give his wife a cell phone with tracking already enabled. Police might try to obtain tracking data for an investigation, or just to issue speeding tickets after the fact. As with a lot of new technology, the law has few rules to govern who can legally obtain cell phone tracking data. And we

haven't even begun to explore the possibilities of malicious hackers turning their attention to this latest generation of phones.

Phone service providers, sensitive to these privacy issues, all reassured me that any phone with a GPS chip in it lets you disable the tracking features (though the option is usually buried in the phone's settings menu). That's great if you spend much time probing your phone's menu system. But if you don't, your phone may reveal much more about you than your taste in ring tones.

—Andrew Brandt



up and try your luck with a different rep. Or try solving your problem via an e-mail conversation or an online text chat with the company's support department.

• **Tell the company** how you feel if you have a disastrous support experience.

Companies have a responsibility to provide high-quality service and support for their customers, period. If they choose to hire an outside company to handle that job, it's up to them to ensure that their customers are satisfied. Because no matter how much money it saves, poor customer service is bad business. ■

Anne Kandra is a contributing editor and Grace Aquino and Andrew Brandt are senior associate editors for PC World. You can e-mail them at consumerwatch@pcworld.com. If you'd like to read previously published Consumer Watch, Privacy Watch, or On Your Side columns, visit find.pcworld.com/31703, find.pcworld.com/31706, or find.pcworld.com/31709, respectively.

ON YOUR SIDE

Router Dies After Firmware Upgrade

I DOWNLOADED a firmware upgrade for my two-year-old wireless router (model BEFW11S4) from the Linksys Web site. After I installed it, my router's wireless capability stopped working. So I called Linksys tech support, and after a few hours of troubleshooting, the technician determined that the upgrade had damaged my equipment and the router could not be repaired. He said the new firmware was not compatible with my old device. (The site didn't warn users that the new firmware might damage older equipment.) His solution: Buy a new router! I asked him what Linksys could do for me, since its own upgrade caused the problem. His reply: Nothing. Linksys has not responded to my e-mail follow-ups.

James Coleman, San Antonio

On Your Side responds: After I called Linksys about Coleman's situation, a technician followed up with him. After a few tests, the tech concluded that the transmitter on the router was broken, so Linksys sent him a replacement router. Coleman's equipment was no longer covered by Linksys' warranty, but the company says that it makes exceptions in some cases.

Linksys technicians believe that Coleman's router was already damaged, possibly as a result of an earlier power surge, when he downloaded the firmware update. Installing the new code caused the already damaged equipment to malfunction, according to a spokesperson. The company says that it has no plans to post a warning with its firmware upgrades.

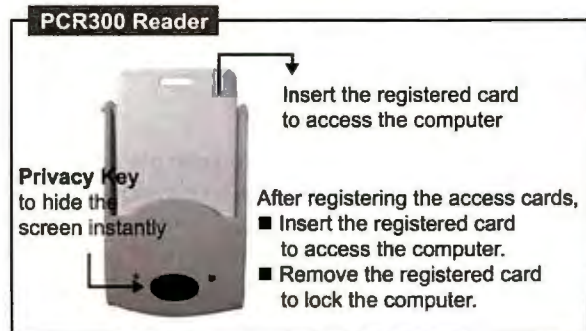
—Grace Aquino

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PUT YOUR WORLD
ON VERBATIM



Work Smart From the Start in Windows

Get faster access to your favorite shortcuts, and give the rest the boot.



"STAND ASIDE," I shouted as I dashed into the room, armed with my icon wrench and shortcut remover. I was on a mission of mercy: My neighbor Al's PC—barely six months old—had a zillion icons and shortcuts littering its Start menu, desktop, and Quick Launch toolbar. After I made a few simple fixes, the bloat was gone. If your PC is as messy as Al's was, you need my handy-dandy, quick course to a superorganized shortcut system.

Rest assured, no actual applications are harmed in the deletion, addition, or reorganization of your shortcuts. If you don't like a change, you can undo it by pressing **<Ctrl>+Z**. Although these tips work in XP, they're hit-or-miss in other Windows versions; your mileage may vary.

START AT THE START

STRAIGHTEN UP YOUR Start menu first. I transformed the Programs/All Programs area of my menu by separating it into folders for various categories: Work Apps (programs I use frequently), Admin (Windows system tools), Utilities (tools I need occasionally), Internet, Video & CD, Music, Photos, and a few others, includ-

ing Experiment, where I put everything I'm not sure I'll keep. I make my XP folders easier to identify by changing their icons: Right-click the folder, choose *Properties*•*Customize*•*Change Icon*, and select a substitute image that has a little color.

Customize your Start menu by dragging, dropping, renaming, and deleting items, or try this power user's secret: Right-click the Start button and choose *Open*. Windows Explorer appears, and voilà! You have a much easier way to change your Start menu. (To make the same changes for all users on the PC, choose *Open All Users*.) When you uninstall a program, its folder and icon shortcuts may not be removed automatically, but that's no biggie—just manually delete them.

Now get rid of all the junk from the Start menu's program folders, such as icons for help files, readme.txt files, and links to Web sites. Take another minute to zap the ubiquitous AOL, RealOne, and other useless advertising icons. In XP, drag and drop often-used applications to the list of "pinned" items in the top left of the Start menu. (They're "pinned" because the items in the list don't change the way shortcuts on the bottom left of the menu do as you use various programs.)

The next step is the Quick Launch toolbar, the area directly to the right of the Start menu. (If yours isn't showing, right-click the taskbar and select *Toolbars*•*Quick Launch*.) Mine's tight: It has just the shortcuts I use every day—Word, Eudora, Explorer Plus, Outlook, IE, the music player Tray Play, and the desktop icon. I also moved the icon for Word's handy Open Office Doc from the Start menu to my Quick Launch toolbar. Drag seldom-

used Quick Launch icons to your desktop, and decide later whether to move them to the Start menu or, if they're duplicated elsewhere, to delete them. Once you have just the Quick Launch shortcuts you need, right-click an empty spot on the taskbar, and if necessary uncheck *Lock the Taskbar*. Grab the vertical divider and slide it to the left to regain taskbar space. In XP, you can also right-click each icon, select *Properties*, and delete the useless, toolbar-obliterating junk in Comments.

A TRÈS COOL SYSTEM TRAY

NOW TO REFURBISH the system tray, which is alongside the clock. Many of the icons here—such as those for AOL and RealOne—are on the Start menu and the Quick Launch toolbar, too. To remove one from the system tray, right-click the icon and look in its preferences or settings for something like "don't load on start-up." Or clean the corner the easy way with WinPatrol, a free utility that lets you safely disable or remove these icons (ironically, the program resides in the system tray). And a note to all you people using Windows 98: You don't have XP's 'Hide When Inactive' system tray feature, so try out Tray Pilot, a freebie that hides the tray to give your taskbar more room for your open-app links. Visit find.pcworld.com/40316 to download both. For more on scrubbing the area, go to find.pcworld.com/40319 to read my in-depth tips for removing icons from your system tray.

Excuse me, I've got to pack up my tools and go. The mail carrier just asked me to work on his PC's desktop. ■

Contributing Editor Steve Bass is the author of PC Annoyances, published by O'Reilly. Contact him at homeoffice@pcworld.com.

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BUGS & FIXES

STUART J. JOHNSTON

Get the Microsoft Help You Deserve

Here's how to find support for your Microsoft products—when you need it.

GETTING HELP from Microsoft—either for free or for a fee—involves negotiating a virtual rat's nest of ifs, ands, and buts. Several readers have asked about Microsoft's policies recently, so this month I'll try to clarify how the company's support options work.

Ironically, if you're having trouble with its software, Microsoft may not always be the company to call. If your version of Windows and Office, say, came preinstalled on your PC—and you're still covered by your vendor's software warranty—the company you should contact is your PC maker.

However, if you purchased your Microsoft product separately, you need to contact Microsoft. And the support you're entitled to will vary. Consumers and small businesses using Windows XP,



and Microsoft Office XP, for example, are entitled to limited free support (via either e-mail or phone): You're covered for free if you have problems with installation, and you get free support for two "incidents" on top of that.

If you want telephone support, start with the Web page at find.pcworld.com/40814 and click through to locate the

right phone number (often a toll number). For online assistance, you must navigate a different series of steps at Microsoft's site (go to find.pcworld.com/40847); you also have to be registered with Microsoft Passport (head to find.pcworld.com/40850 to sign up). Microsoft advises you either to go online or to call the appropriate phone number—but not both (you might give up your two chances at free support that way).

Once you've used up your two free incidents, support will typically cost you \$35 per incident. (Note: Other software, such as Encarta, comes with unlimited support. Also, Microsoft provides free support for downloading or installing security patches; call 866/727-2338.)

One good thing is that as long as the product is still under mainstream support—usually five years from the product's release date—your unused free support does not expire in most cases. After five years or so, older software enters the extended support phase, where you always pay. See find.pcworld.com/40811 for details on the life cycles of all Microsoft products.

And one minor blessing: The paid support lines are toll-free. A good place to start for

most Microsoft products is 800/936-5700 (otherwise, visit find.pcworld.com/40814). ■

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

IN BRIEF

Word Crash

MICROSOFT recently fixed a problem in Word 2003 that can cause the program to crash. Visit find.pcworld.com/40832 for a link to the patch (numbered 830000).

Big Windows Fix

WINDOWS XP, 2000, and NT users need to patch their PCs because of a new threat. To prevent an attacker from taking charge of your PC, go to find.pcworld.com/41003 to grab Microsoft's "critical" update (numbered 828028).

AntiVirus Flaw

SYMANTEC plugged a security hole in Norton AntiVirus's LiveUpdate feature (for retail products). Head to find.pcworld.com/40838 for a link to LiveUpdate 2.0.

BUGGED?

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

TAX TIME: FIX QUICKEN AND TAXCUT SNAGS

Quicken 2004 Release 5 Update (available at find.pcworld.com/40817) fixes several problems, including one where banking transactions would not be counted in the Average Annual Return calculation in the program's Investment Performance Report. Visit find.pcworld.com/40820 for details about Quicken's One Step Update.

Block Financial released an update for the federal version of **TaxCut** for the 2003 tax year to fix a few sticky problems. Among them are two situations where TaxCut may shut down unexpectedly. Go to find.pcworld.com/40823 and find.pcworld.com/40826 for the lowdown on both scenarios. All members of the TaxCut family—the Standard, Deluxe, and Premium editions—are affected. See find.pcworld.com/40829 for TaxCut's update instructions.

NEW PRODUCTS

EDITED BY TOM MAINELLI

New Supersize LCDs

The age of affordable 20-inch LCDs has arrived; we look at the two latest, including a sub-\$1000 model.



BIG, BRIGHT LCDs: NEC's MultiSync LCD2080UX+ (left) and Hewlett-Packard's L2035.

DISPLAYS

I CAN REMEMBER spending in excess of \$1600 to purchase a 20-inch CRT around the time that Windows 95 came out. Today such monitors sell for less than \$300. So even though I'm used to falling display prices, it still amazes me that I can now buy a quality 20-inch LCD monitor for under \$1000—as is the case with Hewlett-Packard's new **L2035**.

I checked out shipping models of a pair of 20-inchers: the \$949 L2035 and the \$1499 **NEC MultiSync LCD2080UX+**, a unit with higher-end features designed for specialized uses.

The displays are similar in many respects. Both provide 1600-by-1200-pixel resolution, bright screens (250 nits), high contrast ratios (400:1), and impressive (16-millisecond) response times for good video

performance. Both units have height-adjustable bases, plus slim bezels that you can easily pivot from landscape to portrait orientation by simply

grabbing an edge and rotating. Our test suite of images looked great on both displays, as each offered razor-sharp text and graphics with vivid, accurate colors. At factory-default settings, the only noticeable difference was that the HP's white screen looked marginally grayer overall than the NEC MultiSync's.

So what justifies the NEC MultiSync's \$550 price premium over the HP?

One of the chief differences: NEC-Mitsubishi software supports unusually long cables. The company says the display can reside up to 326 feet away from the PC that controls it—a useful feature for financial trading floors, retail displays, or other situations where you'd like to save space or locate the PC in a controlled area. In contrast, like most LCDs the HP supports a standard 6-foot monitor cable.

The MultiSync also includes NEC-Mitsubishi's NaviSet software, which enables you to adjust the display settings via mouse and keyboard if you'd prefer not to fiddle with the sometimes confusing buttons

L2035

Hewlett-Packard

★★★★☆

Handsome, general-purpose 20-inch LCD at a competitive price.

Street: \$949

find.pcworld.com/40925

NEC MultiSync LCD2080UX+

NEC-Mitsubishi

★★★★☆

Pricy LCD for specialized uses.

Street: \$1499

find.pcworld.com/40928

60 LARGE LCDs

HP L2035 and NEC-Mitsubishi MultiSync LCD2080UX+

61 FAST-RESPONSE LCD

Samsung SyncMaster 172X

62 FINANCIAL SOFTWARE

Intuit QuickBooks 2004 and ACCPAC International Simply Accounting 2004

INPUT DEVICE

Logitech DiNovo Media Desktop

63 PROJECTOR

NEC LT10

SMART WATCHES

Fossil Wrist Net and Suunto N3

64 SCANNER

Xerox DocuMate 510

DIGITAL CAMERA

Minox DD1

PRESENTATION SOFTWARE

Infommersion Xcelsius

70 DIGITAL CAMERA

Sony Cyber-shot DSC-F828

70 WEB DESIGN SOFTWARE

Adobe Atmosphere

72 MULTIFUNCTION

Canon MultiPass MP390

73 AUDIO

Aiwa UZ-US201

USB One-Point Stereo Speaker System


70
FEATURES COMPARISON

20-INCH LCDs: VITAL STATISTICS

HEWLETT-PACKARD'S AFFORDABLE L2035 offers a wide variety of connectors, while the pricier NEC MultiSync LCD2080UX+ serves up more administrative features and a wider viewing angle.

MONITOR	Resolution (in pixels)	Viewing angle (horizontal and vertical)	Contrast ratio	Connectors
HP L2035	1600 by 1200	170 degrees	400:1	DVI-I, VGA, composite, S-Video
NEC MultiSync LCD2080UX+	1600 by 1200	176 degrees	400:1	DVI-I, DVI-D, VGA

All specifications based on vendor documentation.

on the bezel. An administrator version of the software, available for free on request, allows enterprise IT managers to use these software controls over a local area network; it also offers additional features, including the ability to obtain information such as a unit's serial number and the length of time it's been turned on.

The NEC MultiSync also has an unusually wide viewing angle—176 degrees in any direction—so you can see the image from almost directly above, below, or to either side of the display. HP's monitor has a slightly narrower 170-degree viewing angle. NEC-Mitsubishi also says that the MultiSync's black-level adjustment allows for a degree of image fine-tuning that makes the unit more suitable for the exacting requirements of certain medical uses.

Most general users, however, won't need the specialized features bundled with NEC-

Mitsubishi's high-end LCD. And the HP does have some extra features of its own: In addition to DVI-I and VGA support, it has connectors for composite and S-Video (the MultiSync has DVI-I, DVI-D, and VGA connectors). The

HP also has a nifty picture-in-picture feature that allows you to preview and toggle between images from two different video sources, such as a PC and a DVD player. Both LCDs have three-year limited warranties on parts and labor, and

both offer toll-free, 24-hour, daily phone support for the duration of the warranty.

If you don't really need to view a wider range of spreadsheet cells or multiple open windows simultaneously, you can find any number of quality 17-inch LCDs for under \$500 these days. But if you are willing to shell out for the extra screen real estate, HP's L2035 delivers a high-quality image and a solid set of features at a fair price. The NEC MultiSync LCD2080UX+'s hefty price tag makes that monitor worthwhile only for those buyers who need its highly specialized extras.

—Yardena Arar

A High-Speed LCD for DVD

MONITOR

IF YOU'VE accustomed your eyes to frenetic gaming or to watching DVD movies on your PC's CRT monitor, but you're ready to move to an LCD, direct your gaze at Samsung's 17-inch, performance-oriented **SyncMaster 172X**.

With a fast, 12-millisecond

SyncMaster 172X

Samsung

★★★★☆

A speedy LCD for picky players.

Street: \$649

find.pcworld.com/40877

response time—more than twice the reported speed of most 17-inch LCDs on a recent chart (visit find.pcworld.com/40874)—our shipping display produced cleaner outlines and smoother movements in DVD video tests than our 25ms-rated reference LCD did. Some testers also noticed subtle improvements in gaming graphics. With a price of \$649 (street), the 172X is more expensive than most standard 17-inch LCDs, but if



SAMSUNG
SyncMaster 172X.

movies and fast-paced games are your passion, you could end up all the richer.

—Laura Blackwell ■

New QuickBooks, Simply Accounting Ship

FINANCIAL SOFTWARE

ONE SIZE DOESN'T always fit all—and software developers have finally figured out that a generic accounting program

of new industry-specific versions as well as the generic accounting package. These special mixes of QuickBooks add several useful custom

customers, with up to 100 price levels; Simply Accounting's Pro edition goes even further, offering an unlimited number of price lists. The two programs also make it easier to exchange information with Microsoft Excel spreadsheets for additional analysis.

In both Simply Accounting editions, the payroll function now includes an interface to a direct deposit payroll service. You can sign up for this optional, extra-cost service (\$79 setup, plus \$1.50 per transaction) if you prefer not to print paychecks. The program is also bilingual (Spanish and English) and lets you move between languages.

QuickBooks 2004 excels in financial planning tools and delivers a new and useful Cash Flow Projector that lets you see the money your business will soon have available. QuickBooks 2004 Premier edition also adds new capabilities for managing loans, fixed assets, and vehicle mileage.

Intuit offers its Basic version for \$200, the Pro version for \$300, and the Premier version for \$500. Even though ACCPAC International tacked on \$9 this year to the 2004 version of Simply Accounting (\$49 for the Basic version, \$99 for the Pro version), the small-business program still delivers the greater value.

QuickBooks 2004

Intuit

★★★★☆

Pricy, but latest upgrade delivers good business-planning tools.

List: Basic \$200, Pro \$300,

Premier \$500

find.pcworld.com/40859

QUICK TAKES

Wireless Keyboard Suite With Bite

LOGITECH'S expensive new **Dinovo Media Desktop** screams high tech. The sleek Bluetooth-based \$249 package includes a top-notch keyboard; a highly responsive, rechargeable optical mouse; and a detached keypad called the MediaPad. The bundled Bluetooth hub pro-



vides a wireless bridge for up to six other devices such as mobile phones, PDAs, and printers. The slick MediaPad offers dedicated buttons to control music, video, and photo playback (plus an LCD to show what's playing) and also doubles as a clock and calculator. Finally, here's a high-end product that puts some teeth into Bluetooth. find.pcworld.com/40856

—Michael S. Lasky

Both QuickBooks and Simply Accounting offer enough worthwhile new features to justify upgrading to the 2004 versions. If you're a QuickBooks user but you want to switch to a more economical product, Simply Accounting also includes a tool to import QuickBooks accounting data.

—Richard Morochove ■

Simply Accounting 2004

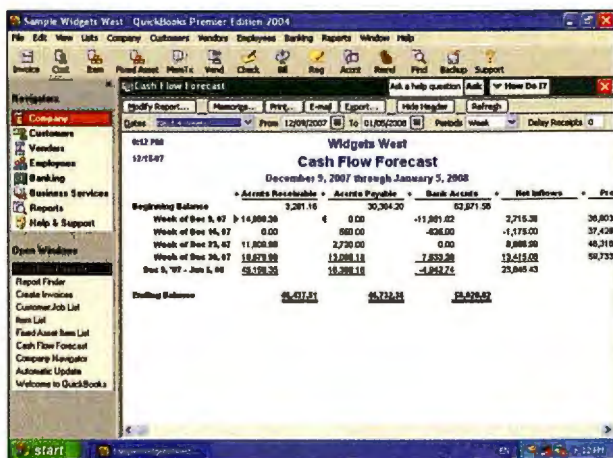
ACCPAC International

★★★★☆

Strong small-business capabilities at a reasonable price, but industry customizations are limited.

List: Basic \$49, Pro \$99

find.pcworld.com/40862



QUICKBOOKS' NEW features include cash flow forecasting.



SIMPLY ACCOUNTING offers an unlimited number of price levels.

doesn't suit all small businesses. Intuit and ACCPAC International have released 2004 versions of their **QuickBooks** and **Simply Accounting** packages that incorporate industry-specific features for businesses such as retailers and manufacturers. I looked at shipping copies and found reasons to recommend both.

Intuit's QuickBooks Premier 2004 comes in a handful

reports, though they are no substitute for pricier vertical applications designed solely for one industry. Nevertheless, Intuit's new take on customization goes beyond the industry-related expert tips and advice ACCPAC includes in the Basic and Pro editions of Simply Accounting 2004.

In addition, the QuickBooks Pro and Premier editions let you fine-tune selling prices to

Tiny Projector Packs Punch

DISPLAY

AT JUST OVER 2 pounds, the NEC LT10 is among the smallest and most compact XGA projectors available for on-the-fly presentations. Despite its diminutive size, however, it offers clear, colorful images—at a price competitive with other travel-size projectors.

The shipping version of the \$2195 LT10 I tested did well at projecting PowerPoint pre-

sentations, digital photos, and geometric patterns from a laptop PC as well as from other video sources (a DVD player, a cable TV, and a video camera).

The unit's rated brightness level of 1100 ANSI lumens made text-filled screens appear crisp and legible; and graphics images displayed strong contrast, with fine details in light and shadowed areas. The LT10's picture-in-picture function allowed me to display video in a small window while delivering a presentation—a great way to add live action, such as a product demonstration, to a slide show. Another plus: The projector runs quietly, with its fan noise rated at just 34 dB.

LT10

NEC

★★★★☆

Easy-to-manage portable projector delivers bright, crisp images at a competitive price.

List: \$2195

find.pcworld.com/40865

Transporting the LT10 is easy (total travel weight with soft case, remote, and cables is 3.5 pounds), and setting it up is simple, thanks largely to its manual zoom lens, which gives you more leeway in positioning the projector in a given space. At a distance of about 10 feet from the screen, the LT10's 7-foot-diagonal image looked impressive in a room with low ambient lighting. The handy remote includes easy-to-use controls for

keystone (geometric distortion) adjustment and other functions, but it lacks a mouse control and a laser pointer. The LT10 also comes without speakers, so you'll need to use a separate sound system for a movie or multimedia show.

Still, for most on-the-road presenters who need a projector, the LT10's excellent combination of portability, power, and price makes it a great traveling companion.

—Richard Jantz



THE NEC
LT10 travel projector.

Microsoft-Based Timepieces: Watch Out!

MOBILE COMPUTING

THE WRISTWATCH I usually wear has been telling time—accurately and attractively—since 1939. What it doesn't do is deliver data wirelessly to my wrist. That is the promise of two new "smart watches" featuring Microsoft's MSN Direct service. Yet the preproduction Fossil Wrist Net and the shipping Suunto N3 I tried proved so impractical that I quickly strapped my trusty Hamilton back on.

MSN Direct service, which costs \$59 per year, piggybacks

on FM radio signals in 100 U.S. and Canadian markets to broadcast bite-size chunks of news, weather, and other timely information. You can also view your desktop Outlook calendar and receive messages sent from the Microsoft MSN Messenger client.

However, gleaning that data takes more than a glance,

as both watches have murky monochrome screens and unwieldy interfaces driven by five unmarked buttons.

Charge times aren't great: The Fossil's batteries are rated to last two to four days; the Suunto's, from six to eight. And if you leave your home city, you need to reconfigure your watch on the Web to continue to receive your personalized data. Also, MSN Messenger messages are one-way, meaning you can't reply.

Still intrigued? The water-resistant Suunto's strong suit is its compact charger, which draws juice from an AC outlet or a PC's USB port. But this hefty watch comes with an equally hefty price tag of \$299.

Fossil's \$179 Wrist Net—also marketed in computer

stores as the Abacus Wrist Net for just \$129—recharges on a bulky docking station that's a pain to travel with. Still, I found it more tolerable than the Suunto, owing to its more-legible screen. Until smart watches get a lot smarter, though, my wrist will remain a Microsoft-free zone.

—Harry McCracken ■



FOSSIL WRIST Net (left) and Suunto N3.

Wrist Net

Fossil

Preproduction model, not rated
Decent screen, but oversize
charger makes travel a chore.

List: \$179

find.pcworld.com/40868

N3

Suunto

★★★★☆

Expensive, water-resistant model
with a slick two-way charger.

Street: \$299

find.pcworld.com/40871

New DocuMate a Fast Read

SCANNER

IF YOU NEED to turn a stack of paper documents into editable electronic text, using a scanner with optical character recognition software and an automatic document feeder attachment—like Xerox's new \$350 **DocuMate 510**—is a speedy alternative to typing.

In testing a shipping version of the DocuMate 510, I was impressed by both its speed (via its USB 2.0 connec-

tion) and its accuracy in converting a variety of sample documents ranging from simple legal contracts and multi-page manuscripts to complex magazine pages with text and graphics. Using its proficient document-management software (ScanSoft PaperPort Deluxe 9), the scanner took a mere 2.5 minutes to scan and convert 20 pages into a nearly flawless Word document file.

Xerox also includes both ScanSoft TextBridge Pro 9, an outstanding dedicated OCR

application that provides more features than PaperPort Deluxe 9, and ArcSoft PhotoImpression 4, an image editor that offers easy photo retouching and enhancement tools.

While the DocuMate 510 is a flatbed model—and therefore takes up more desk space than a slimmer sheet-fed scanner (such as the pricier \$495 Fujitsu ScanSnap)—its removable lid allows you to scan pages from books or other bound volumes, including oversize originals. For any business or workgroup that needs an affordable document scanner, the DocuMate 510 is a solid choice.

—Richard Jantz

DocuMate 510

Xerox

★★★★☆

Speedy, affordable document scanner ideal for small business.

List: \$350

find.pcworld.com/40799



THE NEW Xerox DocuMate 510 scanner.

Xcelsius Adds Life to Excel

BUSINESS SOFTWARE

CAN ANY HOUR be longer than the one spent watching your company's chief financial officer point at a spreadsheet full of gray, unreadable numbers? Infommersion's program **Xcelsius** can't give your CFO charisma, but it can enliven the presentation.

Xcelsius (\$195 for the Stan-

dard edition, \$495 for the Professional) enables you to transform the contents of an Excel spreadsheet into an interactive Macromedia Flash file. Not only does the program translate dry numbers into attractive charts, tables, and maps, but it also lets you use sliders and gauges to alter figures and see immediately how those changes affect your original Excel calculations.

You can also export Xcelsius creations into an HTML file, a PowerPoint presentation, or an Outlook e-mail message so that anyone can view them;

the resulting files operate just as the Xcelsius files do.

Using a shipping version of Xcelsius Professional proved fairly straightforward. First you import an Excel spreadsheet, and then you drag and

drop any of 36 graphic elements onto the canvas. You can associate each element with a cell or series of cells.

However, some of the terminology involved is cryptic: When faced with the question of whether a gauge's 'Initial Limits Calculation' should be 'valueBased', 'zeroBased' or 'zeroCentered', my first reaction was, "Pat, can I buy a vowel?" Fortunately, the program's help file is solid and well organized.

Dedicated bean counters who use Xcelsius will find this bottom line: An investment of some study will yield a healthy return in viewers' interest.

—Edward N. Albro ■

Xcelsius

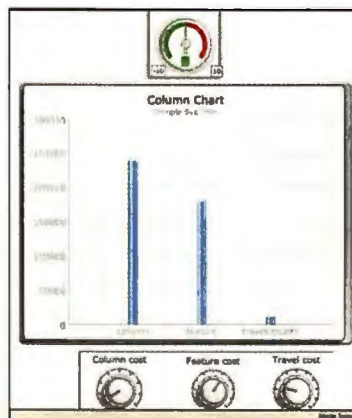
Infommersion

★★★★☆

Clever app makes Excel spreadsheets data more interesting, but is tricky to use at first.

List: Standard \$195, Pro \$495

find.pcworld.com/40757



XCELSIUS LETS you transform Excel documents into interactive Flash files.

QUICK TAKES

Minox Goes Round



THE 2.1-MEGAPIXEL Minox DD1 is one unique-looking camera. About the size of a hockey puck, it sports a rubberized edge and metal trim, and weighs in at about 4.3 ounces. The outdoor shots I took looked fine for casual photography, but my indoor shots were a little blurry, and I missed having a flash, a memory card slot, and an LCD for viewing photos. Still, what the \$285 DD1 lacks in features, it makes up for in quirky, innovative design.

find.pcworld.com/40151

—Grace Aquino



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trailblazer

scout



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IBM recommends Microsoft®
Windows® XP Professional
for Business.

IBM ThinkPad R40

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity
- IBM Embedded Security Subsystem 2.0™ – Strongest security as a standard feature

System Features:

- Intel® Centrino™ mobile technology
 - Intel Pentium® M processor 1.40GHz¹
 - Intel PRO/Wireless Network Connection 802.11b²
- Microsoft Windows XP Home Edition³
- 15" XGA TFT display (1024x768)
- 128MB DDR SDRAM⁴
- 20GB⁵ hard drive
- Ultrabay™ Plus CD-ROM
- IBM UltraNav™ – TrackPoint™ and touch pad
- 1-yr system/battery limited warranty⁶

\$1,199* ■ NavCode 27228FU-M112

ServicePac® Service Upgrade:⁷
3-yr Depot Repair #30L9192 *132

IBM ThinkPad T41

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity
- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor 1.40GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁴
- 40GB hard drive with NEW!
IBM Active Protection System
- Ultrabay Slim CD-RW/DVD-ROM combo
- Only 1" thin⁸ • 4.5-lb travel weight⁹
- 1-yr system/battery limited warranty⁶

\$1,699* ■ NavCode 2378DHU-M112

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3-yr Onsite Repair/9x5/Next Business
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With the easiest way to go from wired to wireless networks,
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Wherever you want to work, the sky is the limit when you have IBM ThinkPad® notebooks with Access Connections software and wireless Intel® Centrino™ mobile technology (on select models). Now it's easier than ever to switch between wired and wireless networks — whether you're at an airport, the office, an Internet café, even your kitchen.¹⁰ So consider the IBM ThinkPad wireless notebook, and experience a whole new level of wireless possibilities. **think freedom**

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Save on shipping. Order online.⁹

warranty issue may be subject to additional charges. ⁷These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. 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. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. ⁸For PCs without a separate video card, memory supports both system and video. Accessible system memory is up to 64MB less than the amount stated, depending on video mode. ⁹Standard shipping included when you order online. U.S. only. ¹⁰Public wireless access limited. Subscription may be required and fees may apply. ¹¹Requires download of client software. IBM, ThinkPad and ThinkCentre are trademarks or registered trademarks of IBM Corporation in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Intel, Intel Inside, the Intel Inside logo, Intel Centrino, the Intel Centrino logo, Intel Pentium, Intel Celeron and Intel SpeedStep are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of others. © 2004 IBM Corp. All rights reserved.

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IBM ThinkPad® R40

Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0¹ – Strongest security as a standard feature

System Features:

- Intel® Centrino™ mobile technology
 - Intel Pentium® M processor 1.40GHz
 - Intel PRO/Wireless Network Connection 802.11b²
- Microsoft Windows XP Professional³
- 15" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁴ • 20GB⁵ hard drive
- Integrated Ethernet and modem
- Ultrabay™ Plus CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength¹²
- 1-yr system/battery limited warranty¹⁴

\$1,299*

NavCode 289783U-M112

ServicePac® Service Upgrade:¹³
3-yr Depot Repair
#30L9192 *132

IBM ThinkPad R40

Distinctive IBM Innovations:

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

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor 1.50GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 15" SXGA+ TFT Display (1400x1050)
- 256MB DDR SDRAM⁴ • 60GB hard drive
- Integrated Ethernet and modem
- Ultrabay Plus CD-RW/DVD-ROM combo
- IBM UltraNav™ TrackPoint® and touch pad
- 1-yr system/battery limited warranty¹⁴

\$1,679

NavCode 28976AU-M112



**MOBILE
TECHNOLOGY**

IBM ThinkPad T41

Distinctive IBM Innovations:

- Access IBM – IBM help at your fingertips
- IBM Active Protection System – Airbag-like technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor 1.40GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" XGA TFT Display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM⁴ • 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin⁸ • 4.5-lb travel weight⁹
- 1-yr system/battery limited warranty¹⁴

\$1,699

NavCode 2378DHU-M112

ServicePac® Service Upgrade:
2-yr Onsite Repair/9x5/Next Business
Day Response
#30L9189 *197

IBM ThinkPad T41

Distinctive IBM Innovations:

- IBM Active Protection System – Airbag-like technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor 1.60GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 14.1" SXGA+ TFT Display (1400x1050)
- 32MB ATI Mobility RADEON 9000 graphics
- 256MB DDR SDRAM⁴ • 40GB hard drive
- Ultrabay Slim CD-RW/DVD-ROM combo
- Integrated Gigabit Ethernet and modem
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin • 4.5-lb travel weight
- 3-yr system/1-yr battery limited warranty¹⁴

\$1,939

NavCode 2379DJU-M112

ServicePac® Service Upgrade:
5-yr Onsite Repair/9x5/Next Business
Day Response
#69P9200 *449

IBM ThinkPad X40

Distinctive IBM Innovations:

- Rapid Restore – Push-of-a-button data backup and recovery
- IBM Active Protection System – Airbag-like technology to help protect your ThinkPad

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor ULV 1GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁴
- 20GB hard drive with IBM Active Protection System
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard
- Only .81" thin
- 2.7-lb travel weight
- 1-yr system/battery limited warranty¹⁴

\$1,499

NavCode 23861CU-M112

ServicePac® Service Upgrade:
3-yr Depot Repair
#30L9192 *132

IBM ThinkPad X40

Distinctive IBM Innovations:

- Epic battery life

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor LV 1.20GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- Intel Extreme graphics
- 256MB DDR SDRAM⁴
- 40GB hard drive with IBM Active Protection System
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard
- 7.5-hr Li-Ion battery
- 3.2-lb travel weight
- 1-yr system/battery limited warranty¹⁴

\$1,749

NavCode 23816GU-M112

ServicePac® Service Upgrade:
4-yr Depot Repair
#69P9195 *249

IBM ThinkPad X40 Solution Pack

Distinctive IBM Innovations:

- Access Connections – Easiest wired and wireless connectivity

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor ULV 1GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁴
- 20GB hard drive with IBM Active Protection System
- 2.7-lb travel weight
- 1-yr system/battery limited warranty¹⁴

Accessories Included:

- UltraBase™ X4 media slice
- Ultrabay Slim CD-RW/DVD-ROM combo

\$1,849

NavCode 23861ZU-M112

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/Next Business
Day Response
#30L9195 *243

IBM ThinkPad X40 Solution Pack

Distinctive IBM Innovations:

- Epic battery life

System Features:

- Intel Centrino mobile technology
 - Intel Pentium M processor LV 1.20GHz
 - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT Display (1024x768)
- 256MB DDR SDRAM⁴
- 40GB hard drive with IBM Active Protection System
- Integrated Gigabit Ethernet and modem
- 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty¹⁴

Accessories Included:

- UltraBase X4 media slice
- Ultrabay Slim CD-RW/DVD-ROM combo

\$2,449

NavCode 23826UU-M112

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/Next Business
Day Response
#69P9198 *299

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(Monitor not included)



(Monitor not included)



(Monitor not included)

IBM ThinkCentre™ A50p

Distinctive IBM Innovations:

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

System Features:

- Intel® Pentium® 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM*
- 40GB hard drive • CD-RW
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- Norton AntiVirus™ 2003 OEM Edition
- Lotus® SmartSuite® Millennium license
- 1-yr limited warranty with limited onsite service**

\$819 NavCode 843398U-M112

ServicePac® Service Upgrade:
2-yr Onsite Repair/9x5/Next Business
Day Response
#54P1859 *75

IBM ThinkCentre A50p

Distinctive IBM Innovations:

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

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 256MB DDR SDRAM*
- 40GB hard drive • CD-RW
- Intel Extreme Graphics 2
- Integrated 10/100 Ethernet
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr parts/1-yr limited onsite service limited warranty**

\$889 NavCode 843298U-M112

ServicePac® Service Upgrade:
3-yr Onsite Repair/9x5/4-hr Response
#41L2732 *229

IBM ThinkCentre M50

Distinctive IBM Innovations:

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

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,149 NavCode 8187EJU-M112

ServicePac® Service Upgrade:
4-yr Onsite Repair/9x5/Next Business
Day Response
#69P9161 *89

IBM ThinkCentre M50

Distinctive IBM Innovations:

- Rapid Restore Ultra – Push-of-a-button data backup and recovery
- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • DVD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,269 NavCode 8187F4U-M112

ServicePac® Service Upgrade:
3-yr Onsite Repair/24x7/4-hr Response
#41L2740 *159

IBM ThinkCentre S50

Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop

System Features:

- Intel Pentium 4 Processor with HT Technology 2.80GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • CD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,189 NavCode 818336U-M112

ServicePac® Service Upgrade:
4-yr Onsite/9x5/4-hr Response
#69P9162 *250

IBM ThinkCentre S50

Distinctive IBM Innovations:

- The smallest IBM desktop without compromise: 62% smaller than a standard IBM desktop
- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature

System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- 512MB DDR SDRAM*
- 40GB hard drive • DVD-ROM
- Intel Extreme Graphics 2
- Gigabit Ethernet-integrated
- Norton AntiVirus 2003 OEM Edition
- Lotus SmartSuite Millennium license
- 3-yr limited warranty with limited onsite service**

\$1,299 NavCode 818343U-M112

ServicePac® Service Upgrade:
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IBM recommends Microsoft® Windows® XP Professional for Business.

IBM Think Express Program

Select and purchase IBM Think Express products, designed and priced for small and medium businesses.

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#58P8772 *389

3-yr Depot to 3-yr Onsite + 3-yr ThinkPad Protection
#58P8774 *279

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Gemplus GemPC400 Compact Smart Card Reader Writer from IBM
#31P8901 *75

Targus Value Mobile Essentials Kit
#22P8684 *90

ThinkPad 72W AC/DC Combo Adapter
#22P9010 *99

ThinkPad Port Replicator II
#74P6733 *179

IBM ThinkCentre Accessories

IBM UPS 500
#33L3477 *99

Lexmark X6170 All-in-One
#22P9147 *250

17" IBM ThinkVision™ L170 Flat Panel Monitor with system purchase
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issue may be subject to additional charges. **This machine is designed to be repaired during the applicable warranty period primarily with customer-replaceable parts provided by IBM. IBM will only send a technician onsite to perform a repair if (a) remote telephone diagnosis and/or customer part replacement are unable to resolve the problem, or (b) the part is one of the few designated by IBM for onsite replacement. For a list of onsite replaceable parts, contact IBM. Support unrelated to a warranty issue may be subject to additional charges. *These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. 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 24x7x24-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. **Standard shipping included when you order online. U.S. only. *Requires compatible wireless-enabled options, sold separately. **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 #58P8774 is for purchase with 3-year warranty systems; #58P8772 is for purchase with 1-year warranty systems. 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. Intel, Intel Inside, the Intel Inside logo, Intel 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. © 2004 IBM Corp. All rights reserved.

Sony's Newest Big Shooter

DIGITAL CAMERA

SONY's **Cyber-shot DSC-F828** is so cool-looking, it's almost more a conversation starter than a powerful 8-megapixel digital camera. Almost. The first camera to use the company's new four-color CCD (it adds emerald to the red, green, and blue found in other chips), the unit also has nearly

every button, dial, and control a serious digital photographer could want. But it'll cost you.

I tested a shipping model of the \$1000 camera and found its long lens barrel and large, boxy body too big and heavy for one-handed shooting. But two-handed, it has the feel and quick action—including minimal shutter delay—of a single-lens-reflex camera. And a turn of the wide zoom ring on the lens barrel lets you quickly set the Sony's impressive focal range from 28mm to 200mm (35mm equivalent).

The other controls are also well designed, and the documentation is solid. The camera supports multiple media

types: Memory Stick (Standard and Pro), CompactFlash, and Microdrive. The only noticeable flaws: You can't undo the auto-off function, and it saves only one group of user-adjusted manual settings.

Test photos looked great overall, though our staff photo judges had difficulty detecting the improvements in reds and greens that Sony promises

with the new CCD. The camera's images were extremely sharp, and their color density and balance were on a par with that in images produced by other high-end digital cameras we've tested. (Read more about this model on page 151.)

The DSC-F828 is a good bet for serious photo hobbyists. Beginners should lower their sights, and pros will be better served moving up to a full SLR camera.

—Tracey Capen

Sony Cyber-shot DSC-F828

Sony

★★★★☆

SLR-like features, outstanding focal range, and ultrasharp images, but Sony's new four-color CCD failed to impress. Street: \$1000

find.pcworld.com/40802



SONY'S PRICEY
NEW Cyber-shot DSC-F828.

3D Web Design for Less

WEB SOFTWARE

IF YOU'RE LOOKING to add a little more depth to your Web site, Adobe's \$399 **Atmosphere** may be the tool for you. Designed to make it easier and less expensive to create three-dimensional interactive online

environments—useful for everything from marketing to education—the new program is competing with established, more comprehensive 3D packages that cost thousands of dollars. Unlike in those programs, however, Atmosphere

files require a player, similar to Flash animations.

Designers familiar with Adobe's Photoshop and Illustrator programs will feel right at home in Atmosphere: Tools are grouped in palettes that you can dock, merge, and resize. Its wireframe view lets you add and combine solid objects that become your new 3D environment. Then you can add color, texture, and lighting effects. Environments can also include interactive elements via JavaScript.

I tested a shipping version and found that creating the basics of a 3D environment was as easy as dragging and dropping—although stitching the pieces together to create, say, doors and alcoves took some practice.

Operation was sometimes a little herky-jerky on my 2-GHz Pentium 4 test system, and previewing required launch-

ing the player, but I attribute these shortcomings to the product's youth. The application's biggest drawback, however, is the 2.6MB download for the required player.

Still, with an easy-to-use interface and a price that's a fraction of what you'd pay for professionally geared competitors (Alias's Maya Complete 5 lists for \$1999, and Discreet's 3ds max 6 retails at \$3495), Adobe's latest is certainly worth a serious look. After all, if you want to get people's attention, there's no better way than to give them some virtual room to move.

—Dennis O'Reilly ■



DESIGNERS FAMILIAR with Adobe's Photoshop will feel right at home creating environments with the company's new 3D Atmosphere.

Atmosphere

Adobe Systems

★★★★☆

Limited but easy-to-use 3D Web app for designers on a budget.

List: \$399

find.pcworld.com/40793



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New MFP Heavy on Functions

MULTIFUNCTION

CANON'S LATEST ink jet multifunction printer is a full-featured space saver selling at a midlevel \$200. The **MultiPass MP390** includes a printer, a flatbed scanner, a copier, an on-panel fax, and a photo printer (with slots that take a variety of media cards).

The MP390 posted very quick print speeds across the board. Text printed at 5.3 pages per minute, slightly above the average of 5.0 ppm in our most recent roundup

of MFPs. Graphics printing was even more impressive at 0.8 ppm—one of the fastest speeds we've seen from such a device. Both scan and copy speeds were good as well, with an average speed of 72 seconds for a 1200-dpi color scan and an average of 26 seconds for a 300-dpi black-and-white scan. A single copy printed in 16.5 seconds.

Printed text looked dark and clean, with sharp letters that were legible even in 2-point type. Color graphics were vivid and realistic, though a bit grainy on plain paper at the default settings. Photos printed on glossy paper at the highest quality also showed very good colors and detail.

Unfortunately, scan quality was generally disappointing. Our gray-scale scan of a page



CANON'S NEW MultiPass MP390 includes media slots.

with text, narrow lines, and a reverse-type logo lost chunks of detail when we printed it. Scans of our photo captured detail better, but looked a bit too red-orange when we printed it. Those same scans, however, improved when viewed on screen. Direct copies (bypassing the computer) of both text and photos also retained color and detail well.

The professional-looking

black-and-silver unit includes a 100-sheet paper tray and a well-designed front panel that offers one-touch access to most features.

Canon's MultiPass MP390 offers easy photo printing, impressive speeds, and good print quality. Only poor scans keep it from being an exceptionally well-rounded multifunction printer.

—Lisa Cekan ■

MultiPass MP390

Canon

★★★★☆

Well-priced unit offers good features and solid performance, but produced poor-quality scans.

List: \$200

find.pcworld.com/40781

One-Box Audio Upgrade

SOUND

HERE'S A SPEAKER setup that can be heard but not seen: Aiwa's \$150 **UZ-US201 USB One-Point Stereo Speaker System** is designed to hide behind an LCD or laptop screen. I tested a preproduction unit of this compact one-piece speaker system and found that while it's a great option for tight spaces, better values exist.

UZ-US201 USB One-Point Stereo Speaker System

Aiwa
Preproduction (not rated)
Capable but slightly overpriced one-piece speaker system.
List: \$150
find.pcworld.com/40751

The UZ-US201 carries the capability to make some fairly decent sound in its small but hefty package (10.5 by 4.1 by 7.6 inches, width by depth by height, and 4.1 pounds). It features three 5-watt drivers arranged in a line on top of the device, plus a front-firing 10-watt subwoofer.

A USB connection provides an easy way to hook the speakers up to a notebook or desktop PC—bypassing your existing audio hardware. Stereo RCA inputs also let you hook the UZ-US201 directly to your current sound card.

Music sounded crisp and detailed when played at a healthy volume through the

UZ-US201. The top-mounted speakers are set up to create some separation—each speaker plays a different set of the stereo channels—and while the soundstage is very narrow, it is fairly accurate. Movies and games didn't fare quite as well, as they rely more on positional audio, which is hard to create when sound is emitted from one point.

Still, the sound you get from the UZ-US201 is pretty good. If you have the room, a more traditional 2.1 speaker set with a good subwoofer will give you better bass response and a larger soundstage, but if space is at a premium, you might want to give this system

a shot. The compact design and USB connection make it an excellent, if pricey, fit for a small work space where you're docking a notebook.

—Eric Dahl ■



AIWA'S UZ-US201 USB speaker system.

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The Web is so full of useful info that no search engine can find it all. But a multitude of specialty sites deliver shopping advice, reference databases, leisure-time ideas, and more-fast.

Beyond Google

BY LAURIANNE McLAUGHLIN

AS HERETICAL AS THIS MAY SEEM to some PC users, Google doesn't know it all. Sure, the paragon of search engines deftly handles most of our search requests. But just as you wouldn't drive miles past the local grocery store to a cavernous warehouse club to buy a dozen eggs, you don't want to slog through pages of search results from Google or another search engine every time you need a bit of information.

Better to rely on a cadre of specialized sites that will swiftly retrieve the nuggets you're looking for. Here are the best data resources on the Web, from the latest business news sites to the most useful addresses for hearth and home.

Of course, there's still a place for the Googles of the world: The big engines remain the best choice for researching pop culture and similar topics. The chart on page 79 lists new features of the major players. But whether you're interested in the usual suspects or little-known gems, I'm here to raise your information IQ. ►

Hardware Helpers
76

Reference & News
77

Business &
Professional
78

Government Info
& Public Records
80

Food & Drink
80

Health Matters
82

Great Getaways
84

Shopping Steals
& Deals
84





Hardware Helpers

YOU NEVER KNOW when you'll need a solution to a computer glitch, a definition of some new technology, or a toll-free number to call because your dishwasher is imitating a geyser. Skip the search site and find what you need at these sources.

Hardware and software support information: Computing.net runs forums for operating systems, hardware, games, and drivers. Or try the Windows tips search engine at Brian Livingston's Brian's Buzz site (www.briansbuzz.com/search).

Technical terminology: Internet.com's

Webopedia (www.webopedia.com) lets you enter a term like Wi-Fi and get a good, quick description of the technology's history, purpose, and details, plus links.

Self help: The computer page at EHow (www.ehow.com; registration required) may seem basic to PC veterans, but everyone will appreciate its checklists for cleaning a PC's interior, evaluating a used system, and performing other tasks.

PDAs: Handheld users will find solutions to their problems at PDAsupport.com. The site covers various popular Palm and Pocket PC models, plus the BlackBerry, and provides links to appropriate vendor pages. PDAsupport.com also serves up software, reviews, and other helpful links.

Alpha geeks and IT pros: TechTarget's search site (find.pcworld.com/40592) lets visitors scour specialized tech sites that

offer extremely useful tips, articles, and lots of facts about databases, security, storage,

mobile computing, Linux, networking, and other topics. O'Reilly's Safari Bookshelf (safari.oreilly.com; 14-day free trial, fee required thereafter) is easy to search and is packed with resources for IT types.

Product recalls: For all the facts you need about faulty consumer products, keep Recalls.gov close at hand. A joint effort of six government agencies, this site lets you search its recall database by product or vendor, or simply browse its categories, which include food, medicine, appliances, furniture, and kids' gear. Recalls.gov has car info, too, but you may find that faster by visiting find.pcworld.com/40718, where the National Highway Traffic Safety Administration keeps its comprehensive list of automobile recalls.

Appliances: When home electronics attack (or begin to make threatening noises) check out Appliance411.com. This site helps you troubleshoot the problem and determine whether you need to call for repair. Along with its tips, the site also provides an estimate of probable repair costs, and it even dispels some myths

WEB TRACKERS

Keep Tabs on What Internet

WE ALL NEED TO KNOW what Web sites are saying about us. If you run a small business, you have to market yourself on the Web to potential customers and partners, but you also must protect your reputation online. And everyone who uses the Internet needs to keep close watch on personal privacy. "You have to find a balance," says Bobby Morgenstern, a Boston-area real estate agent with Coldwell Banker. Like other agents, Morgenstern has to deal with these issues frequently. The golden rule: Always guard your home phone number zealously. Starting with online reverse-lookup directories (www.reversephonebook.com is one), a home phone number opens many windows into your private life.

Don't use your home phone number on business-related documents. Instead, take advantage of inexpensive mobile phone plans. "I give out my cell phone number almost exclusively," Morgenstern says. Just beware of plans that charge for each incoming call.

Morgenstern maintains an AOL profile and several Web pages that advertise her business, but she watches the details closely to keep the information they contain generic.

And while personal networking plays a big role in her work, she declines to answer non-work-related questions for surveys and



GENIE TYBURSKI of
The Virtual Chase.

PHOTOGRAPH: ED WHEELER

about misbehaving machines. When the agitator on my washing machine lost its mojo recently, the site pointed me to a schematic diagram and recommended a site (PartSelect.com) that sold the necessary parts for a grand total of \$41. You'll find other fix-it-yourself tips and instructions at the Do It Yourself Network (www.diy.net.com), which steps you through a wide variety of household projects and suggests solutions to typical problems.

Tutorials: For terrific how-tos on computers, appliances, and almost every other device under the sun, browse to HowStuffWorks (www.howstuffworks.com). Point PC newbies to the computer section at computer.howstuffworks.com when they ask you to explain some technology or importune you for free tech support.

Toll-free numbers: If you're in trouble and only a repair professional will do, quit digging through your kitchen junk drawer looking for a warranty card and use the Internet 800 Directory (www.inter800.com) or AT&T's AnyWho Online Directory (www.anywho.com/tf) instead.



Reference & News

I AM FIGHTING a hereditary condition that impels me to accumulate clutter and to fill basements with boxes of junk at an alarming speed. So I save as little paper as possible, including old books and magazines. With these thorough reference sites, who needs 'em?

Online directories: The jam-packed Refdesk.com is full of facts and figures, updated news, and links to sources from phone books to world clocks. The site virtually speed-dials the answers to you. (Warning: If you're a word-of-the-day type, you may get sucked in by its many lan-

guage goodies.) If Refdesk.com doesn't satisfy your trivia jones, browse to Gary Price's Fast Facts page (find.pcworld.com/40601), where you can consult a directory that covers everything from baseball to plastics.

For another one-stop facts and reference shop, consider Martindale's The Reference Desk (find.pcworld.com/40604), with links to world clocks, boating knots, international copyright information, travel tips, and scientific libraries. Also ►



FIGURE 1: TEACHERS AND PARENTS alike will find useful education resources at the Educator's Reference Desk.

Sites Are Saying About You and Your Business

group directories. "Many say they don't share the information, but you don't know," she notes. Morgenstern also avoids online surveys and removes herself from online phone directories such as Google's (see find.pcworld.com/40703 for directions on removing your number).

WATCH WHAT YOU FILE

INFORMATION ON PAPER CAN GET ONLINE, too, so scrutinize anything—even small forms—you file with a public entity, says Jim Harvey, a partner at the Atlanta law firm of Alston & Bird, where he advises clients on privacy and data management. "If a corporation does a transaction that involves a public authority, like buying property, they have to expect the details will be available publicly. And once it's online, it's out of the box," he says.

When people disparage your business in forums or elsewhere online, your options are limited by a formidable legal heavyweight in the First Amendment right to free speech, Harvey says. "If someone is untruthful or is engaging in a campaign that might break a law, things can be done. Otherwise, people are free to say what they want to say," he says. Check out the public records on your company and/or yourself at Search Systems (www.searchsystems.net) to

see what factual data your clients or partners might uncover.

Should you also pay for a report on your company from a service such as KnowX (www.knowx.com), which aggregates public records? Probably not, says Genie Tyburski, a law librarian at Pennsylvania-based Ballard Spahr Andrews & Ingersoll. She manages The Virtual Chase (www.virtualchase.com), a site packed with Internet research advice. KnowX doesn't dig as deeply as a good professional researcher will, she says. "A good search absolutely requires the use of multiple sources of information," she says.

For a thorough picture, Tyburski recommends that you hire a public records research expert to do an initial investigation covering public records, Web mentions, and information available by phone from professional or public agencies. Look to the Association of Independent Information Professionals (www.aiip.org) for referrals, and expect to spend \$300 to \$500, she advises.

To monitor Web information about your company, Tyburski recommends a service such as TrackEngine (www.trackengine.com), which alerts you to mentions of keywords at specific sites—from newsgroups to competitors' sites. It keeps tabs on up to 10 different sites for \$20 a year, and \$60 per year buys monitoring of 50 sites.



FIGURE 2: GET QUICK ACCESS TO MAGAZINE articles on dozens of popular and academic topics at MagPortal.com.

fast and furiously helpful is the Open Directory Project's reference search at find.pcworld.com/40607. Assembled by volunteers, the site lists diverse categories of information and is ad-free.

Homework helpers: The Yahoo Education page (reference.yahoo.com) is especially handy for kids' research projects. This site lets you search current reference titles, including world fact books and *Bartlett's Familiar Quotations*, and it won't overwhelm young researchers. Or try Wikipedia (en.wikipedia.org), a volunteer encyclopedia with a global flavor, for data on topics from math to mythology to the arts.

Education: The Educator's Reference Desk (www.eduref.org, see **FIGURE 1**) has resources, answers, articles, and links to organizations for parents and teachers. Topics include peer counseling, safety, and distance learning, among others.

Associations: The American Society of Association Executives' Gateway to Associations Online (find.pcworld.com/40610) lets you search more than 6500 associations, using keywords or any word that appears in the association's name. These groups often corral the best, most current information on topics for work and home.

News or magazine articles: All of the major search sites have their own feature-packed news pages. When you can't find a current story or topic at news.google.com, visit Daypop (www.daypop.com), which searches more than 59,000 news sites plus Web logs. Looksmart's Find-Articles (find.pcworld.com/40613) allows you to search on a topic, though strangely, not on an author name. To search for

business, entertainment, and politics. When you find an article that helps, the site scouts out more like it. To access current opinion pieces from about 600 English-language publications, visit the Opinion-Pages (www.opinion-pages.org).



Business & Professional

WHEN YOU NEED financial filings, information on a business, or referrals to professionals in your area, megasearch sites can bog you down or leave you empty-handed. Particularly with localized infor-



FIGURE 3: FOR THE LATEST legal news and essays on a range of legal topics, browse to Doug Isenberg's GigaLaw.com.

mation, specialty sites prove their mettle.

Small business and professional practices: MelissaData (find.pcworld.com/40616) offers one-stop access to phone directories, zip codes, post office locations, and demographics such as income tax statistics and home sales—valuable goodies for doing your own marketing. Aside from the great freebies, MelissaData sells an array of products and services for small businesses and professionals.

For tips, advice, and case studies involving small businesses, the dragnet cast by a big search engine pulls in some dubious sources. Instead, go to Entrepreneur.com and Inc.com. Despite its sometimes dated articles, the latter covers key topics and questions and helps you with sample contracts and other nitty-gritty jobs. It's just too hard to find this stuff elsewhere.

Initial public offerings and 10K filings: For IPOs and corporations' annual 10K filings with the SEC, see EDGAR Online's IPO Express (find.pcworld.com/40619). For a monthly fee of \$6 to \$28, the site searches IPO filings by locale, price, or industry. You get e-mail alerts on new IPOs, full reports on companies once they're public, and weekly reports on IPO activity. FreeEDGAR (www.freeedgar.com) lets you search SEC filings for free once you've registered with the site, but it limits you to 19 document views a month. For a fee of \$900 a year, EDGAR Online Pro (www.edgarpro.com) offers more-

complete company data and a wider range of alert tools, including income statements, balance sheets, cash flow statements, and reports about insider trading. For

year-end SEC-filed annual 10K reports, The 10K Wizard site (www.tenkwizard.com) gives you flexible download options and all the current data you need at fees of \$25 per month, \$75 per quarter, or \$175 per year.

Accessibility

Advertising General, Sweepstakes

Antitrust Basics, Microsoft, Property

Bankruptcy Software, Privacy

Companies, industries, and markets: To get conversant in an industry quickly, or to gain insight into a company or market prior to a job interview or client pitch, go to Gary Price's List of Lists (find.pcworld.com/40622) and drill down on banking, insurance, wholesale and retail trade, and other industries. The site provides information drawn from trade magazines on key companies, crucial deals, power players, and important statistics.

Global public company data: The Scannery (www.thescannery.com) gives investors the scoop on more than 11,000 companies worldwide (including the S&P 500, Euro 400, and Global 1000) by searching corporate Web sites. The site's flexible search options help you find the company you want even if you're not sure of the name (it allows "sounds like" and synonym searches, for example). The Scannery's consolidation option groups all hits on a company's Web site for your search phrase and ranks the documents according to their relevance to your search.

Professional services: The big search engines have yet to conquer the problem of localized data. Google is trying: Its beta program at labs.google.com/location lets you search within a geographic area, but the quality of its results remains hit-or-miss. If you're looking for a networking consultant, interior decorator, civil engineer, or other service provider in your area, yellow-page directories such as B2BYellowPages.com still work faster. When you want the names of companies in a specific industry within a particular area, a good source is the Open Directory Project's list at find.pcworld.com/40625. For example, searching for "CPA + Massachusetts" at this site retrieved a link to the state society of CPAs, which was exactly what I was looking for.

Gary Price's List of Lists for Professional, Scientific, and Technical Services (find.pcworld.com/40631) features industry and trade-magazine rankings of many different types of firms that you or your business might employ, such as intellectual-property lawyers, advertising firms, and PR agencies. A few of the list's entries ►

FEATURES COMPARISON

Old Search Engines, New Tricks

WHEN YOU NEED THE BREADTH of Google or another major search site, check out these recently added tools and services designed to save you time and trouble.

SITE	Feature	Benefit
AlltheWeb www.alltheweb.com	URL investigator	Peruse more information about any URL with this bookmark/toolbar button. Visit find.pcworld.com/40760 to add it to your browser.
	Conversion calculator	Convert units of measure: Type convert ; the amount, and the units in the search field. Browse to find.pcworld.com/40763 for instructions.
	Spelling checker	Get the desired links for Niagara Falls even if you type Niagra Falls . Go to find.pcworld.com/40766 for more information.
Ask Jeeves www.ask.com	Smart Search	Type common questions in the knowledge base, like how many cups are in a gallon? , and you'll receive a direct answer.
	Smart Search, weather and products	Enter the word weather and a zip code to see a seven-day forecast. Enter a product name to see shopping comparison results.
	New toolbar	Add buttons to Internet Explorer for weather, stock market, product, and other shortcut searches directly from the browser.
Google www.google.com	Search by location	Find local information, such as for dining, by typing a term such as hamburgers plus a zip code or city name. Go to find.pcworld.com/40769 .
	Google Deskbar	Add Google searching to your Windows taskbar to see results in a small pane over the app you're running. Go to find.pcworld.com/40772 .
	Google definitions	Type define and then a term in the search box to check what it means. Try this with new terms that haven't made standard dictionaries yet.
HotBot www.hotbot.com	HotBot desktop	Use this toolbar to keyword-search the Web, your local PC files, Outlook e-mail, or RSS news feeds.
Lycos www.lycos.com	Sidesearch ¹	Get a second opinion on a query, with Lycos results and another engine's results in separate side-by-side areas. Go to find.pcworld.com/40775 .
MSN Search www.search.msn.com	Highlighted results	View your search term in bold text throughout the result descriptions.
	File-type-limited searches	Limit searches to file types such as .pdf, .doc, .xls, or .ppt.
Yahoo www.yahoo.com	News Search	Take a shot at more than 7000 news sources in 35 languages.
	Customizable tabs	Get to the type of results you'd like faster, using tabbed categories such as 'products', 'news', and 'images' when you type in a search term.
	Companion	Block pop-up ads while searching by using this Web browser toolbar.
	SmartSort	Use this tool with Yahoo Shopping to narrow the product search results based on the product criteria you specify as most important.

¹ Note that the Lycos Sidesearch will be identified as spyware by Lavasoft's Ad-aware and other spyware-catching programs because it records your search terms to submit to competing engines. The security risk is considered low, however.

are out-of-date, but they're easy to browse.

Industrial products and services: The ThomasRegional.com site (find.pcworld.com/40628) maintains an extensive list of all types of business goods and services—including engineering, consulting, and contracting work—along with the companies that provide them. Choose the appropriate professional services category to find companies that handle jobs such as billing, direct mail, and translating. The site's solid organization will save you and your business much time and hassle.

Business law: Doug Isenberg's GigaLaw.com (see **FIGURE 3**) provides tidy, up-to-date, and comprehensive essays on many legal topics written by attorneys practicing in the specific relevant fields. Running a keyword search on this site often pro-



Government Information & Public Records

ANYONE WAITING IN LINE at a government agency knows the sinking feeling of watching grains of sand drop through an hourglass. Don't replicate this experience by looking for up-to-date government information at the search megasites.

Government agencies: To locate the Web site of a particular agency, just type the name into a search engine. But what if you're unsure which agency you need?

In that case, take a look at FirstGov.gov (see **FIGURE 4**), the granddaddy of government sites. It will direct you to federal, state, and local agencies, or to information on government benefits, driver's license applications, employment opportunities, statistics, laws, and contact in-

formation for lawmakers. Alternatively, you could try google.com/unclesam or SearchGov.com, but FirstGov's organization and categories often work faster, especially if you know what you want but you don't know who's in charge of it.

Public records: Search Systems (www.searchsystems.net) is the best resource I've come across for finding information in national and state records. Choose a state and get data on local banks in trouble, court cases, bankruptcy information, and professional licenses. The last feature is especially helpful when you want to check credentials. Access to most of the site's records is free, and its fee-based services are clearly marked.

Statistics: When you need government stats for a presentation or report, hit The White House Economic Statistics Briefing Room (find.pcworld.com/40637) for economic numbers from federal agencies, such as current unemployment rates. Also pay a visit to the U.S. Census Bureau FactFinder (find.pcworld.com/40640). Need localized census data for your small-business plan or loan application? Consult the Census Bureau's County Business Patterns (find.pcworld.com/40643) for county-level business demographics. Then, for the big picture, check out The Population Reference Bureau's AmeriStat (www.ameristat.org) to get social-science statistics compiled with the assistance of the University of Michigan's Social Science Data Analysis Network.



Food & Drink

NOBODY WANTS TO WASTE precious personal time on Web searches. But big search engines don't work efficiently for some personal needs, such as cooking advice. I learned my lesson last summer when my husband arrived home with a slew of freshly caught fish and I tried plugging the fish's name plus "recipe" into Google. The results list left me ►



FIGURE 5: YOU'LL NEVER GO HUNGRY again when you search for recipes at Epicurious.



FIGURE 4: MAKE FIRSTGOV.GOV your first stop whenever you look for federal, state, or local government resources.

duces good analyses of recent or proposed law changes as well. The Small Business Administration's Laws & Regulations Library (find.pcworld.com/40634) provides quick access to the text of recent regulations and legislation.

Personal finance: Money advice on the Web reminds me of online personal ads: There's an abundance of wacky information. Rather than wade through the dross, head for a site like MSN Money (find.pcworld.com/40667) or Quicken.com for reliable answers and resources on banking, investing, financial planning, and taxes. Whether you like financial advisor Suze Orman or not, her list of Sites to See (find.pcworld.com/40670) quickly points to useful resources on such topics as credit card scores and Roth IRA accounts.



View innovative HP technology through an entirely different lens.

HP's complete line of sophisticated digital projectors starts at a highly mobile 2.2 pounds. The more intelligent the projector, the smarter the presentation. It was this thinking that led us to infuse our digital projector line with the most sophisticated image-reproduction technology available. All our projectors feature Digital Light Processing™ technology, which manipulates light to consistently achieve the sharpest, brightest image possible under a wide range of light conditions. Meaning your conference room doesn't have to be perfectly dark for the finer points of your presentation to appear perfectly crisp. And our projectors are easy to use and easy to maintain. So when your company needs to project an image with impact, you'll just get more from HP.



HP vp6110 PROJECTOR

\$999

Lease for under \$37 a month*

After rebate

\$1,299 - \$300 mail-in rebate** = \$999

6.7 lbs

1500 lumens

Native SVGA (800 x 600 pixels)

Automatic image optimization

3-watt speaker

2-year express-exchange warranty



HP sb21 PROJECTOR

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After rebate

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2.2 lbs

1000 lumens

Native SVGA (800 x 600 pixels)

Keystone correction

Remote mouse

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HP vp6120 PROJECTOR

\$1,899

Lease for under \$57 a month*

After rebate

\$1,999 - \$100 mail-in rebate** = \$1,899

6.7 lbs

2000 lumens

Native XGA (1024 x 768 pixels)

Automatic image optimization

3-watt speaker

2-year express-exchange warranty



HP mp3130 PROJECTOR

\$2,599

Lease for under \$77 a month*

After rebate

\$2,699 - \$100 mail-in rebate** = \$2,599

3.8 lbs

1800 lumens

Native XGA (1024 x 768 pixels)

Automatic image optimization

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Call 1-800-282-6672, visit hp.com/go/innovation, or contact your reseller to see our complete line of digital projectors.

*Implicit lease rate, assuming lessee does not exercise a fair-market-value purchase option at the end of the lease term and timely returns the leased equipment to Hewlett-Packard Financial Services Company (HPFSC) at the end of the lease term and disregarding any charges payable by lessee other than rent payments (such as taxes, fees and shipping charges). Lease products available through HPFSC to qualified commercial customers in the U.S. and subject to credit approval and execution of standard HPFSC documentation. Other restrictions may apply. Visit www.hp.com/go/hpFinancialServices or call 888-277-5942 and ask for the 36-month, 0% FMV lease offer for more information. **Rebate offers good on purchases made between 2/1/04 and 4/30/04 on qualifying HP projectors. Mail-in rebate not valid in the state of Connecticut. Rebates are subject to change; check www.hp.com/go/getmore for most current rebate values. Actual retail prices may vary. HP/HPFSC reserves the right to change or cancel these programs at any time without notice. ©2004 Hewlett-Packard Development Company, L.P.

underwater and underwhelmed: There were too many recipes from amateur cooks, and I had no way to judge whether one recipe was better than another.

Recipes: For the dish on gastronomic creations from *Bon Appetit* and *Gourmet* magazines, how to make a certain cocktail, or where to dine on an impending trip, Epicurious (www.epicurious.com, see FIGURE 5) almost always scores. Its recipes range from restaurant fare to quick meals. The Recipe Power Search at FoodTV.com (find.pcworld.com/40649) lets you be super-specific. You can search

exclusively for recipes that suit a food and meal type, region, occasion, or technique (including "freezes well," "grilled," and "spicy"). For comfort food or directions on how to make a child's birthday cake, step into Betty Crocker's online kitchen at www.bettycrocker.com.

Wine: The advanced search page (find.pcworld.com/40646) at Wine Spectator (www.winespectator.com) lets you do a close-match search—helpful when you aren't sure of a wine's name. The site lets you limit searches to tasting reports, news articles, or other specific categories.



Health Matters

WHEN YOU RESEARCH medical topics, who do you trust? These sites have earned their reputations for trustworthiness.

Physicians: Grab basic information about doctors in your area at the American Medical Association's Physician Select site (find.pcworld.com/40655), ►

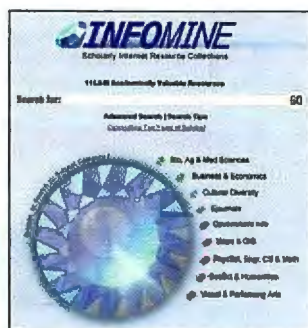
WEB WATCHERS

Searching the Hidden Web

A UNIVERSE OF HIDDEN RESOURCES exists online, in what some people call the "deep" or "invisible" Internet. This includes the rich databases of information from businesses, universities, government agencies, and other organizations that the Web's search engines can't spider and thus can't include in their results. How do you find the ones that are most useful to you?

A wise way to kick off your search: Look through a list of hidden resources, broken down into categories that you can browse for relevance to your work and interests. The Invisible Web Directory (www.invisible-web.net) lists hidden sites in topic groups ranging from art to business. (Much of its material comes from *The Invisible Web*, a book by Chris Sherman and Gary Price.)

Sherman, who now edits the SearchEngineWatch.com newsletter SearchDay (find.pcworld.com/40679), recommends that you check



INFOMINE aggregates the knowledge of university librarians.

Direct Search (find.pcworld.com/40682), a site hosted by FreePint and run by Gary Price, gathers invisible Web databases into well-organized categories and allows you to simultaneously query both regular search engines and some facts databases.

out ResearchBuzz (www.researchbuzz.org) and the Librarians' Index to the Internet (lii.org) for updated advice on hidden sources.

"It's not hard for search engines to find these databases, but it's very difficult for them to get past the search form and explore their contents," Sherman says. He estimates that the hidden Web is 2 to 50 times larger than the visible Web.




FIND LINKS TO "HIDDEN" databases and many other Web resources at BrightPlanet's CompletePlanet site.

For university or academic research sources, try Infomine (infomine.ucr.edu), built by university librarians. The site links to databases, online journals, books, bulletin boards, mailing lists, articles, directories of researchers, and other online resources.

CompletePlanet (www.completeplanet.com), run by BrightPlanet, also links you to deep Web databases. But this site won't find a search term for you in one of these databases; it will only direct you to a possibly appropriate searchable database. Turbo10 (find.pcworld.com/40685) also collects deep Web content and lists more than 1700 specific deep sources that hit everything from business data to libraries to government sources. If you like, you can create your own list of these engines to search with—say, a particular university's collections or a specific government database.

Metasearch sites Dogpile (www.dogpile.com) and Ez2Find (www.ez2find.com) query the popular search sites as well as some deep Web material, often yielding great results with a minimum of visual distraction. A different kind of metasearch engine is Vivisimo (www.vivisimo.com), which clusters results for easy selection. Type in a product name, and Vivisimo breaks down results by descriptions, reviews, and mentions in magazine articles, for example. The site is handy for researching a broad topic or new subject.



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Microsoft
CERTIFIED

Desktop Support
Technician

which allows you to research U.S. doctors (almost 700,000 of them) by name, specialty, and location. Consult the site's medical library, or read information supplied by the doctors about their practices (some provide more information than others).

Medical conditions and drugs: The Merck Manual (find.pcworld.com/40658, see FIGURE 6), a service of the pharmaceutical giant, is a concise and useful starting guide for all things medicinal. The Mayo Clinic's site (www.mayoclinic.com) stockpiles current, expert information on diseases and drugs, interactive



FIGURE 6: Find fast—and trustworthy—answers to all of your medicine-related questions at the Merck Manual site.

tools to help you make health decisions, and question-and-answer material from specialists. I prefer both of these sites to the often-cited WebMD (www.webmd.com), which at times gives too much information (about possible symptoms, for example) without providing enough context, almost convincing me that I have a problem when I don't. The Food and Drug Administration's Center for Drug Evaluation and Research (find.pcworld.com/40661) enables you to compare prescription, over-the-counter, and even discontinued drugs by brand name and active ingredient.

Medical research: Citeline.com (free to consumers after registration) lets you search sources including the Medline database (the best-known of its kind in the United States) for information on diseases and conditions, related organizations, current news and articles, and research and trials.



Great Getaways

YOU KNOW ABOUT the big travel sites and how to find bargains on them (visit find.pcworld.com/40673 for our February "Web Stars" roundup of the best travel sites). But you can't live by Orbitz or Expedia alone if you want travel tips and deals.

Travel: Journey to the USA Today travel

page (www.usatoday.com/travel), and you will find such peripatetic essentials as city guides, hotel deals, and flight trackers. Browse to Watsonwhen (www.whatsonwhen.com, see FIGURE 7) to hunt for happenings around the world. You can search its events listings by date and topic—if you're looking for a good business reason to travel to

Tuscany this summer, for example.

Traveling on a whim? About.com's last-minute travel guide (find.pcworld.com/40676) compiles fare discounts offered on major travel sites. Site59 (www.site59.com) lists last-minute weekend packages on travel to 70-plus cities.

Airlines: Inside Flyer (www.insideflyer.com) provides tips and

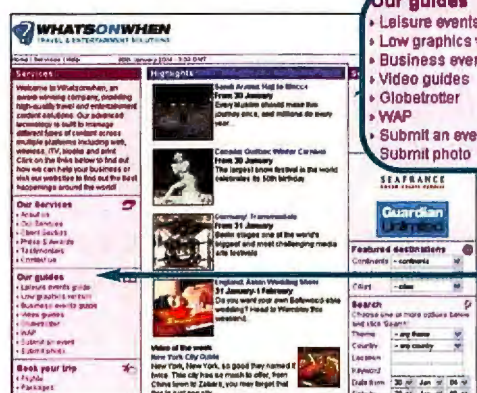


FIGURE 7: Watsonwhen will let you know when to go where for concerts, art exhibits, trade shows, and various other events at venues around the globe.

news alerts on frequent-flyer and other reward programs. Many of the site's articles are free, and the online one-year subscription for full access to articles is a steal at \$12. (Just think of it as an appetizing alternative to one overpriced, dry sandwich from an airport food vendor.) First Class Flyer (www.firstclassflyer.com) provides inside tips on how to score upgraded and first-class travel at discount prices, though full access to the advice costs \$97 per year.



Shopping Steals & Deals

WHEN YOU SHOP ONLINE, you want it all: trusted merchants, help finding precisely what you want, and low prices—at supersonic speed. These sites deliver.

Comparison shopping: Shopping.com (formerly known as DealTime.com and currently the owner of Epinions.com) combines product price comparisons with review information, such as store and product ratings, from Epinions.com. You can compare products, prices, and store reviews in a flash, and then make your purchase. Enter your zip code if you would like the site to include shipping costs in its price comparison calculations. Shopping.com's product finder tool allows you to browse by price or brand.

BizRate (www.bizrate.com, see FIGURE 8) is proud of its lightning-fast results, even displaying how long your search took. But the big bonus here is the site's store ratings: BizRate gleans its ratings from customer feedback via surveys of online purchasers. Click a particular product, and you'll quickly see the number of reviews, an overall recommendation, and the product's pros and cons, as listed by consumers. Checking these ►

Introducing The LG 8X Super Multi Triple Format



DVD-



DVD+



DVD-RAM

Versatile... With DVD- and DVD+ and DVD-RAM, you never have to worry about format compatibility. The LG Super Multi Triple drive does it all.

Capable... DVD provides up to 4.7 GB of storage. Ideal for storing large amounts of data, recording music and saving videos. DVD-RAM features splice-in editing with built-in error correction.

Fast... With 8X maximum burn speed in DVD- and DVD+, plus DVD-RAM and CD-RW functions, the LG GSA-4082B is one fast, flexible drive.

Reliable... LG holds the #1 worldwide market share position in drives and is a trusted source for major PC brands.

In addition to our Super Multi drives, LG carries a full line of award winning CD-RW, CD-RW/DVD Combo drives and CD/DVD Readers.



www.LGUSA.com

Look for the  **super multi**™ for all DVD format compatibility

 **LG**
Life's Good

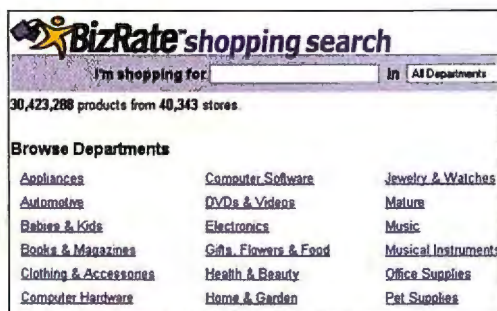


FIGURE 8: Get comparison shopping information—along with store ratings from past customers—at BizRate.

results is much faster than trolling the Epinions.com site. In the past, however, PC World reviewers have noted a seemingly disproportionate number of positive product reviews at BizRate, so you may have to take the opinions you see there with the proverbial grain of salt.

Nextag.com provides quick price com-

parisons similar to BizRate's, but covers fewer stores. PriceGrabber, which you'll find at www.pricegrabber.com and on partner sites such as our own PCWorld.com, supplies store ratings, but from fewer consumers and for fewer stores than BizRate. You can save yourself time when shopping for bargains by signing up to be

notified via e-mail when the price drops below the threshold you specify; Nextag.com provides a similar service, but Shopping.com and BizRate do not. Froogle.com, Google's shopping site, displays prices but not store or product ratings. Nevertheless, Froogle's advanced search option can be helpful when you

want a particular product, don't know what its name is, but do know a word likely to appear in the product description.

MySimon.com has lots of resource guides and suggestions for technology gifts. Overstock.com is a great place to browse for clothing or gift bargains without first knowing what you want.

Complaint sites: Complaints.com just doesn't cut it for me—it has too few reviews, and the content sometimes feels as dated as the PCs I've relegated to my attic. Instead, try ConsumerReview.com or its sibling sites like PCPhotoReview.com for current product and store ratings, and first-person takes on the products. ■

Laurianne McLaughlin is a freelance writer based in Massachusetts.

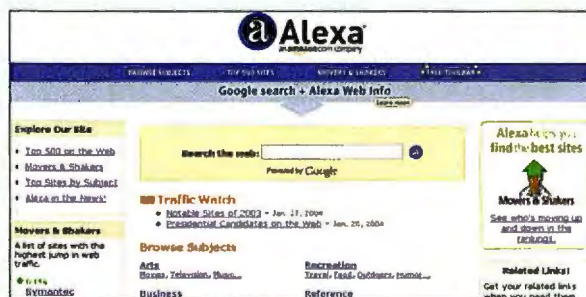
WEB WATCHERS

The Credibility Question

WHENEVER YOU FIND INFORMATION on the Web, you have to determine the source's trustworthiness. The Web makes it easy for people to create fake companies, bogus think tanks, fictional surveys—and even fly-by-night universities, as in a recent case in England, where employers and students were fooled by “university” Web sites unrelated to any real university. Yet investigating a source's credibility can be tough, especially if you're new to a topic.

Always look for an “about us” link, a physical address, and a phone number. While the lack of an “about us” section presents a red flag, the absence of a privacy policy should raise a yellow flag, according to Chris Sherman, author of *The Invisible Web* (with Gary Price) and creator of the Invisible Web Directory (www.invisible-web.net).

“Approach a Web site the same way you would a magazine or book,” he says. “A quick skim should tell you, ‘Who are these people and what do they say about themselves?’” To find out who owns a Web site (including a physical street address and contact person, sometimes with phone number), plug the domain name in a site like Geek Tools (find.pcworld.com/40691), which queries the whois database of domain name registrations. Similar sites include BetterWhois.com for U.S. sites that end in .com, .org, or .net, as well as Allwhois

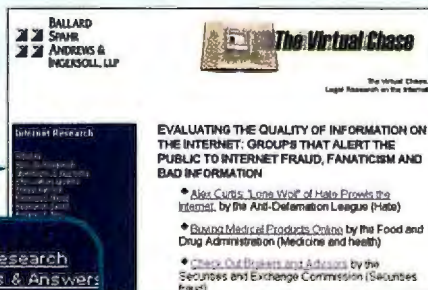


AMAZON.COM'S ALEXA SERVICE tells you how popular a site is, what other sites link to it, and how long it has been around.

(www.allwhois.com) for global sites. To find IP addresses, try ARIN's Whois (find.pcworld.com/40697) or the Internet Assigned Numbers Authority (www.iana.org) for those outside North America.

Amazon.com-owned Alexa (www.alexa.com) helps you identify a page's traffic, how long it has been online, and how many sites link to it, for example. But while this works well for big commercial sites or associations (such as The League of Women Voters), it won't help much with small-business names or obscure groups.

Finally, for an extensive list of links to groups that seek to educate the public about bad information on the Internet, hate information, and online scams, visit The Virtual Chase: Legal Research on the Internet (find.pcworld.com/40700). After all, “forewarned is forearmed” was never truer than with the Web.



DISTINGUISH THE WEB'S good information from its bad by researching at The Virtual Chase.

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Toshiba recommends Microsoft® Windows® XP Professional for Mobile Computing.

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

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ANTEC, INC: BUILDING A QUIETLY SUPERIOR COMPUTER

www.antec-inc.com

ANTEC BRINGS MUCH-NEEDED SILENCE TO THE WIRED LIVING ROOM

Convergence. It's perhaps one of the most overused buzzwords of the modern electronics industry. But after years of hype, the promise of true convergence between home computers and home entertainment systems is finally becoming a reality. Instead of relegating their computers to dens or second bedrooms, plenty of tech-savvy consumers are integrating personal computers into their existing home-entertainment centers. The idea of surfing the Web, catching the latest Hollywood blockbuster, and machine-gunning the Nazi troops inside your favorite video game—without ever leaving the comfort of your couch—appears irresistible to many.

So why haven't millions of consumers embraced the concept of a "wired living room"? For one thing, people like to relax in their living rooms. But it's hard to relax when you're sitting next to an irritatingly noisy PC, full of obnoxiously loud cooling fans. And most PCs aren't particularly pleasant to look at, given the bland, beige boxes that dominate the market. The truth, however, is that people don't have to put up with loud, unattractive computers. Because there are far better alternatives.

Antec
The Power of You

The most obvious alternative is provided by Antec (www.antec-inc.com), the world's leading manufacturer of high-performance computer components. While Antec has attracted a rabid following among PC gamers and "modders," the company has also dedicated itself to producing the world's quietest computer parts. And judging by their whisper-quiet, strikingly attractive Lifestyle Series of computer cases, Antec has certainly succeeded. Users who choose to build their own systems with a Lifestyle case will be rewarded with a quiet, elegant system that effortlessly

blends into even the most tranquil settings. The Lifestyle Series, you could say, deftly removes the final barrier to convergence.

AWARD-WINNING PRODUCTS

It would be all too easy for Antec to simply claim that their components deliver "whisper-quiet" operation. But they've gone a step further, by subjecting the award-winning Sonata case to independent laboratory testing. The result? Sonata generates just 20.9 dBA, which is literally quieter than a whisper. And that makes Sonata the world's quietest PC case, hands down. The test came as no surprise to Antec, of course. After all, Sonata includes a customized, ultra-quiet TruePower 380-watt power supply, plus special rubber grommets that absorb noisy vibrations generated by hard drives. It's little touches like these—which are often overlooked by other manufacturers—that earn Antec its stellar reputation.

Of course, Antec offers far more to the home computer user than one remarkably quiet case. All of Antec's award-winning cases include large drive capacities, ample cooling capacities, and impressively durable construction. The company also produces ultra-quiet power supplies, cooling fans, noise-absorbing accessories, and plenty of other consumer-friendly products that allow users to dramatically quiet their existing computers, or simply build a virtually silent computer from the ground up.

So no matter what kind of computer you'd like to create—whether it be a stylish, ultra-quiet system for your living room, or a no-holds-barred, everything-but-the-kitchen-sink gaming computer—Antec has what you need, wherever you shop for computer equipment. See the complete list of Antec resellers at: <http://www.antec-inc.com/us/wheretobuy.php>.





Easy there, Romeo. She wants your adoring gaze directed at *her*, not at her computer. Sure, her Overture case is breathtakingly elegant. And its ample drive bay capacity, ultra-quiet TruePower power supply, and seductive ebony finish may well make it the perfect addition to your home entertainment center. But that doesn't give you the right to stare. Unless you can get away with it. To learn how we can help you create a truly irresistible computer, visit www.antec-inc.com.

Antec
The Power of You

Fast-Lane

With quicker drives and more-potent software, the time is right to take the rewritable DVD plunge. We test a dozen drives and seven suites for massive data backups, plus high-quality video and audio. ▶

DVD Burning

BY

JON L. JACOBI

HARDWARE 92 SOFTWARE 96



Speedy DVDs

IF YOU BOUGHT A 2X rewritable DVD drive a couple years ago, you needed a healthy dose of patience to go along with your creativity: A full disc would take about as much time to write as a prime-time sitcom takes to watch. But as our tests of 12 models show, new 8X burners can do the job in a third of the time.

The primary distinctions between DVD burners are formats and performance (as indicated by the drive's X-number). The DVD world has shifted to dual-format drives that support the two leading, competing writable formats, DVD-R/RW and DVD+R/RW. Of the drives on our chart, only those from Hewlett-Packard and Benq support just one format (DVD+R/RW)—and both vendors are moving to-

ward dual-format support in the future (Benq is offering a \$10 firmware update to add 2X DVD-R, 1X DVD-RW writing support to its drive, and HP will soon ship its first dual-format model). The advantage to buying a drive with both formats is that you can feel free to buy whichever media is cheaper or more readily available.





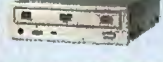





Of the ten dual-format drives in our roundup, only three have matching 8X

FEATURES COMPARISON

**TEST
Center**

Burners on Fire: Faster Speed, Lower Prices

IN A CLOSE FIELD, Plextor's PX-708A and Lite-On's LDW-811S earned Best Buys, in part on the strength of their performance.

	REWRITABLE DVD DRIVE	Features ¹	Performance (min:sec) ²	Comments ³
1	 Plextor PX-708A ★★★★★ find.pcworld.com/38396	• \$200 • 8X DVD+R, 4X +RW; 4X DVD-R, 2X -RW; 40X CD-R • Roxio Easy CD & DVD Creator 6.1	• DVD+R 8:21 • DVD+RW 9:03 • CD-R 3:02	The speediest drive on the chart overall by a small margin, this model can also write at 8X with some brands of 4X DVD+R media.
2	 Lite-On LDW-811S ★★★★★ find.pcworld.com/40463	• \$180 • 8X DVD+R, 4X +RW; 4X DVD-R, 2X -RW; 40X CD-R • Sonic MyDVD 4.5, Sonic RecordNow 4.6	• DVD+R 8:59 • DVD+RW 9:11 • CD-R 3:14	Reasonably priced drive is a strong performer, but software bundle is a couple of versions behind (Lite-On says upgrades will be downloadable at no cost).
3	 Kano Technologies K8Xtreme ★★★★☆ find.pcworld.com/40472	• \$170 • 8X DVD+R, 4X +RW; 8X DVD-R, 4X -RW; 32X CD-R • Roxio Easy CD & DVD Creator 6.1	• DVD+R 9:36 • DVD+RW 8:52 • CD-R 3:40	Fastest drive on the chart for packet writing, the K8Xtreme is the only model to write to some brands of 4X-rated DVD-R media at 8X speed. Manual is skimpy.
4	 TDK External Indi DVD 840G 8x Multiformat ★★★★☆ find.pcworld.com/40475	• \$300 • 8X DVD+R, 4X +RW; 4X DVD-R, 2X -RW; 40X CD-R • Roxio Easy CD & DVD Creator 6.1 • FireWire 400 and USB 2.0 interfaces	• DVD+R 8:22 • DVD+RW 9:02 • CD-R 3:02	Attractive, dual-interface external drive nearly matches the Plextor PX-708A in speed and features. Includes terrific documentation.
5	 Pacific Digital Mach-8 DVD Burner ★★★★☆ find.pcworld.com/40466	• \$175 • 8X DVD+R, 4X +RW; 4X DVD-R, 2X -RW; 40X CD-R • ArcSoft ShowBiz 1.3, Sonic MyDVD 4.5, Sonic RecordNow 4.6, Sonic Simple Backup	• DVD+R 9:20 • DVD+RW 9:12 • CD-R 3:14	Inexpensive model offers average overall performance—and excellent CD-R performance. However, like the Lite-On and the Alera, it uses older software.
6	 Benq DW800A ★★★★☆ find.pcworld.com/40445	• \$140 • 8X DVD+R, 4X +RW; 24X CD-R • InterVideo WinDVD Creator Plus 2, Sonic RecordNow 6.5	• DVD+R 8:31 • DVD+RW 9:15 • CD-R 4:11	Least-expensive drive on the chart works quickly when burning DVDs, but to one format only; it lags behind the leaders in burning CDs.
7	 Memorex True 8X Dual Format DVD Recorder ★★★★☆ find.pcworld.com/40424	• \$200 • 8X DVD+R, 4X +RW; 8X DVD-R, 4X -RW; 24X CD-R • Ahead Nero Express 6.3, Ahead Nero Vision 2.1	• DVD+R 8:30 • DVD+RW 11:52 • CD-R 4:22	Drive supports 8X burning on both DVD+R and DVD-R, but its packet-writing performance was 34 percent off our leader's. Has a great manual.
8	 HP DVD Writer DVD400i ★★★★☆ find.pcworld.com/40454	• \$195 • 8X DVD+R, 4X +RW; 24X CD-R • ArcSoft ShowBiz 2 and Sonic RecordNow 5.1, Sonic Simple Backup, Muvee AutoProducer	• DVD+R 8:29 • DVD+RW 9:12 • CD-R 4:12	Single-format drive is a fast DVD performer but is slower than most on CD-R. Packet-writing software is a separate download.
9	 Alera DVD Cruiser 8 Plus ★★★★☆ find.pcworld.com/40469	• \$275 • 8X DVD+R, 4X +RW; 4X DVD-R, 2X -RW; 40X CD-R • ArcSoft ShowBiz 1.3, Sonic MyDVD 4.5, Sonic RecordNow 4.6	• DVD+R 8:58 • DVD+RW 9:10 • CD-R 3:15	External USB 2.0 model provides great write performance for both DVD and CD burning; but like the Lite-On and the Pacific Digital, it carries older software.
10	 Pioneer DVR-A07 ★★★★☆ find.pcworld.com/40421	• \$230 • 8X DVD+R, 4X +RW; 8X DVD-R, 4X -RW; 24X CD-R • Ulead MovieFactory 3SE, Ulead Burn.Now, Ulead VideoSuite 7SE, NovaStor Backup 7.0	• DVD+R 8:23 • DVD+RW 9:32 • CD-R 4:46	We tested both formats on this dual-format drive and found that 8X DVD-R burning performed comparably with 8X +R. CD-R performance was sluggish.

FOOTNOTES: ¹ 1X DVD±RW = 1.385 MBps; 1X CD-R = 150 KBps. ² We test drives under Windows XP Home on PCs with 1.67-GHz Athlon XP 2000+ CPUs and 512MB of DDR SDRAM, using the DVD software supplied by the vendor and media from the vendor or from Verbatim. Some vendors may change drive suppliers in midstream; our results reflect the configuration tested at the time of our review. ³ Unless otherwise noted, drives are internal. **HOW WE TEST:** Performance tests include mastering 4.35GB of data to DVD+R (as noted), formatting a rewritable disc and packet-writing 2.64GB of data to DVD±RW (as noted), and writing 700MB of data to CD-R. Rankings are based on performance (35 percent), price (25 percent), features (15 percent), ease of installation (15 percent), and service and support (10 percent). All drives have a one-year warranty unless otherwise noted. See find.pcworld.com/10860 for details on PC World's Star Ratings.

DVD+R and -R write speeds—Kano Technologies' \$170 K8Xtreme, Memorex's \$200 True 8X Dual Format DVD Recorder, and Pioneer's \$230 DVR-A07. By the time you read this, however, drives that write at 8X in both formats are likely to have become more common.

While all of the drives in our roundup can burn at 8X speed to 8X-rated media, three of them can write at that speed to some brands of the cheaper and more plentiful 4X media. Both Plextor's \$200 PX-708A and TDK's \$300 External Indi DVD 840G 8x Multiformat write at 8X to 4X +R media; Kano's drive, however, is the only one that does so to 4X -R.

Regardless of which write-once format a drive uses, performance improvements are no longer linear. Thus, for example, whereas a 2X drive takes approximately 30 minutes to write a complete disc, and a 4X drive takes about 15 minutes, an 8X drive requires 9 minutes or so. Unlike earlier drives, the new 8X drives write data at multiple speeds, as if they were shifting gears. They divide the write process into zones and start at a slower speed such as 6X or even 4X—typically for the first 500MB or so—before jumping to 8X. This approach to writing an optical disc is not new: CD-RW drives write in zones, too.

Some vendors choose to jump speeds later in the write process, a choice that affects performance. Sony's \$205 DRU-530A writes at 4X for the first 1.25GB, while LG Electronics' \$170 GSA-4081B starts at 4X and then jumps to 6X at 300MB and to 8X at 2GB. Both of these drives lagged on our write-once performance test and failed to make the chart.

We've also noticed that Memorex, Pioneer, Plextor, and TDK are slowing down their drives' DVD-Video read speed to 2X (the latter two vendors' drives can temporarily disable this function). According to drive makers, this is done to reduce drive noise during playback. But the limitation can become frustrating when you're trying to copy a DVD movie.

LAB NOTES

Boost Your Drive via Firmware

**TEST
Center**

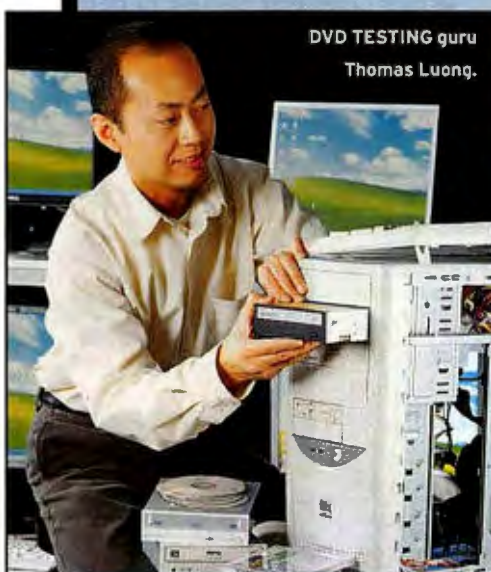
BASED ON OUR EXPERIENCES in the PC World Test Center, rewritable DVD drives are never final: Manufacturers are continually upgrading their drives' firmware and drivers, along with their burning software, which means that you should check your drive manufacturer's support site every so often for the latest updates to make sure you're getting the most out of your drive.

We always test shipping drives. If newer firmware is posted on a vendor's site before we begin our performance tests, however, we will apply the update—as we did for more

than half of the drives in this review (from Benq, HP, LG, Memorex, Plextor, Sony, and TDK).

Firmware updates typically fix performance bugs and add support for additional brands and speeds of media. The media issue is particularly thorny, since new drives often ship several months before high-speed media is ready, or before a drive's firmware has broad media support.

We see this happen a lot. For example, Memorex's True 8X Dual Format DVD Recorder took 54 seconds (or about 8 percent) longer on our packet-writing test with Memorex media than it did when used with Verbatim media, which, at the time of our test, had been available long-



er. Memorex couldn't explain the discrepancy, but the company indicated that its next firmware would be optimized for use with a broader range of media.

Media support isn't all that's being added via firmware upgrades these days. Benq and Sony are both offering upgrades for their respective drives that will add support for 8X DVD-R and 4X DVD-RW.

—Thomas Luong and Melissa J. Perenson

Meanwhile, with dual-format drives taking over, another format—DVD-RAM—is being left behind. Only a few drive makers, including LG, support DVD-RAM, which is the slowest of the rewritable formats. DVD-RAM works best for backups (due to its built-in error correction) and for reading DVDs created on DVD-RAM-capable set-top DVD recorders for TV, such as those from Panasonic.

TRACKING PERFORMANCE

TO SEE JUST HOW the latest generation of 8X rewritable DVD drives stacks up, we ran the drives through DVD and CD mas-

tering and DVD packet-writing tests. We found that the competition was tight.

Before proceeding, we asked each of the multi-format-drive vendors which format they preferred that we use for testing. Pioneer specified -R/RW; all the others, +R/RW. For comparison, we tested the Pioneer DVR-A07 using both formats. The results for 8X -R and +R on this drive were close (just 20 seconds separated them). We saw a bigger differential between the rewritable formats—it took 17 minutes, 59 seconds, or nearly twice as long, to packet-write to DVD-RW as it did to DVD+RW, because we had to use ►

2X DVD-RW media, in spite of the drive's 4X speed rating (4X DVD-RW media was unavailable in time for our tests, but it should appear in stores soon).

For the most part, what we saw fell in line with each drive's X-numbers. A mere 75 seconds separated the fastest and slowest drives on our write-once tests. Nevertheless, Sony's DRU-530A and LG's GSA-4081B were about 20 percent slower than the average drive while writing DVD+R at 8X; we attribute this lag to these drives' comparatively late zone jumps.

The Plextor drive was the fastest per-

former on our write-once test, in which we used each drive's bundled disc mastering software to copy 4.35GB of data to an 8X disc. The PX-708A took 8 minutes, 21 seconds to complete our test—just 1 second ahead of the TDK, and 2 seconds ahead of Pioneer's DVR-A07.

In our packet-writing tests—where we formatted a rewritable disc and dragged and dropped 2.64GB of files and folders onto the disc—the Kano K8Xtreme took the top spot, requiring just 8 minutes, 52 seconds to complete this task. Its closest competitor was the Plextor, which took 11

seconds longer. By contrast, the Memorex True 8X Dual Format DVD Recorder and the LG GSA-4081B were slower by 3 minutes and by 2 minutes, 10 seconds, respectively, than the Kano drive.

CD write performance is greatly improved with this generation of DVD burners. Fully half of the 12 models tested can write to CD-R at 40X, and all perform comparably—a mere 14 seconds separates the six drives, with the Plextor and the TDK drives tying for the fastest time to master a 700MB disc, at 3 minutes, 2 seconds on our test. Five of the drives—from Benq, Memorex, HP, Pioneer, and LG—write to CD-R at only 24X, while the Kano falls somewhere in the middle with a 32X CD-R rating.

FUTURE LOOK

Optical Goes Blue

OPTICAL DRIVES IN THE United States will soon be crooning a new tune, to the beat of blue-laser technology. It's all about wavelength: Blue lasers produce light with a shorter wavelength—405 nanometers versus a DVD drive's 650nm red-laser light. The shorter the wavelength, the more bursts the laser can produce in a given amount of time. The burn marks are smaller, too, so you can fit more data on a disc.

Higher capacity is the main appeal of blue laser. Depending on the implementation, you can pack up to 27GB on a single side of a disc—five to six times the capacity of a single-layer DVD. With a blue laser-based drive, you can fit a 2-hour, high-definition movie on one disc, something current DVD technology can't come close to.

In a repeat of recent history, two competing groups are vying to control lucrative licensing rights for blue-laser products. The DVD Forum champions HD DVD (High-Definition DVD, formerly known as AOD), while the Blu-ray Disc Founders, a consortium of ten major consumer electronics giants along with PC heavyweights Dell and HP, backs Blu-ray. The technologies are incompatible with each other and with today's red-laser DVD players and discs—though either type of blue-laser drive could be paired with a red laser in the same device (at increased cost) to achieve backward compatibility.

Sony's forthcoming Professional Disc for Data drive uses a variation on Blu-ray technology that is incompatible with Blu-ray, but it employs 23GB media made with the same dyes as Blu-ray discs. The \$3300 drive targets data archiving applications rather than video.

Manufacturers generally think that the demand for blue-laser DVD will depend on how quickly HDTV permeates the market. Already available in Japan, the first batch of pricey blue-laser video recorders is due for release in the U.S. later this year.



BLUE GENERATION: Sony's new drive uses optical media housed in a protective cartridge.

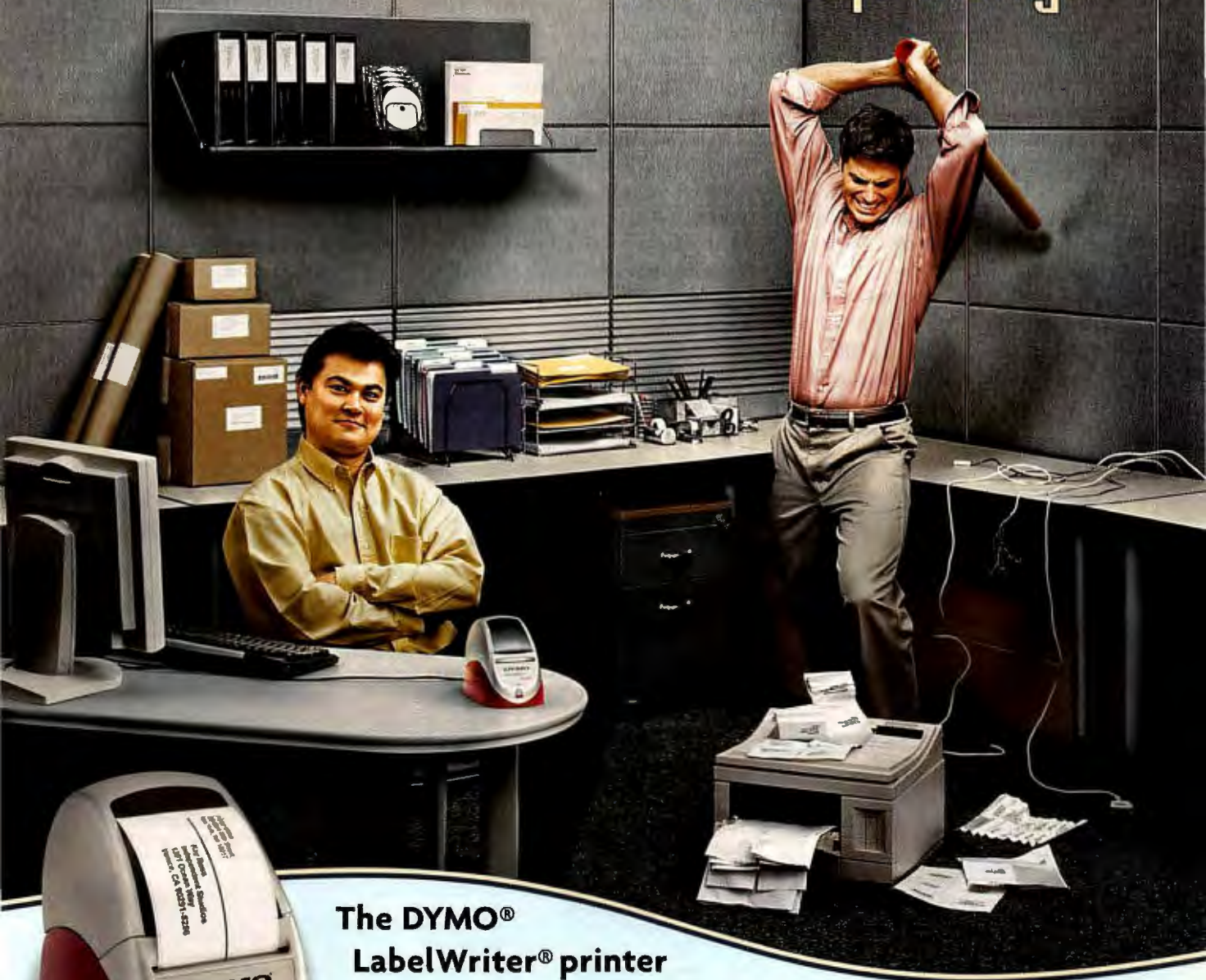
BEYOND SPEED

OUTSIDE OF performance, we saw few variations in these drives' main features. Benq's \$140 DW800A was the only model to include convenient audio playback controls on the front faceplate, which saves you from having to launch a separate app to play and control audio CDs. And half of the drives—the ones from HP, Kano, LG, Memorex, Pioneer, and Sony—lack headphone jacks and volume controls, features that provide an easy way to listen to your audio CDs without snaking a cord behind your PC.

All of the drives here included documentation that will guide you through installation, but only HP, Memorex, Sony, and TDK supplement these instructions with comprehensive CD-based manuals.

Software is an important part of a drive package. All 12 drives bundled basic software, but the Alera, HP, Pacific Digital, and Pioneer models also had dedicated video editing applications (the first comes with Ulead's VideoSuite 7SE; the other three, ArcSoft's ShowBiz 2.0). Surprisingly, the Alera, Lite-On, and Pacific Digital carried older versions of Sonic Solutions' software (Lite-On offers an upgrade online). ▶

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Sweet Suites

EVERY RETAIL rewritable DVD drive comes bundled with basic CD/DVD burning software—including limited, OEM versions of some of the suites we review here. However, boxed software packages may provide extra features such as audio and video editing, customizable DVD menus, and backup.

For this roundup, we examined seven boxed software products: Ahead Software's \$100 Nero 6 Ultra Edition, ArcSoft's \$70 DVD & CD Suite 6.5, MedioStream's \$100 NeoStudio 5, NewSoft's \$90 Presto DVD PowerSuite 1.1, Pinnacle's \$50 Instant CD/DVD 8, Sonic's \$100 MyDVD Studio Deluxe 5, and Ulead's \$100 DVD MovieFactory 3 Disc Creator. All of the suites consist of a number of separate software components, which we refer to by name in the discussion that follows.

One vendor missing from our roundup is Roxio. The company's Easy Media Creator 7—an almost complete redesign of Easy CD & DVD Creator 6—was in beta at the time of our review, but the software will be shipping by the time you read this. What we saw looks promising, with a dazzling interface and better-integrated components. (Look for our review next month.)

We trotted the seven suites through a series of common and not-so-common tasks, judging them on both features and usability. Despite a reputation for bugginess when it was first released last summer—and an interface that remains obtuse in spots—Nero 6 now seems stable, allowing us to award it our Best Buy for its power and breadth of features. That's not to say it didn't have serious



competition: Of the remaining suites, most did something well—as you'll see in

our evaluation of each suite on eight basic tasks. But each seemed to lack at least one important feature, limiting its appeal as an all-encompassing upgrade from whatever might have come with your DVD burner.

After identifying eight core multimedia and data tasks, we scored each suite on that task (see the chart below). Read on to see which suites we liked, and why. ►

FEATURES COMPARISON

Software That Lets You Burn Discs Your Way

OF THE SEVEN DVD burning suites we examined, only Ahead's Nero 6 Ultra Edition handled everything we threw at it—and handled it well.

DVD RECORDING SUITE	Price	Multimedia features	Data features	Comments
Best Buy Ahead Software Nero 6 Ultra Edition ★★★★★ find.pcworld.com/40733	\$100	• DVD authoring, video editing: Very good • Photo editing and slide shows: Very good • Audio CD creation: Outstanding • Labeling: Very good	• CD/DVD mastering: Outstanding • Packet writing: Very good • Disc copying: Outstanding • Backup: Good	Has everything you'll need to do almost anything related to CD and DVD creation. Could be more intuitive, but does fine with most tasks.
ArcSoft DVD & CD Suite 6.5 ★★★★★ find.pcworld.com/40730	\$70	• DVD authoring, video editing: Very good • Photo editing and slide shows: Fair • Audio CD creation: Good • Labeling: Good	• CD/DVD mastering: Good • Packet writing: Good • Disc copying: Good • Backup: Fair	Includes ShowBiz, a wonderful video authoring and editing tool, but has no file-level backup and no software DVD movie player.
MedioStream NeoStudio 5 ★★★★★ find.pcworld.com/40736	\$100	• DVD authoring, video editing: Good • Photo editing and slide shows: Fair • Audio CD creation: Fair • Labeling: Fair	• CD/DVD mastering: Good • Packet writing: n/a • Disc copying: Good • Backup: Fair	Automatically generates slick video projects, but the rest of the suite lags behind the competition. Lacks packet-writing software.
NewSoft Presto DVD PowerSuite 1.1 ★★★★★ find.pcworld.com/40742	\$90	• DVD authoring, video editing: Good • Photo editing and slide shows: Good • Audio CD creation: Fair • Labeling: Good	• CD/DVD mastering: Good • Packet writing: n/a • Disc copying: Good • Backup: n/a	Well-designed interface with content-sensitive menus makes suite easy to use. DVD movie burning is particularly simple. No MP3 encoder.
Pinnacle Instant CD/DVD 8 ★★★★★ find.pcworld.com/40739	\$50	• DVD authoring, video editing: Good • Photo editing and slide shows: Fair • Audio CD creation: Good • Labeling: Good	• CD/DVD mastering: Good • Packet writing: Very good • Disc copying: Very good • Backup: Fair	Bargain-priced suite has lots of marvelous features—such as its slick DVD labeling—but also some half-cooked ones (including its software DVD movie player).
Sonic MyDVD Studio Deluxe 5 ★★★★★ find.pcworld.com/40745	\$100	• DVD authoring, video editing: Good • Photo editing and slide shows: Fair • Audio CD creation: Good • Labeling: Fair	• CD/DVD mastering: Good • Packet writing: Good • Disc copying: Fair • Backup: Poor	MyDVD makes excellent-looking DVD productions, but the rest of the suite offers little improvement over what is typically bundled with a DVD burner.
Ulead DVD MovieFactory 3 Disc Creator ★★★★★ find.pcworld.com/40748	\$100	• DVD authoring, video editing: Good • Photo editing and slide shows: Good • Audio CD creation: Fair • Labeling: Fair	• CD/DVD mastering: Good • Packet writing: n/a • Disc copying: Good • Backup: n/a	The straightforward interface is well tailored to specific tasks. But the suite lacks depth of features, such as MP3 encoding, and has no packet writing or backup.

n/a = Not applicable.

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DVD AUTHORIZING, VIDEO EDITING

COMPETITION WAS FIERCE in this, the glamour category for DVD software. All of the suites include a program that lets you author DVD movie menus and at the very least trim your video clips. The differences lie in support for such features as motion backgrounds and buttons, advanced video editing and effects, and freely placeable menu text and buttons.

Ahead's NeroVision Express 2 offers the best control over the look of DVD menus—it even lets you adjust the starting point and length of the video used for motion backgrounds and buttons. NeroVision Express also provides easy-to-use storyboard and timeline video editing. The program's biggest weaknesses are its mundane templates and its stock images (for buttons, and the like).

For editing video, our favorite was ArcSoft's ShowBiz DVD 2: Its exceptionally logical workflow; well-designed, powerful storyboard and timeline editors; and ability to export video creations to a number of different file types won it high marks.

Sonic's MyDVD Studio Deluxe 5, a long-time front-runner in the entry-level DVD authoring field, deserves a look, too, because of its beautiful motion backgrounds.



The program won't permit you to freely place menu buttons or text the way Ahead does, but it's very easy to use, and it produces professional-looking results.

The rest of the packages layered too many weaknesses in with their strengths. Pinnacle's Expression simplifies applying DVD styles, layouts, and artwork; unfor-

tunately, we found it to be a weak video editor. And the NewSoft and Ulead suites are similarly uneven: Both are a snap to use, but NewSoft's Presto DVD PowerSuite offers limited menu creation abilities, and Ulead's DVD MovieFactory lacks timeline editing.

Taking a more automated approach, MedioStream's NeoProducer analyzes your audio and video clips, and then automatically transforms them into a suave production that doesn't require an ounce of creative talent.

Five of the seven suites—those from Ahead, MedioStream, NewSoft, Sonic, and Ulead—let you capture video straight to disc in DVD-Video or DVD+VR format; they also allow direct editing of discs burned in a set-top DVD recorder or in a rewritable DVD drive using DVD+VR. Support for DVD-VR is less pervasive—only NewSoft, Sonic, and Ulead support it.

PHOTO EDITING, SLIDE SHOWS

EVERY DVD AUTHORIZING program in this roundup has the ability to create photo slide shows and store them on disc.

However, the programs that give you the most control over look and feel are Ahead's NeroVision Express 2 and ArcSoft's ShowBiz DVD 2. Both of them support a wide range of file types, transitions, and photo archiving (so you can include the original-resolution photos on the slide-show disc), and both give you the ability to place text over a photo. Ahead enjoys a slight edge with its integrated photo editing (and ArcSoft takes a ding for not permitting you to apply effects across a range of photos—you must arduously apply them to each image).

The other programs we saw offer some, but not all, of these features. Neither Sonic nor MedioStream lets you place text over your photos, and the latter allows virtually no control over your slide show.



AT A MINIMUM, all these suites

can create audio CDs from .mp3 and .wav files. All but the NewSoft and Ulead packages can rip audio CDs to MP3 and other file formats (MedioStream offers MP3 encoding for only 30 days or 20 files, whichever comes first). And all but the MedioStream suite cache tracks from multiple CDs, so you don't have to reinsert them when it comes time to burn.

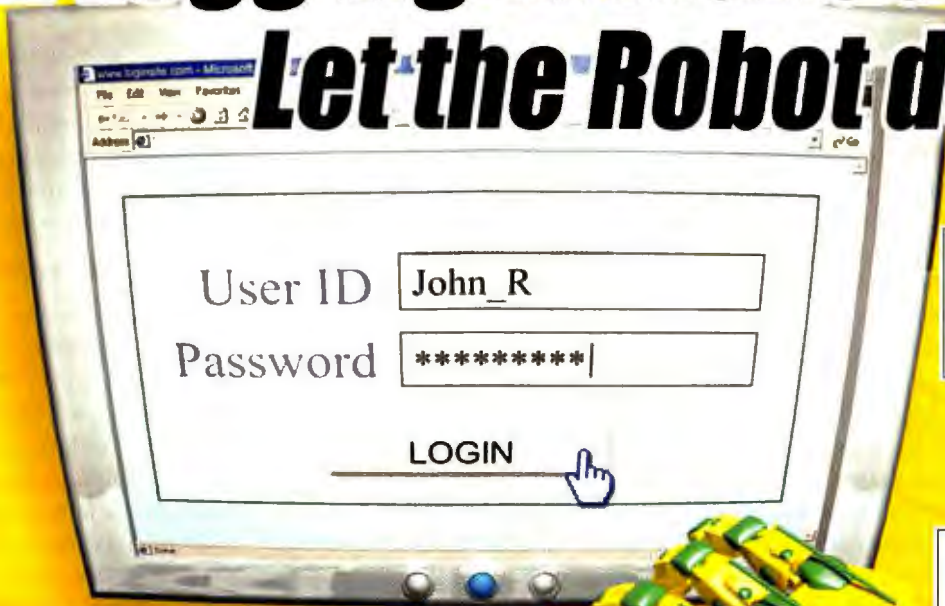
Ahead's Nero offers the broadest support of the bunch for creating compressed audio files. We also gave extra credit to packages that can download album information from Internet databases such as Freedb or Gracenote, so you don't have to enter it by hand. MedioStream, NewSoft, and Ulead lack this feature, while Sonic downloads album information circuitously by using Windows Media Player.

LABELING

EVERY SUITE OFFERS an application that lets you create professional-looking disc labels and jewel-case inserts. Sonic's labeling capabilities are the most rudimentary, and many of the packages are hampered by complex interfaces.

We liked Pinnacle Expression's labeling best because it automatically transfers your DVD menu theme and disc information to the labels and inserts. Ahead's Cover Designer imports information for audio and data discs, while Pinnacle's InstantDisc does so only for audio discs. Cover Designer has two unique and noteworthy points: It handles both slim jewel-case inserts and the large, movie-style DVD case and booklet inserts. ►

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CD AND DVD MASTERING

FOR CREATING a data disc or writing an image file—the structure and contents of an entire disc duplicated in a single file—all the suites offer a competent mastering program. Ahead's Nero Burning ROM and Pinnacle's InstantDisc burn in the widest variety of disc formats. While both programs may take a little time to learn, we feel it's worth the extra effort (Ahead offers a simpler, step-by-step wizard, too).

We particularly liked the way that the NewSoft and Ulead suites are able to tailor their interfaces to the task at hand. You pick a project from either suite's launch bar, and the appropriate application pops up, along with just the right

features and interface to correspond to that activity—file trees for data discs, for example, or track lists for audio CDs.

PACKET WRITING

ONLY FOUR OF OUR seven suites feature packet-writing software, which lets you use rewritable optical discs as a high-capacity alternative to floppies: Ahead, ArcSoft, Pinnacle, and Sonic.

Ahead's Nero InCD, Pinnacle's InstantWrite, and Sonic's DLA (standing for Drive Letter Access, and so called because you can drag and drop data to your optical drive just as you would to a hard disk or floppy) take the hands-off approach, blending into the background and using the Windows interface for drag-and-drop

operations. ArcSoft's FileCD has its own stand-alone interface; you must launch the program to use it. FileCD is also the only program that won't let you write to a DVD-RW disc until it's formatted—a process that takes nearly an hour at 2X.

DISC COPYING

DEDICATED COMPONENTS that automate disc-to-disc or disc-to-image copying are suite staples. But only two of the packages we reviewed—Ahead's Nero Recode 2 and Pinnacle's InstantCopy—shrink the content of a non-copy-protected 9GB, dual-layer disc by reencoding that content to fit onto a standard 4.7GB DVD or onto a 700MB VCD or SVCD.

Nero's Recode 2 takes this a step further by letting you reencode video to its Nero Digital MPEG-4 codec, thereby generating a movie that fits on a single CD and is of much better quality than a VCD (but isn't quite as clean and detailed as the MPEG-2 format that is used on universally accepted commercial DVDs).

BACKUP

THE BETTER SUITES offer time-saving automated backups that can span multiple discs. Ahead's BackItUp and Pinnacle's InstantBackup compare favorably with dedicated backup programs such as Stomp's BackUp MyPC.

We found InstantBackup the simpler of the two, but BackItUp offers more options: differential backups (which include every file changed since your last full backup), full backups, incremental backups, and uncompressed backups that you can restore via Windows Explorer.

Sonic's RecordNow has a fairly useful backup routine, but it doesn't allow true incremental backups, and it lacks a setup wizard. NewSoft and Ulead offer no backup at all, while ArcSoft has only a trial version of NTI's capable Backup Now 3. ■

Jon L. Jacobi is a freelance writer. Thomas Luong is a PC World Test Center development analyst, and Melissa J. Perenson is a PC World associate editor.

DVD COPYING

DVD Duplication: Copying, or Piracy?

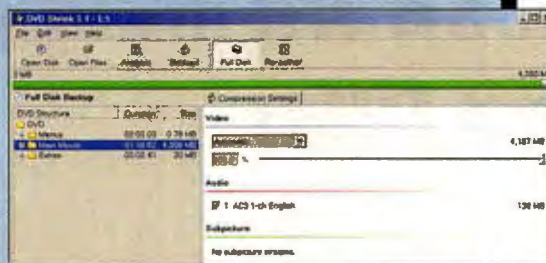
WHEN WE LISTEN to people describe what they want to do with a DVD burner, they usually mention preserving home video, backing up their systems, and burning audio CDs. However, we're also hearing that some prospective users want to make copies of their DVD movies, to play them in different rooms of the house or simply to back them up. Nobody wants to receive a desist-or-get-sued letter, though. Fortunately, you can make DVD copies and still conform to the letter of the law.

Copying so that you can disseminate the duplicates to others—even to friends and family—is illegal. But long-established fair use law condones consumers' right to make personal backups of media they've purchased.

One catch to backing up your movies is that many commercial videos ship on 8.5GB, dual-layer DVD-9 media and can't be copied to a single 4.7GB DVD-R/RW

disc. Dual-layer, 8.5GB-capable burners and media will ship later this year; but in the interim, there's only one solution—shrink the movie. 321 Studios' \$100 DVD X Copy Platinum and the free DVD Shrink (find.pcworld.com/40727) do this automatically, as do programs like Ahead's Nero Recode 2 (a component of Nero 6 Ultra Edition), InterVideo's \$50 DVD Copy Gold, Pinnacle Systems' Instant CD/DVD Copy (included in Pinnacle Instant CD/DVD 8, or sold separately for \$30).

But you don't have to spend a dime to back up your commercial DVDs. Free programs such as SmartRipper and the aforementioned DVD Shrink will copy the content of a DVD to your hard drive, after which you can use the software that ships with your rewritable DVD drive to burn that content back to disc.



DVD SHRINK looks plain but makes copying easy.

antivirus protection:

Can you afford less than the best?

The days of choosing your antivirus program simply because it has a "big name" and a fancy GUI are over! There is no doubt that the two most critical qualities of an antivirus system, whether installed on corporate computer networks or your home computer, are **virus detection** and **scanning speed**. Both are measurable parameters which should never be undervalued in your decision making process. Professional independent test centers provide information about the speed and detection rates of antivirus products using clearly defined testing methodologies involving real live viruses - simulated viruses have no place in serious antivirus testing. In this article we look at how these two performance parameters are measured by the world's leading independent authority on virus prevention, recognition, and removal for more than a decade - Virus Bulletin.

The complete list of known viruses is huge - more than 50000 viruses, with several hundred more are added each month - but many of these viruses are seldom, if ever, encountered outside test labs. The viruses which present the greatest threat to computer users are those which are currently active - the "In the Wild" (ItW) viruses. In addition to the ItW viruses, sample sets containing polymorphic, macro, and standard viruses are used in Virus Bulletin tests. Virus Bulletin grants the coveted VB100% Award to those products which detect 100% of the ItW viruses in both On-demand and On-access tests without producing a false positive alarm.

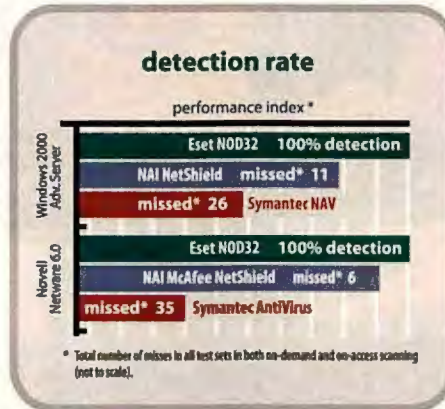
Generally, an antivirus product is expected to be either a good virus detector or a fast scanner - not both. The charts presented here show the results as published in

was more than three times faster than its closest competitor.

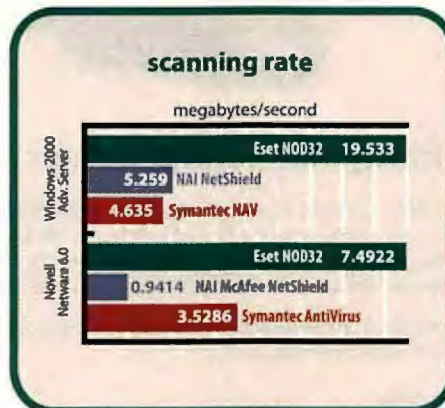
NOD32 is the only antivirus system in the world which has not missed a single ItW virus since its first test by Virus Bulletin in May 1998 - and NOD32 holds the world record of 24 Virus Bulletin 100% Awards as well as being much faster than its competitors!

The importance of making the right selection of antivirus protection is underscored by a striking paradox published in both the ICSA Labs' 2002 Computer Virus Prevalence Survey and PricewaterhouseCooper's 2002 Security Breaches Survey - *the growth in antivirus protection spending and the growth of cost in damages follow the same curve!* The ICSA report states, "The global infection rate calculated from surveys of 1996 through 2001 continued a significant annual growth rate of approximately 20 encounters per month per 1000 PCs for each year in that period." According to the PWC survey, "Viruses caused the most damage, and the vast majority of UK businesses have antivirus software in place to combat this threat."

Clearly, unless you are willing to jeopardize your business or personal data and your time and money by becoming a victim of the next virus attack, questions about the quality of the antivirus system you install on your computers must be asked and answered. Virus Bulletin's test results provide an excellent guide when searching for the best solution for your antivirus needs. Can you afford less than the best?



Information source: Virus Bulletin 8/2003, 11/2002 Detection Rate†



Information source: Virus Bulletin 8/2003, 11/2002 Hard Disk Scan Rate (executables)†

Virus Bulletin's November 2002 and August 2003 Comparative Test Reviews. Not only did NOD32 achieve a "clean sweep" of 100% detection of every virus in every test set - its scanning rate of the executable files on the hard disk

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—The Wall Street Journal, 11/6/2003



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LOCK DOWN YOUR PC



**Hackers.
Spammers.
Even rogue
coworkers
and employees.**

How can you keep the bad guys out and the good data in? Safeguard your system's perimeter with these 29 beyond-the-basics security steps. ►

By Scott Spanbauer

ILLUSTRATIONS BY
TAVIS COBURN

1 Physical Security



EVEN IF YOU ADOPT the best encryption schemes, employ the strongest passwords, and implement the toughest security policies on your PC, an insider—a coworker, a contract employee, or even a family member—can still steal information right out from under your nose if you don't protect the physical integrity of the PC itself and turn off some settings that let an insider

bypass your stringent software security.

How bad is the insider threat? Pretty bad, according to the FBI and the Computer Security Institute. In their 2003 Computer Crime and Security Survey, a poll of top corporate IT managers, 45 percent of the companies reported unauthorized access of data by insiders. What's worse, insiders are harder to detect and repel than some anonymous hacker ping-ponging your firewall.

Boot-proof it: Your Windows password may be 26 characters long, with letters, numbers, and special characters—but if an intruder can read your hard drive without having to boot up Windows, what good will it do you? Armed with a freely available, custom boot floppy or CD, a knowledgeable snoop can access your digital goods without ever entering Windows. To prevent this, use the system BIOS to disable boot devices other than the hard disk (or, if that's not possible, select the hard disk as the first boot

device). For computers located in hard-to-protect public areas, consider removing floppy and CD/DVD drives, and disabling or removing USB and FireWire ports, to prevent people from booting the PC with a Linux disc, iPod, flash memory USB drive, or FireWire hard disk.

Password-protect the BIOS: Most types of BIOS let you create a user password that must be entered thereafter to permit the system to start up. If the

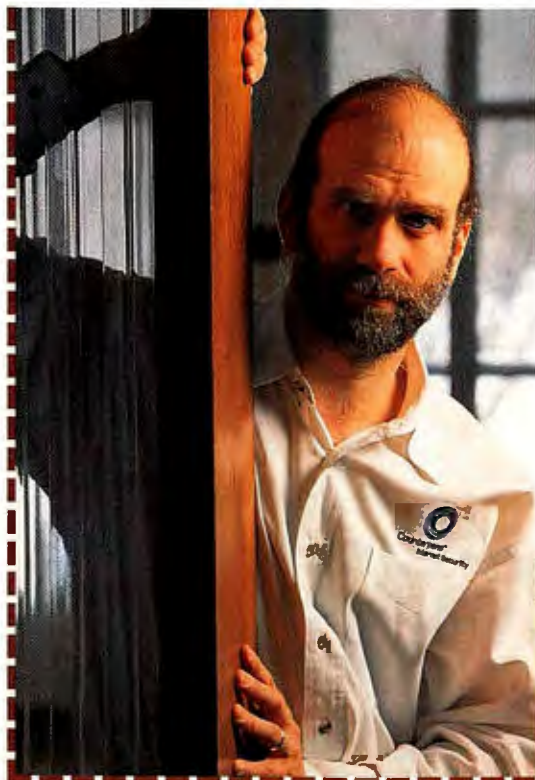
BIOS supports it, an administrator password will prevent intruders from changing your BIOS settings (including the boot password). To get started, check your system's online or printed documentation to find out how to enter the BIOS setup program. In most cases, you'll need to reboot and then press <Delete>, <Esc>, <F1>, or another key or key combination to enter the BIOS setup utility. (Newer computers may come with a configuration program that lets you modify BIOS settings from within Windows.) Once in the program, look for a security or password section; then simply follow the on-screen prompts, enter the password, save the new settings, and restart the system.

Two important warnings: First, write down this password (carefully—it's often case-sensitive) someplace where you'll be able to find it but others won't.

Second, don't assume that a BIOS password will stop everyone. Some systems accept "master" passwords, lists of which appear on the Web. Holding down certain keys or mouse buttons will sidestep password security on other models.

And anyone with the opportunity to open the system's case can clear the passwords by moving a jumper on the motherboard, or by disconnecting the battery that powers the BIOS settings' memory chip. If you're worried about that happening, get a lock for the case itself.

Eliminate data to reduce risk: Is the value of your data so high that its loss or destruction would be a calamity? Are you keeping a supersensitive file on your laptop unencrypted, and carrying it to out-of-town business meetings? If you have no pressing need to carry that valuable stuff



Bruce Schneier, CTO, Counterpane Internet Security

"Keep your laptop and PDA with you at all times, like a wallet or purse. Regularly purge unneeded files from it, and encrypt the rest."

around with you, stick it on your file server (or on a CD) and delete the sensitive documents from your hard drive today.

Shackle that laptop: Do you and your notebook spend hours in libraries, coffee shops, airports, hotel rooms, and other public or semipublic places? Depending on where you are, leaving your laptop unattended falls somewhere between risky and just plain nuts.

Cable locks deter out-in-public, broad-daylight thefts (but not in private places, like your hotel room; bolt cutters slice through cables like butter). Most laptops, some desktop PCs, and even some flat-panel monitors are designed with standard cable-lock slots. Just be sure to wrap the cable around something substantial and escape-proof—unless it's bolted to the floor, a straight table leg won't do. The 6.5-foot Targus Defcon CL lock sells for less than \$30 (street), and Kensington's \$43 (street) MicroSaver Guaranteed Notebook Replacement lock offers theft reimbursement of up to \$1500 if someone steals your locked laptop.

Go biometric: Ready to go all James



BIOS PASSWORDS, accessed through your PC's setup utility, prevent unauthorized people from bypassing Windows security. Some newer BIOS utilities let you create one password for logging in to the computer and another for making changes to the BIOS.

Bond on your coworkers? Consider using a biometric device, such as a fingerprint reader. Many biometric devices include password manager software to keep track of passwords for networks, Web sites, and even other applications. For instance, the Fellowes Secure Touch Mouse (\$70 list, www.fellowes.com) combines a biometric fingerprint scanner with Omnipass password management and encryp-

tion software from Softex. After training either device with your fingerprint, you will be able to log in to Web sites or Windows, or encrypt and decrypt files and folders, with merely the press of a finger.

PC, phone home: If someone manages to swipe your PC or laptop despite all your precautions, you stand a chance of getting your machine back if

you've installed tracing software on it. Programs like Absolute Software's ComputracePlus (\$50 per year) and ZTrace Technologies' ZTrace Gold (also \$50 per year) lurk invisibly, checking in with the vendor's tracking servers whenever the computer is connected to the Internet. When you report the computer stolen, the software vendor can help authorities locate the laptop and the thief.

2 Software Security



ONCE YOU HAVE the physical stuff licked, your software—both the operating system and the applications that you run—need to be tightened up to prevent break-ins, data theft, mischief, or destruction. Your first

mission: Plug the innumerable gaping security holes that many software vendors leave open by default. But securing your software doesn't stop there. You should also take advantage of optional features, like password protection, that can prevent casual to moderately determined snoops from ruining your day.

Always log in with a password: When you log in to a Windows 2000 or XP computer, you can make it very difficult for another person who uses that computer to access your files. By comparison, Windows 9x and Me passwords are laughably easy to bypass. But there's a big problem: No Windows operating system requires you to use a password at all. In fact, by default, Windows 2000 and XP Home Edition create user accounts without passwords and log you in automatically, even

when those accounts belong to the all-powerful administrator group. In the absence of an account password, anyone strolling by the PC can take it over, create a password that keeps you out, or establish a passworded account for their own use. Blank passwords also make your system more vulnerable to Internet hacks.

To create a password for your account in Windows 2000, open Control Panel (Start•Settings•Control Panel), double-click *Users and Passwords*, and fill in the check box labeled *Users must enter a username and password to use this computer*. Next, press <Ctrl>-<Alt>-, and click the *Change Password* button. If you haven't created a password before, the 'Old Password' field will be grayed out; otherwise, enter your old and new passwords in the required fields, and click OK. In ►

FEATURES COMPARISON

ARE ALTERNATIVE OSs MORE SECURE THAN WINDOWS?

WE OFTEN HEAR THAT other operating systems are more secure than Windows, but all three major OSs offer at least basic security out of the box. Nevertheless, Windows XP's popularity is its Achilles' heel: Malicious code writers virtually ignore Linux and Mac OS X, targeting their malware at Windows.

OS	Pros	Cons
Windows XP Professional	Secure user log-in; user-level file access controls; file encryption. Includes a very basic firewall. Automatic, semiautomatic, and manual system updates. Many commercial and free firewall and antivirus products.	Firewall limited: Blocks only incoming connections and is not enabled by default (will change in SP2). Known flaws patched sometimes in days, sometimes in months. High volume of viruses and worms specifically target the OS.
Linux (2.4 kernel)	Secure user log-in; user-level file access controls; file encryption. Bidirectional firewall. Automatic, semiautomatic, and manual system updates in some distributions. Many commercial and free firewalls. Antivirus rarely needed. Security flaws almost always patched within days of discovery.	File encryption requires expert configuration. Firewall demands expert configuration in some distributions and is not enabled by default in most distributions.
Mac OS X	Secure user log-in; user-level file access controls; drag-and-drop file encryption. Bidirectional firewall. Semiautomatic and manual system updates. Many firewall and antivirus products. Fewer viruses and worms than Windows.	GUI-accessible firewall blocks only incoming connections and is not enabled by default. Bidirectional firewall configuration requires manual configuration or third-party utilities. Known flaws patched in days or weeks.

Windows XP, open the User Accounts Control Panel, select the account that you want to protect with a password, and click the *Create a password* button.

Always protect the administrator: We discussed this last month in the "Safety First" section of "76 Ways to Get More Out of Windows" (find.pcworld.com/40889), but one point is worth emphasizing: The most important account to protect with a password is the administrator account. Simply renaming that account offers little protection, and you should log on to the administrator account only to perform system upgrades, install software, or configure hardware.

Choose a strong password: You know the drill: Passwords should never be names, dates, or words from the dictionary, and they should always include upper- and lowercase letters, numbers, and at least one special character—the ones on the keys in the number row work great. But how do you keep track of a bunch of strong passwords? You can use a biometric device that comes with a

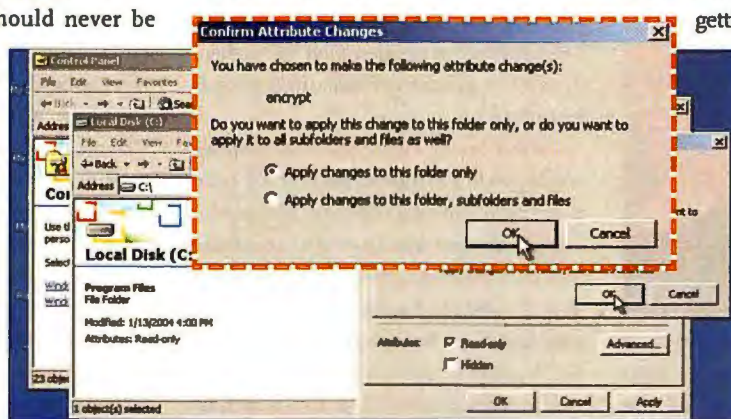
password manager (see "Go biometric" on page 105), or you can resort to a sophisticated method of choosing and using passwords, as discussed in the October 2003 *Internet Tips* column (find.pcworld.com/40886).

If you need a portable way to make and keep track of lots of passwords, check out the EBP Lite Password Manager (\$65, available from www.mandylionlabs.com), a key chain-size password generator and storage device that looks like a high-end car alarm remote. The password manager stores passwords for up to 20 different accounts, and can even remind you when it's time to change the passwords for your most sensitive accounts.

Lock it when you leave: If you step away from your computer for a minute, what's to keep someone else from stepping in? Since you have a good password, put it to use by logging off when you go to lunch or to the loo (choose *Start>Shutdown*, then 'Log off' username' in Windows 2000; choose *Start>Log Off* in Windows XP). For a handy automatic log-off, right-click the Windows desktop, choose *Properties*, and click the *Screen Saver* tab. In Windows 2000, choose a screen saver, check *Password protected*, and click OK. In Windows XP, specify a reasonably short time-out period in the *Wait* field (3 to 5 minutes suits some people, but 15 minutes is a reasonable compromise if you don't like

getting timed out while you're just sitting there), check *On resume, password protect*, and click OK.

Encrypt your files, if you must: If you store sensitive data on your PC, consider encrypting your files—especially if the PC is portable. Windows 2000 and XP Professional (but not XP Home) include built-in encryption for files and folders; alternatively, you can purchase third-party



WINDOWS 2000 AND XP Professional have a file and folder encryption feature that makes your sensitive documents unreadable even if someone manages to copy them.

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file encryption software. Encryption makes it much harder for someone to boot your computer with an install or recovery disc, decrypt your passwords, or take control of Windows.

To encrypt a folder in Windows 2000 or XP Professional, right-click it in Explorer, choose *Properties*, click the *Advanced* button, fill in the *Encrypt contents to secure data* check box, and click *OK* twice. Click *OK* again in the next dialog box to accept the default choice, *Apply changes to the selected items, subfolders, and files*.

Now the caveats: Encrypting your whole drive is time-consuming, may retard system performance, increases the likelihood that you'll lose access to your files, and may be overkill unless you have something really important to protect. So don't encrypt just for the thrill of it.

Password-protect Outlook's in-box and identities: Some of the most sensitive information on your PC lurks in your in-box and out-box. Fortunately, a few programs allow you to encrypt and password-protect your missives.

In Outlook 2003 and 2002, choose *File>Data File Management*, click *Settings* and then *Change Password*, enter a password in the 'New password' and 'Verify password' fields, and click *OK*. Thereafter, only someone who knows this password will be able to look at previously received messages stored in your in-box, out-box, or other mail folders.

If you use Outlook Express, you can password-protect only your e-mail identity (a file that contains your e-mail account user name and password) to thwart a thief who might want to steal your account information. This prevents people from being able to read your new mail, but serious snoops can still import your messages into another program. Choose *File IdentitiesManage Identities*, select the identity to protect, click *Properties*, check *Require a password*, click *OK*, and then click *Close*.

Auto-update key software: No matter how hard you try to protect yourself, OS and application security flaws can victimize you. There are some good arguments



Lance Spitzner, founder of the Honeynet Project

"Don't use Microsoft's browser or e-mail client, if you can get away with it—when bad boys release an exploit, they go for the biggest bang for their buck."

against allowing programs to download and install updates automatically; if a patch causes an incompatibility with a critical program or operating system component, for instance, you could end up in hot water. But for most people, the risk is probably worth taking. The alternative could be finding your computer hacked into via a software hole whose patch was released last week.

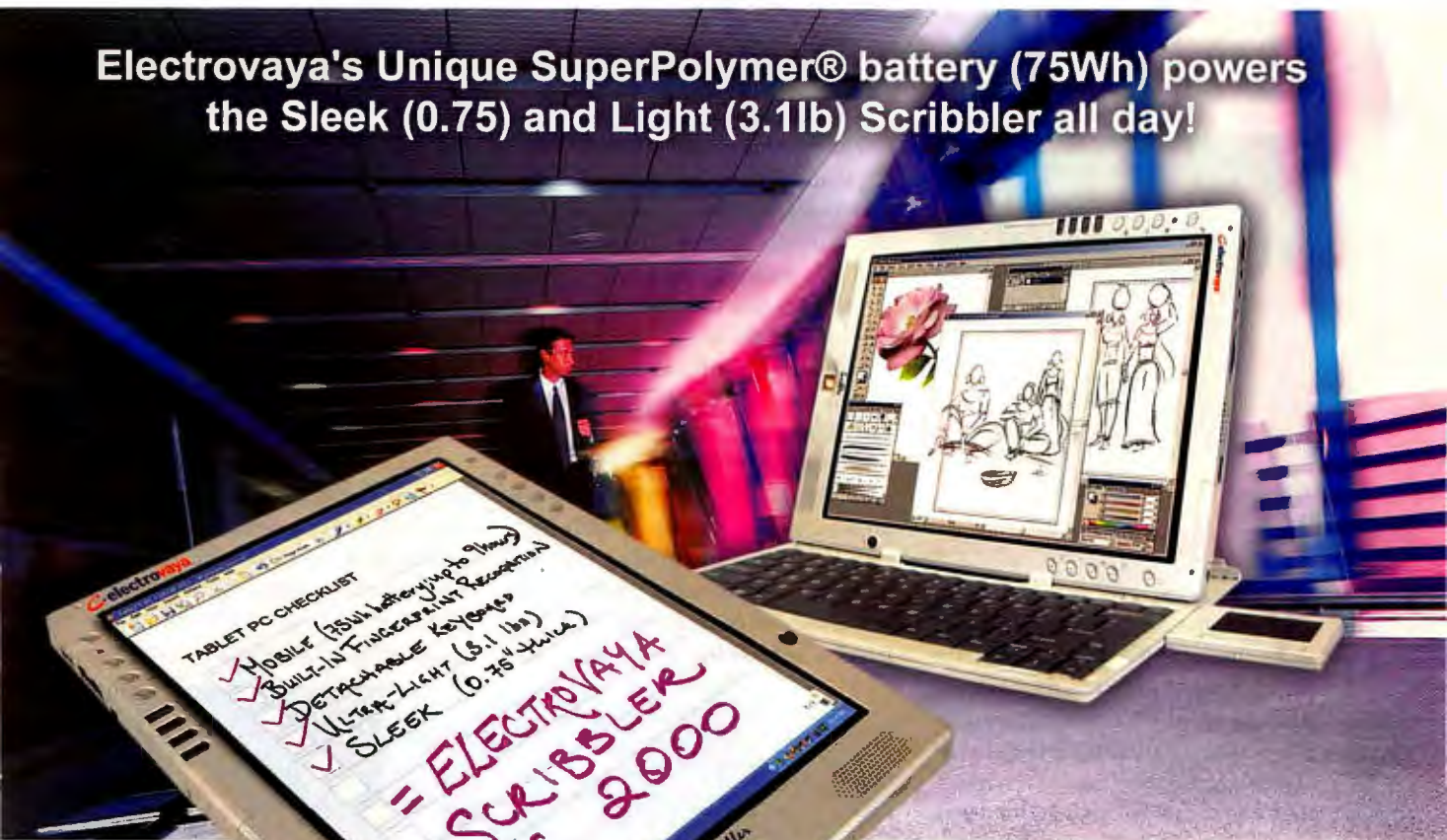
Windows 2000 systems with Service Pack 3 installed can receive automatic updates, but enabling the feature is a bit complicated. Microsoft explains it painstakingly (find.pcworld.com/40892). To arrange to receive automatic updates in

Windows XP, right-click *My Computer*, choose *Properties*, select the *Automatic Updates* tab, check *Keep my computer up to date*, select one of the three options for downloading and installing updates under *Settings*, and click *OK*.

Your antivirus program is much likelier to stop the latest viruses, worms, and Trojan horses if it has the most recent virus signature databases. Many, though not all, antivirus programs will download and install their program and database updates automatically by default. Dig into your program's settings (and documentation) to make sure it's set to deliver maximum protection. ►

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3 Network Defense



YOU MEET THE BIGGEST threat to your computer when you connect it to the Internet. Given the huge volume of well-crafted worms and infectious spam, it's a wonder more computers haven't turned into zombies obeying the commands of malicious hackers. Here's how to prevent your PC from joining the digital undead.

Put a firewall on every PC: Regardless of its connection type—dial-up, broadband, or wireless—any computer that connects to the Internet needs a firewall to protect it from attacks over the network and rogue programs sending data out. In fact, your best bet is to use two firewalls: an external, hardware firewall, such as the kind built into most wired and wireless routers (and some cable or DSL modems); and a software firewall that runs on your PC, watching your applications.

In addition to blocking unsolicited incoming and outgoing traffic, hardware firewalls provide Network Address Translation. NAT, in combination with the router's built-in Dynamic Host Control Protocol (DHCP) server, masks your true IP address from computers outside your local network, making your PC nearly impossible to target. Because hardware firewalls are the first line of defense against incoming attacks, properly configuring them in accordance with the manufacturer's documentation is crucial. In particular, you have to create a strong

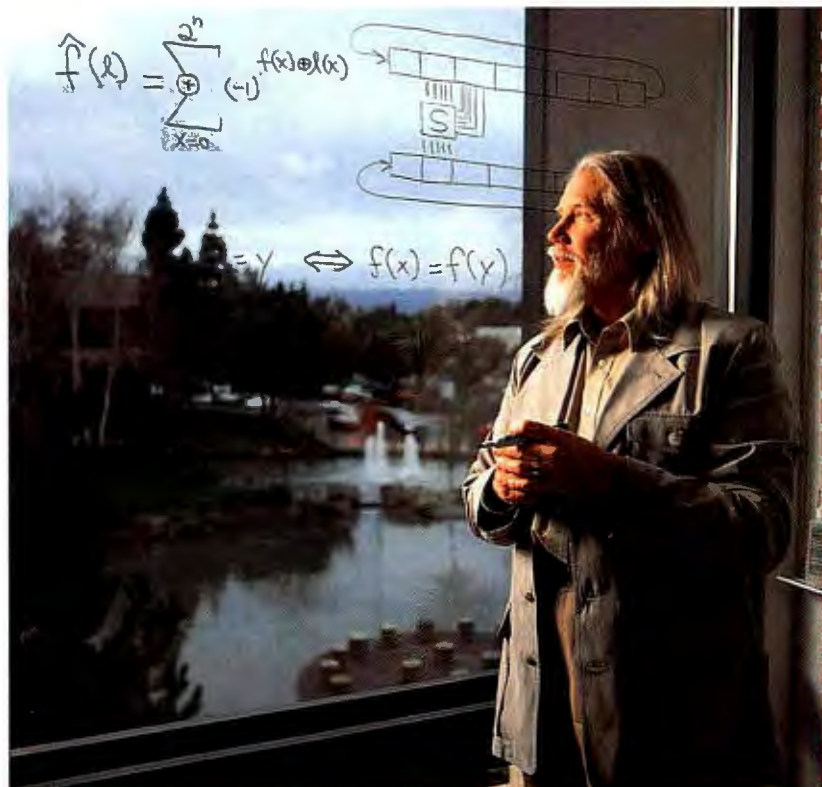
administrator password to prevent someone from taking control of your firewall.

Software firewalls protect you from inside threats—viruses, Trojan horses, and spyware—that may come to reside on your PC. For more details on both types of firewalls, including a list of four free software firewalls, see the December 2003 *Internet Tips* column (find.pcworld.com/40901).

Spurn spyware: If new programs unexpectedly show up in your taskbar or browser toolbar, you've probably been stung by some form of adware or spyware. To avoid spyware, watch out for unwanted components while installing freebies, and use free anti-spyware utili-

ties like PepiMK Software's Spybot Search & Destroy (find.pcworld.com/28403) and Lavasoft's Ad-aware (find.pcworld.com/37322). Commercial key-logging software—spyware installed on your PC by a boss, spouse, or other snoop when you're not around—is harder to detect and remove. See this month's *Internet Tips*, page 160, for advice on tracking it down and removing it.

Boost wireless network security: Wireless networks are a wonderful innovation, but they're also a security nightmare because they have no boundaries. Anybody who lives, walks, or drives within radio range of your wireless hub can probably hitchhike on your wireless ►



Whitfield Diffie, Chief Security Officer, Sun Microsystems

"To protect yourself fully, the right thing to do is to replace Windows with a Unix-like operating system, like Linux, Mac OS, or Solaris."

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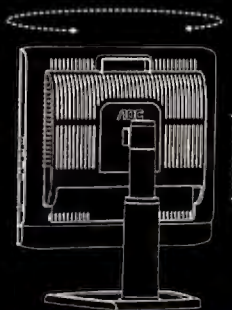
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LAN, if you never change its default settings. Here are a few basic steps for safer wireless networking:

- Set your wireless access point or router so it won't broadcast its SSID (the access point's name). Most access points are set by default to send a short announcement every few seconds to any computer within range. If you turn yours off, passers-by might bypass your Wi-Fi.
- Change the default SSID. Even if your router isn't broadcasting its SSID, the default ones used by major manufacturers are common knowledge to people experienced at borrowing connections

from others. Changing even one character of this name makes it harder for unauthorized users to tap into your broadband.

- Encrypt your connection with WPA (the newer, more secure method) or WEP (an older, less secure, but still useful scheme). The toughest level of protection your access point can handle, and a hard-to-guess passphrase, will stop all but the most determined data snoops. If your access point or router lacks WPA, you might be able to get it with a firmware upgrade from the manufacturer.
- Enable media access control filtering. Each wired or Wi-Fi network card has a

unique MAC address. You can set your access point to grant wireless network access only to computers with MAC addresses you specify (see the April 2003 *Internet Tips* at find.pcworld.com/40919 for more MAC filtering advice).

- Be careful when you use public wireless networks. Other users can easily capture your passwords when you check your e-mail, and they can also read e-mail messages and other data you transmit or receive. If your office has a VPN, by all means use it whenever you're on a public Wi-Fi network. If a VPN isn't possible, ask your ISP about secure mail server ►

IN-BOX IMMUNIZATION

Kill **Viruses** Before They Get You

OF ALL THE THREATS to your PC's security, viruses (and their kin, Trojan horses and worms) seem the scariest. Using an up-to-date antivirus program will prevent many virus attacks, but if a virus hits before you update, you can still get infected and spread that infection to others. To protect yourself from unknown attacks, you need to anticipate the hackers and know how to lock down the part of your computer where the next virus will strike—before the attack happens. Here are a few ways to do just that.



(find.pcworld.com/40910) once a week—patches sometimes show up there days (and occasionally weeks or months) before they get into Windows Update. Programs that lack automatic updating may still offer menu commands that check for updates.

Sign up for e-mail alerts: The United States government's Computer Emergency Readiness Team sends out missives the instant it hears about serious threats to the nation's computers. You don't have to be a systems administrator to understand them. You can browse the alert list (find.pcworld.com/40916) at your leisure, or sign up to get e-mail notification

Back it up: The MyDoom worm wiggled onto hundreds of thousands of computers, but fortunately it didn't destroy or steal files. If it had, you would have been really glad that you backed up your important data before it struck. The next worm may not be so benign. See "Backing Up to Happiness," part of the February issue's "The Trouble-Free PC" (find.pcworld.com/40907), for a review of reliable backup utilities.

Install all critical updates ASAP: The Blaster worm hit only people who hadn't installed a patch issued months earlier. Setting Windows and your applications to update automatically is best for most people (see "Auto-update key software" on page 107). To be really thorough, however, glance at Microsoft's Security Bulletins

the minute the CERT learns of new viruses, hack attacks, online scams, or other Net threats.

Test for flaws: Once you've rigged your PC for battle, check its readiness by using one or more free security scanners. Microsoft's Baseline Security Scanner (find.pcworld.com/40913) probes for missing security updates and service packs, weak passwords, and misconfigured security zone settings in Microsoft Office, Outlook, and Internet Explorer. Steve Gibson's Shields Up site (grc.com) scans your PC for open network ports and running services, looks for browser vulnerabilities, and determines whether Windows XP's spam-prone Messenger service is running.

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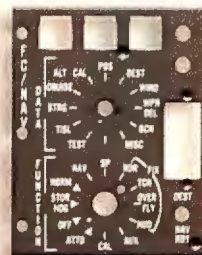


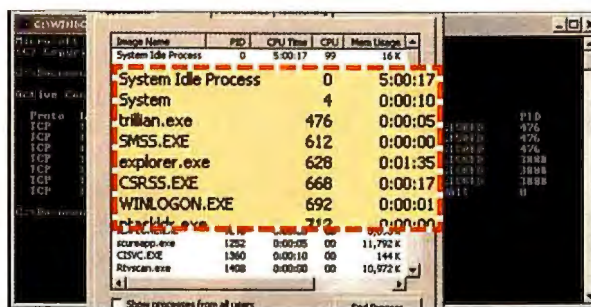
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UNTIL WINDOWS XP, WITHOUT a special utility you couldn't figure out which programs were communicating with other computers over the Internet. Now you can use the command line and Task Manager.

log-in options, or use a secure Web-based e-mail interface. If you have Windows file sharing turned on, your café co-denizens can browse those shared files and folders: To prevent this, you'll need to disable file sharing, remove the shared resources, or block access with a software firewall.

Browse more securely: Internet Explorer is the world's most widely used Web browser. Advertisers, spammers, and con artists have learned to take full advantage of its ability to shower you with pop-up ads and "helpers" that hijack your home page, install adware, or steal data.

You can block many of these threats by boosting IE's security and refusing to install the ActiveX controls that Web sites ask you to download (see the September 2003 *Internet Tips* at find.pcworld.com/40904 for specific steps to tighten IE's security settings). Better yet: Switch to an alternative browser that doesn't support ActiveX controls, such as Mozilla.org's Mozilla (www.mozilla.org) or Opera Software's Opera (www.opera.com).

Don't mess with spam: Your e-mail inbox is probably the most dangerous thing on your computer, harboring viruses, worms, and phishing attacks—messages designed to trick you into revealing passwords, credit card numbers, and other personal information. Here are a couple of ways to reduce your vulnerability:

- Use an antispyware program, such as the *PC World* Best Buy, Sunbelt Software's IHateSpam for Outlook (find.pcworld.com/37625),

from masquerading as safe file types. In the Control Panel, open *Folder Options*, click the *View* tab, uncheck *Hide extensions for known file types* under 'Advanced settings', and click *OK*.

Figure out which program is blabbing:

Even if your computer seems not to be doing anything, you might see modem lights blinking. Often this is just because an automated process is downloading software updates or performing some other housekeeping procedure. But occasionally, it can indicate that your PC has been taken over by an outsider, and is communicating with its digital overlord.

With Windows XP, you can nail down the programs and find out who they're talking to. While connected to the Internet, choose *Start>Run*, enter *cmd* in the 'Open' field, click *OK*, and then

Process	Protocol	Local Address	Remote Address	State
SVCHOST.EXE:1084	TCP	ABRANDT-8300:1025	ABRANDT-8300:0	LISTENING
SVCHOST.EXE:1200	UDP	ABRANDT-8300:1900	**	
SVCHOST.EXE:1200	UDP	abrandt-8300:1900	**	
System:4	TCP	abrandt-8300:2357	ABRANDT-8300:0	LISTENING
nnotes.exe:3872	TCP	ABRANDT-8300:2984	ABRANDT-8300:0	LISTENING
nnotes.exe:3872	TCP	abrandt-8300:2984	pcwhub.pcworld.com:1352	ESTABLISHED
[System Process]:0	TCP	abrandt-8300:2990	pcw3.pcworld.com:netbios...	TIME_WAIT
SVCHOST.EXE:1200	TCP	ABRANDT-8300:5000	ABRANDT-8300:0	LISTENING
SVCHOST.EXE:988	TCP	ABRANDT-8300:988	ABRANDT-8300:0	LISTENING

enter the command *netstat -no*; in response, Windows will list all the active network connections, including your IP address, the destination IP address, and the process identifier (PID) number of the program on your computer that is making the connection. Every running program, even if it is running in the background, gets a unique PID. (In case you're curious, the address 127.0.0.1,

pcworld.com/37625), to block most spam.

- Never launch a file that's attached to an e-mail message unless you are absolutely sure it's safe.
- Configure Windows to keep virus-bearing attachments

which shows up frequently in these lists, just means "your PC".)

In the screen shot at left, one program, using PID number 476, has connections open to three different computers. To figure out which program is associated with a particular PID, you need to see the *Processes* list in Task Manager (press *<Ctrl>+<Alt>+* and click *Task Manager*). Select the *Processes* tab. Scanning down the PID column for the system in the screen shot reveals that PID 476 is none other than the IM software Trillian (whew). Sysinternals' free TCPView utility (find.pcworld.com/40895) will show you the same thing in one handy utility, as will most firewalls' application logs.

If you see a program whose name you don't recognize, don't panic: Many Windows components have oddball names. Check the WinTasks Process Library (find.pcworld.com/40898), or look up the file name on Google; if you discover a worm or Trojan horse, update your antivirus software, cut off your online and network connections (pull the cord out of the back of your PC if you have to), and do the most thorough scan possible. In an

TCPView - Sysinternals: www.sysinternals.com

File Options Process View Help

Process	Protocol	Local Address	Remote Address	State
SVCHOST.EXE:1084	TCP	ABRANDT-8300:1025	ABRANDT-8300:0	LISTENING
SVCHOST.EXE:1200	UDP	ABRANDT-8300:1900	**	
SVCHOST.EXE:1200	UDP	abrandt-8300:1900	**	
System:4	TCP	abrandt-8300:2357	ABRANDT-8300:0	LISTENING
nnotes.exe:3872	TCP	ABRANDT-8300:2984	ABRANDT-8300:0	LISTENING
nnotes.exe:3872	TCP	abrandt-8300:2984	pcwhub.pcworld.com:1352	ESTABLISHED
[System Process]:0	TCP	abrandt-8300:2990	pcw3.pcworld.com:netbios...	TIME_WAIT
SVCHOST.EXE:1200	TCP	ABRANDT-8300:5000	ABRANDT-8300:0	LISTENING
SVCHOST.EXE:988	TCP	ABRANDT-8300:988	ABRANDT-8300:0	LISTENING

PROCESS-MONITORING UTILITIES, such as the freeware TCPView from Sysinternals, can show you which programs have made connections to the Internet, and which are just listening for them.

extremely rare, worst-case scenario, you may not be able to remove the malware; you might have to format your hard drive and reinstall Windows from scratch. ■

Scott Spanbauer is a contributing editor for *PC World*, and writes the monthly *Internet Tips* column.

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THE CHEAPSKATE'S GUIDE TO PRINTING



You want great-looking
output. You don't want to spend
a fortune on ink and paper.
These tips and tricks can help. ►

BY MELISSA RIOFRIO



WHETHER YOUR PRINTER costs \$40 or \$400, the purchase price is only the first item on your new list of ongoing printing expenses. Over time, buying the ink or toner and acquiring media (paper, envelopes, transparencies) will very likely make a far bigger impact on your wallet. These costs will vary depending on what you print, how much you print, and what kind of media you use. Some expenses are unavoidable: Printing an 8-by-10 photo on premium, glossy paper will never be dirt cheap. Shaving cents off of other kinds of printing, however, involves just a little thought, effort, and advance planning. Read on for tips on how to choose and use your printer wisely—or perhaps not at all in some cases.



The ink jet that costs the least may not be the cheapest to own. Ink expenses can drive your total costs above that of a more expensive printer.

KNOW BEFORE YOU BUY

SAVING MONEY ON PRINTING starts (ideally) before you buy the printer. Before you begin researching new models, make sure that you'll be getting the best printer for the types of documents you plan to produce. For more on the criteria you should use, see "The Right Printer for the Job" (find.pcworld.com/40373), and read our comparison of pricing versus print quality trade-offs in "The Best and the Cheapest," below. Once you start looking at specific models, make a point of checking the recommended print volume; if you typically print 100 pages a day, for example, don't buy a printer that's rated for 500 pages a month.

TECHNOLOGY FACE-OFF

THE BEST AND THE CHEAPEST

PART OF PRINTING SMART INVOLVES using the right printer for the job. None of the major technologies—monochrome laser, color ink jet, color laser—is perfect for everyone. Below are representative models of each major technology, along with prices and per-page costs (based on industry-standard assumptions of 5 percent coverage per color per page), as well as general text- and photo-quality ratings and best uses.

Color lasers offer the best balance of image quality and consumables cost, but only if your printing volume justifies the hefty purchase price. Ink jets offer low initial costs and the best photo quality, but ink and photo paper costs can rise quickly (photos will often require 100 percent ink coverage per page). Workhorse monochrome lasers are best for offices of any size that want to print just text documents.



This is 5 point text
This is 6 point text
This is 7 point text
This is 8 point text
This is 9 point text
This is 10 point text
This is 11 point text
This is 12 point text



This is 5 point text
This is 6 point text
This is 7 point text
This is 8 point text
This is 9 point text
This is 10 point text
This is 11 point text
This is 12 point text



This is 5 point text
This is 6 point text
This is 7 point text
This is 8 point text
This is 9 point text
This is 10 point text
This is 11 point text
This is 12 point text



Monochrome office laser

Brother HL-5040

- Purchase cost: \$229
- Toner cost per text page: 2 cents
- Toner cost per page of graphics: 6 cents
- Text quality: Outstanding
- Gray-scale images: Fair
- Best for: plain text and rudimentary graphics

Ink jet

HP DeskJet 5150

- Purchase cost: \$100
- Ink cost per text page: 4 cents
- Ink cost per color page: 13 cents (cost based on standard inks and default settings on plain paper)
- Text quality: Good
- Photo quality: Outstanding
- Best for: art and photos

Color laser

Samsung CLP-500

- Purchase cost: \$699
- Toner cost per text page: 1.7 cents
- Toner cost per color page: 8.1 cents
- Text quality: Very good
- Color graphics: Good
- Best for: color business documents

How much is that cartridge in the window?

Replacement ink or toner cartridge costs represent a major part of your long-term printing expenses. As we learned when we researched Hewlett-Packard's \$40 Deskjet 3520 (find.pcworld.com/40376), replacing the cartridges can cost as much as buying the printer (see "Pay It Again, Sam: Ink Costs Can Dwarf Printer Prices" on page 118). In general, expect to pay \$10 to \$40 for an ink cartridge, and \$60 or more for a toner cartridge.

But don't judge a cartridge by price alone; its efficiency, or *page yield*—the number of pages it can print—matters just as much. Of course, that figure will vary depending on how much ink you use on a page, but the industry-standard assumption is 5 percent coverage per page for each color. Some companies make yield information available on the Web along with other printer specifications; others will provide it if you ask, either by e-mail or phone.

You can use yield information to calculate per-page costs, which can be useful in determining what your printing costs for different printers would look like over time. Laser printer toner cartridges may cost a lot more than ink jet cartridges, but their higher yields make per-page costs lower.

Some printer manufacturers offer multi-packs of inks, which can knock a few dollars off the price per cartridge. The standard-capacity black ink for Dell's \$79 J740 ink jet, for instance, costs \$30 alone; a two-pack is \$56.

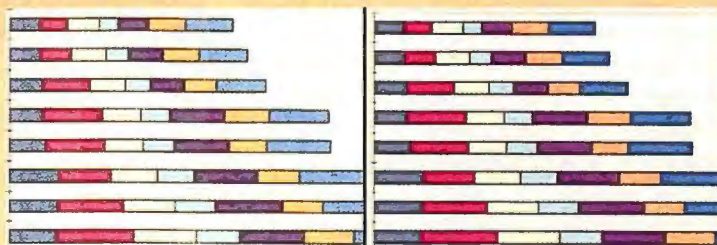
A few colors more: Some ink jet printers produce superior photo quality by using additional colors beyond the usual cyan, magenta, yellow, and black. But all the color cartridges may not come with the printer. For instance, Canon's \$200 i960 printer is bundled with all six of its inks (including Photo Cyan and Photo Magenta), and they cost \$12 each to replace. But HP's \$100 Deskjet 5150 includes only the standard HP 56 black and HP 57 tricolor cartridges (\$20 and \$35, respectively); the HP 58 photo cartridge is a separate, \$25 purchase.

The incredible, shrunken starter cartridge: Many lower-cost laser printers come with starter cartridges that last anywhere from 60 percent to as little as 33 percent as long as a regular cartridge. Granted, if you don't print much, that first cartridge could last you a while; but if you know you'll be printing at least 100 pages per month, either find a printer that comes with a full-size cartridge or factor in the cost of an early replacement. Of course, if you get a great deal on the printer, your overall cost may still be quite affordable.

INK JETS

PRINTING WITH A LIGHT TOUCH

AN EASY WAY TO MAKE INK JET CARTRIDGES last longer is to use your printer's draft-mode setting. This lays down less ink on a page, saving as much as 50 percent on the per-page printing cost. Your pages will look light (see draft, left, and normal samples below from the HP Deskjet 5150), but will be fine for quickly checking layouts or a Web page. Many printers offer a range of ink-saving options for a gradual trade-off between print quality and print speed. —Yardena Arar



The cheapest paper for the job: The heavier, brighter (whiter), or more specialized the paper is, the more it will cost. You'll generally pay as little as a half-cent per page for typical, 20-pound office paper, or as much as a dollar for an 8.5-by-11-inch sheet of glossy photo paper.

Save the pricey stuff for final prints; for everything else, use the cheapest paper you can find. It will affect the print quality from your laser printer minimally, if at all, and it will work fine for producing drafts and other internal documents on your ink jet printer. Third-party brands often cost less per page than the printer manufacturer's media, but test ink jet-specific media on your printer to see if you like the results. You may have to buy a full pack to do this, unfortunately.

Cable not included: Some printer manufacturers save on costs by omitting the USB or parallel cable that you may need to connect the device to your computer. If you can't use the same cable you had for your last printer, shop around: You don't need the expensive models with gold connectors and heavy shielding unless you have a lot of interference in your work area from other devices.

PENNY-SAVING PRINTER SETTINGS

THE PRINTER YOU ALREADY OWN may have money-saving features built into it—simply take a few minutes to delve into its settings.

Sip, don't slurp: Many have a button right up front that sets the printer to draft mode (sometimes called Economode, InkSaver, or the like), ►



Take home discarded pages from the office printer and use them to print drafts and other casual documents on your own printer. Before you print, check for crumpled pages that might misfeed or jam; flatten any pages that are curled; and make sure all sheets are facing the correct way in your printer's input tray.



reducing the ink or toner consumption for everyday documents (see "Printing With a Light Touch" on page 117). Other printers may require or allow you to set draft-mode printing in the driver. To see if yours does, choose *Start•Printers and Faxes* in Windows XP (*Start•Settings•Printers* in Windows 2000). Right-click the icon for your printer and check the menu for *Properties* or an appropriately named option. You may have to search, but you should find a way to set draft printing. Many apps, such as Word or PowerPoint, let you select draft printing; some may be able to print in high-quality mode even when the printer is set for draft mode; check the app's print dialog box.

A utility that can help you save on ink or toner is Strydent Software's \$35 InkSaver (www.strydent.com or www.inksaver.com), which provides you with an intuitive slider for controlling precisely how much ink to use while printing.

Many home users might be better off using an ink jet only when color is required. An inexpensive monochrome laser printer may cost a bit more initially, but lower costs of consumables will quickly make up the difference—and faster print speeds are an added bonus.

Print smaller: For years, presentation pros have printed multiple pages at a reduced size on one sheet of paper. This practice, known in the industry as *n-up printing*, also works well for saving paper. You can access this feature by right-clicking your printer icon and choosing *Printing Preferences*, which brings up a dialog box where you might also find a page-scaling feature that lets you squeeze a legal-size page onto letter-size paper.

Two utilities could help you squeeze more onto a single sheet: The first is the \$50 ClickBook 7 from Blue Squirrel (www.bluesquirrel.com); we lauded version 6 in last year's "Cheap Tweaks" (find.pcworld.com/40382). The other is the \$50 FinePrint 5 from FinePrint Software (www.fineprint.com), a longtime favorite of *Home Office* columnist Steve Bass (see find.pcworld.com/40958).

Both of these products perform a multitude of printing tasks, from n-up printing and docu- ▶

INK JET INK

PAY IT AGAIN. SAM: INK COSTS CAN DWARF PRINTER PRICES

IT'S NO BIG SECRET THAT the ink jet printer business is based on the razor-and-blade economic model: Once you invest in the printer, you're stuck with the ongoing costs of the consumables—in this case, the ink and paper—needed to actually use it. Printer manufacturers rely on such sales to subsidize the relatively low costs of today's ink jets. Does that mean a cheaper printer could wind up costing you more?

To help us find out, the Rochester Institute of Technology's Imaging Products Lab performed page-yield tests on five current ink jets from four major vendors, ranging in price from \$40 (Hewlett-Packard Deskjet 3520) to \$180 (HP Deskjet 6122). Based on those tests and the man-

ufacturers' Web site prices for ink jet cartridges, we calculated ink costs for a page of plain text and a page of text with color graphics, then determined how much you'd spend on the printer and ink (after you'd used up the cartridges that came with the printer) for 500 and 3000 printed pages (half of them with black text only, and half with text and color graphics).

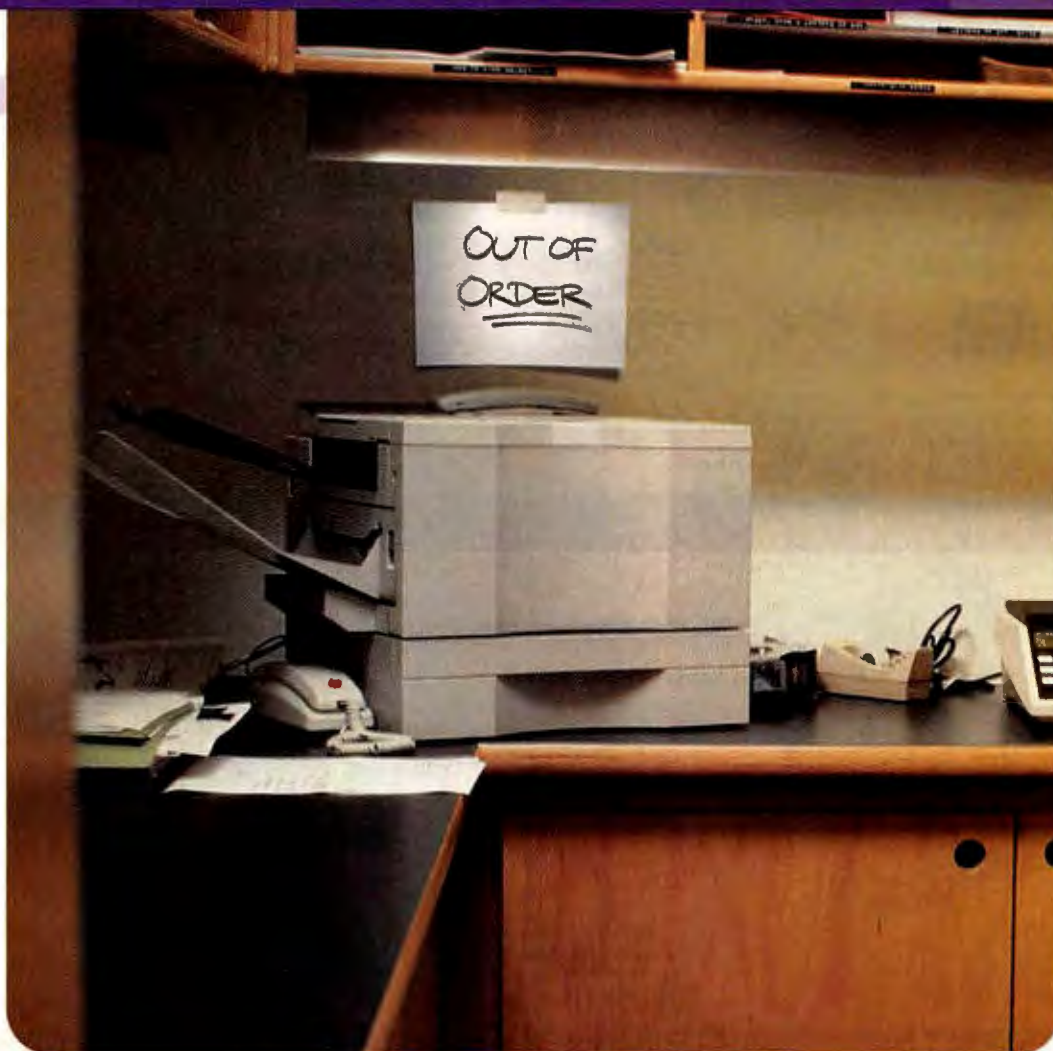
We found that at the 500-page mark (using replacement cartridges), the total cost for each printer ranked in the same order as the printer's purchase price. But after 3000 pages, the total cost for Lexmark's Z605 added up to \$517, a pack-leading figure that belied its \$50 bargain purchase price; the \$130 Canon i560 had the lowest total cost, at \$298.

IPL's tests assume 5 percent coverage per color on an 80-square-inch printing area; ink costs would likely rise more quickly if you print photos. Infrequent printers might wait years to recoup the cost of a more expensive printer that uses cheaper ink. But that printer might also have a lot more features and produce nicer-looking prints—something to think about when you buy your next ink jet. —Yardena Arar

PRINTER	Street price	Ink cost per page ¹		Printer plus ink costs ²	
		Text	Text/graphics	500 pages	3000 pages
Canon i560 Desktop Photo Printer	\$130	2.9 cents	8.3 cents	\$158	\$298
Epson Stylus C84	\$99	6.4 cents	11.2 cents	\$143	\$364
HP Deskjet 3520	\$40	6.3 cents	16.8 cents	\$98	\$387
HP Deskjet 6122	\$180	3.8 cents	10.4 cents	\$215	\$393
Lexmark Z605 Color Jetprinter	\$50	11.0 cents	20.2 cents	\$128	\$517

FOOTNOTES: ¹ Cost-per-page data supplied by the Rochester Institute of Technology's Imaging Products Laboratory. Costs based on manufacturer's Web site price for cartridges and page yields as tested by IPL, assuming 5 percent area coverage per color of a document on an 80-square-inch printed area. Text pages used black ink only; text/graphics pages used all color and black inks. Ink costs for page yields are calculated for replacement cartridges installed after cartridges included in the printer purchase price are used up. ² Ink costs assume half of the pages are text, and the other half are text plus graphics.

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Recommended supplies and accessories:
High Yield Toner Cartridge (CDW 585936, 585938, 585941, 585945)
Lexmark MarkNet N2101e Internal Printer Server (CDW 478840)
Lexmark Additional 1 Yr Extended Onsite Warranty (CDW 205959)

Lexmark C510 Network Bundle² \$749 (CDW 587373)

¹Based on trading in a HP LaserJet 4500 printer in "good" condition; actual trade-in price may vary. Please visit CDW.com/hptradein for a trade-in quote. ²Receive \$100 Okidata mail-in rebate with purchase of the C510; offer ends 5/31/04. ³Receive \$50 Brother mail-in rebate with the purchase of the HL-2700CN; offer ends 6/30/04. ⁴Bundle offer expires 4/30/04. Bundle consists of Lexmark C510 printer (CDW 585935) and Lexmark N4000E External Print Server (CDW 522898). Customer understands that CDW is not the manufacturer of the products purchased by customer hereunder and the only warranties offered are those of the manufacturer, not CDW. All pricing is subject to change. © 2004 CDW Corporation

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ment scaling to print-job management, as well as the creation of layouts for brochures, calendars, greeting cards, business cards, and more.

CHEAPSKATE TRICKS THAT WORK

SOME OF THE BEST ways to control ink, toner, and paper costs are also the easiest.

Duplexing: Cut your paper expenses in half by printing on both sides of the page. Some offices equip their workgroup printers with automatic duplexers, and a few even set duplexing as the default print mode. A handful of personal printers provide automatic duplexing (requiring no manual refeeding of the sheets) as a standard or extra-cost accessory, and some present a handy on-screen guide for turning and ordering the pages. Barring such features, only a patient soul should try manual duplexing for a multipage document.

Do the toner slow dance: If your laser printer software says you're running low on toner, or if you start to see streaks in your printouts, you may still have plenty of toner left—but it's stuck in the cartridge's nooks and crannies. Remove the cartridge from the printer and slowly rock it end-to-end and then to-and-fro a few times. Do not shake it randomly or vigorously. Reinsert the cartridge into your printer. (Check your hands afterwards to make sure you don't soil your clothes with toner.)

DIGITAL PHOTO TIPS

YOU CAN'T PUT A PRICE ON MEMORIES, but printing cherished family photos on an ink jet will definitely cost you. What are your options?

Third-party services: For your highest-resolution, most precious photos, it's probably best to pay the high price for total control over the process from editing to printing. But for everyday shots, letting someone else print the photos (by either uploading your images to an online photo service or dropping off a CD or memory card at a store) is the easiest, and often cheapest, solution—especially for large quantities (see "Outsourcing Photo Printing" on this page).

Find flaws and fix 'em: Whether you've digitized a film photo or downloaded an image from your digital camera, checking for stray thumbs, red-eye, and other flaws before you print will keep you from wasting pricey photo paper. It also pays to preview photos before sending them to a print service; many major services also offer online editing tools. In "Photo Finishers" (find.pcworld.com/40385), our recent roundup of low-cost image editors, Jasc



Using remanufactured ink and toner cartridges may carry some print-quality and archivability risks, but for casual printing it can save money and landfill space.

ONLINE SERVICES

OUTSOURCING PHOTO PRINTING

TIRED OF HIGH INK COSTS FOR PRINTING PHOTOS? Consider using an online photo service instead. They're convenient, and they're cheaper for printing 4-by-6-inch snapshots (though larger photos cost more than if you printed them at home). Among the services we looked at, Wal-Mart's offered the lowest prices.

We researched the costs of printing a 4 by 6 photo and an 8 by 10 photo on several photo service sites and compared them with the costs of printing the same-size photo on two current ink jets, Epson's Stylus C84 and HP's DeskJet 5150. (We based printing costs on vendor data, adjusted where necessary to reflect the assumption that a photo page will be covered 100 percent with ink.)

We also found that it pays to shop around. To avoid shipping fees, use services like Wal-Mart's, which lets you pick up your prints at a local store for free.

SERVICE	Cost per print		Shipping cost ²
	4-by-6-inch photo ¹	8-by-10-inch photo ¹	
Wal-Mart www.walmart.com	\$0.24	\$2.86	\$1.62 ³
Ofoto www.ofoto.com	\$0.29	\$3.99	\$2.49
Shutterfly www.shutterfly.com	\$0.39	\$3.99	\$1.99
Fujifilm.net www.fujifilm.net	\$0.49	\$4.29	\$1.95
PRINTER			
Epson Stylus C84 ⁴	\$0.34	\$1.23	n/a
HP DeskJet 5150 ⁵	\$0.61	\$1.68	n/a

n/a = Not applicable. **FOOTNOTES:** ¹ Service prices are for a single photo at the lowest-quantity rate. ² Lowest-cost method to ship 24 4-by-6-inch prints. ³ No shipping charge if customer picks up prints from a Wal-Mart store. ⁴ Calculations for images printed using Epson's DuraBrite Ink Glossy Photo Paper, Borderless, 4-by-6-inch, 50 sheets (S041734) and DuraBrite Ink Glossy Photo Paper, Letter, 20 sheets (S041731). ⁵ Calculations for images printed using HP's glossy, snapshot, 60-sheet (C7893A) and glossy, letter, 20-sheet (C1846A) photo paper, plus six-ink printing with HP 57 and HP 58 cartridges.

Paint Shop Pro 8 (currently \$82) earned our Best Buy, but we also liked Microsoft Digital Image Pro 9 (\$85) and Adobe Photoshop Elements 2 (\$90).

The best quality is worth the money: When we partnered with the archivability experts at Wilhelm Research (www.wilhelm-research.com) to test and rate ink jet-printed photos for longevity in "The Fade Factor" (find.pcworld.com/40388), we found that the manufacturer's inks and papers generally produce the best-looking, longest-lasting prints. If you want to preserve photos for posterity, you may have to resign yourself to spending a little extra.

Take good care: Who wants to spend money reprinting a photo that's faded or otherwise damaged? Make prints last by taking a few precautions. Henry Wilhelm of Wilhelm Research recommends framing displayed photos under glass ►

and avoiding prolonged exposure to bright light sources. Even mild light exposure may eventually fade a print, however, so just to be safe, Wilhelm also recommends having a second copy in an album. Store redundant copies of your digital image files (in their highest resolution) somewhere safe, too. For more tips, see "How to Print Perfect Photographs" (find.pcworld.com/40505).

BULK INK

FEED THE NEED, CHEAPLY

FOR PEOPLE WHO PRINT hundreds of photos a year and need to maintain complete quality control (an online service won't cut it), a continuous-ink system promises significant cost savings. But it requires a hefty initial investment and several adjustments to how you use your printer. And families, take note: These systems are too delicate to be exposed to curious kids or pets.

Think of a CIS as an intravenous drip for your printer: Large bottles sit in a container next to your printer and administer ink continuously via small hoses into special cartridges. I tried the \$273 Niagara II Continuous Ink Flow System from MediaStreet (www.mediastreet.com) with a 4-ounce set of Enhanced Generations Inks (\$66); NoMore Carts (www.nomorecarts.com) also makes CIS systems that are available at Inkjet Art Solutions (www.inkjetart.com) or Piezography BW (www.piezography.com).

Installing the Niagara II on an Epson Stylus C80 took about 45 minutes. Your printer's lid must remain propped up permanently to allow for the line feeds, exposing the printer's guts to kids, pets, dust, and other elements. I had to clean the printhead and nozzle eight times to get the inks flowing properly.

The text and photo samples I printed were only slightly inferior in quality to identical samples printed using Epson DuraBrite inks and media. Archivability comparisons are more difficult. Ink-longevity experts at the Wilhelm Research Institute project that the DuraBrite inks will last up to 92 years when displayed; however, Wilhelm has not tested current Enhanced Generations inks.

But the ink cost savings can be considerable. Once you're buying only 4-ounce refills, you're paying just \$4.11 per ounce—and larger bottles (up to 32 ounces) offer greater savings. Epson doesn't say how much ink its cartridges hold, but using volume estimates from a manufacturer of Epson-compatible cartridges, we estimated that the ink in an \$11.40 Epson color cartridge costs about \$40.64 per ounce, while the ink in a \$31.35 black Epson cartridge costs \$63.33 per ounce. Epson's prices are no more astronomical than other printer vendors' are, but they're higher than those of MediaStreet and most third-party suppliers.



MEDIASTREET'S continuous ink systems save money, but can be tricky to set up.

TAKING A CHANCE ON CHEAP

THE STICKER SHOCK from replacing your first ink or toner cartridge naturally leads to a search for cheaper alternatives, such as third-party cartridges or refill kits. But proceed with caution.

When we tested several third-party inks last fall (see "Cheap Ink Probed," find.pcworld.com/40391), we found that they varied widely in print quality and were uniformly poor in archivability. Ink refill kits can get messy, and in our tests the print quality was mediocre at best. Continuous-ink systems—intravenous hookups from a printer to big bottles of ink—save money, but they require a large initial investment and involve other drawbacks (see "Feed the Need, Cheaply," at left).

However, Nabil Nasr, director of the Center for Integrated Manufacturing Studies at the Rochester (New York) Institute of Technology, says some third-party products are worthy of consideration. RIT, which ran yield tests for this story (see "Pay It Again, Sam," on page 118), works with printer manufacturers and third-party vendors to develop better ways to remanufacture, reuse, and recycle printer supplies. Nasr says some third-party inks have fared well in RIT's archivability tests; he recommends going with a known brand from a company that tests and guarantees its products. Staples, for example, backs its remanufactured ink and toner cartridges with a promise to pay for any damage caused by a defective cartridge.

KNOW MORE, SAVE MORE

PRINTER VENDORS and computer stores offer little guidance on pennywise printing (see "Irate Over Ink" find.pcworld.com/40394). Educate yourself and experiment. Visit newsgroups—try comp.peripherals.printer (find.pcworld.com/40787), comp.laser-printers (find.pcworld.com/40784), or comp.peripherals.printers (find.pcworld.com/40790)—but exercise caution in trying out home remedies. Regardless, if you stay aware of all of your printing options, your budget will thank you. ■

Melissa Riofrio was the first editor of PC World's Top 10 Printers. Yardeno Arar is a senior editor for PC World. Special thanks to Jim Aspinwall, Gary Funk, Robert Luhn, and Rick Scheerer.

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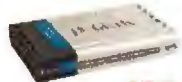


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EDITED BY ALAN STAFFORD

BEYOND THE DIAL TONE

FROM PHOTO SHARING TO INSTANT MESSAGING, NEW CELL-PHONE SERVICES OFFER FAR MORE THAN VOICE CALLS. WE RATE YOUR OPTIONS AND IDENTIFY THE GLITCHES. **BY ANNE KANDRA**

REMEMBER WHEN cell phones were all talk and no action?

These days you can instant-message a group of friends, check your bank account balance, snap a photo and send it to Aunt Julie, catch up on your e-mail, check the weather forecast and news headlines, sync up with the calendar on your

computer, download a game, and finally, call in sick to the office—all using one device.

By most accounts, the evolution of mobile phones into voice, data, and Internet devices is just getting started. Motorola, Nokia, and other companies are making their gadgets more versatile, adding

features like cameras, voice recorders, and tiny keyboards. Meanwhile, service providers are ramping up wireless network technologies that will allow for bandwidth-hungry tasks like videoconferencing and streaming video.

While research shows that U.S. users still are more inter-

ested in making calls than in, say, playing blackjack over the phone or watching a movie trailer, wireless insiders are optimistic about the future. "Carriers are pumping money into development based on the 'build it and they will come' model," explains Avi Greengart, lead wireless ►

analyst at Jupiter Research. "They're banking on [shopper interest and adoption] to take off as the devices improve."

Maybe so, but the first challenge facing users is to make sense of the vast array of providers, plans, and features. So I compared data service plans and tried out features offered by six national carriers: AT&T Wireless, Cingular, Nextel, Sprint PCS, T-Mobile, and Verizon Wireless. (At press time, Cingular announced plans to acquire AT&T Wireless. Cingular said there would be no immediate changes for users, though the deal should mean expanded coverage for each carrier's customers.)

For each carrier, I focused on five categories: messaging (both text and instant through services such as AOL Instant

Messenger, MSN Messenger, and Yahoo Messenger); photo sharing; e-mail; file downloads; and Web browsing. I used each service to send both e-mail and text messages, including SMS (short messag-

"Carriers are pumping money into development based on the 'build it and they will come' model."

ing system) and MMS (multi-media messaging system).

MMS messages (which may include photo, video, and/or audio attachments) can't be sent between different carriers. For example, I tried unsuccessfully to send a photo from a Sprint phone to a Cingular phone. In some instances, however, if you trans-

mit a photo via MMS, the picture is replaced with a text message that points the recipient to a Web site, which is best viewed on a PC.

Cingular spokesperson Ken Keatley says the company is

negotiating with other carriers to allow intercarrier MMS service and expects agreements by midyear. At this time, no such agreements exist.

For e-mail, carriers typically support AOL, MSN Hotmail, Yahoo, and POP3 accounts. Users are required to configure the e-mail settings on their phone. For an additional

fee, you can use Microsoft Outlook and Lotus Notes on Sprint and T-Mobile phones.

All the carriers here, except Nextel, offer camera phones that let you exchange photos with an e-mail account or with a phone that uses the same carrier; I sent photos (and in one case, a short video). I also downloaded fancy ring tones, games, and graphics such as screen savers and wallpaper.

Many of the phones I looked at came with some free content, but you'll have to pay for additional programs, with prices starting at \$1 for, say, a game or a ring tone. Business applications, such as personal information managers and currency conversion tools, are costlier, typically as much as \$20. Acquiring apps usually is a simple matter of selecting

MONTHLY CHARGES

TIME IS MONEY: THE COST OF USING DATA SERVICES

SOME PROVIDERS CHARGE a low monthly fee but deduct minutes from a calling plan; go beyond your allotted minutes, and you'll be billed for the extra time. Other service providers charge by the amount of data transmitted—for example, \$5 a month for 5MB. Bear in mind that these carriers charge different fees for different quantities, and they don't all offer the same features. In this comparison, we priced usage scenarios for light, moderate, and heavy data users. Verizon has the least-expensive plan—if you have the minutes to spare.

SERVICE PROVIDER AND DATA PLAN ¹	Light user ²	Moderate user ³	Heavy user ⁴	Comments
AT&T Wireless MMode	\$11	\$38	\$110	Light and moderate users should consider this plan if they want to use AT&T's faster EDGE network. Heavy users should steer clear due to the high price.
Cingular Wireless Internet Express	\$5.75	\$25	\$62	Cheapest option for light users (charges for light users are à la carte rather than part of Express plan). Using data services won't deduct minutes from voice plan (as Nextel's and Verizon's plans do).
Nextel Online Account	\$10 (airtime charges apply)	\$13.50 (airtime charges apply)	\$50	If you have minutes to spare from your voice plan, Nextel is an affordable choice for light and moderate users. However, Nextel does not offer camera phones or picture messaging.
Sprint PCS Vision	\$15	\$15	\$15	Hands down, it's the best bargain for moderate and heavy users because there are no airtime fees. You can send and receive data to your heart's content.
T-Mobile T-zones	\$11.75	\$18	\$18	Data services incur à la carte fees yet are reasonably priced. Using e-mail or browsing Web services doesn't count against minutes from your calling plan.
Verizon Wireless Get It Now	\$6.85 (airtime charges apply for pictures)	\$13 (airtime charges apply for pictures, e-mail, and Web)	\$18 (airtime charges apply for pictures, e-mail, and Web)	The most affordable plan, but only if you have tons of minutes in your voice plan. If not, choose another carrier. Also, plan descriptions are buried on the site.

FOOTNOTES: ¹ Browse to find.pcworld.com/41078 for an overview of the carriers' service plans and fees. ² Light user transmits 10 text messages, 5 pictures, 10 e-mail messages, and 250KB of Web content per month. ³ Moderate user transmits 100 text messages, 50 pictures, 100 e-mail messages, and 2MB of Web content per month. ⁴ Heavy user transmits 300 text messages, 100 pictures, 300 e-mail messages, and 10MB of Web content per month.

the file you want and downloading it to your phone.

Finally, I checked out each carrier's Web accessibility and its online resources. Unlike a PC browser, cell phone browsers use a formatting standard called WAP (wireless application protocol) that makes Web sites easier to view on small screens. WAP pages strip out most of the graphics and give you just the text.

You can browse through news, sports, weather, entertainment, search engine, shopping, and travel sites, such as ABC News, CNN, ESPN, The Weather Channel, Zagat Online, Google, Amazon, and Fodors. Special-interest sites cover a range of topics from astrology to personal investing. Most carriers also provide tools to help you locate nearby attractions (such as restaurants and movie theaters), get driving directions from services like MapQuest, and check traffic.

AT&T WIRELESS

AT&T OFFERS A full set of data-service options to take advantage of its newest wireless network, called EDGE (enhanced data rates for global evolution)—an upgrade to its existing network that promises users with certain phones data speeds three to four times faster than previously available, says company representative Ritch Blasi.

I tested AT&T's services using Motorola's MPx200, a clamshell-design handset that runs Microsoft's Windows Mobile software and syncs up with Outlook. The phone's browser is familiar and easy to navigate because it's based on

Internet Explorer, but I found AT&T's coverage inconsistent in my stomping grounds. For example, I connected fine in the Washington, D.C., area, but never found any service just north of Boston.

You can choose from four AT&T MMode plans; costs vary depending on how much data is allotted. MMode plans are billed in addition to regular monthly calling plans, which range from \$20 to \$300

the minutes from your calling plan. For a plan with no air-time charges, the company offers Wireless Internet Express. The Wireless Internet service is available across the entire Cingular network. The Express service is available on 90 percent of the network; Cingular expects coverage to extend across its entire network by midyear.

If you're not sure which of its services to sign up for, Cin-

gular using the Nokia 6800 was cumbersome, requiring multiple clicks to navigate, open links, and scroll through text on its small screen. Also, you must wait for each action to complete, and my connection timed out several times.

NEXTEL

THINK OF NEXTEL as the conservative older brother to the teen-targeting, hipster-hyping wireless companies.

Nextel does not offer camera phones or MMS. "We're focused on the business and enterprise user who isn't necessarily interested in a lot of multimedia bells and whistles," says spokesperson Rich Pesce. (Nextel does have a division targeted at teens called Boost Mobile, which offers pay-as-you-go cell phones and entertainment services in California and Nevada only.)

I tried Nextel's service on the Motorola i730 cell phone that runs Direct-Connect, Nextel's walkie-talkie feature. I found the i730's interface easy to navigate, but clicking and scrolling through text was slow.

Despite the service's lack of MMS, it offers many business applications (such as expense logs and loan calculators) and sites, including TheDeal.com, which tracks business mergers and venture capital news, and AlertUSA, which monitors homeland security.

The provider's voice plans range in price from \$20 to \$200 a month.

SPRINT PCS

IF IT CAN BE done on a cell phone, chances are you can do it on a Sprint PCS phone. ►

PHOTO FRIENDLY:
LG's LX5450 camera phone (left) and Motorola's V300 allow you to send pictures easily.



a month. A feature called My MMode lets you customize your phone by saving and organizing your settings, favorite links, and files such as photos, ring tones, and graphics.

CINGULAR

IF YOU CAN'T find a calling plan that suits you at Cingular, you're just not trying. Cingular offers 40 different plans in six categories, with prices from \$20 to \$250 a month.

The company's data-service plans aren't much easier to decipher. Cingular's Wireless Internet plan gets you online for \$4 a month, but deducts

gular provides a chart on its Web site that lists the amount of data used in typical data transmissions. For example, sending a short e-mail uses about 5 kilobytes; checking news headlines and reading an article uses about 10KB. Such file sizes are roughly similar across all carriers.

You can also sign up for extra services like group messaging, which lets you send a single message to a group of users, and customized information alerts (so you can, for example, receive a traffic report every weekday at 5 p.m.).

Browsing the Web on Cin-

The company's PCS Vision service includes a full gamut of messaging, downloading, and Web browsing features that you can tack on to any of the provider's calling plans, which cost from \$35 to \$115 a month. PCS Vision also includes Sprint's push-to-talk (walkie-talkie) feature, ReadyLink. With a camera-enabled Sprint phone, users can capture and send photos and 15-second videos.

I tried the PCS Vision service on a Palm One Treo 600 PDA/phone hybrid and on a Sanyo SCP-5500 (VM4500) camera phone. The Sanyo is a compact unit with a crisp, 2.1-inch screen and video-capture capability. Sprint offers multimedia utilities that let you play short, on-demand video clips, set alerts, and more.

I used the camera to send photos and video clips (of my son rock climbing) to another Sprint PCS phone and to several e-mail accounts. Video was shaky, and the sound was muddy. But watching video on your cell phone is still one of the coolest games in town.

In addition, at press time Sprint was the only carrier to offer so-called television on a phone. On the Sanyo I installed MobiTV (developed by Idetic), an applet that turns the screen into a tiny TV. For an extra \$10 a month, you can choose from about 14 channels, including MSNBC, TLC, and Discovery Kids. While the video was very choppy—one to two frames per second—the audio was good enough to make it entertaining.

T-MOBILE

YOU'LL FIND A rich collection of data services, including video messaging, at T-Mobile.

You have to puzzle your way through the company's maze of plans, which have odd names like GetMore Max and FamilyTime Plus. Calling plans range from about \$20 to \$130 per month (T-Mobile also offers separate plans for businesses, as well as for BlackBerry and Sidekick PDA users).

I tried T-Mobile on a Motorola V300 camera phone and had no trouble snapping and sending photos to several e-mail accounts. I also tried the company's service on a BlackBerry 7230, a device that is much better suited for messaging and other online tasks. The unit's larger screen made Web browsing easy, and T-Mobile's connection was stable and speedy in my area.

VERIZON

SUBSCRIBERS TO Verizon Wireless's Get It Now Web service should soon be getting it a whole lot faster.

This summer the company plans to start upgrading its wireless network with a nationwide program called Broadband Access (the service is already available in San Diego and in Washington, D.C.). Company spokesperson Ken Muche says the technology will let users Web surf at speeds of 300 to 550 kbps.

By comparison, most GPRS networks (AT&T's earlier spec, Cingular, T-Mobile, and Nextel) generally operate at dial-up speeds, while CDMA networks (Sprint PCS and the current Verizon network) are only slightly faster than dial-up. AT&T's newer EDGE network is three to four times as

fast as dial-up. But in my experience with any network, going online on a cell phone still tends to be sluggish.

Verizon's Broadband Access will cost around \$80 a month, on top of the calling plan, which ranges from \$35 to \$300 a month. Handsets with Broadband Access service, along with video messaging and multiplayer gaming, will be available later this year.

Using an LG VX6000 unit, I downloaded an application by Logitech called Mobile Video (which is \$5 a month plus air-time during use) that streams live video; I used it to check out a rather choppy view of traffic on the Brooklyn Bridge. Inexplicably, you can also watch real-time surveillance of an anonymous car wash.

Some of Verizon's phones, including the Motorola V60p, allow you to use push-to-talk.

WHOM CAN YOU TRUST?

WHETHER YOU PLAN to use your phone to check messages only occasionally or to stay connected around-the-clock, your first consideration in choosing a plan should be basic reliability. You want voice communication to be there when you need it, so make sure to check how good

a prospective provider's coverage is in your area. Most cell phone companies offer a 14- to 30-day trial period in which you'll pay only for the minutes you use.

If you can't actually test the service by trying out a phone, talk to your neighbors, and consult Web sites such as PhoneScoop.com, WirelessAdvisor.com, or HowardChui.com, or a blog site such as MobileTracker.net, which includes advice and useful forums with first-hand user feedback about service providers. If you're planning to switch carriers, visit find.pcworld.com/40754 and peruse PC World's tips in the article "Dialed In: You Can Take It With You."

Finally, think about how you'll use your cell phone and its services, and check the details of each plan before you sign on. If you're likely to spend a lot of time online, for example, you might want to look for a plan that charges you for the data—not the air-time—you use. After all, time will simply fly by when you're engrossed in watching that car wash parking lot. ■

Contributing Editor Anne Kan-dra writes the Consumer Watch column for PC World.

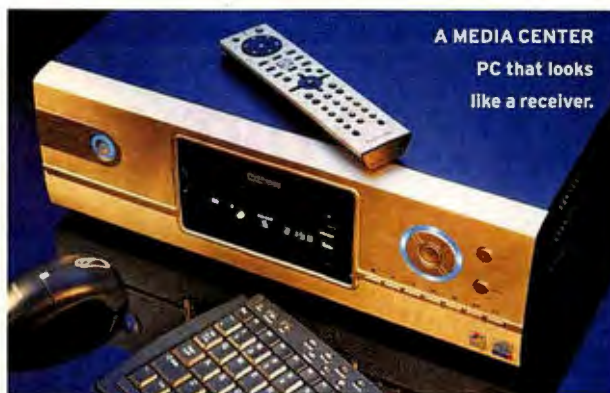


MEDIA CENTER PC

GATEWAY CRASHES THE LIVING ROOM

MOST PCs THAT RUN Microsoft's Media Center operating system look more like desktops than like the home theater devices they're supposed to be emulating. But Gateway's **FMC-901 X** looks right at home in a living-room stereo rack.

The front panel on this big (17 inches wide by 5.75 inches high by 14.5 inches deep) system has an easy-to-read LCD screen, a six-in-one memory card reader, and myriad in-



A MEDIA CENTER PC that looks like a receiver.

FMC-901 X Family Media Center PC

Gateway

★★★★☆

If you must have a Media Center PC, this is the one to get.

Street: \$1800

find.pcworld.com/40526

puts and outputs, including several for audio and video. As with any Media Center PC, you can use the device to record TV broadcasts, watch DVDs, or listen to music. The \$1800 configuration I looked at included a 3-GHz Pentium 4 processor, 512MB of RAM, a 250GB hard disk, and a dual-

format, recordable DVD drive. It earned a quick PC World-Bench 4 mark of 124. A more modestly equipped, Celeron-based version costs \$1000.

I hooked the machine up to a 36-inch TV and a stereo receiver, and settled back on my couch. I had no trouble getting comfortable with the big,

easy-to-read Media Center interface, which runs non-PC functions such as changing TV channels, selecting music, and setting the video recorder.

Like a PC, the system locked up occasionally, and that can be a real drag if you're in the middle of recording a show. (When was the last time your TiVo crashed?) And like all Media Center PCs, it forces you to condition yourself to switching between the wireless keyboard and mouse and the remote control—a jump that's inherently clumsy.

The FMC-901 X looks like an ideal PC-stereo component hybrid, but I still advocate keeping the PC in the home office where it belongs.

—Josh Taylor ■

WIRELESS ADAPTER

PRICEY WI-FI FOR XBOX

IF YOU'RE READY to take your Xbox gaming console online, but you're unwilling to string an ethernet cable from your home office to your living room, Microsoft's new **Xbox Wireless Adapter (MN-740)** may be your ticket to play.

To use the adapter to access Microsoft's Xbox Live online gaming service, you need a

wireless network, preferably hooked to a broadband Internet connection. The MN-740 is a 54-megabits-per-second 802.11g Wi-Fi adapter, so it's also compatible with 11-mbps 802.11b networks.

I tested the unit on my home 802.11b network, which uses a Linksys Wireless Access Point Router. The MN-740 located the network easily; the somewhat tedious task of entering my WEP security key via the game controller was the only inconvenience.

Soon after completing the Xbox Live setup (you have to pay extra for access to the gaming service), I was deeply engrossed in Internet-based,

multiperson play. I rarely experienced any lag during my CounterStrike game session, though other players' voices (transmitted via headset) occasionally dropped out. That didn't prevent them from cheerfully wiping the screen with my carcass.

My positive experience using this adapter on an 802.11b network leads me to question the necessity of paying for an 802.11g-based adapter. Unless you are planning to connect two or more Xboxes on the same 11g network, you're not at all likely to take advantage of 802.11g's higher speeds, be-

GAME ON: This adapter connects your Xbox to a broadband router.



cause even the fastest broadband connections rarely hit 1.5 mbps. Linksys, D-Link, and others offer 802.11b-based adapters that work with the Xbox and cost about \$70.

Microsoft's MN-740 adapter is a well-designed product that is easy to use. It seems a tad pricey, however, if your only objective is to gain access to the Xbox Live service.

—Tom Mainelli ■

Xbox Wireless Adapter MN-740

Microsoft

★★★★☆

Excellent product enables wireless Xbox connectivity, but alternative adapters cost less.

Street: \$100

find.pcworld.com/40529

GADGET FREAK

DAN TYNAN

AUDACIOUS AUDIO OPTIONS



THE OTHER DAY I was sitting in a high-end audio store, having what can only be described as a religious experience. Jon, my stereo spirit guide, popped a Super Audio Compact Disc into a machine, folded his arms, and waited.

In a few moments, I felt the throbbing of a heart that was not my own. A pocket watch was ticking in my right ear while a cash register rang in my left. I could hear two old duffers cursing while a third laughed maniacally behind me. Then the first unmistakable chords of Pink Floyd's "Breathe" washed over me, and I began to hallucinate.

Once I heard SACD, I knew I could never go back to regular CDs. But then I test-drove a 2004 Acura outfitted with DVD-Audio, another high-density music format, and the salesman had to pry me out

of the car afterward. I didn't know which of the competing new formats to choose.

HEARING IS BELIEVING

SACD AND DVD-A make normal CDs sound like AM radio. Both provide six channels of surround sound—so vocals may come from the center channel, a guitar from the left, drums from the rear, and so on. More important, because both store 4.7 gigabytes of data, they can capture much more of the original recording. Naturally, the formats are incompatible, and each one's creators say theirs is the best.

"We finally have a format where nothing is left on the recording studio floor," says Craig Eggers, marketing director for Dolby, which licenses the compression technology used to create DVD-A. Jeroen Keunen, a general

manager for Philips Semiconductor (which partnered with Sony to develop SACD), counters that SACD's proprietary technology "more accurately captures the nuance and atmosphere" of the original than either DVD-A or typical CDs.

Both formats sound great, if you have the right gear. While DVD-A discs will work in any DVD player (and some contain extras such as photos or videos you can watch on your TV), you get the brain-melting sonic experience only with a player that supports DVD-A (and a set of kickin' speakers). Likewise, SACD requires dedicated hardware, though most discs contain a second set of CD-quality tracks so you can play them on any machine but without the amazing sound.

UNIVERSAL PLAY

UNFORTUNATELY, most record companies release albums in just one high-density format. So *Dark Side of the Moon* is only on SACD, while Queen's *A Night at the Opera* is strictly DVD-A. The good news is, universal DVD-A/SACD players start at less than \$200, though Jon recommended the Pioneer Elite DV-45A (\$700). The bad news is, dual players often do a better job with one format than the other, and no car stereo or portable player handles both.

After I emerged from my

NEXT UP

Stereo Receiver Mimics PC



ONKYO'S TX-NR1000 stereo receiver has overt personal computer tendencies. It has a FireWire port for routing Super Audio CD and DVD-Audio streams. Its ethernet port lets you play digital audio stored on a PC and Internet radio. Onkyo claims it's the first receiver with expansion ports, which will eventually permit upgrading the unit. You may not need to, since the \$4000 receiver pumps 150 watts through 7.1 channels. But if you're worried that surround sound won't stop at 7.1 channels, this is the receiver for you.

stupor, I pointed to the RBH T2 speakers in front of me and asked Jon what they cost. "Oh, about \$9300," he said, "plus \$4400 for the other three." When I started choking, he quickly added I could get a \$1000 speaker set that would sound just fine. DVD-A and SACD add-ons for your car should be cheaper, but won't be out before summer.

Factoring in the player, the \$14K speakers, the cost of remodeling my house to fit a home theater, and, of course, a divorce, I estimate moving to high-density audio would cost me about half a million.

I'm still thinking about it. ■

Contributing Editor Dan Tynan is just kidding about the divorce.

Next Generation DVD.



Experience the amazing detail in new high-definition WMV DVDs, play conventional DVDs and games, surf the internet on your big screen, and record/edit all media with the *easy-to-use* SleekLine® 3000 HD. Compatible with all displays and speakers, SleekLine's innovative real-time 5.1 analog to 5.1 Dolby Digital encoder, ultra-quiet operation, and contemporary AV component styling make it the *only* system optimized for your home theater. You'll be glued to your chair!

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DVD as Easy

as **1** **2** **3**

**Choose
the right
tools and
leave
complexity
behind**

» The most common complaint from people trying to enjoy the digital life comes down to this: "Nothing seems as simple as it ought to be." The truth is, most digital technology, like DVD, is pretty simple to use and enjoy. You just have to focus on what's important.



Take DVD burning, for example. Most users can probably accomplish the burning they want without getting too deep into the weeds, technology-wise. The reason is, the kinds of DVD tools you can purchase over-the-counter at popular electronics outlets have built-in limitations. This isn't to short-change customers, but rather to keep them from getting lost in the miasma of advanced features that can often confuse more than clarify functions and features.

But be prepared for some additional reading as well as some old-fashioned trial and error if you want to experiment with a variety of for-

mats and file types. Widely available advanced DVD programs will allow you to do pretty much anything you want with a DVD, including making legal copies of just about anything.

However, users need to be aware that while the tools and software can permit almost limitless DVD creativity, the DVD players themselves are often cursed with incompatibilities. These can make it difficult—even impossible, in some cases—to broadly distribute those movies and photo albums you've made to share with family members and friends around the country. Just don't let the real problem of incompatibilities hold you back. Increasingly, vendors of DVD players are building compatibility into their products, and with sharply declining DVD prices, pretty soon most everyone will have players capable of playing a very wide variety of DVD disks and formats.

One-Stop Media Solution

For those seeking an all-in-one integrated digital media solution, look no further than Roxio's Easy Media

Creator 7, which brings together Roxio's (www.roxio.com) complete line of video, music, burning, and authoring applications to deliver the first and only comprehensive, integrated digital media suite for the PC.

Dozens of new features, refinements, and an enhanced burning engine make Easy Media Creator 7 an upgrade of choice for Roxio's existing customer base of over 100 million. However, by seamlessly combining the improved burning suite, with its best-of-breed PhotoSuite 7 Platinum, VideoWave 7 Professional, and online music service Napster, Roxio extends the appeal of Easy Media Creator 7 to include any consumer looking to take complete control of their digital lives.

"For consumers, maintaining their digital lives on the PC today is a cumbersome task that forces them to manage and learn multiple applications that don't work together," says Tom Shea, president of Roxio. "Easy Media Creator 7 addresses this problem by allowing consumers to effortlessly organize, edit, protect, and share a lifetime of digital photos, music, video files, and data within a single, elegant environment."

Key Benefits of an Integrated Suite Include:

- **A common user interface** design and workflow model that delivers complete consistency and reduces the learning curve, regardless of the type of digital media being used or the task being accomplished
- **A set of shared utilities** for common media tasks such as copying discs, importing photos, capturing video, and making labels as well as a central utility for easily organizing, finding, and accessing files
- **The ability to seamlessly** pass and share media files and file information between components

For more information on Roxio's Easy Media Creator 7, click now on www.roxio.com.

get digital



Your music, your photos, your video, your life.



One product – Infinite possibilities™, that's Roxio Easy Media Creator™ 7. Organize, edit, create, burn, share and do a whole lot more with the premiere digital media program that captures and preserves your digital lifestyle. Roxio's award winning PhotoSuite® 7, VideoWave® 7, Napster® 2.0 and Easy CD & DVD Creator™ seamlessly work together within this easy to use, fully integrated suite.

So get Roxio Easy Media Creator 7 today, and see how Roxio can upgrade your digital life.



Available at roxio.com or your local software retailer.

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TOP 100

EDITED BY THE REVIEWS STAFF

136 SLIDE SCANNERS

142 DESKTOP PCs

146 NOTEBOOK PCs

148 PHOTO PRINTERS

149 AUDIO PLAYERS

151 DIGITAL CAMERAS

153 MORE REVIEWS

**Spot
LIGHT** Pacific Image Electronics' PF3650 Pro3 (left) was speedy, and its software provided lots of one-touch adjustment options. Epson's Perfection 3170 Photo produced scans that had vibrant color and good detail without any image adjustment.



SPOTLIGHT: SLIDE SCANNERS

Put Your Film Into Your PC

If you've spent a lifetime shooting slides, or you've inherited your family's collection of slides and negatives, you may wonder whether you should use a slide scanner to bring them into the digital age. We looked at five models designed to scan slides, negatives, and other transparent film—three flatbeds with transparency adapters and two slide-and-film scanners.

Dedicated slide-and-film scanners have traditionally been considered too expensive for anyone but

professional photographers and designers; now, however, a range of choices under \$1000 is available. And flatbeds' transparency-scanning capabilities have been steadily improving. The models evaluated here are in the midrange in features and price—neither the most nor the least expensive. We tested them side by side to see whether slide scanners or flatbeds had an edge. In comparing their performance and features, we found some surprising results. ►

Advanced Digital Cameras

Top 10 CHART The big and bulky 8-megapixel Sony Cyber-shot DSC-F828 is the first to use Sony's four-color CCD. It also includes loads of dials and creative controls—but at a high price of \$1000.



Desktop PCs

Top 10 CHART Open the handy door on the front of the Sony VAIO PCV-RS530G to access ports galore. This media PC is also geared up for accessing and recording television shows.

142



Notebook PCs

Top 10 CHART Acer's TravelMate C300, a convertible Tablet PC, can twist and turn like no one's business. It's the first Tablet PC to vie for our notebook chart, earning a spot in the desktop replacements section.

146

INSIDE THE TOP 100

See find.pcworld.com/15720 for details on how we compile our charts for the Top 100. Freelance writers Dan Littman, Mick Lockey, and Carla Thornton and PC World editors Richard Baguley, Laura Blackwell,

Eric Butterfield, Tracey Capen, Seán Captain, Rebecca Freed, Kalpana Ettenson, Alexandra Krasne, and Alan Stafford contributed to the Top 100 section. 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.

For this Spotlight, we looked at slide scanners from Minolta and Pacific Image Electronics, high-resolution flatbeds from Canon and Epson, and a less-expensive flatbed from Epson. All are capable of at least 3200-dots-per-inch resolution with no interpolation, sufficient for most nonprofessional photographers. We wanted to include Nikon's brand-new consumer-level film scanner, the \$600 Coolscan V ED, too, but it was released just as we went to press.

Dedicated slide scanners usually scan at a much higher resolution than flatbeds and are more expensive. If you want to print an 8-by-10-inch photo from a slide or negative, the tiny image must be en-



KONICA MINOLTA'S DiMAGE Scan Elite 5400 (left) has the highest optical resolution here; the PF3650 Pro3 can scan up to 40 film exposures at once.

larged much more than for a 3-by-5-inch snapshot, so slide scanners need that high resolution. You might also expect to see better image quality from midrange slide scanners than from flatbeds, but our testing didn't bear that out. Turning con-

ventional wisdom on its head, in our tests Epson's 4870 flatbed delivered the sharpest images, while the Konica Minolta slide scanner—with the highest resolution here—produced images we found flat and lacking in detail. And the least-expensive, lowest-resolution scanner in the bunch, the other Epson, produced images that we found the most pleasing overall. (We judged scans made at default settings, with no editing; all our scans benefited from some manual image correction, however.) We also liked the flatbeds we tried for batch scanning, since they could scan more slides or negatives in one batch than the transparency-only models—not to mention their ability

TOP 100

TEST
Center

Scanners That Handle Transparencies

Visit find.pcworld.com/40973 for more information on products ranked in this chart.

FLATBED SCANNERS	Street price (1/9/04) and features	Test results (min:sec)*	Overall image quality	Comments
Editor's PICK Canon CanoScan 9900F Color Image Scanner find.pcworld.com/37163	<ul style="list-style-type: none"> • \$400 • 3200-dpi optical resolution • Scans 8 slides or 24 negative frames at once • FireWire, USB 2.0 	9:35	Good	Canon's ScanGear CS utility makes batch scanning a breeze, including producing a proof sheet you can print—but the 9900F was slowest on all our scans save one. Most test images appeared fairly attractive, and our enlarged slide looked fantastic. (★★★★☆)
Epson Perfection 3170 Photo find.pcworld.com/38948	<ul style="list-style-type: none"> • \$199 • 3200-dpi optical resolution • Scans 4 slides or 12 negative frames at once • USB 2.0 	8:20	Very good	The 3170's scan times were about average in all our tests, and the model processes fewer slides or negatives in a batch than the other flatbeds here. Image quality was similar to that of the 4870, but the 3170 produced smoother transitions and richer tones. (★★★★☆)
Epson Perfection 4870 Pro find.pcworld.com/40430	<ul style="list-style-type: none"> • \$599 • 4800-dpi optical resolution • Scans 8 slides or 24 negative frames at once • FireWire, USB 2.0 	7:58	Good	The sharpness of the 4870's test images wowed us, but our photos of people looked too contrasty. Editing in prescan with Epson's expert tools produced better results. Comes with professional-level control software and color-management software. (★★★★☆)
SLIDE AND FILM SCANNERS				
Konica Minolta DiMAGE Scan Elite 5400 find.pcworld.com/40433	<ul style="list-style-type: none"> • \$899 • 5400-dpi optical resolution • Scans 4 slides or 6 negative frames at once • FireWire, USB 2.0 	7:02	Fair	The Scan Elite 5400 had the highest native resolution and the fastest cumulative scanning time of the bunch, but we were unimpressed by the sharpness and color saturation of its images. This is the only scanner we tested with a manual focus knob. (★★★☆☆)
Editor's PICK Pacific Image Electronics PF3650 Pro3 find.pcworld.com/40427	<ul style="list-style-type: none"> • \$600 • 3600-dpi optical resolution • Scans 1 slide or up to 40 negative frames at once • FireWire, USB 2.0 	7:22	Good	An autoloader lets this unit batch-scan filmstrips up to 40 frames long. The CyberView X software, though not as slick as some, is full-featured, and we liked this scanner's speed. But it had problems keeping color true, and its documentation is sparse. (★★★★☆)

* Time for 4-negative batch scan at 2400 dpi and 24-bit color depth. Scanning time includes prescan. Scans were made at default settings. Best times in bold.

to handle larger formats, including photos. On the other hand, we saw quicker scans from the dedicated slide-and-film units.

EDITOR'S PICKS

OVERALL, WE liked Canon's CanoScan 9900F Color Image Scanner flatbed and Pacific Image Electronics' PF3650 Pro3 slide unit the best. The 9900F had the easiest-to-use software and required the least effort to produce nice-looking photos; the PF3650 Pro3 scanned slides quickly, and its software controls provide a number of one-touch correction options.

BEST VALUE

FOR OUR MONEY, the \$199 Epson Perfection 3170 Photo—despite a few limitations—is a first-rate deal. Our photos looked great without any adjustment,

EPSON'S PERFECTION 4870 Pro (left) comes with workflow software; Canon's CanoScan 9900F has the largest transparency area we've seen.



though the Epson Scan software has the tools to correct images without a hitch. Epson says the 3170's scanning utility is set to automatically adjust exposure, tonal levels, and color by default, which helps explain why its images impressed us right out of the box. You can use Epson Scan's Full Auto mode to scan slides or negatives, but you are more likely to want to

use Home or Professional mode for more control.

Epson Scan's Home mode didn't have the tools we needed to bring out the dark areas of a very-high-contrast image, though Professional mode did let us make the necessary changes. The 3170 Photo comes with applications for more-general scanning tasks as well, including optical character recognition. This scanner has a smaller transparency area than the other two flat-

beds, accommodating only 4 mounted slides or 12 negative frames at a time.

BEST FOR NOVICES

THOUGH THE PRICE may be a bit steep for scanning newcomers, the nod goes to Canon's \$400 CanoScan 9900F. We saw pretty good results without having to make adjustments, and just a little bit ►

TIPS

Successful Scanning Requires a Little Bit of Skill

1. Let the scanner choose your resolution: If you know the size and quality you want in your finished product, you can let the scanner's software calculate the needed resolution. For example, if you know your scan is destined for printing at 5 by 7 inches and 300 dpi, you can put those specs in most scanners' controls, and the software will determine the scanning resolution required.

2. Adjust first, then scan: It's conventional wisdom that you should prescan, tweak your image, and then make your final scan. Here's why: When you adjust the image before scanning, your final scan retains more data than when you make a similar change in a program like Photoshop Elements. And keeping more data gives you flexibility in how you use your image later.

3. Keep your media clean: The more you handle film, the more smudges and dust they'll pick up, and the more cleanup you'll need to do while scanning. Keep slides and negatives tucked away until you really need to

Color Mode :	Color	
Output Resolution :	400	dpi
Selection		
Width :	Height :	Units :
2.13	0.68	inches
Print Size	Height :	Scale :
Width :	1.91	282 %
6.00	3x	

CHOOSE YOUR output resolution and size; let the software determine scanning resolution.

take them out. You know to hold negatives by the edges, but try using cotton gloves as well, which will also help keep a flatbed's scanning glass clean. You can get these inexpensive gloves from professional photography shops and from sites like CameraWorld.com. You can remove dust from film with a soft brush or compressed air (but go easy—a strong blast can damage your film).

4. Expect to edit: You may have visions of ripping through a generation's worth of slides in an afternoon, but if you want

attractive photos you'll need to invest some time in tweaking them. If batch scanning is important to you, choose a model that makes batch prescanning and adjustments easy, like Canon's CanoScan 9900F.

5. Dig into your software: Getting acquainted with your scanner's advanced control software gives you access to the editing tools that produce the best images.

6. Get educated: A little expert advice can help you get better results, faster. One good reference on scanning and image management is *Real World Scanning and Halftones, 2nd ed.* (by Blatner, Fleishman, and Roth; Peachpit Press, 1998). It has in-depth information on tone and color correction, plus a thorough explanation of resolution. A new edition should be arriving in bookstores soon after you read this. And if Photoshop Elements 2 is your image editor of choice, *Photoshop Elements 2 Restoration and Retouching* (by Laurie Ulrich; Wiley, 2003) is a useful reference.

of tweaking yielded very nice images. The 9900F has great on-screen documentation, with extremely thorough explanatory material and truly useful hyperlinked navigation. Most important, Canon's ScanGear CS software and CanoScan Toolbox quick-launch interface were our favorites to use—both for quick scans and for more extensive editing—because all the tools needed were readily accessible and clearly labeled.

As your expertise grows you won't feel held back by Canon's software: You can turn off all the default settings, such as Auto Exposure, in ScanGear's Preferences. Another utility, called ColorGear, lets you optimize your scan for either on-screen display or output to a printer.

BATCH SCANNING

BOTH THE Perfection 4870 Pro and the CanoScan 9900F scan up to 8 slides in one pass, or 4 filmstrips of 6 frames each. Pacific Image's PF3650 Pro3 scans only 1 slide at a time, but if you have a roll of film, you can feed up to 40 frames into the scanner's autfeeder.

All the scanners we tested display thumbnails of images after prescanning, and you can make adjustments to each image individually or to the whole batch. All the models also let you save custom settings and apply them to an entire batch. The Canon and Minolta units allow you to save all thumbnails from a batch scan into one file for printing or archiving—Canon calls it a "proof sheet."

OUTPUT SAMPLES

Automatic Image Correction

EASE OF USE AND effectiveness varied among the scanners' autofixing technologies.



KONICA MINOLTA'S DIMAGE Scan Elite 5400 cleaned up the dust and slightly reduced the graininess of this photo.

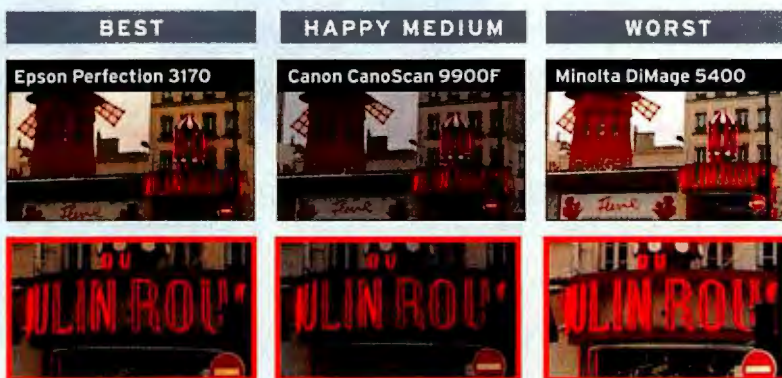


THE CANOSCAN 9900F's FARE technology cleaned up the dirt on this slide, but the image got somewhat softer in the process.

OUTPUT SAMPLES

Test Results: Best and Worst Images

WE EXAMINED PRINTOUTS of uncorrected scans from each model. All of them delivered good images after adjustments, but some raw results looked better than others.



THE PERFECTION 3170 delivered saturated, true color and very good sharpness, while the 9900F's scan had a slightly underexposed look. The Minolta's result looked too light overall.

Because of its ease of navigation through images and the efficiency of its correction tools, the CanoScan 9900F is our pick for hassle-free batch scanning.

AUTOMATIC CORRECTION

EACH SCANNER WE looked at comes with some technology for fixing flaws such as dust, scratches, faded color, or graininess. Except for the Canon, which uses the company's own FARE 2.0 technology, all incorporate Kodak's Digital ICE, sometimes in combination with their own technologies. Pacific Image's PF3650 Pro3, for example, allows you to apply Kodak's Digital ICE, GEM (grain

reduction), or ROC (color restoration), separately or together. And Minolta uses its own Grain Dissolver and Pixel Polish (which automatically corrects exposure and color cast) along with Digital ICE. In all cases, because these technologies require taking multiple scans of the image, you can't see the results of your changes on the fly, as you can when fixing exposure or color.

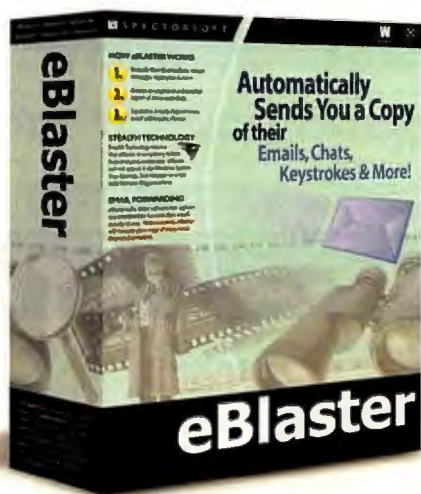
Instead, to use this type of autocorrection, you must select it in the scanner software and then prescan or scan—even if you have already done a prescan. We saw especially good results from the Canon, Minolta, and Pacific Image scanners, but the old "garbage in, garbage out" rule applies—the better your original image is, the better your final result will be. For some examples of these technologies in action, see the "Automatic Image Correction" box, at left.

So who should buy a midpriced slide scanner? Our test results didn't give us a clear-cut answer. People who need very high resolution to radically enlarge their photos might prefer slide scanners. But the flatbeds we looked at—with their lower prices, usable software, flexibility, and impressive image quality—deserve serious consideration by anyone looking for good results from transparencies.

—Rebecca Freed ■

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TOP 15 DESKTOP PCs

	POWER SYSTEM		Overall rating	Street price (1/16/04)	PC WorldBench 4 performance score ¹	Faster	Comments
1	Best Buy ABS Awesome 6300 find.pcworld.com/39152		90	Expensive \$3599	Windows XP Professional	Outstanding 142	This ABS machine is one of the fastest systems we've tested with business applications and games. (★★★★★: Jan 04)
2	Micro Express MicroFlex 64 KB find.pcworld.com/39365		86	Inexpensive \$1999	Windows XP Home	Outstanding 141	This 64-bit PC sped through PC WorldBench 4; and it's a bargain for a model with a 19-inch LCD and a fast graphics card. (★★★★★: Feb 04)
3	Sys Technology Performance 64 3400+ find.pcworld.com/40397	NEW	83	Expensive \$3340	Windows XP Professional	Outstanding 141	One of the fastest systems we've tested, this industrial-black Sys came with a fantastic-sounding audio system. (★★★★★:)
4	Dell Dimension 8300 find.pcworld.com/40409	NEW	83	Average \$2899 ²	Windows XP Home	Fair 126	Well-equipped to handle media, this 8300 has a 250GB hard drive, a fine 17-inch LCD monitor, and a very satisfying sound system. (★★★★★:)
5	Polywell Poly 900NF3-FX1 find.pcworld.com/39149		83	Average \$3199	Windows XP Professional	Outstanding 142	Acing our gaming tests with sky-high frame rates in Unreal Tournament 2003, this PC ties for fastest model on our chart. (★★★★★: Jan 04)
6	ABS Awesome 5500 find.pcworld.com/40166		82	Average \$3299	Windows XP Home	Good 130	System uses Intel's game-centric CPU. It produced top-notch frame rates in gaming tests, but the monitor was mediocre. (★★★★★: Mar 04)
7	Compaq X09 Gaming PC find.pcworld.com/40412	NEW	78	Expensive \$3326	Windows XP Professional	Good 128	Sold only at CompUSA, Compaq's aluminum-clad game machine looks impressive but trails other contenders in performance. (★★★★★:)

	VALUE SYSTEM		Overall rating	Street price (1/16/04)	PC WorldBench 4 performance score ¹	Faster	Comments
1	Best Buy Dell Dimension 4600 find.pcworld.com/40406	NEW	87	Average \$1139 ³	Windows XP Home	Good 123	Well-appointed, this Dell offers fine performance for its configuration, plus an attractive, basic LCD and good speakers. (★★★★★:)
2	Sony VAIO PCV-RS530G find.pcworld.com/40478	NEW	83	Very expensive \$1850	Windows XP Home	Very good 126	Sony's media PC is loaded with amenities for watching and recording television, playing music, and working with digital images. (★★★★★:)
3	HP Compaq Business Desktop D330 find.pcworld.com/39464		82	Expensive \$1571	Windows XP Home	Good 123	Business system is easy to set up, and its DVD playback and sound system performed well in our tests. (★★★★★: Feb 04)
4	Micro Express MicroFlex 3000D find.pcworld.com/40007		81	Average \$1198	Windows XP Home	Very good 130	Nicely designed tall black tower is highly expandable and functional; graphics performance is middling. (★★★★★: Mar 04)
5	NuTrend Kila 2 find.pcworld.com/39461		81	Inexpensive \$899	Windows XP Home	Very good 125	Light on the extras, this sub-\$1000 budget PC is an excellent choice for the casual gamer and multimedia dabbler. (★★★★★: Feb 04)
6	Polywell Poly 900VF find.pcworld.com/40004		80	Average \$1250	Windows XP Home	Outstanding 136	Fastest PC on our value chart when running productivity applications, the 900VF had disappointing graphics performance. (★★★★★: Mar 04)
7	IBuyPower Dream 2004 find.pcworld.com/40001		80	Average \$1179	Windows XP Home	Very good 125	PC has the look of a gaming machine, with a fancy front panel and side window. But it had low frame rates in our tests. (★★★★★: Mar 04)
8	Gateway 310X find.pcworld.com/40400	NEW	78	Very inexpensive \$760	Windows XP Home	Fair 108	Attractively priced, the 310X is a good candidate for a starter system or for an extra, basic workstation. (★★★★★:)

Go to find.pcworld.com/10860 for details on PC World's Star Ratings.

Go to find.pcworld.com/39209 for a breakdown of the weightings we give to the various factors that contribute to a desktop PC's overall rating in each of the two categories.

¹ Performance word scores reflect comparisons of PCs in the same category (power or value). See find.pcworld.com/15720 for more details.

² Total capacity in gigabytes (may represent multiple drives).

TEST
Center

THIS MONTH, AMD GOT THE JUMP on Intel. Though we've yet to see production PCs with Intel's new Pentium 4 processor (code-named Prescott), we tested our first system with the latest chip from AMD. (See find.pcworld.com/40931 for results of our early tests of systems equipped with Prescott chips.) Ranked third on our power chart, a new PC from Sys Technology with the 2.2-GHz Athlon 64 3400+ CPU earned a blazing PC WorldBench 4 score of 141—the second highest

score we have recorded. It's just a single point behind two systems running AMD's 2.2-GHz Athlon 64 FX-51 processor—the first-place ABS Awesome 6300 and Polywell's fifth-ranked Poly 900NF3-FX1.

But the Sys Performance 64 3400+ has more to offer than just speed. Creative Labs' Sound Blaster Audigy 2-ZS card and Inspire T7000 speakers cloaked us in clear, booming, 7.1 surround sound. With

Visit find.pcworld.com/40589 for reviews of all products tested this month and ranked in this chart.

CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³	Optical drives	Other features ⁴	Graphics quality	Setup and ease of use	Vendor's reliability/service
2.2-GHz Athlon 64 FX-51	1024/DDR400 SDRAM	240 [RAID]	19-inch LCD	256MB Sapphire Radeon 9800 Pro	Midsize tower	4X DVD±RW and 16X DVD-ROM drives	Flash media reader (CF I/II, MS, SD/MMC, SM), ⁵ 802.11g wireless PCI adapter, Microsoft Works Suite 2004	Outstanding	Good	Good/ ⁶
2-GHz Athlon 64 3200+	1024/DDR400 SDRAM	120	19-inch LCD	128MB ATI Radeon 9800 Pro	Midsize tower	4X DVD-R/RW and 52X CD-RW drives	Flash media reader (CF I/II, MS, SD/MMC, SM) ⁵	Outstanding	Very good	✓/ ⁶
2.2-GHz Athlon 64 3400+	1024/DDR400 SDRAM	240 [RAID]	17-inch LCD	128MB PNY Verto GeForce FX 5700 Ultra	Midsize tower	4X DVD±RW drive	Flash media reader (CF I/II, MS, SD/MMC, SM), ⁵ Creative Labs Inspire T7000 speakers, no modem, Microsoft Office 2003 Small Business Edition	Outstanding	Good	✓/ ⁶
3.2-GHz Pentium 4	1024/DDR400 SDRAM	250	17-inch LCD	128MB ATI Radeon 9800 Pro	Midsize tower	8X DVD±R/RW and 48X CD-RW drives	High-end Altec Lansing ADA-995 speakers, no modem, Microsoft Office XP Small Business	Very good	Good	Good/Fair
2.2-GHz Athlon 64 FX-51	1024/DDR400 SDRAM	322 [RAID]	19-inch CRT	256MB Gainward FX PowerPack Ultra/1600 XP	Midsize tower	4X DVD±RW and 52X CD-RW drives	Dual 10,000-rpm 36GB SATA drives with RAID and 250GB removable hard drive, brushed-aluminum case with window, games	Very good	Good	✓/ ⁶
3.2-GHz Pentium 4 Extreme	1024/DDR400 SDRAM	160	17-inch LCD	256MB ATI Radeon 9800 XT	Midsize tower	4X DVD±RW and 16X DVD-ROM drives	Flash media reader (CF I/II, MS, SD/MMC, SM), ⁵ Gigabit NIC, Microsoft Works Suite 2004, games	Very good	Outstanding	Good/ ⁶
3.2-GHz Pentium 4	1024/DDR400 SDRAM	240 [RAID]	17-inch LCD	256MB NVIDIA GeForce FX 5950 Ultra	Midsize tower	4X DVD±R/RW and 16X DVD-ROM/48X CD-RW combo drive	Flash media reader (CF I/II, MS, SD/MMC, SM), ⁵ qigabit NIC, 128 MB USB flash drive	Very good	Very good	Fair/Poor
CPU	RAM (MB/type)	Hard drive ²	Monitor	Graphics	Case type ³	Optical drives	Other features ⁴	Graphics quality	Setup and ease of use	Vendor's reliability/service
2.8-GHz Pentium 4	512/DDR400 SDRAM	120	17-inch LCD	128MB NVIDIA GeForce FX 5200	Minitor	16X DVD-ROM and 48X CD-RW drives	Dell ADA-425 speakers, Corel WordPerfect Productivity Pack, Microsoft Money 2003, Quicken 2002 New User Edition	Good	Good	Good/Fair
3.2-GHz Pentium 4	512/DDR400 SDRAM	160	15-inch LCD	128MB ATI Radeon 9200	Minitor	4X DVD±RW and 16X DVD-ROM drives	Flash media reader (CF I/II, MS, SM), ⁵ TV tuner card with remote, GigaPocket PVR hardware and software, Microsoft Works 7.0	Very good	Fair	Good/Fair
3-GHz Pentium 4	512/DDR400 SDRAM	80	15-inch LCD	128MB NVIDIA GeForce FX 5200	Minitor	16X DVD-ROM/48X CD-RW combo drive	Gigabit NIC, no modem, Microsoft Works 7.0	Good	Very good	Fair/Fair
2.17-GHz Athlon XP 3000+	512/DDR400 SDRAM	120	15-inch LCD	128MB ATI Radeon 9600 Pro	Midsize tower	16X DVD-ROM/52X CD-RW combo drive	Flash media reader (CF I/II, MS, SD/MMC, SM) ⁵	Good	Good	✓/ ⁶
1.83-GHz Athlon XP 2500+	512/DDR333 SDRAM	80	17-inch CRT	128MB NVIDIA GeForce FX 5200	Midsize tower	16X DVD-ROM and 52X CD-RW drives	Logitech Z-640 5.1 speakers, Corel WordPerfect Office 11, games	Good	Good	✓/ ⁶
2-GHz Athlon 64 3200+	512/DDR400 SDRAM	80	17-inch CRT	128MB NVIDIA GeForce FX 5200	Midsize tower	16X DVD-ROM and 52X CD-RW drives	Brushed-aluminum case with window and neon light, wireless keyboard and mouse, no modem, games	Good	Good	✓/ ⁶
3-GHz Pentium 4	512/DDR400 SDRAM	120	19-inch CRT	128MB NVIDIA GeForce FX 5200	Midsize tower	4X DVD±RW and 16X DVD-ROM drives	Gamer's case with side-panel window, no modem	Poor	Good	✓/ ⁶
2.6-GHz Pentium 4	256/DDR266 SDRAM	40	17-inch CRT	Integrated Intel Extreme Graphics (845GV)	Minitor	16X DVD-ROM/48X CD-RW combo drive	Microsoft Works 7.0	Poor	Good	Good/Fair

² 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).

³ Unless otherwise stated, systems come with a modem and a 10/100 network adapter.

⁴ CF = CompactFlash, MMC = MultiMediaCard, MS = Memory Stick, SD = SD card, SM = SmartMedia.

⁵ Insufficient data to give a rating.

⁶ Use Dell E-Value code 6V41I-D83REV to get this price.

⁷ Use Dell E-Value code 6V41I-460RPW to get this price.

a little tweaking, ViewSonic's bundled 17-inch VE175b LCD produced rich colors.

In the number seven power slot, Compaq tries on a new look with its X09 Gaming PC. In place of Compaq's standard black-and-silver case, the X09 has an imposing aluminum case from Cooler Master that we've also seen from gaming PC makers like Falcon Northwest. The X09 continues its performance theme inside

with top-tier sound and graphics cards, and Serial ATA RAID. Compaq representatives say that the X09 is a "pilot program" for the enthusiast market. Sold as a fixed configuration, the X09 is available exclusively from CompUSA; a similar model, the X07, is found only at retailer Best Buy. Both are sold as stand-alone PCs without monitors or speakers, but because we ►



COMPAQ GOES FOR GAMERS with its X09. You have to buy the monitor and speakers separately.

review and price systems with monitors, we added Compaq's Presario FP7317 17-inch LCD to the X09 for our tests.

Though it's more conventional looking than the Compaq, the fourth-place Dell Dimension 8300 boasts similarly impressive components and turned in comparably modest performance on PC WorldBench 4 (just two points below the Compaq's mark). We especially liked the rich sound from its Altec Lansing ADA-995 speakers and the fine image quality on Dell's UltraSharp 1703FP 17-inch LCD monitor. A shortage of those monitors was causing shipping delays as we went to press.

A revised Dell Dimension 4600 inherits the value Best Buy position from an earlier 4600 model. As with the Dimension 8300, you need to provide Dell's E-Value code (noted on our chart) when ordering the 4600 to get the lowest possible price.

Sony's VAIO PCV-RS530G takes the number two value spot. While many PC makers (including Sony) sell PCs based on Microsoft's Windows XP Media Center OS, the RS530G instead uses Sony's Giga-Pocket bundle. Like a Media Center PC, this VAIO can tune in and record standard TV broadcasts. Sony also provides applications for editing digital photos and

videos. Sony's SDM-HS53 LCD monitor delivered impressive image quality, although at just 15 inches, it was a bit small for watching TV and movies. Small also describes the feeble sound from the two-piece bundled speaker set. However, the RS530G has a battery of outputs (including S-Video, composite video, analog audio, and optical digital audio) for linking to a television and stereo system.

At the other end of the features and performance scale, Gateway's austere but economically priced 310X system slides into the final slot on our value chart.

—Seán Captain ■

TECH TREND

Giant Notebook Screens: Is Size All That Matters?

THE LINE BETWEEN DESKTOP and notebook PCs continues to blur—not only in terms of processing power but also in screen size. Four models on this month's notebooks chart have 15-inch LCDs; and the fifth-ranked desktop replacement, the HP Pavilion Zd7000, has a 17-inch wide-format screen with a 1440 by 900 resolution. With that much screen, do you need a separate LCD or CRT monitor when you're working at your desk?

A notebook screen is "not much of a [quality] compromise right now" compared with a basic desktop LCD, according to David Mentley of display research firm ISuppli/Stanford Resources. But if you do demanding visual work, such as editing photos or video, you might want to add a high-performance external monitor. Though image quality on notebook displays has been improving, it is still limited by the need to conserve battery power. While a 15-inch desktop LCD can consume 30 to 35 watts, a typical 15-inch notebook display uses only 5 to 7 watts, says Kamal Shah, who works on notebook power conservation for Intel Labs.

Some of those savings come from efficiency enhancements, but other power savings come at the expense of image quality. For example, most notebook panels use a single fluorescent backlight and have a brightness rating of between 130 and 200 candelas per square meter. Desktop PC models—which commonly have four backlights—start at a brightness of 250 cd/m², and they can go as high as 400 cd/m². "The higher the brightness, the more the gradual color changes will show up [in an image]," says Craig Rit-

tenhouse of Sharp Electronics. Another benefit: Multiple backlights help to achieve a more uniform level of brightness across the screen—ensuring more-accurate color and contrast.

ADVANCED TECHNOLOGY IN DESKTOP LCDs

NOTEBOOK LCDs USE A PIXEL type called *twisted nematic*, which is very power efficient but which limits viewing angles to around 90 to 130 degrees horizontally and about 50 degrees vertically. Low-cost desktop LCDs also use TN panels, but high-end models use technologies that boost rated viewing angles up to 170 degrees horizontally and vertically. (For more on screen types, see last month's "Flat Panel Face-Off" at find.pcworld.com/40019.)

Most notebooks provide a VGA port for an external monitor. And a few, such as Apple's PowerBook G4 models, furnish a digital (DVI) output, which typically yields better performance than an analog output in our monitor tests. Other vendors, such as Dell, provide DVI ports via their docking stations.

Even if you aren't a graphics aficionado, an external monitor may improve your comfort and productivity. While a notebook forces you to tilt your head down and stay close to the screen, an external monitor—and keyboard—allows you to place the screen at the optimal height and distance from your eyes. And

for people who use ultraportable notebooks, an external monitor provides a far bigger screen. A second monitor yields even more space, because this lets you spread the desktop across both the external screen and the notebook's LCD—yielding additional room for opening multiple program windows.





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TOP 15 NOTEBOOK PCs

DESKTOP REPLACEMENT		Overall rating	Street price (1/9/04)	PC WorldBench 4 performance score ¹	Faster	Comments	
1	Best BUY Gateway 450XL find.pcworld.com/38528	81	Expensive \$2279	Windows XP Professional	Very good 125	An unremarkable exterior conceals such top-notch features as built-in Wi-Fi, very good battery life, and upgradability. (★★★★☆ Dec 03)	
2	Dell Latitude D600 find.pcworld.com/36077	79	Average \$1887	Windows XP Professional	Very good 122	Midweight machine has legacy ports, but unappealing sound and a springy keyboard. (★★★★☆ Aug 03)	
3	Acer Aspire AS2003Lmi find.pcworld.com/40448	NEW	77	Average \$2000	Windows XP Professional	Very good 126	Though this notebook offers an alluring wide-aspect 15.4-inch screen, it emits only so-so sound. (★★★★☆)
4	HP Compaq Business Notebook Nx7000 find.pcworld.com/37664	77	Average \$1975	Windows XP Professional	Very good 123	This wide-screen notebook incorporates many attractive design touches, but the keyboard feels flimsy. (★★★ Nov 03)	
5	HP Pavilion Zd7000 find.pcworld.com/40460	NEW	75	Average \$2029	Windows XP Media Center Edition	Good 110	Huge portable with a wide-aspect screen has great sound and a nice keyboard, plus a four-in-one memory card reader. (★★★★☆)
VALUE NOTEBOOK		Overall rating	Street price (1/9/04)	PC WorldBench 4 performance score ¹	Faster	Comments	
1	Best BUY IBM ThinkPad R50 find.pcworld.com/40025	82	Average \$1699	Windows XP Home	Very good 117	Well-rounded, affordable laptop turns in strong performance, and has long battery life and a great keyboard. (★★★★☆ Mar 04)	
2	Toshiba Satellite M35 find.pcworld.com/40439	NEW	81	Inexpensive \$1499	Windows XP Home	Very good 118	Reasonably priced wedge-shaped portable allows comfortable typing and offers a great multimedia experience on its 15.4-inch screen. (★★★★☆)
3	Micro Express NP5015A find.pcworld.com/40415	NEW	81	Very inexpensive \$1199	Windows XP Home	Outstanding 128	Fast, low-cost unit has nice features for the money, but the keyboard layout is annoying. The manuals we received didn't match the system. (★★★★☆)
4	IBM ThinkPad T41 find.pcworld.com/39476	81	Expensive \$2039	Windows XP Professional	Very good 123	Eraserhead and mouse buttons feel a bit flimsy, and the battery is awkward to remove, but the overall design is still pleasing. (★★★★☆ Feb 04)	
5	Acer TravelMate C300 find.pcworld.com/40436	NEW	77	Average \$1899	Windows XP Tablet Edition	Good 115	Convertible Tablet PC notebook has a big 14.1-inch screen plus great performance and a built-in memory card reader. (★★★★☆)
ULTRAPORTABLE		Overall rating	Street price (1/9/04)	PC WorldBench 4 performance score ¹	Faster	Comments	
1	Best BUY IBM ThinkPad X31 find.pcworld.com/39512	80	Average \$1698 ²	Windows XP Professional	Good 116	This near-perfect small notebook's only flaw: The optical drive is located in a separate \$199 docking station. (★★★★☆ Feb 04)	
2	Toshiba Portégé M100 find.pcworld.com/38870	78	Expensive \$2249	Windows XP Professional	Good 115	Sporty notebook almost does it all, with a good keyboard, solid performance, strong audio, and a long battery life. (★★★★☆ Jan 04)	
3	Dell Latitude X300 find.pcworld.com/38531	76	Expensive \$2257 ²	Windows XP Professional	Good 116	On its own, this portable weighs just 3 pounds; its 1.9-pound media slice adds a full set of connections and great sound. (★★★★☆ Dec 03)	
4	Fujitsu LifeBook P5020 find.pcworld.com/39482	76	Average \$1899	Windows XP Professional	Good 107	Relatively compact for a portable with a modular bay, the P5020 has a small screen and is somewhat slow. (★★★ Feb 04)	
5	Sharp Actius AV18P find.pcworld.com/38873	73	Inexpensive \$1399	Windows XP Professional	Poor 95	Basic thin-and-light offers Wi-Fi computing on the go, but only so-so typing and a hard-to-remove battery. (★★★ Jan 04)	

Go to find.pcworld.com/10860 for details on PC World's Star Ratings. Go to find.pcworld.com/40049 for a breakdown of the weightings we give to the various factors that contribute to a notebook's overall rating in each of the three categories.

¹ See "Your Guide to the Top 100" at find.pcworld.com/15720 for more details.
² All Intel CPUs listed are SpeedStep chips, which run at a slower speed on battery power. (We performance-test all notebooks plugged in.)
³ Features listings are not exhaustive.

⁴ Unless otherwise noted, all notebooks come with a lithium ion battery.
⁵ Includes computer, AC adapter, power cord, optical drive, and floppy drive (if offered).

NEED ROOM TO ROAM—across the Windows desktop, that is? The HP Pavilion Zd7000 offers plenty of space for your electronic excursions, with a huge 17-inch wide-format screen that runs at an impressive resolution of 1440 by 900 pixels. But you may not feel like taking many real-world excursions with this Media Center notebook:

It tips the scales at a back-straining 11.1 pounds. On the other hand, its TV capture card and bundled remote control make it ideal for someone who doesn't have room for both a TV and a PC, as it can either record TV programs for later playback or burn them to recordable DVD.

Visit find.pcworld.com/40778 for reviews of all products tested this month and ranked in this chart.

	CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Bays and optical drives	Other features ³	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
	1.7-GHz Pentium M	15.1	512	60	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11g, six-in-one media card reader, Microsoft Works 7	Very good	Very good/ 4:59	Average/ 8.1	Good/Good
	1.6-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, Smart Card reader	Good	Good/ 3:26	Light/ 6.5	Good/Fair
	1.6-GHz Pentium M	15.4 (wide)	512	60	Touchpad	Fixed DVD-ROM and CD-RW combo drive	802.11b, FireWire, four-in-one media card reader	Good	Very good/ 4:33	Average/ 8.1	✓
	1.6-GHz Pentium M	15.4 (wide)	512	60	Touchpad	Fixed DVD-ROM and CD-RW combo drive	Bluetooth	Good	Fair/ 3:00	Average/ 7.6	Good/Poor
	2.8-GHz Pentium 4	17 (wide)	512	60	Touchpad	Fixed DVD-R/RW drive	802.11g, remote control, TV capture card, Microsoft Works 7	Good	Fair/ 1:53	Very heavy/ 11.1	Good/Poor
	CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Bays and optical drives	Other features ³	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
	1.4-GHz Pentium M	14.1	256	40	Touchpad, eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, S-Video-out port	Outstanding	Good/ 4:04	Light/ 6.5	Good/Good
	1.4-GHz Pentium M	15.4	512	60	Touchpad	Fixed DVD-ROM and CD-RW combo drive	802.11b, SD slot	Good	Good/ 3:47	Average/ 7.1	Good/Fair
	1.5-GHz Pentium M	14.1	512	40	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, FireWire	Good	Very good/ 4:41	Average/ 6.9	✓
	1.6-GHz Pentium M	14.1	512	40	Touchpad, eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, Bluetooth, gigabit ethernet	Good	Good/ 4:19	Light/ 5.9	Good/Good
	1.5-GHz Pentium M	14.1	512	40	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, gigabit ethernet, Smart Card reader	Good	Very good/ 5:09	Average/ 7.8	✓
	CPU ²	Screen (inches)	RAM (MB)	Hard drive (GB)	Pointing device	Bays and optical drives	Other features ³	Overall design	Battery life (hours:min) ⁴	Average weight (pounds) ⁵	Vendor's reliability/service
	1.3-GHz Pentium M	12.1	512	20	Eraserhead	DVD-ROM and CD-RW combo drive ⁶	802.11b, CompactFlash slot	Very good	Very good/ 4:49	Light/ 6.4	Good/Good
	1.2-GHz Pentium M	12.1	256	40	Eraserhead	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, FireWire	Very good	Good/ 4:11	Light/ 5.3	Good/Fair
	1.2-GHz Pentium M	12.1	640	40	Touchpad	DVD-ROM and CD-RW combo drive ⁶	802.11b/g, SD slot	Very good	Fair/ 2:07	Light/ 6.0	Good/Fair
	1-GHz Pentium M	10.6	256	60	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, SD and CompactFlash slots	Good	Good/ 4:15	Very light/ 4.7	✓
	1.53-GHz Mobile Athlon XP-M 1800+	12.1	256	40	Touchpad	One multipurpose bay with DVD-ROM and CD-RW combo drive	802.11b, FireWire	Fair	Fair/ 2:55	Light/ 5.1	✓

⁴ Insufficient data to give a rating.

⁵ Price includes the extra-cost docking station.

⁶ Multipurpose bay is in docking station.

The Acer TravelMate C300 is a convertible Tablet PC that can operate as a normal notebook. Flip its large screen over, though, and the device will work as a touch-screen tablet. Toshiba's budget Satellite M35 provides a lot for its very reasonable \$1499 price: strong perfor-

mance, good speakers, and integrated 802.11b wireless networking. Meanwhile, The Gateway M675 boasted strong performance from its 3.2-GHz Pentium 4 processor, but its battery life of just over 2 hours was rather disappointing, and it did not make the chart this month. ■

ACER'S AS2003LMI packs a lot into its svelte case.



TOP 5 PRINTERS

Visit find.pcworld.com/40595 for additional reviews.

	PHOTO PRINTER	Street price (1/15/04)	Overall rating	Score/speed for photo (ppm)	Print quality for photos	Number of color cartridges/cost each	Comments
1	Best Buy Canon i960 Photo Printer NEW find.pcworld.com/40490	\$200	91	Outstanding/ 1.0	Outstanding	5/\$12	FEATURES: 4800-by-1200-dpi maximum resolution; six-ink printing; letter maximum paper size; USB 1.1, USB 2.0, and direct-print (for compatible cameras) ports. SUMMARY: The i960 produced very detailed color glossy prints with realistic colors. Gray-scale images showed smooth textures. Text appeared sharp even at small sizes. No control panel. (★★★★☆)
2	HP Photosmart 7760 Photo Printer NEW find.pcworld.com/40487	\$200	90	Fair/ 0.4	Outstanding	2/\$35 ¹	FEATURES: 4800-by-1200-dpi maximum resolution; six-ink printing; memory card slots; ² two USB 2.0 ports; 1.8-inch LCD. SUMMARY: Unit printed very detailed photos. Print quality of text and gray-scale photos was on a par with that of printouts from the more expensive Photosmart 7960. Unfortunately, line art was marred by banding. (★★★★☆)
3	HP Photosmart 7960 Photo Printer NEW find.pcworld.com/40481	\$300	87	Fair/ 0.4	Outstanding	2/\$35 ¹	FEATURES: 4800-by-1200-dpi maximum resolution; eight-ink printing; memory card slots; ² two USB 2.0 ports; 2.5-inch LCD. SUMMARY: Color glossies looked very detailed, and skin tones appeared natural. Gray-scale photos lacked contrast; text looked grayish at large sizes and fuzzy along the edges. (★★★★☆)
4	Epson Stylus Photo R300M NEW find.pcworld.com/40484	\$229	85	Fair/ 0.4	Outstanding	5/\$13	FEATURES: 5760-by-1440-dpi maximum resolution; six-ink printing; banner maximum paper size; memory card slots; ² USB 1.1/direct-print (for compatible cameras) and USB 2.0 ports; two 2.5-inch LCDs. SUMMARY: Color photos showed excellent detail. Faint yellow bands marred gray-scale photos. Text looked slightly blurred at small sizes. (★★★★☆)
5	Canon i560 Desktop Photo Printer find.pcworld.com/39194	\$130	81	Very good/ 0.8	Very good	3/\$12	FEATURES: 4800-by-1200-dpi maximum resolution; four-ink printing; USB 2.0, parallel, and direct-print (for compatible cameras) ports. SUMMARY: Fastest printer here for text and color graphics on plain paper. Glossy photos showed smooth textures, but colors looked yellowish; inks tended to smear. (★★★★☆ Feb 04)

FOOTNOTES: ¹ Cost for tricolor ink cartridge; photo ink cartridge costs \$25. ² CompactFlash, Memory Stick, SD, SmartMedia, and XD-Picture Card format support. **HOW WE TEST:** Our test image measures 5 by 7 inches, at 2929 by 2092 dpi. Visit find.pcworld.com/34616 for detailed information on how we test photo printers. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. **CHART NOTES:** The overall rating for each photo printer is based on output (35 percent), features (20 percent), ease of use (18 percent), speed (10 percent), price (10 percent), and support policies (7 percent). Maximum paper size is legal, unless otherwise noted. See find.pcworld.com/10850 for details on PC World's Star Ratings.

TEST Center THERE'S NEVER BEEN A BETTER time to put your local photo lab out of business. All four of the new photo printers on this month's chart printed superb color glossies—and two are priced at \$200.

A year ago, outstanding print quality was rare; at that time, only relatively expensive printers produced such attractive photographs.

Though the current crop doesn't print on paper wider than 8.5 inches, you'll like the glossy prints, any of which we'd hang beside the lab-printed photos on our walls, without a twinge of embarrassment. We noticed small differences in skin tones among the prints, but all of them accurately rendered subtle details in shadowed areas and had vivid, realistic colors.

Our Best Buy, the Canon i960 Photo Printer, edged the competition with its all-around print quality—not just for glossy photos. While other models faltered with less impressive prints of line art or photos on plain paper, the i960 delivered consistently good results. A plus for the impatient: The i960 was quick at generating

color glossies—more than twice as speedy as the other new models tested this month. If your digital camera doesn't support Canon's PictBridge direct-print standard, however, you may want to look elsewhere, as the i960 has neither memory card slots nor an LCD for previewing your images.

The other new models on the chart have memory card slots and at least one LCD; and the Epson Stylus Photo R300M has two LCDs, so you can preview photos on one display while looking at control panel menus on the other. The R300M is also the only unit here that can print directly onto specially coated CDs and DVDs.

Except for its slightly less attractive line art, the \$200 HP Photosmart 7760 equaled



THE CANON i960 prints high-quality color glossies and gray-scale photos, though it lacks memory card slots and an LCD.

the print quality of the \$300 HP Photosmart 7960. So what do you get for the extra \$100? The Photosmart 7960 has a slightly larger LCD, and it simultaneously holds three, instead of two, ink cartridges. And if you purchase the optional black and photo gray cartridges for the 7760—the cartridges come standard with the 7960—you'll have already spent almost half the amount you originally saved. ■

TOP 5 AUDIO PLAYERS

Visit find.pcworld.com/40955 for reviews of all products ranked in this chart or tested this month.

	HARD-DRIVE AUDIO PLAYER	Street price (2/2/2004)	Overall rating	Weight (in ounces)	Features/Ease Of use	Comments
1	Best BUY Apple iPod 20GB find.pcworld.com/38453	\$399	83	5.6	Very good/Outstanding	FEATURES: 20GB capacity, dock with USB 2.0 and FireWire interfaces, iTunes software, remote; supports MP3 VBR, AAC, and .wav formats. SUMMARY: This sleek—albeit relatively pricey—member of the iPod family sports streamlined, easy-to-use controls. In our informal tests, it transferred music quickly; and you have the choice of using either FireWire or USB 2.0 as its interface. (★★★★★: Dec 03)
2	Rio Karma find.pcworld.com/40943 NEW	\$350	79	5.5	Very good/Very good	FEATURES: 20GB capacity, dock with USB 2.0 interface, Rio Music Manager, Rio Taxi software; supports MP3 VBR, WMA, Ogg Vorbis, and FLAC formats. SUMMARY: The Karma won't win any beauty contests, but it has a large display plus a docking station with dual RCA line-outs and an ethernet port. You can create and save your own custom playlists or use the player's Rio DJ to automatically generate them. (★★★★★)
3	Archos Gmini 220 find.pcworld.com/40946 NEW	\$350	77	6.0	Outstanding/Good	FEATURES: 20GB capacity, USB 2.0 interface, Musicmatch Plus software, voice recording, optional FM tuner and remote, CompactFlash slot; supports MP3 VBR, WMA, and .wav formats. SUMMARY: One of the many niceties on this full-featured model is its 2.5-inch gray-scale screen, which displays JPEG images on Type I and II CompactFlash cards. The player transfers music very quickly over its USB 2.0 interface. (★★★★★)
4	Creative Nomad Jukebox Zen Xtra find.pcworld.com/40949 NEW	\$400	76	7.9	Very good/Very good	FEATURES: 60GB capacity, USB 2.0 interface, Creative MediaSource software; supports MP3 VBR, WMA, and .wav formats. SUMMARY: Player with huge 60GB hard drive offers three times the capacity of other MP3 players in the same price range. It also provides a host of audio adjustment features and an unmatched playlist interface. Unlike many other players, the Zen Xtra uses a disposable lithium ion battery. (★★★★★)
5	IRiver IHP-120 find.pcworld.com/39296	\$350	76	5.6	Very good/Good	FEATURES: 20GB capacity, USB 2.0 interface, FM tuner/recorder, voice recorder, remote; supports MP3 VBR, WMA, ASF, .wav, and Ogg Vorbis formats. SUMMARY: The player includes no music-ripping software, nor does it require drivers—just drag and drop music files from your PC. The included optical inputs and outputs let you connect the device to a stereo. Handy remote has an LCD screen. (★★★★★: Feb 04)

TEST Center

THE APPLE IPOD 20GB remains the top hard-drive player this month, thanks to its dock (equipped with FireWire and USB 2.0 interfaces), slim design, graceful controls, and remote. But it faces stiff competition from many attractive new models—from large-capacity do-everything devices to simple, smaller players with less storage space.

A full-featured digital audio player, the number three Archos Gmini 220 does a lot more than play your music. The small, square player displays JPEG photos on Type I and II CompactFlash cards, and it stores your images, too. Archos sells an optional \$40 add-on that combines a remote and FM tuner, enabling the Gmini to record radio transmissions as MP3s. Another loaded player new to our chart, the fifth-place IRiver IHP-120 encodes digital or analog music with or without your computer, records voice, and plays and records FM radio. The IHP-120 isn't bundled with music management software, but you can move your tunes onto the device by dragging and dropping them from Windows Explorer. Unfortunately, the player's numerous buttons and

controls were difficult to master initially.

The 20GB Rio Karma doesn't offer any of the aforementioned models' extras. Nevertheless, we liked using its smooth and simple joystick to access music and menu options. An included docking station with built-in ethernet port means that there's no need to constantly reconnect USB 2.0 and AC adapter cables. The fourth-ranked \$400 Creative Nomad Jukebox Zen Xtra didn't wow us with lots of add-ons, either, but this somewhat bulky player gives you a whopping 60GB of storage space for a little less than \$7 per gigabyte. The unit's bright seven-line display and its plethora of equalizer and playlist options make it quite appealing, too.

If you don't need to schlep your entire music collection with you at all times,



ARCHOS'S 20GB Gmini 220 displays JPEG images on its blue-backlit, gray-scale screen.

lower-capacity models like the 4GB Creative Muvo2 and the wafer-size, 1.5GB Rio Nitrus—neither of which made our chart—are an attractive alternative to larger hard-drive players, offering tons more room than the flash-based units that they nearly match in size and weight.

In the near future, we'll be looking at other new digital audio players, including the highly anticipated iPod Mini, in our *New Products* section. ■



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- 4x Digital Zoom



OLYMPUS

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- 10x Optical Zoom
- 4x Digital Zoom



Canon

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- 20x Optical Zoom



MINOLTA

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DIMAGE G500

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- 3x Digital Zoom



FUJIFILM

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FinePix A210

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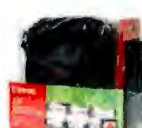
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Portable MP3 Player

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Rio

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Digital Music Player

TOP 10 DIGITAL CAMERAS

TEST
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Visit find.pcworld.com/40922 for reviews of all products tested this month and ranked in this chart.

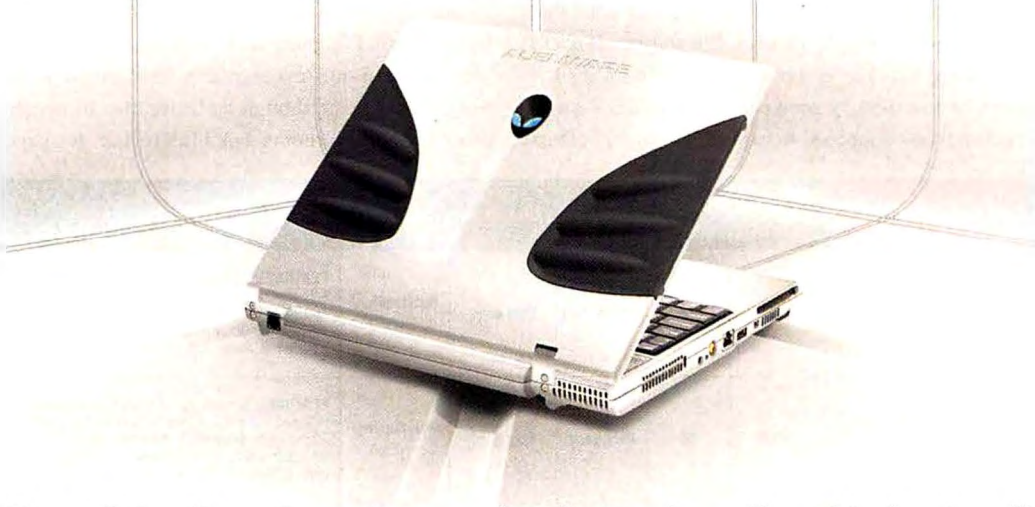
SONY'S LATEST ADVANCED CAMERA, the snazzy Cyber-shot DSC-F828, has several unique features. For starters, it packs an unusually long lens barrel; but more important, it's the first camera to use Sony's new four-color CCD—an 8-megapixel chip that's supposed to capture a range of colors

closer to what the human eye sees. According to Sony, the four-color CCD is more accurate than the standard red-green-blue CCD. In our image-quality tests, pictures taken by the Sony looked great, though no better than those generated by other high-end cameras. For a full review, see page 70.

	ADVANCED CAMERA	Street price (1/30/04)	Overall rating	Image quality	Ease of use	Battery life/shots	Comments ¹
1	Best Buy Olympus C-5060 Wide Zoom find.pcworld.com/39527	\$700	86	Outstanding	Very good	Outstanding/over 500 ²	FEATURES: 5.1-megapixel resolution, 32MB XD-Picture Card (also accepts CompactFlash 1 and 2), 27mm to 110mm focal range, 640 by 480 video with audio, 17.9 ounces. SUMMARY: The successor to the C-5050, this bulky model has a 4X zoom and intuitive controls, and it earned top image-quality scores. (★★★★★: Feb 04)
2	Best Buy Canon EOS Digital Rebel find.pcworld.com/38810	\$1000	84	Very good	Very good	Outstanding/over 500 ²	FEATURES: 6.3-megapixel resolution, CompactFlash slot (media not included), 28mm to 90mm focal range, no video or audio recording, 29.5 ounces. SUMMARY: A bargain for an SLR digital camera with interchangeable lenses; though priced here as a kit with a midrange lens (3.2X zoom), it is also sold body-only. (★★★★★: Jan 04)
3	Canon PowerShot G5 find.pcworld.com/37358	\$600	82	Very good	Good	Very good/438	FEATURES: 5-megapixel resolution, 32MB CompactFlash, 35mm to 140mm focal range, 320 by 240 video with audio, 18 ounces. SUMMARY: For an advanced camera, this big and boxy model is easy to use; it earned high marks for image exposure accuracy and sharpness. Lens casts a shadow in wide-angle flash shots. (★★★★★: Oct 03)
4	Olympus C-750 Ultra Zoom find.pcworld.com/37364	\$550	82	Very good	Good	Outstanding/over 500 ²	FEATURES: 4-megapixel resolution, 16MB XD-Picture Card, 38mm to 380mm focal range, 320 by 240 video with audio, 13.9 ounces. SUMMARY: This 10X zoom camera has powerful creative controls. It did an admirable job of taking accurate outdoor shots with high contrast. (★★★★★: Oct 03)
5	Sony Cyber-shot DSC-F828 find.pcworld.com/40802 NEW	\$1000	81	Very good	Very good	Outstanding/over 500 ²	FEATURES: 8-megapixel resolution, Memory Stick and CompactFlash slots, 28mm to 200mm focal range, 640 by 480 video with audio, 33.9 ounces. SUMMARY: The DSC-F828 uses Sony's new four-color CCD for more-vivid colors; our test shots looked great, but competing models earned higher image scores. (★★★★★:)
6	Fujifilm FinePix S7000 find.pcworld.com/40880 NEW	\$700	81	Very good	Very good	Good/304	FEATURES: 6.3-megapixel resolution, 64MB XD-Picture Card (also accepts CompactFlash 1 and 2), 35mm to 210mm focal range, 640 by 480 video with audio, 17.8 ounces. SUMMARY: This fairly easy-to-use camera turned out decent photos. Unlike many cameras on the chart, it relies on disposable batteries. (★★★★★:)
7	Olympus C-5000 Zoom find.pcworld.com/39530	\$400	80	Very good	Very good	Fair/227	FEATURES: 5-megapixel resolution, 32MB XD-Picture Card, 38mm to 114mm focal range, 320 by 240 video without audio, 9.7 ounces. SUMMARY: Low-priced and relatively small for an advanced, 5-megapixel camera with a hot shoe, the C-5000 produced slightly better-than-average image quality in our tests. (★★★★★: Feb 04)
8	Nikon Coolpix 5400 find.pcworld.com/37370	\$700	79	Good	Fair	Good/330	FEATURES: 5.1-megapixel resolution, 16MB CompactFlash card, 28mm to 116mm focal range, 640 by 480 video with audio, 13.7 ounces. SUMMARY: This unit has a wealth of features, but they're dauntingly presented. The Coolpix 5400 is relatively compact, but its LCD is small for this class of camera. (★★★★★: Oct 03)
9	Nikon Coolpix 5700 find.pcworld.com/37118	\$900	77	Good	Fair	Good/336	FEATURES: 5-megapixel resolution, 16MB CompactFlash card, 35mm to 280mm focal range, 320 by 240 video with audio, 19 ounces. SUMMARY: The complex and powerful Coolpix 5700 takes fine pictures, but some newer models perform better. Its long 8X zoom is useful for photographing wildlife. (★★★★★: Jan 03)
10	Minolta DiMAGE A1 find.pcworld.com/40883 NEW	\$900	75	Good	Very good	Outstanding/over 500 ²	FEATURES: 5-megapixel resolution, 16MB CompactFlash card, 28mm to 200mm focal range, 640 by 480 video with audio, 13.3 ounces. SUMMARY: The DiMAGE A1 has a huge number of convenient controls; it produced images with fine color and exposure, but they weren't as sharp as we expected. (★★★★★:)

FOOTNOTES: ¹ Resolutions are expressed in effective pixels, focal range is identified as 35mm equivalent, and camera weights include batteries. ² We cut off testing at 500 shots, or approximately 4.5 hours of testing. **HOW WE TEST:** We take a series of shots, with and without flash, at the camera's highest resolution and at its default, automatic settings. 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:** Each camera's overall rating is based on price (20 percent), picture quality (30 percent), ease of use (10 percent), features (20 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better.

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MORE REVIEWS

TOP 100

TEST
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MISSED AN ISSUE OF *PC World* or passed your copy along to a friend? Here's a recap of other *Top 100* topics from previous issues. To read reviews of the products ranked on these Top 10 charts, go online and type in the *PC World* Find-It

URL at the top of each chart. Next month, the *Top 100* section will include reviews of 15-inch LCD monitors, scanners, and point-and-shoot cameras. Our Spotlight review will examine the merits of several new external hard drives.



THE XEROX PHASER 8400N is well suited for printing illustrations that contain large blocks of bold, bright colors. It does not fare as well when printing photos and other documents that require subtle shading.



THOUGH IT ISN'T the most innovative camera, the Nikon Coolpix 3700 does include some unique controls, such as the ability to shoot in time-lapse mode.

POINT-AND-SHOOT CAMERAS	COLOR LASER PRINTERS	INK JET PRINTERS	PDA's
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1 Best BUY Nikon Coolpix 3700 find.pcworld.com/40298	1 Best BUY Oki Data Oki C7300n find.pcworld.com/33929	1 Best BUY Canon i350 Color Bubble Jet Printer find.pcworld.com/39191	1 Best BUY PalmOne Treo 600 find.pcworld.com/38543
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3 Canon PowerShot SD100 Digital Elph find.pcworld.com/38789	3 Xerox Phaser 7300DN find.pcworld.com/35912	3 Canon i560 Desktop Photo Printer find.pcworld.com/39194	3 BlackBerry 7210/7230 find.pcworld.com/38036
4 Kodak EasyShare DX6440 find.pcworld.com/38795	4 Ricoh Aficio CL5000 find.pcworld.com/33947	4 HP Deskjet 5150 find.pcworld.com/39197	4 Sony Ericsson P800 find.pcworld.com/36878
5 Toshiba PDR-5300 find.pcworld.com/40301	5 Oki Data Oki C9500dxn find.pcworld.com/33932	5 Epson Stylus C84 find.pcworld.com/38171	5 Samsung SPH-i700 find.pcworld.com/36875
6 Sony Cyber-shot DSC-P10 find.pcworld.com/38468	6 HP Color LaserJet 5500n find.pcworld.com/33941	6 HP Deskjet 5850 find.pcworld.com/39200	1 Best BUY Dell Axim X3i find.pcworld.com/39005
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From the March 2004 issue	From the March 2004 issue	From the February 2004 issue	From the February 2004 issue

PHONE/PDA HYBRID

STANDARD PDA

STOP bugging ME!

More potent weapons
thrown into the battle
against viruses and
worms



The headline and story in the trade magazine were compelling. The bottom line: IT managers are losing ground in the virus battle.

This kind of story can be scary news for small businesses, and for consumers as well. After all, if organizations with big, well-heeled IT staffs are bailing water on the stormy seas of virus control, what does that bode for other users? The MyDoom virus this past winter temporarily shut down a major computer vendor.

And the estimated costs of these viruses are eye-popping, most all of those costs derived from the downtime of workers idled while their computer systems were deloused. London-based mi2g, an information security company, pegged the cost of MyDoom at more than \$22 billion; last year's Sobig virus ran up a tab of \$37 billion. And there is no reason to assume that threats to businesses or consumers are going to ease anytime soon.

Your computers are under constant threat of virus attack that, if successful, can stop your operations dead in their tracks. That's why the anti-virus solutions offered by ESET Software's NOD32 (www.nod32.com) are gaining widespread attention and praise. NOD32 is the only system

in the world that has not missed any "in the wild" virus for more than five years.

The simple fact is that all anti-virus solutions are not created equal. Some work better than others to block viruses without users having to utilize so-called "virus signature database" updates written by vendors. With its **Advanced Heuristics**, NOD32 will catch up to 85% of viruses and worms without the requirement for a "signature database" update, and before these threats are even known to anti-virus researchers.

NOD32 does its job significantly faster than other competitive anti-virus products. This lets users be productive rather than wallow in an "idle state" while their system is scanned for infections. NOD32's smaller footprint also uses less of a system's resources, leaving them available and thus allowing greater productivity.



Virus Bulletin, the independent voice of anti-virus protection, put it this way: "It is almost a truism, in the anti-virus world, that you must choose between fast scanning speed and good virus detection. NOD32 bucks that idea by effectively coupling the two."

Praise continues to rain down for NOD32 as a premier anti-virus

solution. Dell Computer has selected NOD32 to protect its network attached storage solutions worldwide. Canon System Solutions has signed a joint marketing agreement to distribute NOD32 in Japan. And for the third consecutive year, Microsoft continues to use NOD32 to scan all its products for virus infections prior to being released to their customers. Finally, for the second year in a row, Deloitte & Touche has named ESET Software among the 500 fastest-growing technology companies in Europe.

To discover more about NOD32 and its innovative way of protecting your vital information assets, click now on www.nod32.com

Meanwhile, it is important to remember that a little reasonable caution and care in using your computer, particularly for email, can go a long way toward preventing disaster in the form of Internet-borne viruses or worms. NEVER open an email attachment from anyone you can't absolutely identify. Be wary of multiple messages from people you do know, but which arrive with the same wording in the subject line. And keep your ears to the ground for news of virus outbreaks, which are usually highly publicized.

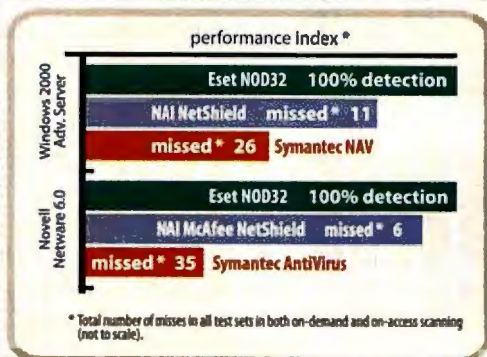


Record winner of Virus Bulletin 100% Awards

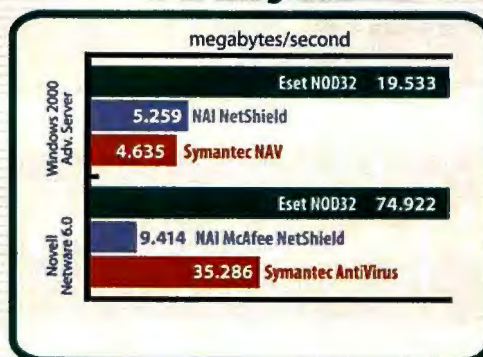
only one antivirus product in the world...

detection rate

Information source:
Virus Bulletin 8/2003, 11/2002



scanning rate



There can only be one #1... Why settle for second best?

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HERE'S HOW

EDITED BY MICHAEL S. LASKY, DENNIS O'REILLY, AND ERIC DAHL



WINDOWS TIPS

SCOTT DUNN

Seven Ways to Make Living With Windows Easier

EVERY TIME I SET UP a new Windows machine, I labor for the better part of an afternoon to get it just the way I like. These tips get the OS up to flank speed.

REVEAL YOUR SYSTEM FILES

Windows
2K XP
98 ME

WHEN YOU OPEN a folder that contains important system files—notably the Program Files, Windows, System, or System32 folder—you're likely to see a patronizing warning that modifying the

contents of the folder could cause your programs to stop working correctly. Duh! In versions of Windows prior to XP, this warning appears only if you use the View-as Web Page option (in Windows 98) or if 'Enable Web content in folders' is selected under the General tab of the Folder Options dialog box (in Windows 2000). Often this warning requires you to click a 'Show Files' link to list the folder's files. If you find this annoying, you're not alone. Fortunately, there's a quick fix.

In Windows Me and XP, just click the text that reads *Show the contents of this folder*. The contents will remain visible until you click the text in the left column to hide the contents again. If you don't see this text, close the folder pane (if it's visible), choose **Tools•Folder Options**, and ensure that *Enable Web Content in Folders* (in Me) or *Show common tasks in folders* (in XP) is selected under the General tab.

To introduce a permanent fix in Windows 98 and 2000, choose **View•Folder Options•View** or **Tools•Folder Options•View**. In Windows 98 select *Show all files* in the 'Advanced settings' list, and in Windows 2000 check *Show hidden files and folders* and uncheck *Hide protected operating system files*. Click Yes to acknowledge the warning (if any) and then click OK.

If you think you may someday want to revert to the old warning, create a backup of the folder.htt file that's in each of the folders where the warning appears by first renaming it—call it something like 'folder_old.htt'. Then copy the folder.htt file that's in the Web subfolder of your Windows or Winnt folder (which lacks the 'Show files' warning) to the folders whose warnings you find bothersome. When you want to restore the warning for a given folder, simply delete the folder.htt file from that folder, and then change the name of folder_old.htt back to 'folder.htt'.

DOUBLE UP YOUR TOOLBARS

Windows
2K XP
98 ME

IF YOUR TOOLBARS take up too much space in Explorer and in your folder windows, conserve screen real estate by putting two or more toolbars on a single line. First, make sure that your screen resolution is high enough and your folder window large enough to accommodate the extra

156 WINDOWS TIPS

Change Windows' default settings to make the OS work the way you prefer; teach your folders some new tricks.

160 INTERNET TIPS

Keep keyloggers and other spyware off your system; double your firewall pleasure; reject e-mail return receipts.

162 STEP-BY-STEP

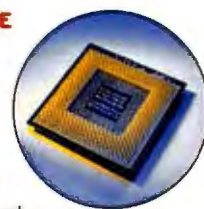
All those new audio and video gadgets plugged into your PC have worsened your cable clutter. Here's the cure.

164 HARDWARE TIPS

Extend an old PC's life with system tweaks and add-ons; stream MP3s to your car stereo; keep CAB files handy.

167 ANSWER LINE

Get the inside scoop on your PC's components; broaden your Web printing; drop the fonts you don't use; set tasks on the hour.



164



FIGURE 1: PUT YOUR TOOLBAR on a diet by removing text labels and tossing all the buttons you don't need.

toolbar buttons. Otherwise, they will be difficult to find when you need them.

Before you merge your toolbars in Windows 98, right-click the standard buttons toolbar (the one that starts with the Back button) and make sure 'Text Labels' is unchecked (the labels make the toolbar buttons huge). In 2000 and XP, right-click the toolbar area and make sure 'Lock the toolbars' is unchecked. In all versions, drag the left edge of each toolbar and drop it where you want it. One toolbar can share space with the menu bar, or you can place two or more toolbars side-by-side. When you're happy with the arrangement in Windows XP, right-click any toolbar and choose *Lock the toolbars* to set them in place. By clicking the double chevron symbol (>>), you can access any button

that's pushed off the right edge.

Windows 2000, Me, and XP give you other ways to abbreviate your toolbars. Right-click the standard toolbar and choose *Customize*. To put your toolbar on a diet, use the list appearing on the right to select the icons you don't need, and then click *Remove* (FIGURE 1). You can rearrange a toolbar's buttons by dragging and dropping them, or by using the

Move Up and Move Down buttons to shift items you use less frequently to the right (where they disappear into the >> menu but remain accessible).

To save even more space, choose *No text labels* from the 'Text options' drop-down list. When you're done, click *Close*. If you type in the Address bar and press <Enter> (instead of clicking the Go button), save some space by right-clicking the Address bar and unchecking *Go Button*.

RELOCATE MY DOCUMENTS

Windows THE FIRST TENET of good file management is to keep **2K XP** your applications separate **98 ME** from your work documents. Windows even encourages this practice by giving you a folder called My Documents, which is located on your C: drive by default. But you don't have to put your data where Microsoft wants you to put it. To redirect the My Documents folder, right-click the icon and choose *Properties*. With the Target tab in front, click in the Target box and type the path to the drive and folder where you want to store your files (see FIGURE 2). In Windows 98, you can click *Browse*, select the folder, and click *OK*. If the folder name you type doesn't exist, Windows will cre-

ate it for you. Recent versions of Windows will also offer to move the contents of the existing My Documents folder to the new location; feel free to click *No* if you want to reassign the My Documents location but don't want to move existing files.

To redirect My Music, My Pictures, My Videos, and other built-in Windows folders, use the right mouse button to drag their shortcuts to a new location and then



FIGURE 3: USE THE FOLDER Options dialog box to make folders look the way you want.

choose *Move Here*. Finally, to change the name of any of these folders, simply select its icon, click its name (or press <F2>), type a new name, and press <Enter>.

SET EXPLORER DEFAULTS

Windows WINDOWS EXPLORER gives **2K XP** you many ways to view your **98 ME** files—as large icons, small icons, thumbnails, lists, or details (the folder view I prefer). To make Details view the default for all your folders, use the View menu to set up a single folder window the way you want; then in Windows 98, choose *View>Folder Options>View>Like Current Folder*. In other versions of Windows, click *Tools>Folder Options>* ►



FIGURE 2: SEND MY DOCUMENTS packing to the drive, folder, and name you choose.

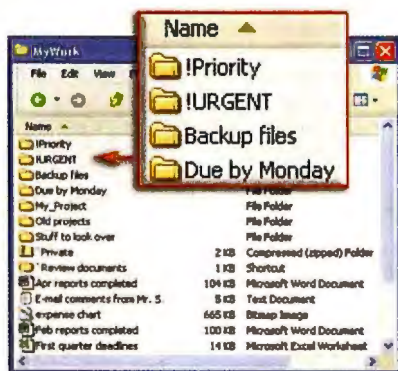


FIGURE 4: USE PUNCTUATION to place a folder, file, or shortcut at the top of the list.

View Like Current Folder (in XP, *Apply to All Folders*; see **FIGURE 3**). If you change your mind and want to go back to the default folder view, click *Reset All Folders*.

But what if you want some folders to use Details view, others to show thumbnails, and so on? No problem. First, use the preceding steps to set the view you'll use with most of your folders. Then, in the 'Advanced settings' list at the bottom of this dialog box, make sure that *Remember each folder's view settings* is checked. Click OK. Whenever you subsequently change the view setting or sort order for a particular folder, it will retain that view the next time you open it.

SORT OF FIRST RESORT

Windows 2K XP 98 ME WHEN YOU SORT Explorer windows by name, folders appear at the top, and other files are listed underneath, each group in alphabetical order. If you'd like to place a file or folder at the top of the list, or if you (like me) want compressed folders and shortcuts to folders at the top near the

folder groups—since these items behave just like folders—rename the item and place a special character at the beginning of its name. Select the shortcut, file, or folder, and press **<F2>**. Press **<Home>** to move the insertion point to the beginning of the name, and type a punctuation character such as **!**, **&**, **[**, or **(**. Press **<Enter>** to finish the renaming (see **FIGURE 4**).

To see the effect, either close and reopen the folder and click *Name* at the top of the column (in Details view), or choose *View>Arrange Icons by Name*. If the folder is already sorted by name, you'll have to follow these steps twice to see the contents in ascending alphabetical order.

SUPERFAST TASK MANAGER

Windows 2K XP 98 ME BACK IN THE January 2002 issue, I listed several ways to get fast access to the Task Manager in Windows 2000 and XP (find pcworld.com/39941). But John H. Rhee of New York tells us what may be the fastest method of all: Press **<Ctrl>-<Shift>-<Esc>** to see Task Manager instantly.

A FRESH START (MENU)

Windows 2K XP 98 ME WHY BOTHER opening a My Documents window, a Control Panel window, and a Printers window (or some other window) just to reach a file or icon you want? With a little tweaking, you can make these and other items appear automatically as submenus off the Start menu. You'll still have to navigate through one or more submenus to get to the item you want, but at least you won't have to worry about closing the file's folder window later.

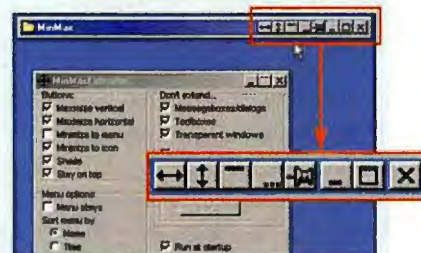
To create new Start menu shortcuts, right-click the taskbar and choose *Properties*. In Windows XP, choose the *Start Menu* tab and click the *Customize* button next to the variation of the Start menu you're using. In all versions, click the *Advanced* tab. In

the list of check boxes at the bottom of the dialog box, select the items you want on your Start menu. For example, check *Expand Control Panel* (in 2000 and Me), or check *Display as a menu* under the Con-

WINDOWS TOOLBOX

MinMaxExtender: New Ways to Tame Your Windows

THE MAKERS OF the MinMaxExtender utility believe that three is not enough. I'm referring, of course, to the buttons on the top right of folder and application windows. With this program you can add as many as six new buttons there to maximize windows vertically or horizontally only, hide a window except for its title bar (the window shade effect), hide a window completely, minimize it to the system tray (the taskbar area near the clock), or make it stay on top of all other windows. You can turn off the buttons you don't need and customize them in other ways. Unfortunately, the program's creators don't support the product anymore, so it



is now open-source. Still, it works well for me, except in XP's default blue, olive, or silver color schemes, whose large buttons collide with MinMaxExtender's stay-on-top button. So either forget about using that feature in this case, or tweak additional MinMaxExtender settings in the Windows Registry so the buttons accommodate each other. And here's the kicker: The program is free. Go to find pcworld.com/39953 for your copy.

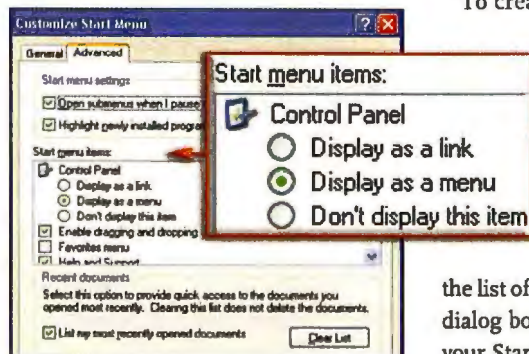


FIGURE 5: CONVERT YOUR important folders to submenus of the Start menu.

trol Panel category in XP's 'Start menu items' pane (see **FIGURE 5**). Depending on your version of Windows, you can do the same for My Documents, My Music, My Pictures, My Computer, Printers, and Network and Dial-up Connections. When you're done, click OK to see the result. ■

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.

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INTERNET TIPS

SCOTT SPANBAUER

**KEYLOGS: WHO'S
WATCHING YOU?**
**HOW TO REJECT
RETURN RECEIPTS**
**THE FIREWALL
COMBO SOLUTION**

Fight Back Against Surveillance Software

YOU PROBABLY KNOW by now that using a computer can be hazardous to your privacy, especially if you use your system online. But your privacy can be compromised even if you never link to a network. Sure, Web sites track your browsing habits with ads, cookies, and Web bugs, and they sell your personal information to marketers. Also, spyware and adware install on your PC by piggybacking onto file sharing utilities and other free software downloads. This column frequently discusses such privacy threats.

But another, less-common threat could be more devastating to your privacy than any of the above: surveillance software installed on your machine by an employer or a family member.

Commercial "keylogger" programs spy on you invisibly. They include SpectorSoft's Spector Pro and EBlaster, TrueActive's WinWhatWhere, X Software's XPCSpy and XPCSpy Pro (see **FIGURE 1**),

and Omniquad's Desktop Surveillance Personal Edition. Not only can these utilities log your every keystroke, e-mail message, Web visit, and instant message, they can also grab screen shots and forward spy reports to a remote computer, all without your knowledge. These programs will ferret out and pass along everything you do with your computer. Worse, an employer or spouse is probably legally entitled to install this software on your computer while you're away from it.

FINDING THE STEALTH APPS

IT'S DISTURBING that mistrust can support so many software companies. Even more disturbing is the fact that it's not easy to detect and remove the surveillance programs these companies produce. Many of the products do such a good job of hiding themselves on your PC that simply looking for the installation files or for an application or process running in memory won't work.

While testing various anti-spyware utilities for a *PC World* review last July (find.pcworld.com/40211), I discovered that two otherwise top-notch spy catchers, Lavasoft's Ad-aware and PepiMK Software's Spybot Search & Destroy, weren't particularly good at finding the keyloggers that I had running in stealth mode on my test PC. Two other

programs—PestPatrol Inc.'s PestPatrol and Webroot's Spy Sweeper—were better, though still hit-or-miss. No product found all of the keyloggers I had installed, and even when they did find one, seldom could they completely disable or remove it.

While most of those programs—both the keyloggers and the anti-spyware utilities—have been updated since my tests, one thing is undoubtedly still true: The more anti-spy tools you employ, the better your chances of detecting a stealth keylogger. Everyone who connects to the Internet should install and use both Ad-aware and Spybot as a matter of course. To do a more thorough scan, add PestPatrol and Spy Sweeper to your counter-espionage arsenal. Both programs are available in trial versions (see "Keyloggers Begone" for download details).

If you suspect a keylogger is installed on your PC, you may be able to bring it out of stealth mode and uninstall it. Most of the programs emerge from stealth mode via a keystroke sequence—Spector Pro 4's default sequence is <Ctrl>-<Alt>-<Shift>-S, for example, and XPCSpy's wake-up call is <Ctrl>-<Alt>-X. Even if the person who installed the spy software has

JUST SAY NO TO RETURN E-MAIL RECEIPT REQUESTS

I'VE BEEN RECEIVING more e-mail messages lately that request permission to send the author a return receipt. All I need to top off the stress caused by an in-box full of unresolved e-mail is the knowledge that the senders know I'm ignoring them. That's why I reject all return receipt requests by default. To do so in Outlook 2002 and 2003, choose *Tools>Options*, click *E-Mail Options* (under the Preferences tab), and then click *Tracking Options*. Select *Never send a response* at the bottom of the dialog box, and click *OK*. In Outlook Express, choose *Tools>Options>Receipts*, select *Never send a read receipt*, and click *OK*. In Mozilla/Netscape Mail, choose *Edit>Preferences*, highlight *Return Receipts* under 'Mail & Newsgroups' in the Category window, select *Never send a return receipt*, and click *OK*. You're set.

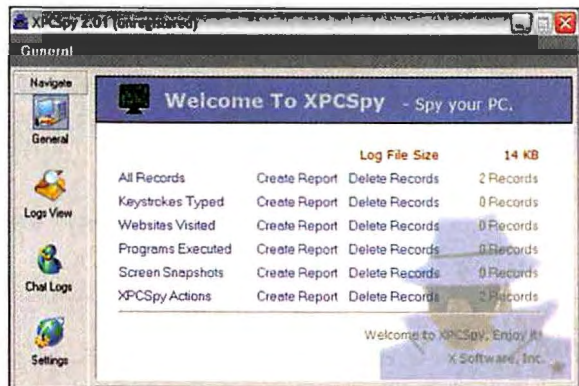


FIGURE 1: STEALTH SPY PROGRAMS such as X Software's XPCSpy track your every computing move.



FIGURE 2: EPIC.ORG'S SITE includes a Workplace Privacy page that offers a solid summary of your rights.

changed this key sequence to something else, a little determined keyboard exploration might reveal the new combination—just be sure to close every application (including those running in the system tray) beforehand to minimize the chances of invoking unwanted keyboard commands in Windows or your apps. Once all your programs are shut down, press **<Ctrl>-<Alt>**, **<Ctrl>-<Shift>-<Alt>**, or a similar combination, and then by trial and error start pressing other keys.

There may be other ways to reveal a hidden spy program. I found one right on X Software's Web page: To bring XPCSpy out of stealth mode, choose **Start+Run**, enter **rx** in the 'Open' field, and click **OK**.

If you find a keylogger on your system, you may not be able to access its settings, since the majority of these programs are password-protected. At least you now know that someone really is spying on you. Though you may feel some chagrin about what the keylogger has recorded, the sense of betrayal at being spied upon is probably worse. However, employers can legally install any tracking software they want on company equipment, and most will undoubtedly feel justified in doing so. Disabling the program, or even mentioning its existence, may not be in your best interest. Before doing anything, study up on your rights, starting with the Privacy Rights Clearinghouse's Employee Monitoring fact sheet (find.pcworld.com/40214) and the Electronic Privacy Information Center's Workplace Privacy page (find.pcworld.com/40217; see FIGURE 2).

If the computer belongs to you or a

member of your household, the situation is even more delicate. Disabling the software may alert its installer that you're on to him or her. If you attempt to get rid of the spy software but discover that it's password-protected (preventing you from accessing its uninstall routine), you may be able to delete the program's files if you can figure out what they are called and where they are stored on your PC. PestPatrol maintains a huge list of keyloggers—both commercial programs and those created by malicious hackers (find.pcworld.com/40223). Click a linked name on that page to find information that often includes instructions for manually disabling or deleting the surveillance program (see FIGURE 3).

If you've tried various tactics and you still can't get the keylogger off your system, try contacting the software maker. TrueActive states that it will assist you in removing its WinWhatWhere monitoring program if the company agrees with you that the software has been installed inappropriately. If all else fails, you can start over: Back up all of your data, reformat your hard disk, and then reinstall your operating system and applications.

To prevent someone from installing surveillance software on your computer, use an operating system that offers strict log-on security, such as Windows 2000, Windows XP, or Linux. (Windows 98 and Me provide less-restrictive log-on protocols.) Be sure to choose strong passwords (different from the ones you used previously if you just uninstalled a keylogger) for any user accounts on the computer, and keep them to yourself.

MORE ON FIREWALLS

LAST DECEMBER'S column on installing and configuring firewalls (find.pcworld.com/40220) generated a flood of reader mail, most of it asking for more details. The most common question I received was, "Should I use both a hardware-based firewall (the kind built into a router's or

REVISION UPDATE

Keyloggers Begone

TRAPPING SURVEILLANCE programs isn't anti-spyware's main job, but all of these tools will uncover at least some commercial keyloggers:

Lavasoft Ad-aware 6.181: free for individual, noncommercial use, 1.7MB, find.pcworld.com/34058

PepiMK Spybot Search & Destroy 1.2: free (donations accepted), 3.5MB, find.pcworld.com/32678

PestPatrol Inc. PestPatrol 4.2: \$40 (feature-limited free trial version detects but does not remove spyware), 6.1MB, find.pcworld.com/35420

Webroot Spy Sweeper 2.2: \$30 (one-year support and update subscription; free version includes one update), 2.5MB, find.pcworld.com/35423

gateway device's firmware) and a software firewall that runs on my PC?"

The answer, which I didn't come right out and say in the column, is: Yes! The hardware router will do what it does

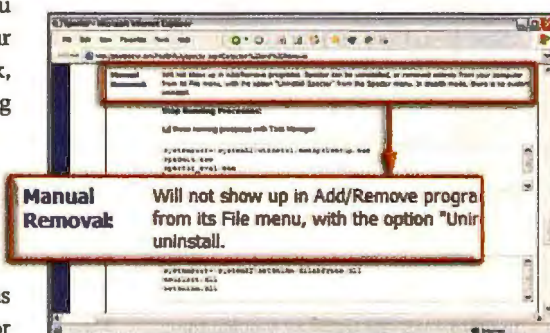


FIGURE 3: DISABLE SURVEILLANCE programs manually, using information in PestPatrol's online pest database.

best—masking the IP addresses of the PCs on your local network from the outside world—while the software firewall will provide a service that the hardware firewall can't (easily), blocking rogue applications on your PC from opening outgoing connections to remote servers. ■

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.

STEP BY STEP

STAN MIASTKOWSKI

Conquer Multimedia-Center Cable Clutter

PEER AROUND THE back of a typical home computer installation (if you dare), and you're likely to see a rat's nest of hanging cables that are twisted around one another. In "Eight Tips to Tame Cables" (find.pcworld.com/30071), we showed you how to go from messy and confused to neat and organized.

But personal computers aren't the only home electronic components wired together. What used to be a couple of stereo

components, a pair of speakers, and a small TV in the living room is gradually morphing into a home theater and media center with a big-screen TV, surround speakers, multiple electronic boxes, and (often) a PC. A messy cable installation might be okay behind your computer in the corner of your family room, but chances are that video or speaker cables draped around your living space won't pass muster with family and visitors.

THE TOP DOWN

Benefits: Organize and hide cables.
Cost: Variable, from nothing to \$100-plus
Expertise level: Beginner to intermediate
Time required: 30 minutes to a few hours
Tools required: Screwdrivers, cutter pliers, wire stripper, crimping tool
Vendors: Belkin (www.belkin.com), Best Buy (www.bestbuy.com), CableOrganizer.com (www.cableorganizer.com), Circuit City (www.circuitcity.com), Home Depot (www.homedepot.com), Lowe's (www.lowes.com), RadioShack (www.radioshack.com)

You can snake the cables through your walls and install wall jacks—or hire a professional to do it—but that can get complicated and expensive. Fortunately, there are some quick, low-cost ways to organize and hide your media-center wiring. ■

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.

1 Cut back cable lengths. Nothing adds to the clutter more than unnecessarily long cables. Find the correct length to purchase by setting up your components and speakers in their final locations. Measure carefully, adding a bit of slack to ensure that the cables aren't taut when connected.

You can save money on speaker or video cable by buying it in bulk. Cut the correct length of cable, and then trim the ends with a wire stripper. In most cases, you'll also need to purchase connectors and attach them to each end using a crimping tool.

2 Hide long runs of cable. If the room where you'll be installing audio and video cable has wall-to-wall carpeting and standard baseboards, there's usually enough



room between baseboard and carpet to tuck cables out of sight. Work carefully, using your fingers, a paint stirring stick, a ruler, or a large wooden spoon to push the cable under the baseboard. Be careful not to damage the cable or mar the baseboard as you do so.

If the baseboard is flush with the floor, consider buying flat speaker cable, which you can hide beneath an area rug. You can also attach wire channels, or raceways, to your baseboard.

3 Go below. If your home theater space has a basement or an accessible crawl space beneath it, the easiest way to hide cables is to drill a hole

in the floor (hidden behind speakers, components, or furniture) and run the cables under the floor. One caveat: Be careful where you drill. Scope out the

space first to avoid pipes and electrical cables. If in doubt, get professional help.



4 Hide in plain sight. In some settings, none of the preceding techniques will work. In that case, consider tucking cables into spiral wraps, split tubing (technically called wire loom), or expandable braided sleeving. They'll be in full view, but their high-tech look makes them less objectionable.



5 Label and dress cables. Be-

fore you hook them up, consider tagging your cables by using either a label maker that prints on plastic tape or a set of cable ties with built-in labels. With long cables, label both ends to ease future changes and troubleshooting. Then use inexpensive cable ties and short runs of spiral wrap or split tubing to dress the cables behind your components.



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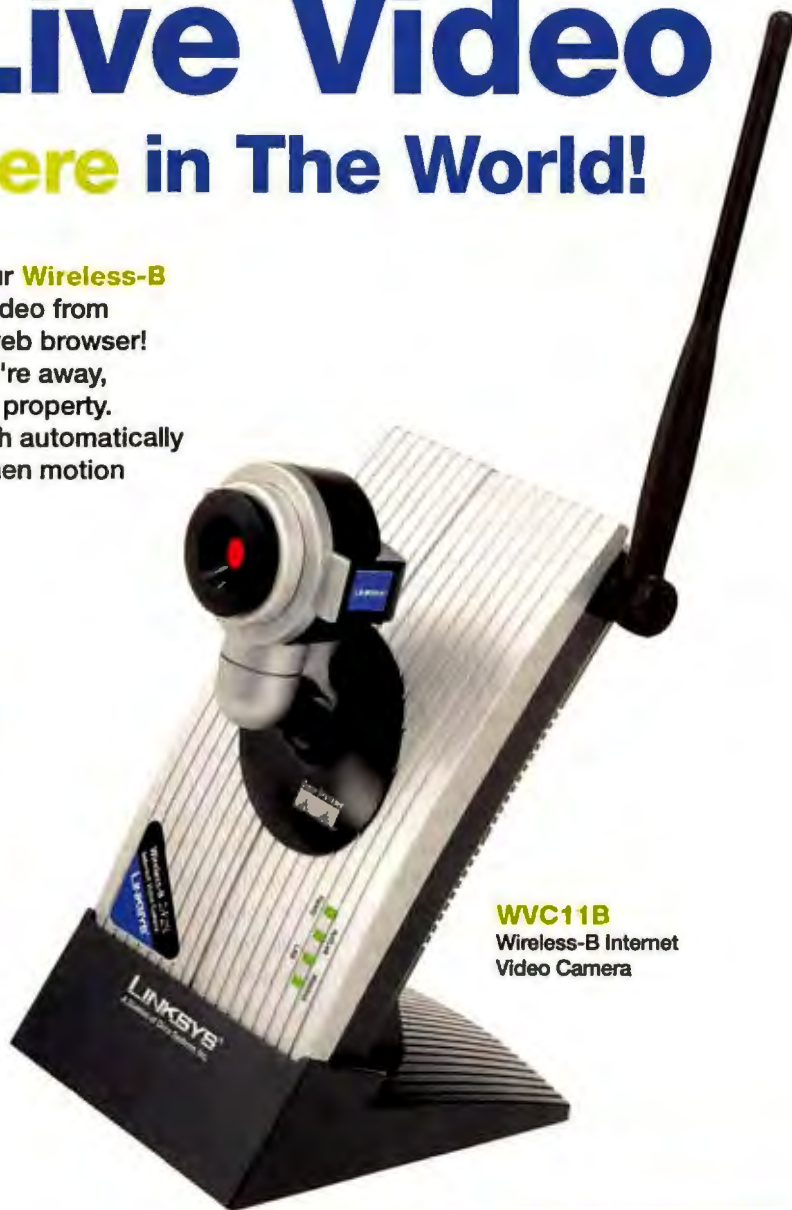
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Can You Postpone That New PC Purchase?

THERE ARE LOTS of good reasons to buy a new PC. But there's also a way to upgrade almost any old PC to match the performance of a new machine on any one of these parameters for a fraction of the cost of a new system. This month I look at common reasons for wanting a new PC and (in the case of valid reasons) tell how a new system compares with an upgrade satisfying each need. Note: If more than four of the reasons below apply to you, maybe you really do need a new system.

I can buy a new PC for a song: This observation never justifies a PC purchase. Any new system will set you back at least several hundred dollars—far more than the cost of most upgrades. And remember, most super-low-cost new systems have limited graphics and upgradability.

I need better performance: If your PC is more than two years old and you want to play the latest games, edit hours of digital video, or perform other demanding tasks,

a new, top-of-the-line PC is unquestionably your best bet. But if you use your PC primarily for Internet browsing, word processing, and occasional spreadsheet work, several component upgrades and system tweaks will satisfy your needs, for less dough.

Adding memory usually provides the most bang for your upgrade dollar; RAM is reasonably priced, and it's easy to install. If your system slows whenever you have lots of open programs, extra memory should perk it right up. Browse to find.pcworld.com/40067 for tips about selecting the perfect memory for your machine.

Upgrading your CPU can improve your computer's performance, but you'll pay a lot for a modest speed boost. Both PowerLeap (www.powerleap.com) and Evergreen Technologies (www.everttech.com) offer CPU upgrades ranging in price from \$100 to over \$300. Rules of thumb: Don't ever buy a CPU upgrade unless the new processor runs at least twice as fast as your current one. And if you're at all squeamish about opening your PC's case and pulling out parts, it's probably best to leave your chip alone.

If your PC uses an early Socket 423 Pentium 4 (circa 2001), the \$50 PL-P4/N adapter from PowerLeap will enable you to run a later model Northwood Pentium 4 processor in the older Socket 423 aperture (see **FIGURE 1**). Your system's performance will benefit from a faster clock

speed—up to 2.4 GHz—and from the Northwood's larger L2 cache. PowerLeap offers the adapter and a 2.6-GHz CPU for \$290. Run PowerLeap's InSpecs utility at the company's Web site to determine your PC's upgrade options. (Note that the InSpecs program may not work if your browser is set to block ActiveX controls.)

I need better graphics: That's easy—just get a new graphics card, right? But some systems won't let you add a new graphics adapter. These budget machines have a graphics chip integrated on the motherboard in lieu of a card in an AGP slot. Some PCs with chip-based graphics come with dedicated graphics RAM, while others tie up system memory to handle the duties. Either way, such systems' graphics performance typically ranges from sluggish to downright glacial.

If your PC has integrated graphics and

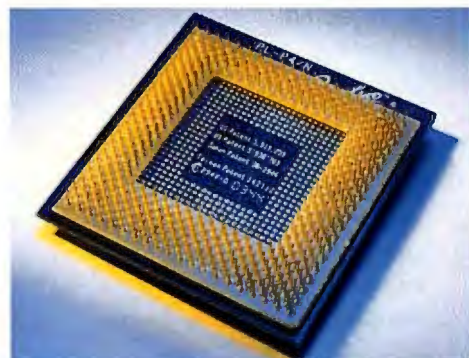


FIGURE 1: SPEED UP your early-model Pentium 4 CPU by adding PowerLeap's \$50 PL-P4/N adapter.

an empty AGP slot, you can probably upgrade your graphics without difficulty, though you may need to disable the system's on-board graphics chip in your PC Setup program. (Visit find.pcworld.com/40241 for more details on changing your PC Setup program.) If your machine doesn't have an empty AGP slot but does have an open PCI slot, you may be able to add a PCI-based graphics card instead. Consult your PC's manufacturer.

If your graphics rely on shared system RAM, you may be able to speed them up by assigning more RAM to graphics (and reducing the amount available for system tasks). Check your PC Setup program for graphics-related memory options.

Looking for a free graphics tweak?

FIND INSTALLATION FILES

YOU CAN SPEED UP hardware installations by moving hardware drivers and system files off your Windows CD and onto your hard drive. Copy all the CAB files—the compressed system and driver files with .cab extensions—from the CD over to your hard drive, and then run BanishCD from AnalogX. This free program reconfigures Windows to check the hard drive whenever it needs a file from the Windows CD. Browse to find.pcworld.com/40265 to download the utility.



FIGURE 2: THE DIRECTX diagnostic utility will tell you whether your PC is running the latest version.

Upgrading to DirectX 9.0b drivers will improve any PC's graphics. Visit find.pcworld.com/40244 for the latest release. If you're not sure what version of DirectX your system runs, click **Start**•**Run**, type **dxdiag**, and press **<Enter>** (see **FIGURE 2**).

I need to connect to external hard drives and video cameras: All new PCs have USB 2.0 ports for linking to high-speed peripherals, and many also have FireWire ports for this purpose. But if your old machine has a free PCI slot, you can add USB 2.0 and FireWire ports by attaching a combination adapter like Belkin's \$70 Hi-Speed USB 2.0 and FireWire 6-Port PCI Card. A dedicated USB 2.0-only or FireWire-only adapter costs \$10 less. Go to find.pcworld.com/40247 to see more information on Belkin's combination card.

I need a notebook with built-in wireless: If you constantly move from one wireless locale to the next, you'll benefit from a notebook with wireless capabilities built in. Sure, a wireless PC Card adapter costs much less than a new notebook, but built-in wireless is much more convenient because there's no PC Card or antenna to carry, lose, or damage. Also, a notebook whose antenna is built into the screen—for example, our Best Buy Gateway 450XL (find.pcworld.com/40250)—gets much better reception than one using a wireless PC Card adapter. **Bonus tip:** If you plan to go wireless but you currently use an old version of Windows, upgrade to XP's improved wireless-network support.

I need more storage space: You can buy an 80GB hard drive for your old PC for less than \$100. Hard drives should be on one

IDE channel and optical drives on the other. If you have no open hard-drive IDE connectors to accommodate a new drive, you can install a \$40 EIDE adapter in an empty PCI slot. Or if you have a free connector on the optical IDE channel, invest in a rewritable DVD drive (approximately \$150).

I need a faster Internet connection: A new PC will accelerate your Web surfing only if your current setup uses an antediluvian 28.8-kbps modem and doesn't have an ethernet card. If you're already at 56 kbps, you'll get better network performance by adding broadband or high-speed dial-up to your existing machine.

I need Windows XP: The path to upgrading a system from Windows 9x to Windows XP can be fraught with peril, which makes wanting an upgrade to your operating system a pretty good argument for buying a new PC. Still, a clean install of Windows XP—which requires that you reinstall all of your applications as well—can extend your old computer's life span at a cost of only \$199 (and several tedious hours of swapping discs). But before you proceed, you should make sure that drivers exist for each of your peripherals. Visit find.pcworld.com/40256 for details on upgrading to XP.

PLAY MP3s IN YOUR CAR

I HAVE CONVERTED most of my music collection to MP3 files and would like to listen to them in my car. In the past, I listened to CDs on the road by using an adapter that attached a portable CD player to my old car's cassette player. Is there an MP3 equivalent?

Lowell Robinson, Frankfort, Kentucky
I DON'T KNOW of any MP3-player-to-car-CD-player adapters, but if your car has an FM radio, you can use an adapter that transforms your MP3 player into a small radio station. And I do mean small: The transmitter is just strong enough to broadcast the analog signal from your

MP3 player to your car radio, boom box, or other nearby FM receiver.

I looked at two models during a recent cross-country road trip: the \$30 TuneCast from Belkin (find.pcworld.com/40259) and the \$30 400FM Wireless Music Adapter from Irock (find.pcworld.com/40262, see **FIGURE 3**). The adapters are the size of a small cell phone and use a short cord that plugs into the headphone jack of your player. Since they're wireless, you can place them almost anywhere, as long as they're within a few feet of the radio's antenna. When the radio receives a clear signal, both models produce acceptable FM-quality sound. But I heard continually clear signals only in regions with few radio stations—between Butte, Montana,



FIGURE 3: BEAM TUNES from your MP3 player to your FM radio with one of these car-stereo adapters.

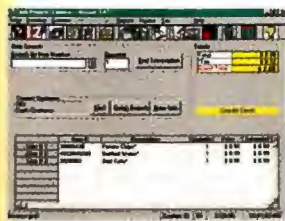
and Bismarck, North Dakota, for example. In urban areas, the signal was consistently stepped on by local radio stations.

Changing frequency settings helped—each model comes with four separate settings—but having to change the settings continually soured the experience for me. (Note that Belkin's new \$50 TuneCast II scans all FM frequencies rather than just four.) The bottom line: How successfully these transmitters will work in a given area is a hit-or-miss proposition, so check the return policy before you buy. ■

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.

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ANSWER LINE

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Get All the Details on the Hardware Inside Your PC

? MANY PC WORLD TIPS require some detail about my PC's innards. How do I find out about my processor, hard drive, graphics card, and so on?

Oscar Meza, Junction City, Oregon

TO TUNE UP your PC, you need to know what hardware is inside the box. To find out, right-click *My Computer* and select *Properties*. Listed under the General tab is your processor's make and speed, plus the amount of RAM in your system.

But the Device Manager will give you even more info. To get to it from here in Windows 2000 and XP, click *Hardware* and then *Device Manager*. In Windows 98 and Me, click the *Device Manager* tab. On it you'll find information covering pretty much all the devices—inside and out—that are attached to your PC and require a driver, including your display, DVD and CD drives, and network adapter.

To determine your hard drive's capacity, right-click the drive's icon in *My Computer* and select *Properties*. To find even

more information, run the System Information program: Select *Start•Run*, type *msinfo32*, and press *<Enter>*.

You'll get a simple yet thorough report with the free Belarc Advisor program. SiSoftware Sandra Standard provides even more detail (the utility is free only for private and educational use; see **FIGURE 1**). Visit find.pcworld.com/40268 to download these programs.

PRINT WIDE WEB PAGES

? SOME WEB PAGES are so wide that when you print them, the right side is missing. Is there a solution?

Ken Brusoe, Haines City, Florida

THE SIMPLEST WAY is to print the page in landscape mode: In Internet Explorer, select *File•Page Setup*, choose *Landscape*, and click *OK*. Now you can print the page.

If you don't like the horizontal printout, convert the Web page to Adobe Acrobat (.pdf) format. Tell your file-conversion software that you want a larger, tabloid-size page, and then select the option to fit everything onto a single page.

You'll need an Acrobat conversion program such as Pdf995 (free for the version with advertising; \$10 for the version without ads). Pdf995 installs itself as a printer driver, and when you "print" to it, you get a .pdf file. Visit find.pcworld.com/40271 to download Pdf995.

Once you've installed Pdf995, go to the wide Web page and select *File•Print*. For your printer, select Pdf995. If you use Internet Explorer 5.x, click the *Properties* button and then the *Paper* tab. With Internet Explorer 6, click *Preferences•Layout•Advanced*. In either version, select the *Tabloid* paper size. "Print" the page, giving

the new .pdf a name at the prompt. Load the .pdf file into Acrobat Reader, select *File•Print*, make sure that the *Shrink oversized pages to paper size* option is checked, and print your page.

SLIM DOWN YOUR FONTS

? I HAVE FAR MORE fonts in my computer than I need, and they're slowing down my boot process. How can I safely remove them?

Jim Nibl, Ponte Vedra Beach, Florida

THE TRICK IS to move—not remove—the fonts, so you can easily get them back.

First, create a folder on your hard drive called **Excess Fonts**, and open that folder in Windows Explorer. Select *Start•Run*, type *fonts*, and press *<Enter>* to bring up your Fonts folder in another Explorer window. Select fonts to remove (double-click a font to see how it looks), but keep Arial, Courier, Courier New, Modern, MS Sans Serif and MS Serif (these two may appear as "MS Reference"), Symbol, Tahoma, Times New Roman, and Wingdings.

When you move a font, bring along its bold and italic variations. Drag unwanted fonts to the Excess Fonts folder. If you ever need one of them, open both folders again and drag the font back to Fonts. ■

Send your questions to answer@pcworld.com. Answer Line pays \$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.

SCHEDULE TASKS HOURLY

WANT TO SCHEDULE a task to happen every hour? Or every 4 hours? Windows' Task Scheduler doesn't schedule for intervals of less than one day...unless you know the secret. First, create the task as you normally would: Select *Start•Programs (All Programs in Windows XP)•Accessories•System Tools•Scheduled Tasks*, and then double-click *Add Scheduled Task* to start the wizard. Set your task to run once a day. When the wizard is complete, double-click the task and click *Schedule•Advanced*. Check *Repeat task* and define the rules.



FIGURE 1: GET DETAILED hardware reports from the SiSoftware Sandra Standard utility.

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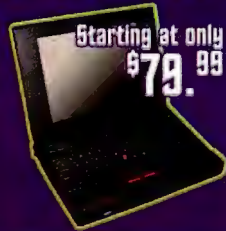
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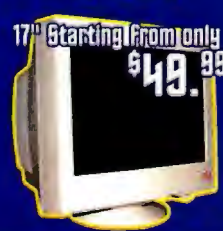
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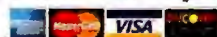
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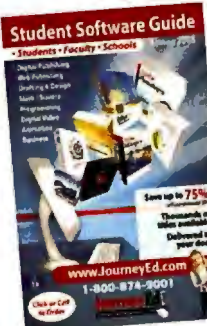
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Ahead Software	www.nero.com	125	Linksys	www.linksys.com	163
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Antec Inc.	www.antec-inc.com	89	Microsoft Tablet	www.microsoft.com	20, 21
AOC Monitors	www.AOCmonitor.com	109	MSN	www.msn.com	14
Autodesk, Inc.	www.autodesk.com	71	MSN Direct	www.msndirect.com	99
Avocent	www.avocent.com	72, 73	NEC-Mitsubishi Electronics Display of America, Inc.	www.necmitsubishi.com	52
BenQ America Corp.	www.BenQ.com	10	NewEgg.com	www.newegg.com	4-5
BenQ America Corp.	www.BenQ.com	29	NewEgg.com	www.newegg.com	126
BenQ America Corp.	www.BenQ.com	58	NewEgg.com	www.newegg.com	150
Buffalo Technology	www.buffalotech.com/pcworld	97	PC America	www.pcamerica.com	166
Canon USA	www.usa.canon.com	8-9	PC Power & Cooling Systems	www.pcpowercooling.com	133
Canon USA	www.canondv.com	50	Princeton Digital	www.princetongraphics.com	65
CDW Corporation	www.cdw.com	2-3	Roxio	www.roxio.com	135
CDW Corporation	www.cdw.com	119-122	R-Tools Technology	www.r-tt.com	46
Cisco Systems	www.cisco.com	39	Samsung Electronics America Inc.	www.samsungusa.com/printer	27
Dell, Inc	www.dell.com/pcw	16-17	Siber Systems	www.siber.com	99
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eMachines, Inc.	www.emachines.com	159	SpectorSoft Corporation	www.spectorsoft.com	141
Eset Software	www.nod32.com	101	Toshiba America	www.toshiba.com	87
Eset Software	www.nod32.com	155	Universal Laser Systems	www.versalaser.com	111
Gateway	www.gateway.com	102	Upfront Rewards	www.4mylaptop.com	106A
Gigatek USA	www.gigatms.com.tw	55	Verbatim	www.verbatim.com	56
Hewlett-Packard	www.hp.com	C4-1	ViewSonic Corporation	www.ViewSonic.com	44
Hewlett-Packard	www.hp.com	81	Visioneer	www.visioneer.com	12
Hostway	www.hostway.com	114	Xerox Office Group	www.xerox.com/office/1964	48-49
IBM	www.ibm.com/shop/m112	66-69	Yahoo!, Inc	www.yahoo.com	168
IOGEAR Inc.	www.iogear.com	47	ZT Group	www.ztgroup.com	6
ISPWest	www.ispwest.com	179			
Kingston Technology	www.kingston.com	145			



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Networked Entertainment: Just Say No

THE OVERARCHING MESSAGE from January's Consumer Electronics Show was pretty much the same as it has been for the last couple of years: Sooner or later everybody will be using wired and wireless home networks to seamlessly shuttle entertainment from room to room.

My message: Bet on later. Whenever I hear it applied to technology, the word *seamless* always has me in stitches.

True, home networking parlor tricks are available right now. Lots of devices permit you to stream tunes from your PC to your home stereo, or to show computer-stored photos and videos on a living-room TV. Some ReplayTV and TiVo video recorders let you access shows from a unit elsewhere in the house. How cool is that?

Not very, thanks to snags such as these:

Speedy obsolescence: Compressed music files incorporating digital rights management technology—generally the only files the music industry will let you download legally—come in at least four incompatible formats from Apple, Microsoft, RealNetworks, and Sony. Right now, only Microsoft's WMA and the ubiquitous MP3 tend to play well with networked stand-alone players.

Buy or rip music in the wrong file format, and you're likely to end up buying or ripping it again. And if you spend your money on one of today's low-definition DVRs or DVD recorders, you're sure to head back to the store someday for a high-def replacement.

Minuscule risk/reward ratio: Back when users had to declare themselves on one side or the other of the Betamax-VHS war, they at least got hitherto unavailable benefits, namely the ability to time-shift TV and rent movies. What do you get today for the time and money you spend setting up a network and downloading or ripping entertainment? The ability to

avoid lugging incredibly weighty CDs or DVDs from one room to another. This violates Manes's First Law: Never adopt technology that requires great initial effort for minimal future reward.

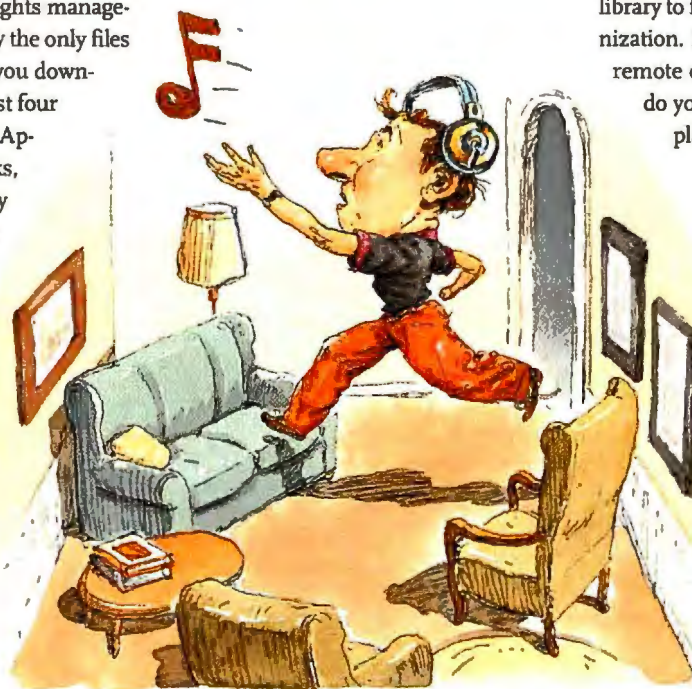
Inadequate bandwidth: 802.11b wireless networks have plenty of bandwidth to handle music if you're not doing some other data-intensive job at the same time. But for low-definition video, you'll need 802.11g, and even that may not work well. In the short run, high-def over wireless is likely to be a story of hiccups, pixelation, and breakup. And if you're entertaining thoughts of ripping up walls to put in ethernet cabling, revisit Manes's First Law.

Half-baked products: Media-streaming boxes sound like a great idea until you try one. Most require you to massage your library to fit their software's ideas of organization. Most respond sluggishly to the remote control. Crashes abound. How do you avoid these problems? Use a plain old CD or DVD player!

Geeks will probably delight in whiling away countless hours networking their entertainment. Normal folks who have enough trouble figuring out today's increasingly baffling TVs will stick with systems that don't crash and won't quickly turn into buggy whips. ■

Visit find.pcworld.com/31595 to see additional columns by Contributing Editor Stephen Manes. He has been writing about technology for the past two decades.

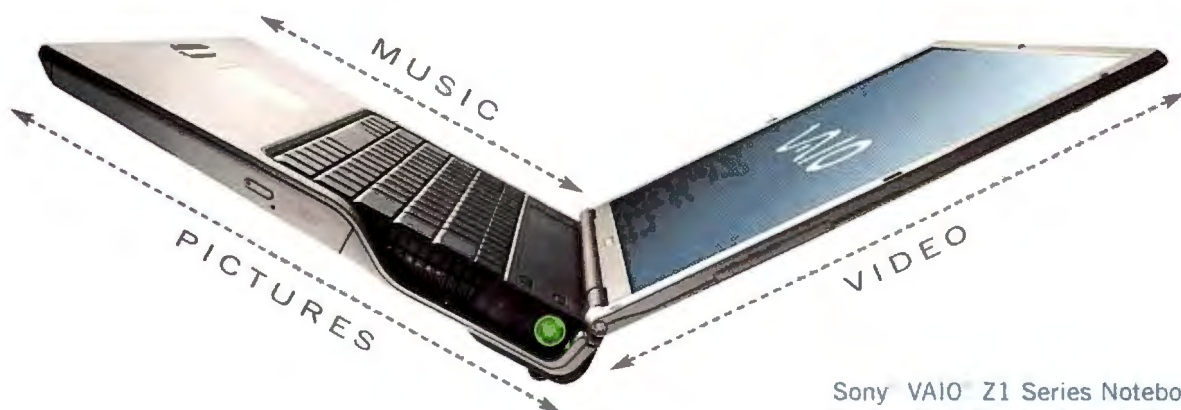
Streaming media? What a runaround!



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