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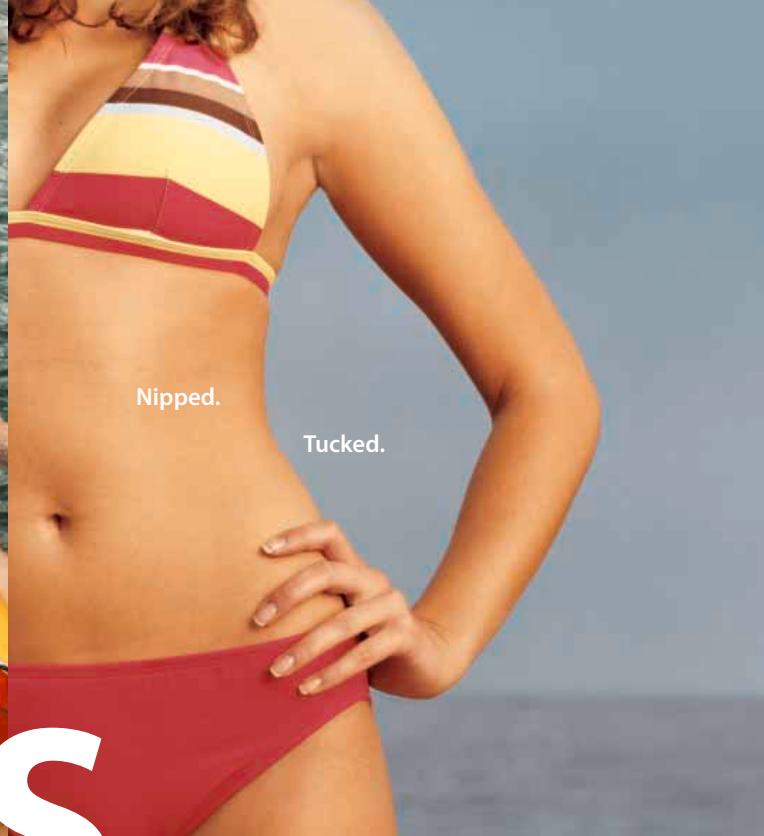
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Forward Thinking



The Year of Living Musically

Among all the cool products we saw in 2004, the Apple iPod made the biggest impact. Apple introduced the iPod in 2001, and even then it wasn't an entirely new concept. I've been playing music on my PC for over a decade. The first jukebox software came out in the late nineties, and the first hard drive-based portable music player I saw was from Creative Labs almost five years ago. But 2004 is the year when iPods proliferated, and people starting taking their music libraries with them everywhere.

Why the iPod and why now? The answer is simple: It's the user interface. Apple has always made the easiest-to-use portable music players, and with the new click wheel on the iPod mini the UI got even better. It may not offer the most options for the most technical users, but it's really simple for someone who just wants to play music. The same is true for iTunes, Apple's jukebox and music store.

I expect Apple will face more competition in the future, though I have yet to see a competitor that threatens the company's dominance. A number of new contenders are in the mini hard drive space, which Apple pioneered with the iPod mini. The Dell Pocket DJ costs less, and the Creative Zen Micro and the Rio Carbon have better battery life. I recently used the Zen Micro and liked it a lot. I especially like that I can replace the battery in the Zen Micro, so with two batteries I get an amazing amount of music-playing time. But let's face it, the iPod still has a slightly better user interface and a lot more name recognition.

Among the larger units, Apple again has the best UI, as well as the biggest selection of products. I've been playing with an iPod Photo (see First Looks, page 28), and it's very cool for showing a slide show of your photos while your music is playing. But if you really want an adjunct to a digital camera for storing photos, then the Archos Gmini400 may be a better bet.

Apple doesn't offer a product for playing videos or recorded TV. The Archos and iRiver players do a reasonable job, and Microsoft has made it relatively easy on the Portable Media Centers from Creative, iRiver, and Samsung. So far, the Samsung YH-999 looks best. But Portable Media Centers require a Media Center PC to work with TV, and they still seem bulky and not quite ready for the mass market.

Apple's biggest advantage may be how well the

iPod works with iTunes, but that could also be a disadvantage. If you go the Windows Media route, you can choose from a lot more hardware and software options. And the Windows world also offers the ability to stream music, important for people who use a desktop primarily. Musicmatch On Demand, Napster, and Real Rhapsody provide access to huge libraries of music for about \$10 a month.

I'm particularly intrigued by the idea of playing rental music on a music player. The latest version of Windows Media DRM allows this, and it's implemented in Napster To Go and similar services. Filling your portable music player with as much music as you'd like for \$15 a month is a more complicated proposition than buying music tracks, but it's partic-



Dell Pocket DJ, iPod Photo, Creative Zen Micro

ularly appealing for people who don't own a lot of music. I'm not quite sure why putting the music on a portable player should cost more than playing it on my PC, but that's something the music industry needs to figure out.

If portable rental music gains traction, it could well become the biggest competition yet to the file-sharing services. I'm sure we'll see much more activity in rental music in the year to come on the Windows side of the market, and I wouldn't be surprised if Apple embraced the concept as well. Any way you look at it, people carrying around huge amounts of music—whether downloaded, rented, or ripped—is a trend that's here to stay.

If portable rental music gains traction, it could well become the biggest competition yet to the file-sharing services.

Forward Thinking

MICHAEL J. MILLER

The Year of the Blog

The other big trend of 2004 was the emergence of the blog as a force in the political debate. Political Web sites have been around for years, and weblogs or blogs go back about five years. But only this year did blogs gain the attention of the public at large.

Blogs and meeting sites, such as Meetup (www.meetup.com), were instrumental in getting like-minded groups of voters together to promote their candidates. In fact, early in the year, these were seen as a huge boost in the candidacy of Howard Dean for the Democratic nomination. Soon after, politicians of all stripes embraced them.

During this year's presidential campaigns and in a number of close local elections, blogs on various sides of the issues exchanged charges and countercharges, many of which found their way into the national debate. Much of the discussion about Senator Kerry's Vietnam service, President Bush's National Guard service, and the mainstream press's coverage

of each issue took place in blogs.

Some of the blogs and some of the sites were filled with unsubstantiated stories, which were nearly always debunked by other blogs. And many of the blogs were wildly partisan, which may account in part for why this election was more partisan than any other in recent memory. I appreciate the diversity of voices that the Internet allows to flourish. I'd rather see a debate on the issues than hear one more story about how the candidates stand in the polls.

Blogs clearly had an impact on the way the mainstream media covered the election, even making the media the news story in some cases. There's a lot to be said for news coverage that strives to be accurate and unbiased, but the editorial nature of most of the blogs helped raise many of the issues that became important in the campaign. Blogs are positioned to have an even greater impact during the next election cycle.



New Computing Platforms

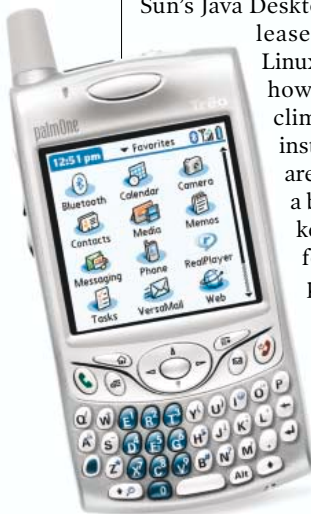
I thought 2004 would be the year for Linux on the desktop, but it really didn't turn out to be much of a competitive threat to Windows. We saw some interesting new distributions—Novell's Linux and Sun's Java Desktop System—and a lot of press releases about organizations adopting Linux. Except in the hacker community, however, Linux still faces a difficult climb. Better driver support, simpler installations, and better management are all necessary for Linux to become a bigger player in the corporate market. And that needs to happen before Linux makes its consumer push. Maybe in '05.

Two other areas did evolve as new platforms. Web applications like Employees.com, NetSuite, RightNow, and salesforce.com have been growing each year. All continued to gain converts to the concept of Web-based applications. We also saw more attempts to integrate Web-based applications—both commercial ones and those developed in-house. I expected to see even greater adoption by larger companies, but Web-based apps are having a huge

impact on the way big IT departments approach application development and deployment.

The mobile phone also started to develop as a platform in 2004. Most of the phones on the market this year can do a lot more than just place and receive calls. Many phones appeared with built-in cameras, but the cameras aren't very good. I expect they'll get better in the coming year.

E-mail also became more commonplace on phones, with the palmOne Treo 600/650 and the RIM BlackBerry 7100t offering built-in keyboards for businesspeople. And nearly every phone and service now offers mobile games, which are improving all the time. I expect to see more phones become personal media devices, gaining many of the features of portable music players. Mobile phones are definitely a platform to watch in the year to come.



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Treo 650**



**BlackBerry
7100t**

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SAMSUNG

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Best of the Year

Are you into compromise? Neither are we. We spent the past 12 months testing thousands of products to find the ones that stand out. We debated their merits in all categories—including PCs, phones, speakers, scanners, cameras, photo editors, firewalls, routers, games, and high-definition TVs. Here are the hundred best we've seen all year.

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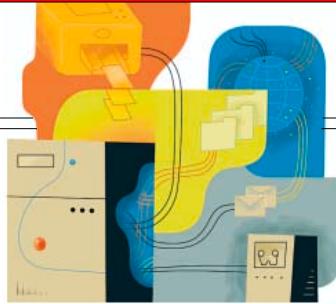
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ANNUAL READER SURVEY

118 Readers' Choices

In Part 2 of our 17th annual survey, thousands of *PC Magazine* readers tell us how they feel about their ISPs, home printers, home networking routers, digital cameras, and cell phones. Has pricey ink, narrow bandwidth, or poor service caused users to turn their backs on manufacturers and service providers? Read on.



NETWORKING

130 A No-Hassle Server?

A simple, affordable, multipurpose appliance could be the best way to equip your small business with a network. Find out who needs these appliances and who is better off with an alternative.

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ONLINE EXTRAS

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- Coming soon:**
- Exabyte VXA-2 PacketLoader
 - Firefox 1.0
 - Sony DRU-710A DVD Rewriter
 - Waves Maxx Home MiniWoofers
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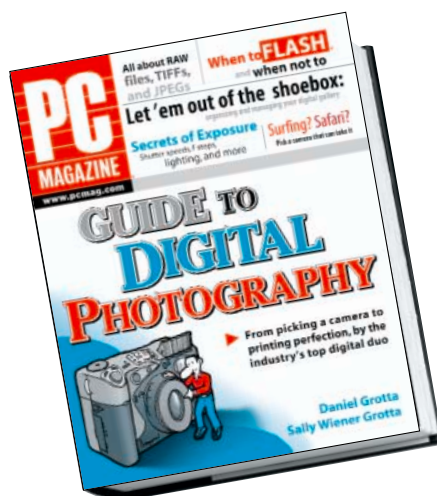
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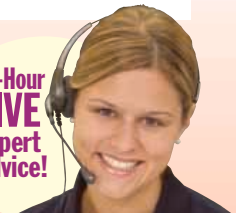
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TECHNOLOGY TRENDS & NEWS ANALYSIS

Making Movies, Taking Movies

Lawsuits are coming for people trading films online.

FILE SHARERS, listen up. Echoing the furor over recording-industry lawsuits against music-file swappers, the Motion Picture Association of America (MPAA) announced in early November that it will work with film studios to begin filing suits against people illegally trading movies online.

"Illegal movie trafficking represents the greatest threat to the economic basis of moviemaking in its 110-year history," said MPAA president and CEO Dan Glickman, who compared trading movies online to shoplifting a DVD from a store. "People who have been stealing our movies believe they are anonymous on the Internet and won't be held responsible for their actions. They are wrong. We know who they are, and we will go after them, as these suits will prove."

The MPAA estimates that piracy currently costs the film industry \$3.5 billion a year, and a recent federal interagency report estimates that all kinds of piracy cost the American economy \$250 billion a year.

"Suing people who break the law is an important part of solving the piracy problem, [and is] part of protecting artists in the digital age," says Alan Davidson, associate director of the Center for Democracy and Technology.

The MPAA's announcement comes on the



heels of several other signs that file trading is affecting multiple industries. New versions of high-profile video games like Halo 2 have recently been released on the Internet before their official debuts. And in early November, rappers Eminem and Snoop Dogg announced that they were moving up the release dates for their new albums after all the songs on them appeared on the Net.

Congress may mandate some form of digital rights management (DRM) technology for media content in 2005.—*Sebastian Rupley*



Canon PowerShot S70

Photo Fever

THERE'S NO stopping digital cameras, with 2004 a banner year for them. They are now the number one planned consumer electronics holiday gift, replacing DVD players, according to survey data from the Consumer Electronics Association. And U.S. unit sales for digital cameras are expected to show 40 percent year-over-year growth, with more than 20 million cameras sold, say market researchers at Gartner.

"Price continues to be the primary driver of digital camera sales," concludes the Gartner report, "and sales will continue to increase as more products become available in the \$300-to-\$500 price range." The report also predicts that 80 percent of U.S. households will have a digital camera by 2008. That's a lot of digital shutterbugs.—*SR*

SPEED DEMON IBM's Blue Gene/L system has been officially crowned the world's fastest supercomputer, after verification of 70.72-teraflop speeds from the TOP500 project, an independent group of university computer scientists.

Small-Biz Suite

A NEW EDITION of Microsoft Office is on its way. The company has commenced prerelease testing of a version targeted at small businesses, expected to ship in late 2005. The new edition includes the

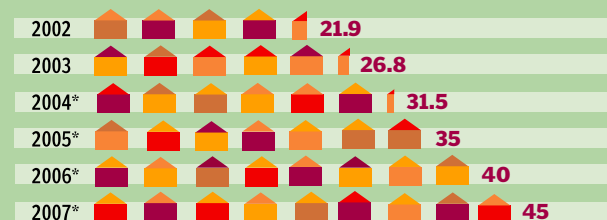


Microsoft Office 2003 programs, an updated version of Outlook featuring a business contact manager, and accounting software.

Prospective prerelease testers of the new edition can sign up at www.microsoft.com/office/accounting.—*SR*

Online Banking: All That It Can Be?

Substantial numbers of U.S. households are banking online, but a new report suggests that banks are having a tough time adjusting. The problem is that banks are "treating the Internet as a new, separate channel run by a separate division," creating customer service trouble, says David Hallerman, senior analyst at eMarketer.



U.S. Households Banking Online, 2002-2007 (in millions)

*Projected.

Source: eMarketer, September 2004.

My Very Own Robot

WANT TO RIG your own robot? After more than a year of development, White Box Robotics is preparing to ship its 912 series of customizable robots (shown) in the first quarter of 2005.

The 912's chassis looks like a racy version of R2-D2 and comes with a VIA motherboard and customizable software from Evolution Robotics. "The software is capable of speech synthesis, speech recognition, motion sensing, obstacle avoidance, and more," says Tom Burick, White Box's president.

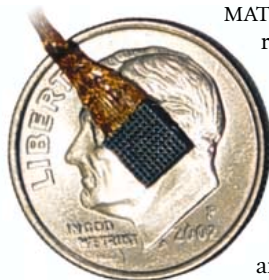
The chassis is designed to let users add hard drives,



cameras, and other extras. Burick estimates that the base price for a robot will be about \$800, with hobbyists spending approximately \$1,300 to \$1,500 to finalize their creations.

Meanwhile, a new report from the United Nations Economic Commission for Europe predicts a big uptick in demand for industrial robots and multibillion-dollar markets for consumer and service robots by 2007. Purdue University is also spearheading an effort funded by the National Science Foundation to enable humanoid robots to move more like people. Using sensors, researchers will record human motion in three dimensions. —SR

The Thought Interface



MATTHEW NAGLE is a 25-year-old quadriplegic with unique kinetic capabilities, thanks to a small sensor chip implanted in his brain. Developed by Cyberkinetics Neurotechnology Systems to help the severely disabled communicate directly with a PC, the BrainGate Neural Interface System consists of an internal sensor and a wire bundle, which goes from the sensor up through the skull and out to a dime-size pedestal connector on the scalp.

When in use, the pedestal is connected to external processors that convert neural signals into digital ones and relay them to the PC. By imagining that he is moving his arm, Matthew has been able to control a computer cursor to choose a desktop icon that turns on a television across the room. He can also play the computer game Pong with a technician, and he can check e-mail.

BrainGate may eventually give people like Matthew the ability to move a limb, says Tim Surgenor, president and CEO of Cyberkinetics. "Theoretically it is possible down the road," but he adds that step one is to control the immediate environment. "We want to come up with a set of devices that quadriplegics would like to control and build a computer operating system that would allow them to do so." He lists computers, televisions, phones, lights, and wheelchairs as examples.

The next task for Matthew will be to work on four or five simulated gestures, such as executing keystrokes. "Eventually we will have built for him the equivalent of a game controller," says Surgenor, "and he will be able to do a lot of things." —Karen Jones

ALMOST TOLL-FREE

Internet telephony got a big boost in early November when the FCC exempted Voice over Internet Protocol (VoIP) calling services from state regulation. Calls placed on the Net, through flat-fee providers like Vonage, can mean big cost savings compared with other kinds of calling. FCC chairman Michael Powell said the decision would lead to cheaper, better service and more innovation. The exemption from state regulation could also mean that large, local telephone services will start offering VoIP services.

Make Way for Mozilla

IS SPYWARE slowing down your surfing? If so, you may want to join millions of others who are hopping off the Microsoft Internet Explorer merry-go-round and jumping on the Firefox browser bandwagon.

According to Web analytics firm WebSideStory, at the beginning of June over 95.48 percent of American Web surfers were using IE, but by October's end, that percentage had fallen to 92.86. Where did those users go? Most of them apparently switched to Mozilla and its open-source derivative browser, Firefox.



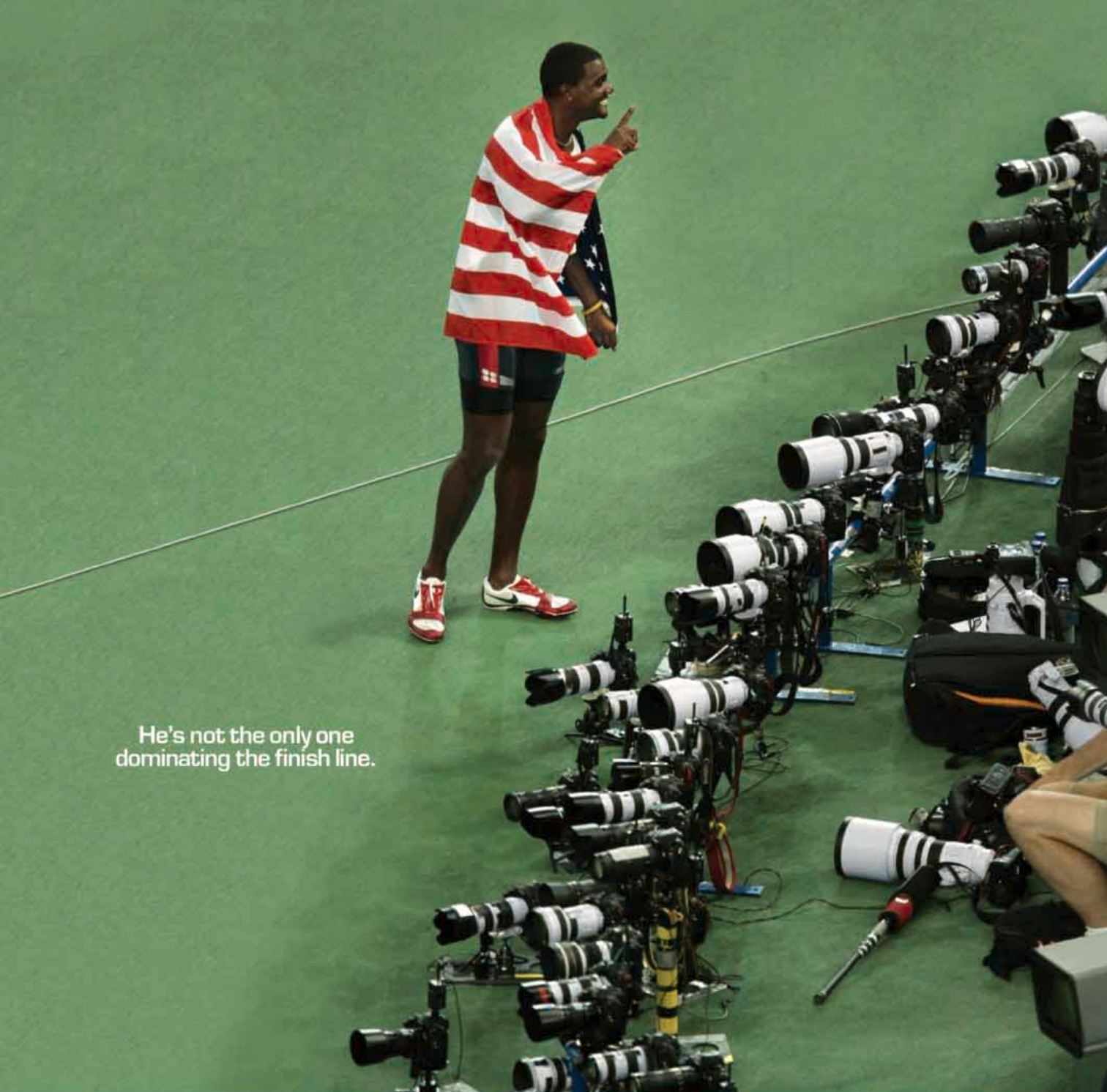
"It's the first time we've seen IE's market share decline in the six years we've covered it," says WebSideStory CEO Jeff Lunsford. "It looks like people are switching at a rate of about half a percentage point a month."

Many analysts have specu-

lated that surfers are switching in order to avoid the security headaches and spyware that are plaguing IE. Indeed, Firefox, which was downloaded one million times in the first 24 hours after version 1.0's release, does not allow ActiveX programs to run or let so-called trusted sites circumvent security settings. That's how the program is able to avoid spyware infections, says Firefox director of engineering Chris Hofmann.

According to Hofmann, the Firefox e-mail client companion, Thunderbird, should be finished by December. —John R. Quain.

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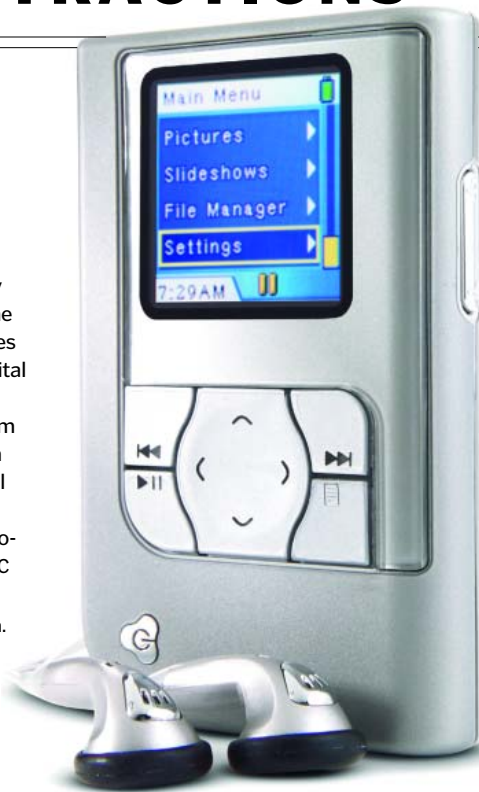
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Free to join. woot inc., www.woot.com.

Dust Off Those Old Records

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Tired of sending the same old post-card-style photo greeting cards at holiday time? Then check out the new offerings at PhotoWorks.com. The company's **Signature Photo Cards** resemble store-bought cards, complete with textured paper stock, die-cut reveals, and classy designs. The difference? They feature photos of you and yours, not what someone at Hallmark drew. In addition to holiday themes, PhotoWorks also has styles appropriate for birth announcements or just saying hello.

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- Toshiba Qosmio E15

GAMING NOTEBOOK

- Dell Inspiron XPS

VALUE NOTEBOOKS

- Apple iBook

- eMachines M5405

TABLET PCs

- Motion Computing M1400
- Toshiba Portégé M205-S809

MOBILE DEVICES**PDAs**

- HP iPaq hx4700

- palmOne Zire 72

PHONE/E-MAIL DEVICE

- BlackBerry 7100t

PHONES

- Audiovox SMT 5600

- Nokia 6620

DIGITAL NOTE TAKER

NEW Logitech io2 Digital Writing System

GPS DEVICES

- TomTom Bluetooth GPS Receiver

- TomTom GO

HOME ENTERTAINMENT**MEDIA HUBS**

- Creative Sound Blaster Wireless (music)

- Prismiq MediaPlayer

DIGITAL VIDEO RECORDER

- SnapStream Beyond TV 3

HDTVs

- Pioneer Elite Pro-1110HD

- Sharp Aquos LC-37G4U

CAMERAS**ULTRACOMPACT**

- Sony Cyber-shot DSC-T1

COMPACT

- Canon PowerShot S60

- Casio Exilim Pro EX-P600

- Kodak EasyShare LS743

SUPERZOOM

- Olympus Camedia C-765 Ultra Zoom

ENTHUSIAST

- Konica Minolta DiMage A2

- Leica Digilux 2

- Olympus C-5060 Wide Zoom

- Olympus C-8080 Wide Zoom

DIGITAL SLR

- Canon EOS 20D

CAMCORDERS

- Canon Optura 400

- JVC GR-D33US

- Sony DCR-DVD201 DVD Handycam

- Sony DCR-HC40 MiniDV Handycam

- Sony DCR-HC40 MiniDV Handycam

DIGITAL IMAGING**FLATBED SCANNER**

- Canon CanoScan 8400F

IMAGE EDITORS

- Adobe Photoshop CS (pro)

- Adobe Photoshop Elements 3.0 (consumer)

PHOTO-ARCHIVING SOFTWARE

NEW ACDSee Version 7

- Adobe Photoshop Album 2.0

PHOTO-SHARING SERVICES

- OurPictures

- smugmug

PHOTO-PRINTING SERVICE

- Shutterfly

DIGITAL AUDIO & VIDEO**VIDEO EDITORS**

- Adobe Video Collection 2.5

- Pinnacle Studio Plus 9

CD-/DVD-BURNING SUITE

- Roxio Easy Media Creator 7

DVD AUTHORIZING

- Sonic MyDVD Studio 6

- Ulead DVD Workshop 2

SLIDE SHOW CREATOR

- Arcsoft DVD SlideShow

PORTABLE AUDIO

- Altec Lansing inMotion

- Apple iPod

- Apple iPod mini

- Belkin Digital Camera Link

NEW Creative Zen Micro

- Delphi XM Roady2

- iRiver H140

- Samsung Yepp YP-T5V

SOUND CARD

- Creative Sound Blaster Audigy 2 ZS

SPEAKERS

- Creative Gigaworks S750

- Klipsch ProMedia GMX D-5.1

NEW M-Audio Studiophile DX4

PC MEDIA PLAYER

- Windows Media Player 10



M-Audio Studiophile DX4



Creative Zen Micro

MUSIC STORE

- Napster 2.0

WEBCAM

- Logitech QuickCam Pro

MOUSE

- Logitech MX1000 Laser

PRINTERS**PERSONAL PRINTERS**

- Canon Pixma iP4000

- Lexmark C510n (color laser)

- Samsung ML-2250 (laser)

PERSONAL AIOs

- Brother MFC-3420 (ink jet)

- Brother MFC-8420 (laser)

- Canon MultiPass MP390 (ink jet)

PHOTO PRINTERS

- Canon i9900 Photo Printer

- Epson PictureMate

- Epson Stylus Pro 4000

NETWORK PRINTERS

- HP Color LaserJet 4650n

- HP LaserJet 9000dn

- Xerox Phaser 4500DT

- Xerox Phaser 7750DN

DISPLAYS & STORAGE**BUSINESS DISPLAYS**

- Envision EN7220

- IBM ThinkVision C220p

- NEC MultiSync LCD1960NXi

BUSINESS PROJECTORS

- Sony VPL-CX85

- Toshiba TDP-T91U

GAMING GRAPHICS CARDS

- ASUS V9999 Ultra Deluxe

- ATI Radeon 9800 XT

MAINSTREAM GRAPHICS CARD

- PNY Verto GeForce 5700 FX Ultra

DVD BURNERS

- HP DVD Movie Writer dc4000

NEW LaCie 16X d2 DVD+/-RW Double Layer

- Pioneer DVR-A08

EXTERNAL DRIVES

- Transcend 1.8" Portable Hard Drive

- Western Digital Media Center

- WiebeTECH Fire800

EDITORS' CHOICES

DECEMBER 14-DECEMBER 27, 2004

REMOVABLE STORAGE

- Iomega Rev 35

NETWORKABLE STORAGE

- Buffalo LinkStation
Network Storage Center

PORTABLE PHOTO STORAGE

- Micro Solutions RoadStor

PRODUCTIVITY SOFTWARE**OFFICE SUITE**

- Microsoft Office 2003

OCR

- ScanSoft OmniPage Pro 14 Office

PDF CREATION

- Adobe Acrobat 6.0
- FinePrint pdfFactory PRO 1.57

- Jaws PDF Creator 3.0

DOCUMENT MANAGEMENT

- ScanSoft PaperPort Pro 9 Office

DESKTOP PUBLISHING

- Adobe InDesign CS

FINANCE & ACCOUNTING

- Microsoft Money Premium 2005
- QuickBooks Premier 2004
- QuickBooks SimpleStart

WEB SITE CREATION

- NeoVerve StoreSense

WEB RESEARCH

- Amplify
- enLighter Retriever
- NEW** Keyhole 2 PRO

- Onfolio Professional

MEDIA CREATION SUITE

- Roxio Easy Media Creator 7

E-MAIL CLIENT

- Microsoft Outlook 2003

VIDEOCONFERENCING

- SightSpeed Video Messenger
- VidiTel

WEB COLLABORATION

- Intranets.com

FILE SHARING

- Grouper 1.0

DATABASE

- FileMaker Pro 7

BLOG/WIKI TOOLS

- EditMe
- Socialtext Workplace 1.0
- TypePad

UTILITIES**ANTIVIRUS**

- Norton AntiVirus 2005

FIREWALLS

- Norton Personal Firewall 2005

- ZoneAlarm Pro 5

SECURITY SUITES

- Norton Internet Security 2005
- ZoneAlarm Security Suite 5

ANTISPYWARE

- Ad-Aware SE Plus 1.0.2
- SpySweeper 3.0

ANTISPAM

- Cloudmark SafetyBar 4.0
- MailFrontier Desktop 4.0
- Qurb 2.0

POP-UP BLOCKER

- PopUp Cop

INSTANT MESSAGING

- MSN Messenger 6.1

FILTERING/MONITORING

- Cybersitter 9.0

- Spector Pro 5.0

- The Children's Internet

ANONYMIZER

- GhostSurf 2005 Platinum

FILE COMPRESSION

- PKZip 8.0 for Windows
- StuffIt Deluxe 8.0

BACKUP

- IBackup
- Retrospect Pro 6.5

ROLLBACK

- Norton GoBack 3.0

DISK IMAGING

- Symantec Ghost 9.0

PARTITIONING

- Norton PartitionMagic 8.01

DEFRAGGERS

- Diskeeper 8.0 Pro
- PerfectDisk 6.0

REMOTE ACCESS

- LapLink Everywhere 3.0

FILE MANAGER

- Novatix ExplorerPlus 6.1

MIGRATION

- Alohobob PC Relocator Ultra Control

- Desktop DNA Pro 4.7

TOOLBARS

- Dogpile

- Google Toolbar

DESKTOP CUSTOMIZATION

- Object Desktop 2004

DOWNLOAD MANAGER

- DownloadStudio 1.0

SCREEN CAPTURE

- SnagIt 7.0.3

FILE VIEWER

- IrfanView 3.85

VIRTUAL PC

- VMware Workstation 4.5

PASSWORD MANAGER

- AccountLogon 2.5

ENTERPRISE SOFTWARE & DEVELOPMENT**NETWORK ANTIVIRUS**

- Trend Micro Enterprise Protection Strategy

ENTERPRISE ANTISPAM

- Postini Perimeter Manager

E-MAIL SERVER PLATFORM

- IBM Lotus Notes and Domino 6.5

WIRELESS PLATFORM

- GoodLink 3.0

WEB FILTERING

- Websense Enterprise 5.1

CRM

- salesforce.com Enterprise Edition

DATABASE

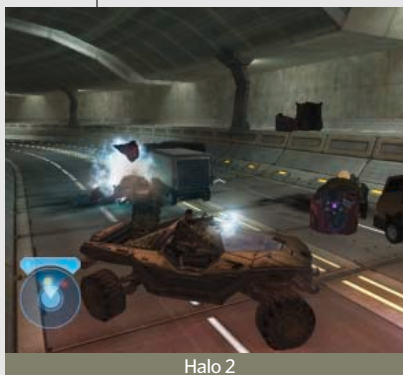
- Oracle 9i Database

WEB CONFERENCING

- WebEx Meeting Center

ENTERPRISE DEVELOPMENT

- Borland JBuilder 2005



Halo 2

- IBM WebSphere Studio Device Developer 5.6 (mobile)

- SQL Anywhere Studio 9 (mobile)

WEB SITE DEVELOPMENT

- Macromedia Contribute 3
- Macromedia Studio MX 2004

WEB SITE ANALYSIS

- WebSideStory HBX
- WebTrends 7 Enterprise

VULNERABILITY SCANNER

- Retina Network Security Scanner

SERVER OS

- Microsoft Windows Server 2003 Enterprise Edition

NETWORKING

- Microsoft Windows Server 2003 Enterprise Edition

WIRELESS INFRASTRUCTURE

- Cisco Aironet 1200
- D-Link DCS-5300G 802.11g Internet Camera
- Hawking HWPS12UG
- Linksys Wireless-G WRT54GS (802.11g)
- Netgear ProSafe-FWAG114
- 3Com OfficeConnect Wireless 54Mbps 11g Travel Router

SECURITY APPLIANCE

- ServGate EdgeForce

SECURITY SOFTWARE

- Astaro Security Linux 5

SERVER APPLIANCE

- NEW** EmergeCore IT-100

REMOTE-ACCESS APPLIANCE

- Neoteris Access 1000

GEAR & GAMES**HOME AUTOMATION**

- X10 ActiveHome Professional

SIMULATION

- Microsoft Flight Simulator 2004
- The Sims 2

ACTION/COMBAT

- Battlefield Vietnam
- Far Cry
- NEW** Halo 2
- Orbz 2
- Savage: The Battle for Newerth

SPORTS

- Madden NFL 2005

REAL-TIME STRATEGY

- Rise of Nations: Thrones and Patriots

VIRTUAL WORLD

- Second Life

ONLINE GAME

- EverQuest: Evolution

MOBILE GAME

- Bejeweled
- NEW** Warfare Incorporated

EDUCATION

- eMedia Beginner Guitar Method 3.0
- Math Mission: The Race to Spectacle City Arcade, The Amazing Arcade Adventure
- VTech V.Smile Learning System, Smartridge Library
- Zoombinis Island Odyssey

REFERENCE & HOBBIES

- Coin Collector's Assistant Plus
- Microsoft Encarta Reference Library 2005
- Sonicfire Pro 3.2
- Visual Thesaurus



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Music Players Add More

THE MAGAZINE
WORLD'S LARGEST
COMPUTER-TESTING
FACILITY



BY BILL MACHRONE

If you've held off buying a portable digital music player (or are in the market for a new one), you're in luck: Each month this fall brought new models that deliver more—features, capacity, and often both—for less. • We tested four of the latest hard drive-based players to see how they compare with the bench-

marks in the field: the iPod and the iPod Mini. Our conclusion: For the majority of buyers, the fourth-

generation iPod (First Looks, September 21) still delivers the best ease of use, and it remains our Editors' Choice.

But if you often wish you had a way to keep photos with you as well as music, the iPod Photo reviewed here may well be worth the \$100 premium that Apple charges for the color screen and photo-display capabilities. And the iRiver H340 we review below is also worth a look, especially for audiophiles, as it combines unsurpassed playback with a bevy of features, including a color screen and photo compatibility.

Among the smaller players, the Creative Zen Micro joins the iPod Mini as an Editors' Choice in that class. The Zen Micro is the bang-for-the-buck leader, delivering more capacity, an FM tuner, and voice recording for the same price (\$249.99 list) as the Apple unit. But the iPod Mini remains an Editors' Choice as well, because its elegant interface still has not been topped.

Apple iPod Photo

One of the theater's most enduring slogans is "Leave 'em wanting more." And that's exactly how we feel about the new Apple iPod Photo. On the one hand, it's still the music player to beat, now with a color screen and easy-to-use photo-viewing features. But while we enjoyed the performance, we were left wanting more.

In addition to its familiar music duties, the iPod Photo stores and displays photos—thousands and thousands of them—on its 40GB (\$499 direct) or 60GB (\$599) hard drive and 2-inch color screen. Options in the new iTunes 4.7 let you synchronize the images in a specific folder, so that your photos are always up to date. The unit can also turn collections in Adobe Photoshop Album 2.0 or Photoshop Elements 3.0 into iPod Photo slide shows—a nice touch for hobbyists who have committed their photo libraries to those apps.



THE IPOD PHOTO lets you store and share images easily.

With the new color screen, Apple omitted a brightness or contrast control, but you can still adjust the auto-off time for the backlight. We found the display to be just a bit dimmer than we would have preferred, and the color balance is slightly shifted towards the

red, but not objectionably so.

You can arrange your photos in albums, though the album view is fixed in a 5-by-5 image grid that yields thumbnails approximately $\frac{3}{16}$ of an inch high by $\frac{1}{4}$ of an inch wide. Distinguishing one image from another can be difficult, especially when they have similar subjects or backgrounds. But navigating through the images is a joy. Click on a thumbnail to make it full screen and you can quickly—and we mean quickly—scroll forward or backward through the library by running your thumb around the scroll wheel.

The iPod Photo stores images in an internal database in a resolution suitable to its 220- by 176-pixel screen or to a TV screen (if you connect the included audio/video breakout cable or use the S-Video connector on the provided docking base). Slide show settings let you control the amount of time each slide is on the screen, turn on a wipe transition, and select one of your playlists as a background music source. The TV image is sharp and stable, and Apple claims 15 hours of music playing or 5 hours of slide show viewing from the rechargeable battery.

Musically, the iPod Photo is identical in performance to the fourth-generation iPod, which is to say excellent. One addition: You can now view album art on the Now Playing screen.

Odd, minor limitations keep the iPod Photo from being a killer implementation. You can't zoom in or pan around your images. All adjustments have to be made before you download the

LOOKS

WHAT THE RATINGS MEAN: ●●●●● EXCELLENT | ●●●●○ VERY GOOD | ●●●○○ GOOD | ●●○○○ FAIR | ●○○○○ POOR

- 46 Dell Laser Printer 3100cn
- 46 Samsung SyncMaster 710M
- 46 Sharp Notevision XR-1S
- 48 LaCie 16X d2 DVD±W Double Layer
- 48 Microsoft Optical Desktop with

- Fingerprint Reader
- 48 M-Audio Studiophile DX4
- 48 Cambridge SoundWorks MicroWorks II
- 48 Aliph Jawbone
- 50 Microsoft Works Suite 2005



- 50 WordPerfect Office 126Home Edition
- 52 Trend Micro PC-cillin Internet Security 2005
- 52 NOD32 Antivirus System 2.0
- RED denotes Editors' Choice.

images. If you want to store full-resolution pictures that can be transferred to another computer or printed, you have to select that option in iTunes. If you forget, you'll wind up with low-res images on the unit's hard drive, and they'll lack full-resolution counterparts.

Also, the iPod Photo insists that only one computer can be its source of photos. If you connect it to another computer, it asks whether you want to replace all the images currently on the iPod with the images currently on that computer. The only way to add to the photo database is to add photos to the "home" machine and update the iPod. Likewise, digital photographers can still use the Belkin Digital Camera Link or a card reader on the road to off-load images to the iPod Photo, but you won't be able to display those images on the iPod Photo (since they do not pass through iTunes).

As a music player, the iPod Photo is still virtually unassailable. But in the growing arena of portable multimedia players, it is not king of the hill. For example, the svelte Archos Gmini 400 (First Looks, November 30) matches the iPod Photo's music abilities, trumps it as a photo viewer/storage companion, and handles video to boot. That said, for users looking for a great music player that also delivers the ability to store, view, and display photos, the iPod Photo is the latest in this line of must-have devices.

Apple iPod Photo

40GB, \$499 direct; 60GB, \$599.
Apple Computer Inc., www.apple.com.
●●●●○

Creative Zen Micro



The new Creative Zen Micro beats the iPod Mini on capacity and features. If you want the best value for your dollar, the Zen Micro is it. But be aware that the iPod Mini trumps the newcomer on interface and ease of use.

Creative has bested its own Zen Touch by making the entire front control surface of the Zen Micro touch-sensitive, with the vertical scrolling area dominant in the center. You can set the sensitivity of the pad to three levels. Low worked best for us, since the pad and buttons can be too sensitive. We often found ourselves one or two menu levels above where we wanted to be because of errant presses.

The metal surface has raised lines and dots that guide your fingers to the right places. Blue-backlit legends add to the sophisticated overall appearance, and a thin, blue fiber-optic line outlines the player. To top it off, the line pulsates eerily while the player is charging.

The Zen Micro offers much more than appearances, however. This 5GB player packs an FM receiver and voice recording, plus all the usual music features, into a case that's no wider than the iPod Mini and just slightly shorter. It's also slightly thicker than the Mini, but that is attributable to the user-replaceable battery.

We also appreciate the driver that makes the Zen Micro compatible with Windows Media Player 10. We've never been fond of Creative's music soft-

ware, and this iteration is no exception. The software installation was tediously long, and the installer loaded more components than we requested. But you can now use the excellent WMP 10 (First



THE ZEN MICRO packs a lot of features into a well-designed and sleek-looking shell.

Looks, October 5) to load the player and manage your library.

The Zen Micro's audio performance is impeccable. Frequency response is dead flat, harmonic distortion is all but unmeasurable, and the music emerges out of a background of silence 100 dB deep. Although the measured audio performance was essentially identical to that of the Virgin Player we also review here, they do sound subtly different. The Virgin Player has output power to spare (perhaps a bit too much for your hearing safety), and you can hear the reserve power when it's called upon to deliver

loud, deep bass tones.

The Zen Micro, conversely, delivers fast, transient high frequencies more crisply. Either player handily outperforms the iPod Mini. We're talking listening room and lab headphones shades of difference, however; differences that are entirely lost in the noise of traffic and your everyday listening environment.

The Zen Micro's built-in FM radio stores up to 32 presets (in many parts of the country, that's more stations than you can receive), and operation is straightforward. Reception of stronger stations is very good, but sensitivity on weaker stations is lacking. You can record FM, but the player takes 6 or 7 seconds to set up a file and start recording, and another 6 or so seconds afterwards to close the file.

An onboard microphone allows voice recording. Quality is adequate for a lecture or a meeting if you're close to the sound source, but it's probably best reserved for audio notes to yourself. The same 6-second delay applies, so capturing audio requires some anticipation. On the other hand, you can record for 10 hours, so if you have the disk space, just turn it on and let it run.

One final touch: The Zen Micro can sync with Outlook and give you a read-only snapshot of your calendar, tasks, and to-do list. That exhaustive feature list makes the Zen Micro a winner. Its interface still lags that of the iPod Mini, but that can be forgiven considering all you get for the price.

Creative Zen Micro

\$249.99 list. Creative Technology Ltd., www.creative.com. ●●●●○

iRiver H320

The iRiver H320 is the follow-up to the company's successful H140 audio player, and it's even more feature-rich than its predecessor. The first thing you notice is the bright, color screen, then the flat buttons instead of the joystick control.

While it retains the deck-of-cards form factor and 6.5-ounce weight, the 20GB H320 is slightly thinner than the H140, with even better battery life: an astounding 17 hours 35 minutes. The H320 has an FM tuner and an optional wired remote control (\$34.99). It also gains a text mode that lets you display and scroll text files.

The 2-inch color screen lets you display JPEG and BMP photos, and it auto-scales them to the screen. As with the iPod Photo, you can't zoom in or pan over images. But unlike the iPod Photo, the H320 doesn't have a video output to let you display photos on a connected TV.

The color screen, bold fonts, and bright icons help navigation, and you can read the screen even in bright sunlight. The four-way rocker that surrounds the central navigation button steers you easily through the menu and file structures. You can select your EQ preset from the front panel and switch easily between music on file, FM, recording, and text.

Press and hold the navigation button to see the internal music database by artist, album, or genre, in addition to the folder-oriented file menu that holds individual songs. There is no listing by song, however, if you've loaded your tunes in folders by album. In the Sound menu, you can choose your own treble and bass settings or set the SRS WOW system to your liking. We found that SRS helps some music feel spacious, but it's best in small doses.

Like other iRiver players



THE IRIVER'S
color screen displays photos and aids navigation.

we've tested, the H320 has excellent audio playback quality. Its audio recording capability far exceeds the abilities of any other player, allowing MP3 recordings of up to 128 kilobits per second on the internal microphone and up to 320 Kbps with external mono or stereo microphones. You can choose lower bit rates for longer recording times, and you can also record from a line source, such as a CD player.

We were surprised, however, that the H320 does not play WAV files, nor does it support lossless compression, although it supports MP3, WMA, and ASF at up to 320 Kbps and Ogg Vorbis up to 500 Kbps. While WAV support is unimportant for most users, we would very much like to see lossless WMA and FLAC in the next firmware update. You won't hear the difference between lossless and the existing codecs when you are out and about, but if you're driving high-quality speakers, it's nice to have.

The included earbuds sound surprisingly good but are slightly large for our ears. The FM radio is selective and stable, and

it works well in fringe areas. You create playlists in MoodLogic (supplied) or Windows Media Player. The H320 has two USB connectors. One gives you general access to the disk; no software driver is required for it, and the player rebuilds its database automatically each time you update. The other connector is for transferring purchased music with DRM to the player. It requires Windows XP and Windows Media Player 10.

The color screen and photo support are more convenience features than reasons for buying the H320. But its sonic abilities and advanced audiophile features are.

iRiver H320
\$329.99 list. iRiver America, www.iriver.com. ●●●●○

Virgin Player

How do you combine attitude and ease of use? It's not easy, but the Virgin Player succeeds with little comments in its pop-ups and a cheeky get-acquainted script, along with a straightforward user interface and lots of dedicated buttons.

Measuring 3.7 by 2.2 by 0.6 inches, the 5GB Virgin Player is marginally tall-

THE VIRGIN PLAYER delivers a bit of attitude along with the music.

er, wider, and thicker than the benchmark iPod Mini. It has an FM radio that has good sensitivity and stability. The screen is readable, but the backlight could be brighter.

Audio fidelity is excellent, and the Virgin Player can drive its earbuds to very loud levels. The provided earbuds sound very good, but they're not the most sensitive. With higher-efficiency earphones, the Virgin Player drove the

speakers to painful levels. Even at the highest levels, however, harmonic distortion remains commendably low.

The Virgin Player has an astounding 20 equalization presets. A few sound similar, but basically there's something here for everyone, despite the lack of a five-band EQ or separate bass and treble controls.

While some players pride themselves on having the fewest possible controls, the Virgin Player has twice as many buttons as the functionally identical Creative Zen Micro. But more buttons mean less menu diving, and the buttons don't have to have different functions in different modes: The Home button always takes you to the top-level menu and the Back button always takes you back to the last thing you did. Another unique feature is the twin headphone jacks: A friend can plug in to share your tunes with no loss in volume.

When we first opened the Virgin Player's box, we thought they had omitted the software CD. But a glance at the quick-start guide told us that the software was on the unit's hard disk, and all we had to do was connect the player via the USB cable, click on the Virgin 5GB

icon under My Computer, and click on the setup program to install it. Plugging in the player automatically brings up Windows Media Player, which takes care of file transfers and synchronization. The player can handle MP3 files up to 320 kilobits per second and VBR, and WMA files up to 256 Kbps.

The Virgin Player has done things right. It's worth a look, especially if you want a dose of 'tude with your tunes.

Virgin Player
\$249.99 list. Virgin Electronics, www.virginelectronics.com. ●●●●○



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**CAN YOU BLOCK
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Pinpoint Locations in 3-D

BY RICHARD V. DRAGAN



Think of a scene from any sci-fi movie, where the camera swoops in from outer space right down to street level, and you'll have a good idea of what to expect from **Keyhole 2 PRO**. Aimed at businesses such as real estate offices, contractors, and any company that needs geographic data, this impressive software service lets you view and package satellite imagery with impressive range and clarity.

The 20MB client software runs on Windows XP or 2000; you'll also need a 3D-capable video card, plus at least a 128-Kbps network connection. For business users, an annual subscription costs \$599 and lets you grab digital imagery via the Windows Clipboard, e-mail, or JPEGs. For an additional \$299, you can use the company's Premium Printer Module and

print images at higher resolutions. (If you just want to find your house from space, try Keyhole's free trial or the \$29-a-year Keyhole LT version.)

At its heart, Keyhole has stitched together a remarkable array of satellite and aerial data in its databases. Unlike Microsoft MapPoint Services, Keyhole's focus is on actual photographic imagery (as opposed to line maps). You can search for an address, and the virtual camera zooms to that location. You can then pan in four directions and tilt the imagery. Keyhole has six million points of interest in its database, including restaurants, stores, schools, and roads.

You can annotate geographic sites and share place markers with other Keyhole users via e-mail. It's also a snap to save or



KEYHOLE 2 PRO stitches together highly detailed images for over 100 cities, plus 6TB of satellite and aerial photographs.

e-mail an image as a JPEG. We liked the measuring feature for distance or area, which lets you determine the size of a property or the distance of a trip.

Better yet, Keyhole optimizes streaming of this imagery over

a broadband connection. On a typical DSL connection, we noticed some lag as we zoomed into a location, but performance was remarkably smooth.

In several hours of simulated zooming and swooping over the digital globe, we noticed that Keyhole does a great job with highly detailed maps of 100 cities, including many major U.S. and European cities. Flying over areas with less detail produces a fuzzy map as you zoom in, but you still benefit from the topographical data. Overall, Keyhole 2 PRO is a truly

innovative digital mapping service with significant business, educational, and even entertainment value.

Keyhole 2 PRO

\$599 direct per year. Keyhole Corp., www.keyhole.com. ●●●●●

Halo 2 Is the Ultimate Xbox Game

BY MATTHEW D. SARREL



From the moment the first beautifully rendered cinematic scene begins until the controversial ending (which we are not allowed to reveal), you will be dazzled by and engrossed in **Halo 2**. Cinematic cut scenes and the story that they advance are of movie quality, with interlaced plots that twist and turn. The platform-defining game for Xbox has arrived.

For those of you not familiar with the story, we'll briefly set the stage without spoiling anything. Having destroyed the doomsday machine

known as Halo at the end of the first game, Master Chief (you), a genetically altered, cybernetically enhanced Spartan supersoldier, returns to a defense station high in Earth's atmosphere to receive an equipment upgrade and a commendation



ONE OF THE ENHANCEMENTS in Halo 2 is better vehicle control, which lets you commandeer (then wreck) autos.

for saving the universe. The ceremony comes to a halt, however, when the Covenant troops (the bad guys) invade. Master Chief is ordered to defend the space station.

The essence of Halo 2 is the frenetic combat and the way that plot-developing cut scenes pace it. Game play has been enhanced over the original. The most noticeable change is that Master Chief can now wield two weapons, enabling him to cut a swath of destruction.

The game's graphics and audio have also been improved, and the positional Dolby Digital 5.1 surround sound creates

a fully immersive combat experience. NPC AI (nonplayer-character artificial intelligence) has been enhanced, too, making the Covenant enemies smarter and more difficult to defeat, and making human allies actually useful in combat. There are more vehicles, and they're easier to control: It is now possible to attack someone on a vehicle, throw them off it, and seize control of it.

You can play in single-player story mode, cooperative (two-player) story mode, multiplayer, or Xbox Live multiplayer modes. Players can form teams with personalized armor and take on opponents from around the world. Game play in multiplayer mode is a frenetic onslaught of chaos and mayhem, facilitated by Halo's well-designed maps or arenas.

Halo 2

\$49.99 list. Microsoft Game Studios, www.microsoft.com. ●●●●●



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3.8 GHz: The P4's Final Speed Bump?

BY JOHN DELANEY

The latest iteration of Intel's Pentium 4 processor, which runs at 3.8 GHz and includes 1MB of L2 cache and an 800-MHz front-side bus (FSB), is the company's fastest desktop chip yet. Officially named the Pentium 4 570J, this could very well be the final speed increase (in terms of gigahertz) for the 90-nm Prescott processor, considering Intel's recent decision to scrap a 4.0-GHz version of the chip. (Intel's plans for 2005 include the release of a line of dual core processors.)

The "J" designation in the new P4 570J denotes the use of Intel's XD (eXecute Disable) bit in memory. The XD bit, when used with Windows XP SP2, helps stop viruses that attack using buffer-overflow methods. This is the first desktop chip from Intel to use XD bit technology; Intel has already enabled it in its Itanium processors. AMD has a similar technology that has been rolled out in its Athlon 64 line of processors.

As expected, we noticed a slight increase in performance with the new 3.8-GHz 570J processor over the 3.6-GHz P4 560 chip. But the new P4 still generally falls shy of the performance you'll see from an AMD Athlon FX-55 box. That said, the new 3.8-GHz P4 (married to the right components) will deliver a fine high-end gaming or multimedia experience.

Alienware Area-51

There's no mistaking the Alienware Area-51, with its shiny Saucer Silver case offset by black air grills with blue lights, and a backlit alien head insignia adorning the drive bay cover. Even by boutique PC standards, this is one unique-looking machine.

Under the hood, the Area-51

is equally impressive. All cabling is neatly routed to improve airflow, and while some of the components may not be bleeding-edge performers, they are high quality nonetheless.

Unlike the Velocity Micro



THE AREA-51

is unmistakable among PCs thanks to its alien-inspired case.

ProMagix PCX we also tested for this story, which uses a high-end nVidia GeForce 6800 Ultra video card, the Area-51 came configured with the slightly less powerful GeForce 6800 GT. We were also surprised that the dual 160GB hard drives, configured to RAID Level 0, were of the 7,200-rpm variety; 10,000-rpm drives are called for in this type of system.

There is just a single optical drive, but being a dual-layer/dual-format DVD burner, it covers the gamut of optical media. There's plenty of room to add additional optical drives (three external bays open) as well as additional hard drives (four internal bays open). Two PCI Express slots and a single PCI slot are available for expansion, as well as eight USB ports (four up front), one

FireWire, and a game port.

Although the Intel 925 motherboard has integrated 5.1 sound, our system came with a Creative Audigy 2 ZS sound card paired with a set of Logitech Z-5500 Digital 5.1 speakers. This 500-watt, THX-certified speaker system delivers the thunderous bass and rich middle and high tones that serious gamers and movie buffs expect in their systems.

Included in our as-tested price is a 19-inch NEC Multi-Sync LCD 1960NXi monitor, which was bright and clear and easily viewed from all angles thanks to NEC's XtraView technology. Along with Windows XP Home Edition, the Area-51 ships with PowerDVD 5 playback software and Nero 6 CD/DVD burning software.

The Area-51 turned in respectable scores on our SYSmark 2004 benchmark tests, easily beating the HP Media Center on our Office Productivity tests. But it couldn't match the overclocked Velocity Micro ProMagix PCX system. On our gaming tests, the Area-51 performed as expected, trouncing the HP system (with the X600 Pro video card) but lagging the



HP'S 3.8 ENTRY is still tops among Microsoft Media Center Edition 2005 PCs.

ProMagix (with the more powerful 6800 Ultra video card) across the board.

Although the Area-51 would benefit by adding a faster set of hard drives and a more robust video card, to do so would easily add another \$350 or more to the price. Still, we think the Alienware Area-51 is a good choice for gamers who want a serious gaming system with lots of room for expansion.

Alienware Area-51

With Pentium 4 570J (3.8 GHz), 1GB DDR2 SDRAM, nVidia GeForce 6800 GT 256MB graphics, two 160GB SATA 7,200-rpm hard drives, DVD±RW drive, Creative Audigy 2 ZS sound card, Logitech Z-5500 Digital 5.1 speakers, Microsoft Windows XP Home Edition, \$3,977 direct.

Alienware Corp., www.alienware.com.
OVERALL ●●●●● Music: 80 (out of 100); Photos: 65; Video: 78; Gaming: 100

HP Media Center Photosmart PC m1050y

Why mess with success? We named the HP Media Center PC m1050y best among Media Center PCs the last two times around, and now it's more powerful than ever. Based on Intel's new Pentium 4 570J processor running at 3.8 GHz, the m1050y retains the chassis and component configuration that helped propel it to the top of its class.

In addition to a spacious 400GB SATA drive, an ATI Radeon X600 graphics card running on the PCI Express bus, DDR2 memory, and a Creative Audigy 2 ZS sound controller, the system comes with a wireless keyboard and mouse, a wireless 802.11g network adapter, and a wireless Media Center remote. Multimedia features are plentiful and include a Conexant TV tuner card with TV, FM, S-Video, and audio input jacks. There's also a dual-layer, dual-format DVD burner, a nine-in-one memory card reader, six USB ports, and two FireWire ports.

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Media Drive expansion slot on the front of the system. For an additional \$219, you can purchase a 160GB Personal Media Drive, which can be used on any PC with a USB port and is ideal for storing, sharing, and backing up digital data such as photo, music, and video files.

A sliding panel on the front reveals S-Video and composite video ports, dual stereo audio jacks, headphone and microphone jacks, one USB and one FireWire port. There's room for an optional HP camera dock (\$79.99) on the top of the PC, which lets you view and transfer photos as well as recharge your HP camera's batteries.

Although the Altec Lansing 2.1 speaker set is adequate for music listening, we recommend springing for a set of 5.1 speakers to take full advantage of the Audigy 2's multichannel sound capabilities, especially if watching movies or game play is a priority. Our system came with an optional HP f2304 LCD (\$2,099.99). This high-definition 23-inch widescreen monitor is as sharp as it is expensive, delivering bright, flicker-free video whether you're watching DVDs movies or TV, or playing Doom 3.

Besides having the living-room-friendly Windows XP Media Center Edition 2005 (First Looks, "The Home PC, Perfected," November 16), the m1050y comes with a good amount of multimedia software, including iTunes, RecordNow, WinDVD Creator, and HP's Image Zone Plus suite of photo-editing and photo-manipulation applications.

The m1050y couldn't touch the benchmark scores turned in by the gaming-oriented systems also reviewed here, but this is a different class of machine. In a media center, it's common to forsake the performance generated by a hard drive RAID configuration in favor of lots of storage space for video and other digital files. And, while the HP's video card is fine for a media center, it can't compete with the high-end cards found in performance desktops used for gaming and digital content creation.

Still, the m1050y continues to impress. Loaded with the latest processor and multimedia components and featuring a big, bright, high-definition display, it will satisfy casual gamers and digital video buffs alike.

HP Media Center Photosmart PC m1050y

With Intel Pentium 4 570J (3.8 GHz), 1GB DDR SDRAM, 400GB SATA hard drive, 256MB ATI Radeon X600 Pro graphics, 16X dual-layer DVD±RW drive, DVD-ROM drive, Creative Audigy 2 ZS sound card, Altec Lansing 2.1 speakers, Microsoft Windows XP Media Center Edition 2005, \$2,474.99 direct. Hewlett-Packard Development Co., www.hp.com.

OVERALL ●●●● Music: 88 (out of 100); Photos: 87; Video: 91; Gaming: 94

Velocity Micro ProMagix PCX

Although the Velocity Micro ProMagix PCX uses the latest Intel 3.8-GHz chip, for some buyers that still isn't enough. So the company has overclocked the processor to 3.88 GHz for increased performance—to good effect. The ProMagix also comes configured with a wealth of multime-



dia components packed into its brushed aluminum case.

The ProMagix boasts a neatly organized cabling system, a standard feature among gaming PCs. Based on Intel's 925 XCV motherboard, this system is loaded with high-end



SLEEK BRUSHED aluminum wraps Velocity Micro's top-notch system.

parts, including dual high-speed 74GB hard drives configured to RAID Level 0 for performance, a 250GB hard drive for storage, 1GB of heat-shielded DDR2 memory, and a 256MB nVidia PCI Express GeForce 6800 Ultra video card.

Two optical drives (a dual-format/dual-layer DVD burner and a DVD/CD-RW) are all you need for creating DVD and CD projects. A multiple memory card reader/floppy disk combo handles virtually every media format on the market. Our ProMagix came configured with the excellent Creative Audigy 2 ZS sound card.

In addition to six USB ports

(two up front) and three FireWire (one up front), integrated components include six-channel and SP/DIF audio connections and a Gigabit Ethernet port. And there's room to expand, with two available PCI Express slots, three PCI slots (although one is blocked by the video card fan), space for one more hard drive, and two additional 5.25-inch external drives.

The ProMagix shipped with a bright, color-rich 19-inch Sharp LCD monitor. The bundled Ulead Digital Creation Suite contains the fine PhotoImpact (image editing), VideoStudio (video editing), DVD MovieFactory (DVD authoring), and Burn.Now (DVD/CD burning).

With its overclocked processor, high-end video card, and speedy hard drives, we expected the ProMagix to outperform the Alienware and HP systems, which it did on all of our SYSmark and 3DMark tests.

Of course, the Velocity Micro ProMagix PCX is fairly expensive. But it offers a very good blend of power and features, so if you're looking for a system that fulfills both your gaming and multimedia needs, the ProMagix is a sure bet.

Velocity Micro ProMagix PCX

With 3.8-GHz Pentium 4 570J (overclocked to 3.88 GHz), 1GB DDR2 SDRAM, nVidia GeForce 6800 Ultra 256MB graphics, 19-inch LCD monitor, two 74GB SATA hard drives (10,000 rpm), 250GB SATA hard drive (7,200-rpm), dual-layer DVD±RW drive, DVD/CD-RW combo drive, Creative Audigy 2 ZS sound card, Logitech Z-5500 Digital 5.1 speakers, Microsoft Windows XP Home Edition, \$3,874 direct. Velocity Micro Inc., www.velocitymicro.com.

OVERALL ●●●● Music: 75 (out of 100); Photos: 95; Video: 85; Gaming: 98

BENCHMARK TESTS

High scores are best.
Bold type denotes first place.

Anti-aliasing/Anisotropic filtering ▶

HIGH-END DESKTOPS

	Processor	Graphics chipset	SYSmark 2004: Overall	3DMark05 1,024 x 768	Doom 3 (medium quality, fps) 1,024 x 768	Doom 3 (high quality, fps) 1,600 x 1,200	Halo: Combat Evolved (fps) 1,024 x 768	Halo: Combat Evolved (fps) 1,600 x 1,200
Alienware Area-51	P4 3.8	nVidia GeForce 6800 GT	215	4,582	88.7	34.5	96.4	57.7
HP Media Center Photosmart PC m1050y	P4 3.8	ATI Radeon X600 Pro	204	1,455	26.2	4.6	32.8	14.8
Velocity Micro ProMagix PCX	P4 3.8 (overclocked to 3.88)	nVidia GeForce 6800 Ultra	239	4,974	91.7	37.9	107.6	65.0
Dell Dimension 8400*	P4 3.60	ATI Radeon X800	203	5,187	82.8	33.9	87.5	60.8

RED denotes Editors' Choice. * Reported for comparison.

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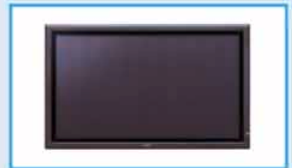
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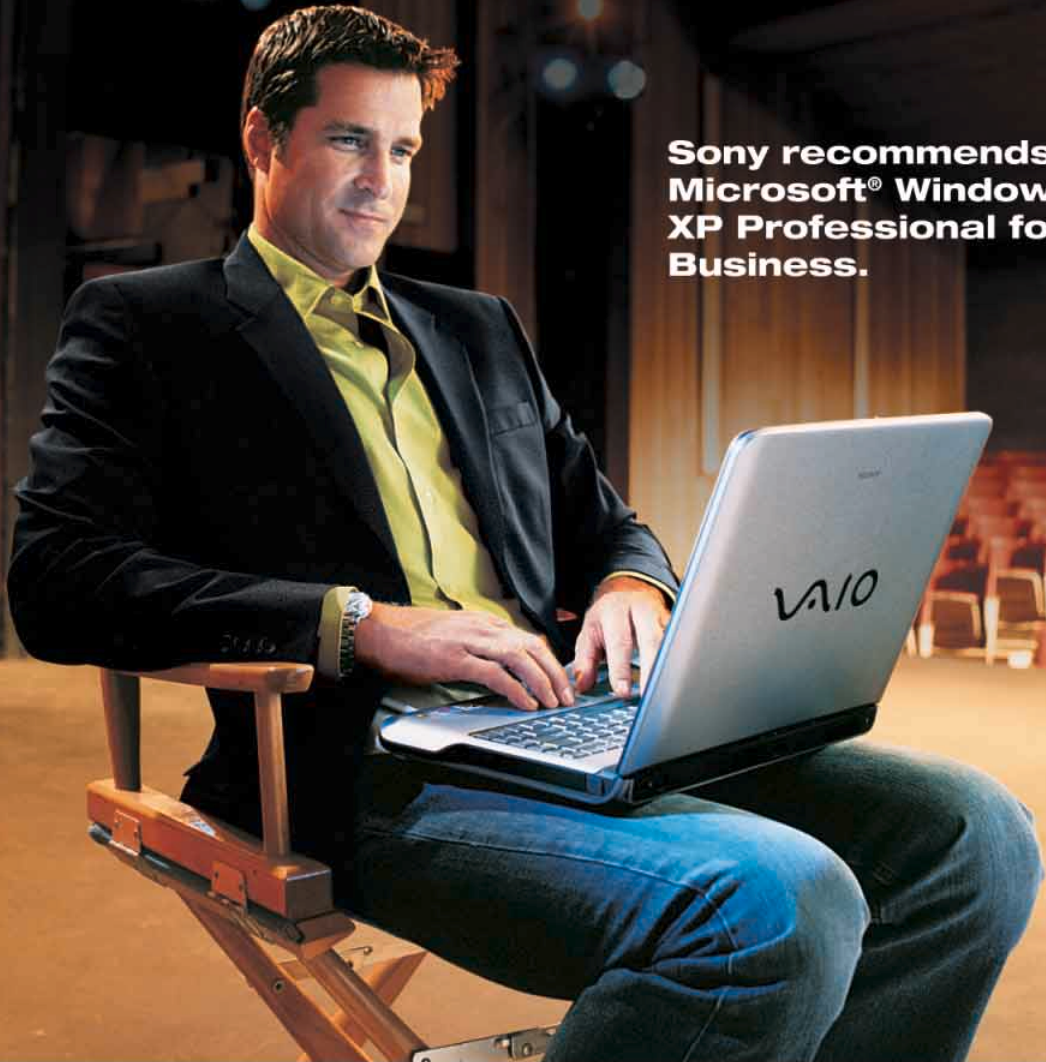
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No matter how good your digital SLR camera and lens are, the primary colors may not line up perfectly (lateral chromatic aberration), straight lines may bulge out or bow in (barrel or pincushion distortion), details may appear soft (blur), and light may fall off from the edges

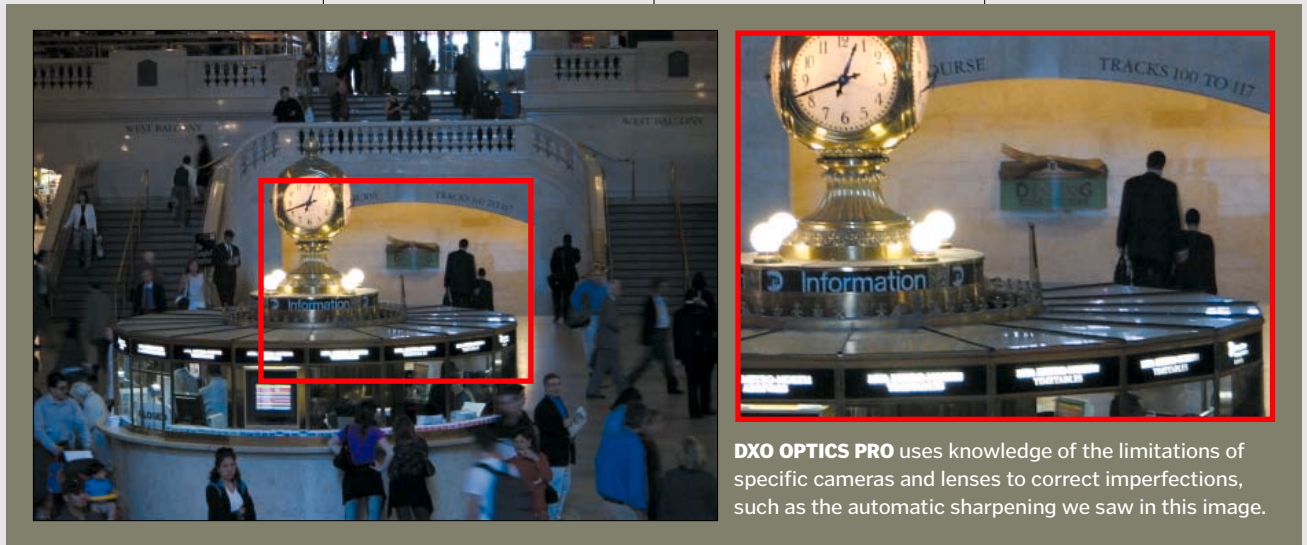
supported camera/lens combinations, but you need to purchase the profile for each type of camera body and lens that you use. While modules for many popular D-SLRs and lenses are available, check before you buy, because some cameras are not yet supported.

Installation and setup is simple. Loading images into the app from a memory card or drive

right combination (assuming that you have purchased both lens profiles). The program considers all important givens and variables (image sensor size and type, lens focal length and *f*-stop, color profile, nonlinear sensor response, and so on) and quickly and automatically applies corrections that improve the image to its theoretical optical optimum.

will want more precise control over corrections. Also, there's no zoom tool. But our biggest complaint is that you can't open and save files in other viewer or image-editing programs before running Optics Pro, because doing this adds information to the EXIF files, which prevents Optics Pro from working.

One other gripe, which con-



DXO OPTICS PRO uses knowledge of the limitations of specific cameras and lenses to correct imperfections, such as the automatic sharpening we saw in this image.

(vignetting). Some of these optical errors can be corrected in Adobe Photoshop, but it's tedious and time-consuming work, often with results that are less than satisfactory.

But there is a better way. DxO Labs' **DxO Optics Pro 2.0** applies mathematical algorithms to images shot with specific camera/lens combinations, eliminating (or at least greatly reducing) the known Achilles' heels of said equipment: chromatic aberration and distortion, vignetting, and so on. The effect ranges from minimal to amazing, depending on the subject, the camera/lens combination, and the angle of the shot.

Optics Pro is marketed in three separate segments: the core program, the camera profiles, and the lens profiles. The core program works with all

folders is easy and fast. Using the software is so straightforward and intuitive that you don't need documentation (there's a terse Help menu to assist if you need it). Users can accept the default settings or customize options for white balance, exposure compensation, corrections desired, output, language, and handling of missing EXIF data. (Not all lenses report their settings to EXIF, so you must either input that data manually or ignore it and hope for the best.) These settings can be applied to individual or multiple frames.

The software uses each picture's EXIF file to identify what camera and lens were used, then applies the appropriate correction. So if you shoot some frames with one lens and then switch to another lens, Optics Pro will automatically apply the

Actual processing time depends on the file size and degree of correction required. In our testing, 6MB RAW images (from a Nikon D70 with an 18- to 70-mm lens) took about 20 seconds apiece to correct. After processing, you can see before-and-after comparisons, because Optics Pro is nondestructive: It automatically corrects and saves images without disturbing the original files. Every test image we shot displayed slight to significant improvements, such as more even corner illumination, greater delineation of detail, straightening of bulging or bowed lines, and elimination of purple fringing.

We have several quibbles with Optics Pro. While the interface is simple, it's a little too basic for its intended market—serious photographers—who

cerns only photographers who use the RAW format: Since processed files are saved only to TIFFs or JPEGs and not back into native RAW, many of the advantages of using camera manufacturer or third-party RAW processing software will be lost. The company promises that a future version of Optics Pro will incorporate more robust RAW processing tools.

Eventually, DxO Labs hopes that its optical-correction algorithms will be built into every digital camera. But until then, D-SLR owners with supported equipment would be well advised to process their images through Optics Pro.

DxO Optics Pro 2.0

8-bit core program, \$34 direct; 16-bit core program, \$89; \$29 to \$119 for each camera body profile and \$24 to \$98 for each lens profile. DxO Labs, www.dxo.com. ●●●●○

“Easy Media Creator 7.0 offers the most comprehensive and well integrated suite of CD- and DVD-burning tools on the market.”

CNET Editors' Choice – March 4, 2004

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Image Management for Pros

BY CADE METZ

With the debut of **ACDSee 7**, the well-known high-end photo-management application has topped itself yet again. ACDSee's latest incarnation is easier to use than previous versions, yet it's even more powerful. It offers dozens of new tools, giving you more ways to organize, view, edit, and share your digital pictures. It isn't quite as simple to use as products like Adobe Photoshop Album or Jasc PaintShop Photo Album, but the payoff is more power and control over your image library.

When you first launch the app, it gives you an Explorer-like view of your Microsoft Windows folder tree, and as you move from folder to folder, it seamlessly—and quickly—weeds out everything but your digital images, rendering thumbnails of each photo in the blink of an eye.

When browsing, you can quickly sort photos by file size, image type, and other properties. Using the Calendar interface, you can view pictures by the month, day, or even hour they were taken. As with other image managers, you can manually enter properties for each photo—adding captions, associating keywords, rating images on a scale of 1 to 5, editing EXIF data, and so on. Adding tags is simple; when you highlight an image, a window with all the metadata fields opens on the right side.

ACDSee 7 is also a powerful tool for downloading, editing, and sharing photos. It now includes a context-sensitive toolbar that helps you find the right

tools at the right time. The options presented change depending on what features you are most likely to need at a given

up to four different images, using exposure, histogram, and color filters. The image-editing tools are decent but haven't changed much since the last version. You can do all the things you'd expect, like cropping images, adding effects, and removing noise. The editing tools in Photoshop Elements, however, are more robust.

You can create slide shows in PDF, Flash, and screen-saver formats. You can burn images onto CD and DVD. You can also send photos via e-mail, print photos via SnapFish, publish photos to TiVo's Digital Photo Viewer, and so much more.



ACDSEE 7 HELPS YOU ORGANIZE your digital photo collection using any number of criteria.

time. If you're in Calendar mode, for instance, you'll see buttons for switching to monthly or yearly views.

A new "Image Comparison" tool lets you carefully compare

ACDSee 7
\$49.99 direct. ACD Systems International Ltd., www.acdsystems.com. ●●●●○

Remote Control for the Experienced

BY CADE METZ

Nowadays, with apps like GoToMyPC and LogMeIn, you can access a remote system simply by opening a Web browser on any Internet-connected computer. But what if you need access to a machine that's not always on the Internet? What if you want access to the e-mail inbox of a system that connects to the outside world via modem, not an "always-on" broadband connection? What if you want to retrieve a few files from an old laptop that doesn't even have a modem?

What you need is a tool that directly connects two systems without the help of

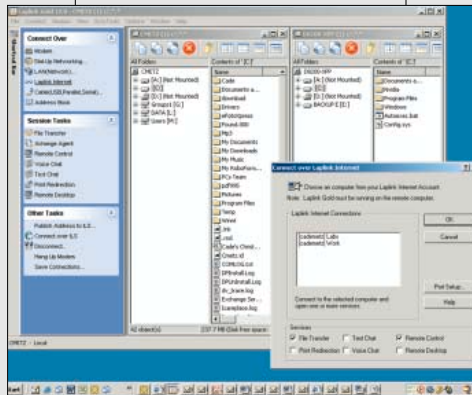
third-party Web servers. Something along the lines of **Laplink Gold 12**. With Laplink Gold, you can make modem-to-modem connections, connect over a local area network, or even connect two machines simply by stringing

a serial, parallel, or USB cable between them. Be forewarned: Point-to-point remote control isn't quite as simple as the new Web-based variety. Laplink takes as much pain out of the process as possible, but you'll need at least a modicum of modem and networking experience to make a direct connection. Still want the option of connecting over the Internet? No problem. Unlike previous builds, Version 12 lets you access remote machines over the Internet much as you would with Laplink Everywhere.

Once you make a connection, there are all sorts of ways to communicate with a remote

machine. You can do full remote control, freely navigating the system's OS. There's also a file-transfer client for moving documents back and forth, as well as a tool that synchronizes files and folders across PCs. If you're using remote control to provide ad hoc technical support, you can even use the text and voice chat module.

Even if you don't need support for all the connections, Laplink Gold may be worth considering. A subscription to Laplink Everywhere, one of the cheaper Web-based remote-access tools, costs \$89.95 a year. Laplink Gold, on the other hand, will set you back with only a one-time fee of \$109.95 (direct download), which will save you money if you use it over the long haul.



LAPLINK GOLD 12 gives you full-access PC remote control over a variety of connections.

Laplink Gold 12
\$129.95 boxed; \$109.95 download.
Laplink Software Inc., www.laplink.com. ●●●●○

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agree. You can expect newfound instrumental and vocal clarity from tiny satellite speakers. Resounding low notes from a hideaway

Acoustimass® module. Spacious sound from TrueSpace™

stereo signal processing circuitry. Plus convenience and elegance: the satellites can sit on your desktop or

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input – for a portable MP3 player, for example – all at your fingertips. Ready to experience more pleasure from music, movies and gaming soundtracks while at your computer? Upgrade to Bose® Companion 3 multimedia speakers...and give them a review of your own.



**Editor's
BEST
PICK** 2004

"...delivers surprisingly full, clean sound for music, movies and games."

– Laptop

"The Bose Companion 3 multimedia speaker system sounds a lot larger than it is..."

– Electronic House

"The Companion 3 satellites... deliver sound that doesn't play around."

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– Saskatoon Sun

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Pixma iP5000 Delivers Good Output

BY M. DAVID STONE

The new **Canon Pixma iP5000** is the next step up from the iP4000, our current Editors' Choice among personal ink jet printers. Although Canon bills both as photo printers, they're also good choices for all-purpose printing. Significantly, the iP5000 offers even better-quality text and graphics than the iP4000. But it's one step lower for photo quality, and it's slower for photos as well.

The iP5000 comes complete with two 150-sheet paper trays and the ability to duplex. It lacks the iP4000's parallel port, but, like the iP4000, it offers a USB 1.1 connection for your computer and a second USB connector for a PictBridge camera. It also uses the same five-ink system, comprising both pigment-based and dye-based black inks, with the

dye-based version aimed primarily at photo output. Unfortunately, its installation routine also includes a registration step that you can't bypass or exit easily, an oversight that Canon says it is correcting.

The key differences between the iP5000 and iP4000 are the iP5000's 1-picoliter minimum drop size (compared with 2 picoliters for the iP4000) and its 9,600- by 2,400-dpi resolution (compared with 4,800 by 1,200



THE IP5000 delivers solid text, graphics, and photo output.

dpi for the iP4000). On our tests, these differences yielded better-quality text and graphics for the iP5000 but slightly lower-quality photos.

Performance (using QualityLogic's hardware and software for timing, www.qualitylogic.com) was a mixed bag. On our business-applications suite, the iP5000 almost matched the record-holding iP4000, with a total time of 16 minutes 9 seconds, a difference of just 21 seconds spread out over 13 tests. On our photo suite, however, it was significantly slower, averaging about 1 minute longer for both 4- by 6-inch photos, at 2:06 each, and 8- by 10-inch photos, at 3:38 each.

The Pixma iP5000 is worth considering, but the iP4000 is the better value.

Canon Pixma iP5000
 \$199.99 direct. Canon U.S.A. Inc., www.usa.canon.com.
 OVERALL ●●●●○ Text ●●●●○
 Graphics ●●●●○ Photos ●●●●○

LaCie's Solid High-End Monitor

BY ALFRED POOR

LaCie positions the \$999 **photon20visionII** as an LCD monitor for professionals using advanced computer-aided graphics, imaging, and desktop publishing. The 20-inch display has some advanced features, a fine 1,600-by-1,200 resolution, and an excellent viewing angle. It has some flaws, but is still a solid entry.

The thin-bezel monitor comes with a stylish four-pronged base that has tilt, swivel, and height adjustments, as well as a panel that rotates from landscape to portrait mode. The unit has both a standard

analog connector and a DVI-I connector, which accepts both digital and analog signals. LaCie includes a standard analog cable and a digital cable.

The front-panel controls are well marked and provide quick access to the signal source, auto-sync, brightness, and contrast. The on-screen menu has a stylish graphics design, and you can set the level of transparency that you prefer.

Tests that we ran with the DisplayMate software utility (www.displaymate.com) revealed generally good image quality. Viewing-angle perfor-

mance was excellent along both axes, as is required for a pivoting panel. Color tracking was good, and we saw only faint bands in color ramps. Black-screen uniformity looked good, and the white screen had only some faint shadows in the bottom corners.

The one weak aspect of the display was that we could not get it to show the lightest shades of gray under either a digital or an analog signal. This could be a handicap for a graphics professional, since it would not show highlights in some images. We also observed noticeable smearing of moving images, which is as expected for a panel with a 16-ms pixel speed rating.



LACIE'S 20-INCH LCD model is worth a look.

LaCie photon20visionII
 \$999 direct. LaCie, www.lacie.com.
 ●●●●○

Dell Laser Printer 3100cn

Pros: Output quality is in the top tier for color lasers.

Best performance for business applications in its price range.

Cons: Did not have enough memory to print our 8-by-10 photos in high-quality mode (and boosting memory to handle those photos would add over 10 percent to the price).

Bottom line: The Dell Laser Printer 3100cn offers good or better quality overall. It also gives reasonably good overall performance for the price.

\$549 direct. Dell Inc., www.dell.com.
 OVERALL ●●●●○ Text ●●●●○
 Graphics ●●●●○ Photos ●●●●○



Samsung SyncMaster 710M

Pros: Value-priced monitor with extra features. Good image quality. Speakers better than average.

Cons: Merely fair viewing-angle performance.

Bottom Line: The Samsung SyncMaster 710M has a few extras beyond the basic feature set. The image quality is also better than that of the typical entry-level model, making it an attractive option.

\$440 street. Samsung Electronics America Inc., www.samsungusa.com/monitor. ●●●●○



Sharp Notevision XR-1S

Pros: Extremely small. Bright image for a 3.2-pound projector.

Cons: Fairly noisy. Limited connectors.

Bottom line: The Sharp Notevision XR-1S is a tiny projector that makes big, bright images. It has some limitations and relatively minor display-quality flaws but costs only a few hundred dollars more than similar projectors that weigh twice as much.

\$1,300 street. Sharp Electronics Corp., www.SharpLCD.com. ●●●●○



For an in-depth look at these products, go to www.pcmag.com/guides.

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Top-Notch External DVD Burner

BY DON LABRIOLA

PC The LaCie 16X d2 **MAGAZINE EDITORS' CHOICE** DVD±RW Double Layer external burner has many of the same strengths that earlier models offered: a tough, rack-mountable aluminum chassis, an auto-sensing dual FireWire/USB 2.0 interface, and a generous assortment of Roxio applications that together support most recent Windows and Mac operating systems.

Like other outboard LaCie drives we've reviewed, the 16X d2 took about twice as long as most internal models to rip a DVD to a hard drive. But it compensated with solid results on other tests and by adding support for the latest 4X DVD+R double-layer and 16X single-layer DVD-R and DVD+R specifications. And unlike many dual-layer rewriters, it produced DVDs and CDs that played flawlessly in every one of our set-top

and computer test drives.

The unit burned a 4.7GB DVD-Video image to 16X DVD+R media in 7 minutes 10 seconds and to a DVD-R disc in exactly 8 minutes. We also backed up a 2GB hard-drive folder to a 4X DVD-RW blank in 7:35 and to a 4X DVD+RW disc in 7:12. All these results were comparable to those of most internal 16X drives we've tested (First Looks, December 14). The 16X d2 recorded a 30-



THIS LACIE DVD burner is fast and feature-rich.

minute Video CD in a mere 1:53 and burned an 8.5GB dual-layer DVD-Video image in 32:42, a result surpassed in our labs only by the Pioneer DVR-A08. The 16X d2 also distinguished itself on our compatibility tests.

Despite its overall good performance, the 16X d2 isn't perfect. In addition to its lethargic DVD-ripping performance, the drive's bundled Easy Media Creator 7 digital-media suite did not include the MP3 encoder or DivX codec required to complete our audio CD-ripping and DivX transcoding tests.

There's no way to design an affordable external DVD rewriter without making compromises, but LaCie has done a respectable job of choosing where and how deeply to cut.

LaCie 16X d2 DVD±RW Double Layer
\$189 list. LaCie, www.lacie.com. ●●●●○

M-Audio Studiophile DX4



Pros: Stun-ningly realistic sound.



Cons: Constrained volume levels.

Limited bass. Large footprint.

Bottom line: The Studiophile DX4's extraordinarily detailed, lucid sound comes closer to meeting audiophile expectations than any desktop we've heard in its price range. Gamers who crave head-banging output levels and bombastic bass will want to look elsewhere, however.

\$200 list. M-Audio, www.m-audio.com. ●●●●○

Cambridge SoundWorks MicroWorks II

Pros: Moderately high volume levels.



Tight, detailed bass. Reasonable price.

Cons: Strident high end. No deep bass.

Bottom line: Cambridge has revived its pioneering MicroWorks brand with a higher-powered offering that has more in common with the company's pricier MegaWorks line than with the original MicroWorks. The result is a reasonably priced system that falls somewhere between the two in terms of volume levels, bass output, and overall sound quality.

\$150 direct. Cambridge SoundWorks, www.cambridgesoundworks.com. ●●●●○

Aliph Jawbone

Pros: Effective noise cancellation.

Cons: Limited phone compatibility. Reduces phone's battery life.

Bottom line: If you need to make phone calls from noisy places, the Aliph Jawbone headset is essential. The Jawbone uses military-grade audio technology to remove background noise from your side of the conversation.

\$150 direct. Aliph, www.jawbone.com. ●●●●○

For an in-depth look at these products, go to www.pcmag.com/guides.

Keyboard Keeps Passwords Safe

BY ROBYN PETERSON

Combining password management with biometric security on a common multimedia keyboard, the **Microsoft Optical Desktop with Fingerprint Reader** is an input device that not only provides a comfortable typing experience but also secures your digital identity and automates the log-on process for Web sites and Windows programs.

As Microsoft's first keyboard with fingerprint recognition technology (compliments of DigitalPersona), it's remarkably well designed. The outer ridge is lined with common multimedia buttons (play, pause, rewind, fast forward) and other application and directory shortcut buttons (Mail, Web, My Documents, and more). The F-keys are also

enhanced to provide dual functionality. For instance, when the F-Lock is off, the F2 and F3 buttons serve as undo and redo, respectively. Accompanying the keyboard is the stalwart Wireless Optical Mouse 2.0, which makes the package quite business-friendly but not ideal for gamers.

To the left of the keypad lies the most important feature of this entire suite: the red, illuminated biometric sensor. Setting it to accept your fin-



THIS KEYBOARD lets you replace passwords with a finger swipe.

gerprint rather than a log-on username and password is simple. On our tests, the automated log-on process rarely failed and was simple to configure. On a home PC, you can easily log into Windows using a fingerprint scan. This Windows log-on automation isn't designed for a corporate network or domain, however.

If you find your office or desk littered with Post-It notes scribbled with username and password combinations, you should seriously consider increasing your security, and this keyboard and mouse combo will certainly give you a push in the right direction.

Microsoft Optical Desktop with Fingerprint Reader

\$104 list. Microsoft Corp., www.microsoft.com. ●●●●○



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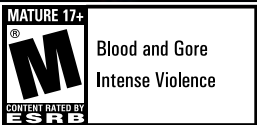


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Sweeter Home Suites from Microsoft and Corel

BY EDWARD MENDELSON

Home office suites are the hyperactive siblings of mature office suites, with fewer productivity applications (such as presentation tools) and more entertainment and school-based software (like picture editors and encyclopedias). Corel and Microsoft have updated their home software applications with bargain-priced collections of programs that are worth having for their components, even if you won't use all the parts.

Microsoft Works Suite 2005

Microsoft packs a virtual truckload of software into Works Suite 2005. Even if you don't want to use the project templates and links to Microsoft sites that come in the package, you may still want it for high-quality programs such as Microsoft Word 2002, Streets & Trips 2005, Encarta 2005 Encyclopedia Standard, and Picture It! Premium.

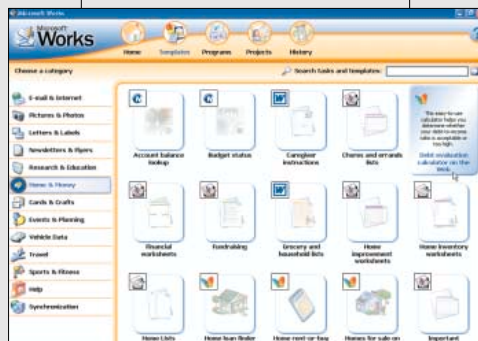
You can launch all these apps, plus the low-powered Works spreadsheet (from the standalone Works 8 package; First Looks, October 19), from either their own Start menu entries or the graphics-heavy Task Manager. The latter organizes activities under categories that in turn lead to templates that open in one of the programs. Task Manager is meant to be beginner-friendly, but it may leave you feeling overwhelmed rather than helped.

Word 2002, while not the latest build of the stalwart word processor, has more features than most people will ever use. The Works spreadsheet, which doubles as a flat-file database, is more than enough for household tasks. It's not nearly as full-featured as Excel or Corel's

Quattro Pro, however. Streets & Trips (First Looks, November 30) is the slickest and most detailed street-map program available, and the version in the suite includes GPS capabilities.

Works Suite 2005's version of Encarta provides far more information than the limited Britannica version in Corel's suite, complete with online integration that (for example) displays the current weather in any city you look up. Unless you have complex, rapidly changing financial assets, the standard version of Money provides all the banking and budget features you need, in a smooth-running package.

Microsoft Picture It! Premium delivers a decent mix of management and touch-up features and is far more automated than Corel's offering—though it's still no match for standalone



THE BLIZZARD of choices presented to you by Microsoft Works Suite 2005 can be overwhelming.

offerings such as Adobe Photoshop Album 2.

Instead of an overall manual, Works Suite gives you Getting Started booklets for the suite itself and for Streets & Trips, plus a thorough manual for Picture It!. For assistance with the other programs, you'll need to rely on the help screens.

Microsoft Works Suite 2005

\$99.95 direct. Microsoft Corp., www.microsoft.com. ●●●●○



THE INTERFACE of Corel's suite gives quick access to programs (top) or templates (left).

WordPerfect Office 12—Home Edition

Corel designed WordPerfect Office 12—Home Edition to be the only software package you need to buy after you purchase your computer. Compared with Microsoft Works Suite 2005, Corel offers fewer luxuries but more essentials—notably Pinnacle Instant CD/DVD creation software and the full Norton Internet Security 2005 firewall, antivirus, and privacy package (with a three-month subscription).

A single installation program sets up the WordPerfect 12 word processor, Quattro Pro 12 spreadsheet, and a centralized task manager that launches document and spreadsheet templates for common family and school-based tasks. You can also opt to install the Norton security package, the OfficeReady template launcher with additional templates for family finances, the Corel Photobook image-enhancement program and Corel PhotoAlbum image manager, and the Britannica Ready Reference 2005 encyclopedia. You also get a slightly limited version of Pinnacle Instant CD/DVD. A single printed manual presents the basics about all the applications.

The hundred templates

available from the tab-organized Task Manager are generic enough to be useful, unlike the cute-looking styles provided by Microsoft. When you launch WordPerfect and Quattro Pro, a Workspace Manager dialog box lets you decide whether to use toolbars and other settings that make the Corel programs resemble Word and Excel—and whether

to save files by default in Microsoft Office formats. Expert-level features such as custom paragraph spacing and complex charting options won't translate perfectly between WordPerfect Office and Microsoft Office, but home and school users are unlikely to encounter any problems.

Image-enhancement features in Corel Photobook aren't as easy to use as those in Microsoft Picture It! Premium, but the Corel product comes with a wider range of filters, including a selection from the imaginative Kai's PowerTools package. The bundled Pinnacle CD/DVD creation module is all that most users will need to burn audio, video, and data to CDs or DVDs. The Britannica encyclopedia is a sharply reduced version of the full encyclopedia, which you can access online at no charge.

The Corel entry is friendlier and more usable than the other leading Microsoft Office competitors (OpenOffice, StarOffice). Users who want to buy all their software at once may find the balance tipped in Corel's favor by the Norton Internet Security package, which comes with a three-month subscription to virus and firewall updates (upgradable to a one-year subscription for \$39.95).

WordPerfect Office 12—Home Edition

\$69 direct. Corel Corp., www.corel.com. ●●●●○



*Turns coach
into first-class.*

Fujitsu recommends Microsoft® Windows® XP Professional for versatile mobile computing.

The ultra-small, full-featured notebook you don't have to make room for.

More lap and tray table room. A wide-screen display with a Crystal View enhanced outdoor screen and enough battery life for a full-length feature. With its ultra-small size and ultra-big multimedia capabilities, the award-winning Fujitsu LifeBook® P7000 notebook will make any trip feel like an upgrade. A "micro" revolution in mobile computing, the LifeBook P7000 notebook features Intel® Centrino® Mobile Technology, a modular bay, a biometric security option, integrated Intel® 802.11 b/g wireless and extended battery life in an 8" x 10" chassis you have to see to believe. Watch DVDs with Dolby stereo, burn CDs, or drive powerful mobile applications—without having to lug around an extra carry on. To see what your new travel companion can really do, call **1.800.FUJITSU** or visit **us.fujitsu.com/computers/P7000**.

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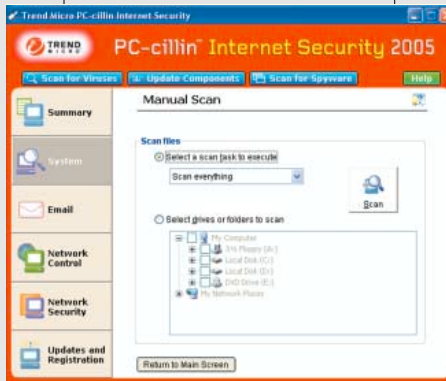
BY NEIL RUBENKING

The new **Trend Micro PC-cillin Internet Security 2005** (PCIS) has all the elements you could want in a security suite: virus protection, firewall, antispam, spyware removal, URL filtering, privacy protection, and even a few completely unique features. But only the antivirus protection is truly top-notch, and the security console that wraps this bundle of features, though nominally designed for ease of use, succeeds mainly in confusing the user.

The PCIS main console consists of six pages selected by buttons at the left. Clicking one of up to six buttons on a page opens a detailed settings page which, confusingly, replaces the main page. Some of these can drill down still farther. We repeatedly found ourselves stumped looking for particular screens—even ones that we had viewed recently.

PC-cillin antivirus rates highly with all the testing labs. As expected, it scans files on access, on demand, and on schedule. Its e-mail scanner filters incoming (POP3) and outgoing (SMTP) messages as well as attachments in Web-mail messages. On blocking a virus, it pops up an alert but doesn't require user intervention; it stacks up as many as ten alerts for perusal later. The scanner will scan inside as many levels of ZIP files as you specify.

The firewall module comes preconfigured with four possible profiles and the ability to associate particular network connections with a given profile automatically. We tested it under "Direct Connection," nominally the strongest protection. To our surprise, it failed



THE DECEPTIVELY INVITING user interface of PCIS quickly gets confusing as you drill down.

many of the standard port-scan tests, leaving some ports wide open and others closed but not "stealthed." We had to edit the profile and raise its security level in order to get the expected level of protection. On the plus side, when we attacked the firewall process and forced it to terminate, it disabled the network connection on its way out.

PCIS's antispam and antispyware modules were underwhelming on our tests. The program's URL filter can block access to inappropriate Web sites in 20 specific categories, with user-defined exceptions. The filtering is system-wide, not user-based. The Private Data Protection feature lets you record private data of any kind and prevent it from being sent out via e-mail, instant messag-

ing, or the Internet.

PCIS is an ambitious suite, but in the end, we prefer Norton Internet Security 2005.

Trend Micro PC-cillin Internet Security 2005

\$49.95 direct. Trend Micro Inc., www.trendmicro.com. **OVERALL**
 ●●●○○ Antivirus ●●●●●
 Antispam ●●●○○ Antispyware
 ●●●○○ Firewall ●●●○○
 Privacy/parental control ●●●○○

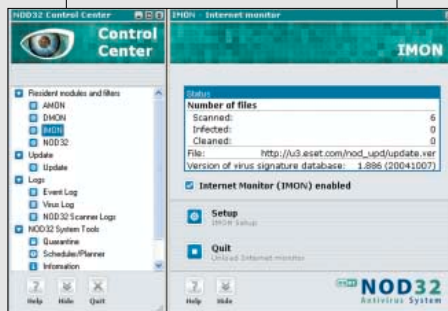
NOD32 2.0: Easier, But Not Yet Easy

BY NEIL J. RUBENKING

Eset's **NOD32 Antivirus System 2.0** is a speedy and highly configurable antivirus tool that regularly gets top ratings from independent testing labs. For emerging threats, two types of heuristic analysis block unknown viruses. NOD32's vast number of configuration options, however, may prove confusing for typical PC users.

NOD32's Control Center centralizes four previously separate antivirus modules. NOD32 scans the entire system for viruses on demand or on schedule; AMON scans files on access; and DMON scans Microsoft Office documents. Most important, IMON scans incoming

POP3 and HTTP streams (but not outgoing mail), blocking viruses in e-mail and downloaded files. When scanning a particularly large file, IMON can



THE CONTROL CENTER wraps four formerly separate modules into one handy console.

NOD32 relies on frequently updated virus signatures to recognize known viruses and includes defenses against unknown threats as well. Standard heuristic detection is enabled by default; Eset warns that "Deep" detection may accidentally flag innocuous programs. Advanced heuristics protection actually executes suspect code on a virtual PC and watches for suspicious behavior. This feature is turned off by default for on-access scanning, to save time.

When a virus is detected, NOD32 optionally sends an alert via e-mail or the Windows Messenger service. Users can configure every aspect of the four modules: what

to scan, where to scan, how to scan, how to handle viruses, and more. You can save multiple profiles for different on-demand scans and schedule them to execute at intervals or based on system events. Though experts will love this flexibility, ordinary users may have trouble finding the settings they need.

NOD32 Antivirus System combines excellent detection of known viruses with powerful heuristic scanning to stop unknown viruses in their tracks. The Control Center in this version makes it easier to use the four previously separate scanning modules. Configuring it, however, will still be a challenge for ordinary users.

NOD32 Antivirus System combines excellent detection of known viruses with powerful heuristic scanning to stop unknown viruses in their tracks. The Control Center in this version makes it easier to use the four previously separate scanning modules. Configuring it, however, will still be a challenge for ordinary users.

NOD32 Antivirus System 2.0

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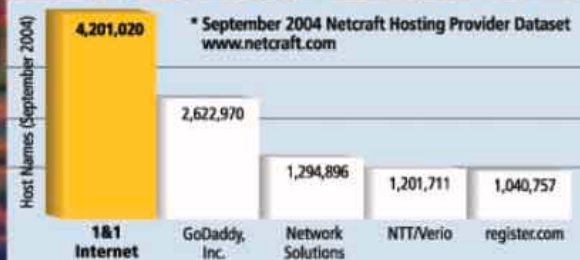


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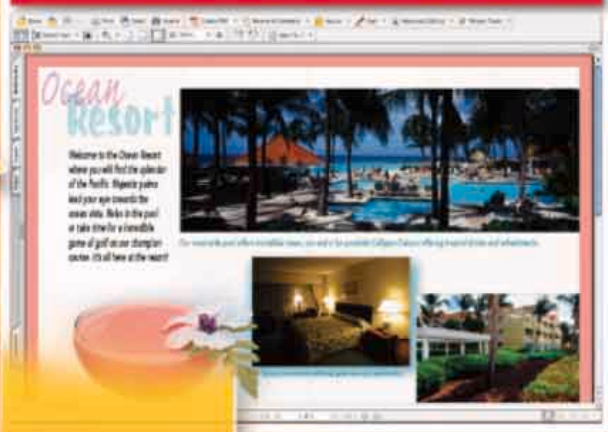


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NOTCARDS2004: Which product can I help you with?

LANCE: I am interested in ordering some business cards. What difference between gloss and matte stock?

NOTCARDS2004: Matte stock is a coated paper that has a dull or flat finish often preferred for readability on projects that are text rich or that contain charts or graphs. Gloss stock is a coated paper with a shiny or reflective finish. It is generally less expensive than matte and serves to help full color photos, images and graphics appear more vibrant, real and real appealing.

LANCE: I think I'm going to go with the gloss. Thanks so much for help!

Thanks so much for your help!

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In2site Live Dialogue

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To access the Newsletter Tool, simply login to your Control Panel and you're just steps away from communicating with your website visitors more easily than ever before. And since the 1&1 Newsletter Tool is browser-based and launched right from your Control Panel, there's no software to install.

When you're ready to build an e-mail newsletter, editing tools and built-in design templates let you create professional looking e-mails quickly and with no programming knowledge. Then click your completed newsletter is fast made and click send!

My own website wants to build your own mailing list? Simply incorporate a template-driven subscription form on your site or interested visitors can quickly request to receive your e-mail newsletters. Once the form is submitted, the data is automatically entered into a

1&1 Newsletter Tool
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Membership List

Alan Bishop	634 E. 39th Street, New York, NY 10019	alanb@myhost.com
Stephen Bradshaw	1954 Corgan Street, Hudson, OH 44236	bradshaw@myhost.com
Catherine Leonard	64 Stanhope Drive, Pittsburgh, PA 15237	family@myname.com
Carl Brown	653 Liberty Avenue, Wilmington, NC 28403	brownc2521@ycos.com
Tom Stowe	26 N. Hills Road, Chandler, AZ 85226	weburited@gmx.net
Helen McSwenny	817 Providence Hwy., Boston, MA 02116	helenmcswenny@hotmail.com

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1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
Chat channels	1	1
1&1 WebStatistics	✓	✓
SITE-BUILDING TOOLS		
NEW PDF2Web Converter	✓	✓
NEW DynamicSiteCreator	✓	✓
NEW Graphic archive	✓	✓
WebsiteCreator	12 pages	12 pages
Software suite worth \$600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	-	✓
DOMAIN NAMES		
Included Domains	1	1
Subdomains	10	10
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
E-mail accounts w/ 1 GB space each	200	200
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Spam filtering for all accounts	✓	✓
Virus Protection for all accounts	✓	✓
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
Dedicated SSL Certificate	optional	optional
PER MONTH	\$4⁹⁹	\$6⁹⁹

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PACKAGE FEATURES		
Web space	2,000 MB	2,000 MB
FTP accounts	5	5
Monthly Transfer Volume	50 GB	50 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
Chat channels	5	5
1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
NEW PDF2Web Converter	✓	✓
NEW DynamicSiteCreator	✓	✓
NEW Graphic archive	✓	✓
WebsiteCreator	18 pages	18 pages
Software suite worth \$600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	-	✓
ASPNET, .NET Framework	-	✓
Perl, PHP3, PHP4, and PHP5	✓	-
1&1 WebDatabase	✓	✓
Database	1 MySQL	MS Access
Cron Jobs	✓	-
SSI (Server side includes)	✓	✓
DOMAIN NAMES		
Included Domains	3	3
Subdomains	50	50
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
E-mail accounts w/ 1 GB space each	500	500
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Spam filtering for all accounts	✓	✓
Virus Protection for all accounts	✓	✓
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
SSH Secure Shell Access	✓	-
Dedicated SSL Certificate	optional	optional
PER MONTH	\$9⁹⁹	\$12⁹⁹

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PACKAGE FEATURES		
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FTP accounts	25	25
Monthly Transfer Volume	100 GB	100 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
Chat channels	10	10
1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
NEW PDF2Web Converter	✓	✓
NEW DynamicSiteCreator	✓	✓
NEW Graphic archive	✓	✓
WebsiteCreator	25 pages	25 pages
Software suite worth \$600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	-	✓
ASPNET, .NET Framework	-	✓
Perl, PHP3, PHP4, and PHP5	✓	-
1&1 WebDatabase	✓	✓
Database	3 MySQL	MS Access, MS SQL
Cron Jobs	✓	-
SSI (Server side includes)	✓	✓
Advanced Developer Tools	✓	-
DOMAIN NAMES		
Included Domains	5	5
Subdomains	200	200
Run multiple independant sites	✓	✓
Full DNS management	✓	✓
E-MAIL		
E-mail accounts w/ 1 GB space each	1,000	1,000
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Spam filtering for all accounts	✓	✓
Virus Protection for all accounts	✓	✓
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
SSH Secure Shell Access	✓	-
Dedicated SSL Certificate	✓	✓
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FEEDBACK

“I hope we all try to use the power-saving features of our machines. Or just turn them off.”

POWERING THE DIGITAL HOME

Your “Future Home” (Fall 2004 Special Issue) looks like a gadget junkie’s dream house, except for a couple of important things that were not mentioned and immediately struck me by their omission. I have been a technician and electrical engineer for 35 years, and, because most of my work now involves programming Crestron panels and systems to control our clients’ homes and entertainment systems, I had to write to remind you to consider two more things to complete the Future Home’s picture.

With all those electronics, you need power. And in the imaginary basement, there surely must be some kind of backup power source, at least to run things until the backup generator fires up to keep things running. And then, there is the issue of “too much power,” which can come from a commonly overlooked threat. The roof areas ought to have ample lightning arresters, or strips of conductive flashing installed on the peaks and edges and tied to neutral ground, or else someday all that wonderful gear will be fried silicon. Sadly, I have seen it happen all too frequently.

I suggest that this home’s owner should spend a little more money to keep this equipment running, and to protect it not just from thieves but from Mother Nature as well. Otherwise, this “Future Home” cannot fulfill its purpose of taking the stress out of the lives within! In this case, effectively planning for the future may also require stepping “outside the home (box)” to see the bigger picture. It is so amazing how often we take for granted that the power to run our equipment will always be at hand.

TOM CHURCHILL

TRY CONSERVING POWER

Finally! Someone with enough foresight to take a stand on electron waste (Bill Machrone, October 5, page 75, and November 16, page 75). It is especially impressive coming from someone in the usually shortsighted technology field! Our society’s addiction to all things electronic comes at a steep price—from colossal piles of e-waste to gigawatts of squandered electricity.

One further comment to be made is the impact on building cooling. Almost all offices and many homes in the developed world use air conditioning for at least part of the year (year-round in warmer climates). Computers and other electronics can pro-



duce tens of thousands of BTUs per hour of needless heat in an office building when they’re not being used. This electricity waste is automatically doubled. You waste a kilowatt-hour running a computer, and then you waste another kilowatt-hour running the HVAC system to counteract it.

I hope we all try to use the power-saving features of our machines. Or just turn them off.

JOEL BURNETT

WATER AND MICROWAVE ABSORPTION

In John Dvorak’s discussion of 802.11b, he says that its frequency is the same as that of a microwave oven. Therefore, if you amplify the signal, the human body will be increasingly damaged because it is mostly water. While true, this statement hides a common misconception: that liquid water absorbs in a narrow frequency range, making other frequencies safer to use. While water vapor has a resonant frequency, as a liquid it absorbs over a very wide range of frequencies.

GARY COHEN

MORE LINUX, PLEASE

It saddens me to see that your computer magazine covers Windows while most of the time not giving much/any consideration to Linux/Unix or any other PC OS. I feel that this to some extent alienates those of us who do not use, or like, Windows. I stopped using Windows because I could not stand all the problems I had with it. I know people who have had all sorts of virus and firewall problems with Windows XP and SP2. I have not had any such problems on my Red Hat Linux 8 or 9 machines. I admit that some popular software, such as Shockwave or QuickTime, is not available for Linux, but I still can check out Web pages, play games (including Windows games, using the wine plug-in) and compose text documents and spreadsheets. I am also able to create CDs for friends who want to try Linux without installing it.

For those readers who want to learn about Linux and try it, I suggest <http://www.distrowatch.com>, which gives a listing of all the major distributions and links for downloading them.

CHRISTOPHER ROSE

How to Contact Us

We welcome your comments and suggestions. When sending e-mail to Letters, please state in the subject line of your message which article or column prompted your response.

E-MAIL pcmag@ziffdavis.com

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Corrections and Amplifications

■ In the Issue 22 HDTV introduction, we said “These models use reflective microdisplay devices such as Texas Instruments’ DLP technology, high-temperature polysilicon (HTPS) LCD projectors, and even liquid crystal on silicon (LCoS).” The word “reflective” should have been omitted from this sentence.

■ A direction in “Beyond Halves and Quarters in Microsoft Word”, User to User, Fall issue, page 75, reads “Between these braces enter “EQ\F(5,16)” In the article as submitted, there was a space after EQ and before the backslash. Without the space it does not work.



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Bill Machrone



The Mind-Altering Computer

Everybody knows that computers can drive you crazy, but what can they do to improve your mental state—or even change the way your brain functions? In our stress-filled world, it's good to learn how to get a grip, or at least mellow out. There are many solutions, spanning a variety of technologies. Some, such as screen savers with soothing images and nature sounds, are intended to engender a nonspecific feeling of relaxation, while others are more directed. Some use hardware for biofeedback and reinforcement, so you know when you're achieving results.

The Journey to Wild Divine (www.wilddivine.com), for example, is an adventure-style game with rich graphics, music, and sensor cuffs that you place on your fingers to read your heart rate and galvanic skin reaction level. As you play the game, you learn to modify your energy levels in both directions—lower and higher—by controlling your breathing, visualization, and even laughter. I've used Wild Divine and can attest to its effectiveness. Some may find its earth mothers and blissed-out guru mentors off-putting, but there's nothing wrong with what the program teaches. It's a bit strange at first to move things on the screen and navigate by focusing or defocusing your mental energies, but you'll feel like a Jedi in no time.

Another hardware-software combination, Play Attention (www.playattention.com), is aimed at the education market. It's designed to help students increase their attention span and perhaps overcome the stigma associated with attention deficit disorder. Many schools, including my local district, have adopted Play Attention. It consists of software “games,” an interface box, and a bicycle helmet equipped with several electrodes to pick up brain waves.

One of the games features a bird flying across the landscape. If you focus on the bird, the electronics pick up the greater ratio of high theta to beta brain waves and the bird soars higher. If your attention wanders, beta waves increase and the bird sinks down until it's skimming the ground again. Other games reward attention and focus in various ways, and the program tabulates each user's progress. By increasing the students' awareness of their attentiveness, the program also teaches them to focus in contexts outside of the games. Adults can use it as well as children; the company recommends 40 to 60 hours of training. It is setting up and franchising Play Attention Learning Centers across the country.

Another method uses brain entrainment to stimulate brain waves at specific frequencies, including the mellow alpha waves (8–12 Hz) and the deeper theta (3–8 Hz) waves. According to researchers, entrainment occurs when the brain is stimulated by flashing lights or sounds at these frequencies. Since these frequencies are below the lowest tones our ears can detect, entrainment audio typically has binaural tones that generate beats at alpha or theta frequencies. Sometimes the audio is modulated, much like a singer's natural vibrato, to encourage entrainment without the need for earphones. Out of curiosity, I looked up the frequency range for singers' vibratos, and it ranges from 4 to 7 Hz, right in the theta range. It's possible that we find such singing pleasant because it coaxes our brains into a more relaxed state.

You can download many programs to create relaxation or self-improvement recordings, and commercial, mission-specific recordings are also plentiful. Some add subliminal messages; others simply include a voice track while playing entraining tones. Have a look at www.transparentcorp.com; its Neural Programmer has prerecorded scripts and allows you to record your own over its relaxing background sounds.

For ultimate control over your recordings, check out the Subliminal Recording System (www.subliminalrecorder.com). It looks like home recording studio software but creates binaural entrainment frequencies and allows you to shift your messages into different frequency bands.

If you want to see what your brain is doing, check out the OpenEEG project, which enables you to build your own electroencephalograph (<http://openeeg.sourceforge.net>). You'll need to be handy with a soldering iron: This is no RadioShack project. The components should run \$400 to \$500. The code is written for Linux. A commercial two-channel brain wave recorder, such as the BrainaMaster (<http://store.biofeedbackzone.com/braba.html>) or WaveRider Jr. (www.dynamind.com/waveriderjr.htm), will set you back about \$1,000.

While some people dispute the efficacy of entrainment, subliminal messages, and similar techniques, others swear by them. Try some of the downloads and make up—if not improve—your own mind.

It's a bit strange at first, navigating by focusing or defocusing your mental energies, but you'll feel like a Jedi in no time.

MORE ON THE WEB: You can contact Bill Machrone at Bill_Machrone@ziffdavis.com. For more of his columns, go to www.pcmag.com/machrone.

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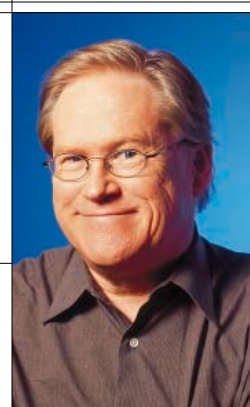
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John C. Dvorak



Déjà Sue

Whoever influenced the Motion Picture Association of America to start suing movie downloaders gave them the same bad advice the Recording Industry Association of America has been following for the past decade. I suspect it was the mavens at the RIAA, as misery loves company. This initiative will exacerbate what has been merely a nuisance to the movie industry.

The MPAA argues that the disaster that the RIAA experienced happened because the RIAA did not “nip it in the bud.” Nothing could be further from the truth. The RIAA tried to nip the downloading problem in the bud numerous times, and each time made it worse. It began in the 1990s, when the RIAA cracked down on a few dozen college Web sites that were established so students could exchange songs among themselves. These were all shut down, and in the process the kids created an impenetrable underground.

This was followed by the boneheaded mistake of suing Diamond Multimedia over its Rio MP3 player a few years later. Suddenly MP3s were mainstream. Big time. A few thousand users became 10,000 users. Along came Napster. The RIAA sued Napster when it had fewer than 100,000 users, and the service soon registered millions more. Each step of the way, the RIAA was nothing more than the publicity machine for free music and MP3s.

Meanwhile, Apple and the iPod came along and showed that it would have been just as easy to incorporate a paid service instead of wasting millions of dollars of membership money by suing everyone.

Until now, the MPAA was cool about the few users (mostly kids) who managed to go through the agony of downloading movies. Meanwhile, machines in Southeast Asia are churning out hundreds of thousands of copies of bootleg DVDs. Until that stops, I can't see a reason to go after small fry. It's pointless, and has put the MPAA members on the same track stupidly taken by the RIAA. The MPAA has now publicized the availability of downloadable movies to a previously unaware public. It has also created an environment where users have to be cautious so they won't get caught. Concealing mechanisms will evolve faster than the lawyers can file paperwork. It's a disaster waiting to happen.

When the public first read about the MPAA suits, people didn't say to themselves, “It's about time something was done to eliminate piracy!” They

mostly said, “Hmm, I didn't know you could download movies. Wow, cool.”

That said, the MPAA has a few things in its favor. First of all, the mechanisms and rationale for downloading movies are different from those for downloading music. Movies are not as easily available as music is. The DVD of a film might not be released for months, maybe even years in Europe. The movie business, unlike the record industry, has an old-fashioned distribution system in which the film goes to theaters in the U.S., then Europe, then Asia; then it appears on pay-per-view, then on DVD or HBO, then on network TV, etc. This process can take forever. The international rollout is arcane and is the reason behind the various DVD country codes that keep the French from seeing a DVD that Americans can buy at Wal-Mart. This system, as far as the public goes, is unacceptable. Enter downloading to give the people what they want. It's that simple.

The next difference between music and movies is file size. No one in their right mind wants to spend hours downloading movies if he doesn't have to. I've played with this technology; it's painful and breaks too often to be popular. When the file size is reduced by converting to AVI files, the quality suffers tremendously. Downloading movies will never become popular unless a market is created for better mechanisms and a more secure underground—and publicity can create that market. By suing users, the MPAA makes the process seem effortless—if they need to sue, everyone must be doing it. Who knew?

One other difference the MPAA should be aware of is that it has goodwill, while the RIAA doesn't. People have rationalized that the RIAA represents a music industry that has been ripping them off with overpriced CDs and a mean spirit. By comparison, a DVD is a good deal and provides all sorts of extra features. Nobody sees a rip-off here.

The movie industry seems levelheaded and smart. Now it's setting itself up to follow the failed strategy of the RIAA. And it's doing so for no apparent reason other than the fear created by the RIAA. “Look what happened to us! It will happen to you!”

Indeed it will, if the MPAA continues on the same litigious road as the RIAA.

The MPAA has now publicized the availability of downloadable movies to a previously unaware public.

MORE ON THE WEB: Read John C. Dvorak's column every Monday at www.pcmag.com/dvorak. You can reach him directly at pcmag@dvorak.org.

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Inside Track

Value-Add Seems Always Bad Dept.: I recently attended a wireless telecom confab and saw a lot of phone-related products and trends, many of them good ideas. But the most overlooked trend that **dominates** the scene is the push toward value-added services, when stand-alone products would be a better idea—or at least would serve the public better. This will become more apparent as the new video standards for phones emerge.

Take the new DVB-H (Digital Video Broadcasting-Handheld) front-end tuner for cell phones. The DVB-H standard is designed for the reception of a specific type of TV signal to be seen on portable devices. It's expected to be a **big seller** in Europe, where they are **gaga** over all sorts of new cell-phone gizmos. This technology, of course, has competition from the Japanese ISDB-T (Japanese Integrated Services Digital Broadcasting-Terrestrial). (And I have no idea why we are suddenly seeing all these monikers with the dash incorporated for no apparent reason.)

Texas Instruments is also getting into the act with a **chip code-named Hollywood**, which combines all the standards.

Okay, the thing that I don't understand is, why the new standard? I'd be quite happy watching plain broadcast TV on a handheld device. You know, with a plain tuner. But we can't have that, because these schemes are giving the carriers an **incentive to sell handsets** with the new tuners, so they can somehow make an extra \$10 a month in added service fees. Value-added. Heaven forbid we get something for free someday.

At the same trade show that I mentioned before, there was an operating-system shell running on top of the Symbian OS. It **made Symbian cool**, if that's possible—a little more like a PDA or Windows CE. I was jazzed. I wanted it for my phone immediately. But no, it was not a product but a service. Value-added. The vendor was hoping that T-Mobile or some other carrier would offer it as a **value-added service** for a few bucks a month. I shook my head and walked off.

What's Going on with Internet2 Dept.: Many of you have heard of the next-generation Internet, dubbed Internet2. It was developed specifically for academia and industry, where there is a need for a **gigabit pipe** to move large amounts of data around. Last September, it moved a chunk of data at about **7 gigabits per second** from the U.S. to Switzerland.

Much of this is a prelude to the start-up of the **Large Hadron Collider (LHC)**, which will be operated by CERN (the European Organization for Nuclear



While there's chatter that Internet2 will never hook up to the legacy Internet, I find it hard to imagine keeping two such networks running parallel for long.

Research), located west of Geneva, Switzerland. This particle accelerator is expected to come online in 2007 and to become the world's premier research tool for **subatomic physics**. Previously, the U.S. seemed poised to dominate this sort of research. But years ago we shut down the Superconducting Supercollider project in Texas, apparently for political reasons.

The LHC is likely to generate **terabytes of data** whenever it's used, and researchers here and elsewhere want remote access to the data. This is one of the sources of demand for Internet2's high-capacity data flow. Exactly how much of this project will sneak over to the Internet we all know and love is still **a mystery**. But the news reports of the data transfers mention that at the current highest speeds, an entire **DVD movie can be transferred in 4 seconds**. While there is a lot of chatter about the fact that Internet2 will never hook up to the legacy Internet, I find it hard to imagine keeping two such networks running parallel for long.

NAS Everywhere Dept.: The number of large-capacity hard drives is going to increase as the demand for **HD-PVR devices** begins to emerge. The beneficiary is the lowly computer user, who can now buy cheap 250GB drives from all the vendors. In an effort to move more drives, more and more vendors are creating network-attached storage options. This was pioneered for the desktop market by companies like Meridian with its **Snap Server**, now made by Snap Appliance. This is still the device by which all others must be judged.

Now Linksys has gotten into the act with a genuine network-attached storage unit and a tricky product called the Network Storage Link for USB 2.0 Disk Drives (NSLU2), which sells for around \$85. You can **stick one of the cheap USB drives** or even a thumb drive onto the NSLU2, which is itself connected to the network, to create a makeshift NAS. Netgear allows similar functionality with a USB port on its home gateway. The reviews of the NSLU2, however, have not been kind, and my experience with the Netgear device is that it's too slow.

I think the best bet for NAS is a dedicated NAS server like the Snap or the new Linksys EFG250, which is a 250GB NAS drive running off a **Gigabit Ethernet port**. Priced at around \$800, this is an expensive proposition compared with the USB-drive solution, but it's much more robust and a lot faster. The drive bays are **cartridge types** for removability, and you can drop in two drives effortlessly. This is a very **slick piece of gear**. If you want to go with the cheap USB drives, then hook them up to the computer, not the network.

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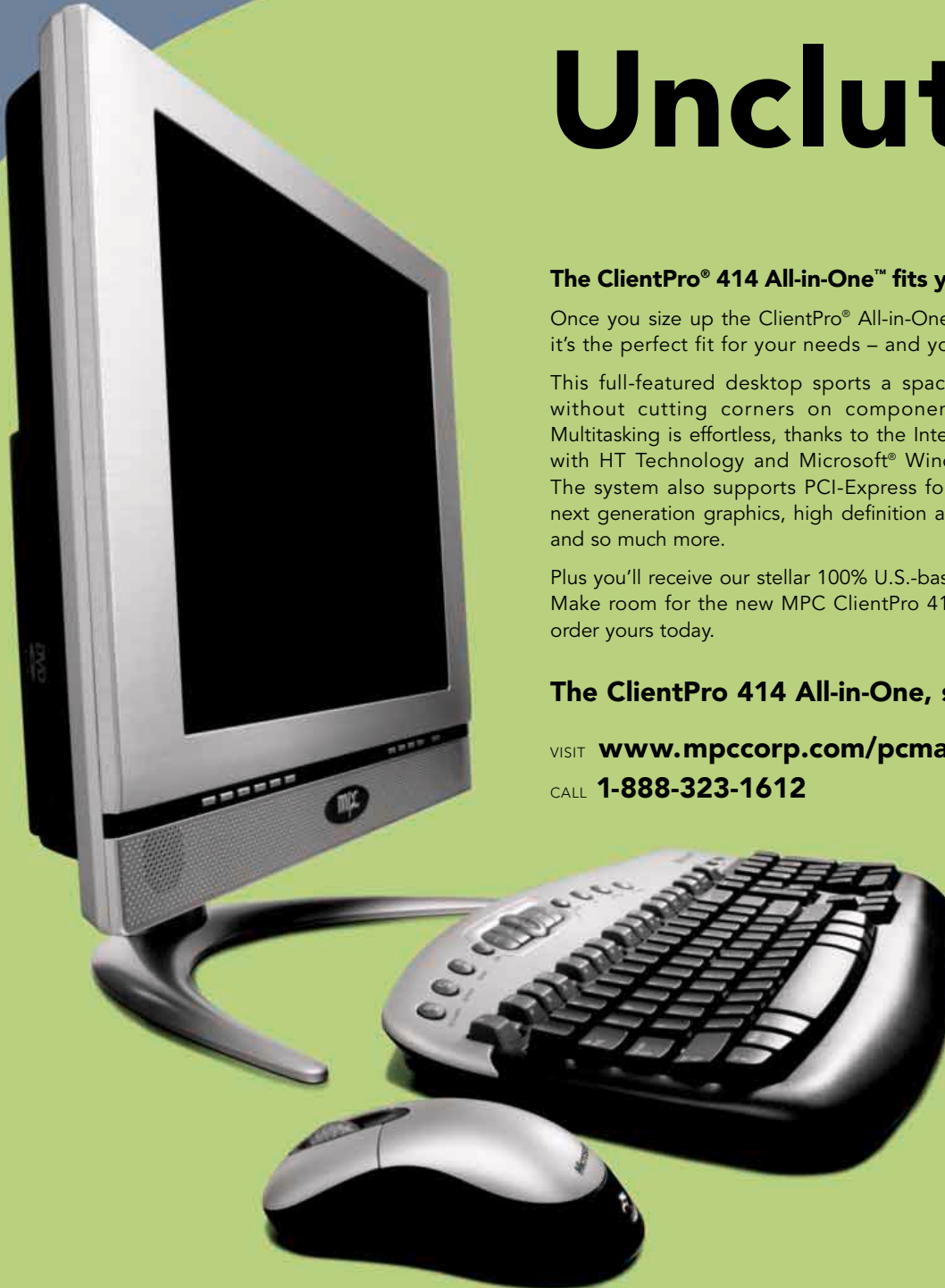
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Bill Howard



Gear to Go

You learn as you go along, when it comes to going on road-warrior road trips. Everything you need to know, you do not learn in kindergarten—not unless Montessori lets kids bring their own laptops and cell phones. Here's what I learned from six weeks on the road as part of *PC Magazine's* Digital University road show.

Hotels are much better than they used to be at providing wired or wireless broadband. Some charge as much as \$13 a day for access, though I suspect room rates with broadband included are the way we're headed. With cellular air cards already here and competitors like WiMAX coming in two to four years, there'll be more ways to connect cheaply, so broadband prices have to fall. This is what's happening with hotel long-distance calls—now that so many people use cellular, a lot of hotels are cutting back to more realistic rates. I made an hour-long conference call and the tab was less than \$5. God bless competition.

Most hotel broadband comprises a connection box at your desk and a restrictive 3-foot Ethernet tether, so it's helpful to carry a cassette-size mobile router (see <http://go.pcmag.com/roadrouters>) (\$75 to \$100) that lets you roam anywhere in your room, in the bathroom, on the balcony—possibly even as far as the pool. I've had good luck with Netgear (<http://go.pcmag.com/wgr101>). The 3Com OfficeConnect (<http://go.pcmag.com/3comtravelrouter>) is our current Editors' Choice, and the always-on wireless WiFlyer is a fascinating alternative: While a little hard to use with its first-generation firmware, it includes a modem so you can have wireless Internet via either broadband or dial-up. If you carry two laptops (say, if your spouse is traveling with you), do be sure to call the front desk and remind them to charge you another \$10 a day, since the router masks the second laptop.

As notebooks get lighter, you can lug ever more other stuff. I carried one of IBM's 2.4-pound DLP projectors (M400, \$1,850), and while it wasn't as bright as the 50-pounder trucked in by the road crew for the core presentation, the color and convergence were always spot-on. Similarly, we had big in-room loudspeakers, but I got more than adequate results with a 5-pound NXT flat-panel system called GoSpeak! (\$400 from InterLink Electronics, \$600 with a wireless mic), which is the size of a thick coffee-table book (9 by 13 by 3 inches). No question, the pro tools are better, but the BYO tools are good enough for crowds of 50 to

100. And after three or four presentations, you'll come out ahead owning instead of renting.

With planes even fuller than before, it's a hassle to reach down to the bag at your feet, let alone get out to your overhead bag. (Hint: Window seats typically have more floor stowage than aisle seats.) I've been wearing an equipment vest that holds my music player, headphones, pen, cough drops, paperback novel, wallet, ticket, cell phone, tissues, and more.

The most thoughtfully designed is the SCOTTVEST classic (\$130, www.scottevest.com) with some 30 interior pockets—so many that you have to remember which overlapping, zippered, Velcro pocket has your wallet. A couple staffers thought the competing Tumi T-Tech vest (\$150, www.tumi.com), with fewer inside pockets, was more stylish on the outside, or maybe it's just the magic of the Tumi logo. Both have zippered-sleeve jacket/vest combinations for about \$75 more. The look is somewhere between geek and safari chic, and I'm fine with that. When you get to the airport X-ray machine, you just drop the whole thing in one of the bins (it makes a big *thunk*) and retrieve it on the other side.

For lugging clothes as well as props, I carry the largest rolling bag that fits in overhead bins (22 by 14 by 9 inches) with a gusset, or expanding zipper, that can increase the depth by 3 inches. If you bring back more than you started with, one bag will still hold it, just not in overhead storage. Virtually everyone makes a rolling bag like that. Inside the luggage and computer bags are smaller mesh pockets that make it easier to find all the stuff I still carry and for airport security to see what's inside—on the occasions when they actually do a thorough check.

As the number of electronic devices I carry goes up, I've found that the iGo Juice transformer (\$120, www.igo.com) saves the weight of carrying multiple transformers. The Juice can charge your laptop and one accessory (phone, PDA, camera, music player) using modular tips; the smallish Everywhere Power (\$70) can charge two accessories simultaneously. As iGo has grown more popular, its range of device tips has grown too, covering more than a dozen phone brands now. Despite our ever-increasing number of gadgets, being a road warrior is easier than ever.

MORE ON THE WEB: You can contact Bill Howard directly at bill_howard@ziffdavis.com. For more of his columns, go to www.pcmag.com/howard.

I've been wearing an equipment vest that holds my music player, headphones, pen, cough drops, paperback novel, wallet, ticket, cell phone, tissues, and more.

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SOLUTIONS

MAKING TECHNOLOGY WORK FOR YOU

How to Make an Award-Winning Movie

Tight deadlines and consumer-level gear need not deter a resourceful DV filmmaker. **BY BILL DYSZEL**

Everyone knows that you can't make a movie in just 48 hours. Everyone also knows that you can't make a movie completely alone on an ordinary Windows laptop. Everyone is wrong.

To prove that point, I entered the 48 Hour Film Project's New York competition (www.48hourfilm.com), a breakneck contest in which caffeine-crazed filmmakers are challenged to dash off a finished movie in just two days. To stretch the point, I decided to go it alone, using no crew or cast—other than myself. I'd be writer, actor, editor, photographer, everything! I also limited myself to consumer-level gear, which I defined as a store-bought Windows laptop, no cameras costing over \$1,500, and no software costing over \$600. To top that, I decided to make my movie a musical. Everybody thought I was crazy.

On a Friday evening at 7 P.M., I joined 22 filmmaking teams; we drew lots to determine the genre of each of our films. I drew science fiction. Every film had to include three compulsory elements: a character (M. Montclair, housekeeper), a prop (a checkbook), and a specific line of dialogue ("I can't take much more of this").

Not to spoil the ending, but I was pretty pleased. My film took the Audience Award and two judged awards. It's called *Area Two Slash Two*, and you can view it at <http://go.pcmag.com/area2slash2>. Only six of the 22 competing films won any award at all. Nobody else worked solo.

Can you complete a movie from scratch in the next 48 hours? I think you can! Here's how I did it:

Friday, 7 P.M. to midnight: Creating songs and script. In a movie musical you create the soundtrack first, while in a



CREATE A GRANDIOSE opening title in Ulead Cool 3D Production Studio.

nonmusical film the soundtrack comes last. I sketched out several songs with Band-in-a-Box (\$88, www.pgmusic.com), which creates a fully orchestrated arrangement from chords that you enter. My first few efforts fell flat, but after a few hours two tunes worked well, so I used the program's Render to WAV to convert the tracks directly to WAV files. I opened these in Sound Forge (\$400, www.mediasoftware.sonypictures.com) and cut and pasted parts to give the songs the shape I wanted. I also did some pitch shifting, adding key changes to make the songs feel more dramatic. I then burned each song to a separate CD in order to record the vocals.

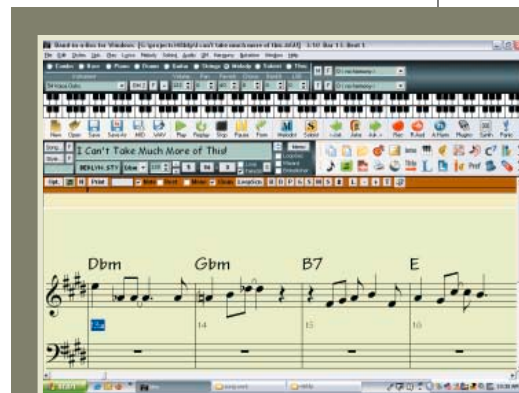
Saturday, midnight to 2 A.M.: Recording vocals. I don't have my own home recording studio; in fact, I live in a tiny one-room apartment in Manhattan, so I had to devise an acoustically isolated spot in the apart-

ment for recording the vocal track. I picked a hallway near the bathroom and a closet. With the bathroom door closed and the closet door open to expose the clothing and linens inside, I created a small echo-free zone for recording vocals in the wee hours without bothering the neighbors. I used the built-in microphone on my camcorder, a Panasonic AG-EZ50U (discontinued, bought for \$1,399 from www.jandr.com) as my vocal mic. I plugged a set of earbuds into the camcorder and another set into a CD player, on

which I played the instrumental track I had burned. With a bud from the camcorder in one ear and a bud from the CD player in the other, I held the camera in one hand, rolled tape, and recorded the songs. Then I connected the camera to my computer, opened my video editor, Vegas (\$559, www.mediasoftware.sonypictures.com), and captured the recording I'd just made. I deleted the video track, leaving only the unaccompanied vocal track. Then I added the instrumental tracks I had created earlier and mixed the two tracks together. Now I had a full vocal soundtrack, which I burned to make a new soundtrack CD.

Saturday, 2 to 7 A.M.: Sleeping.

Saturday, 7 A.M. to 6 P.M.: Shooting main video sequences. Only 36 hours remaining and I still hadn't created any video. I had to shoot full takes of each song in a variety of



SKETCH OUT SONGS quickly with Band-in-a-Box and burn to CD.

82 OFFICE:
Edit XML with
Word.

84 INTERNET:
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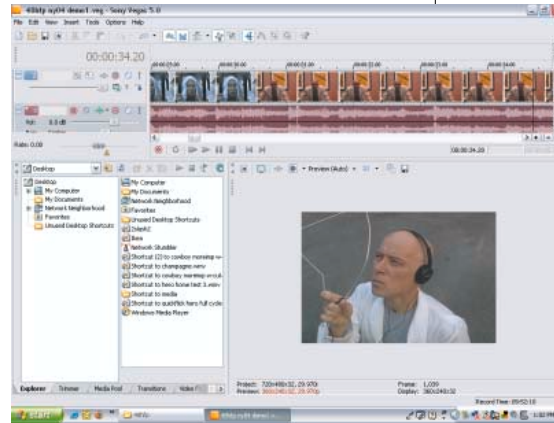
settings. Each time I found a location with light that was bright enough but not too direct, I'd set up the camera on a tripod, frame a shot, play the soundtrack from my CD player, and lip-sync while the tape rolled. I normally kept the CD player on Repeat mode, and repeated each take several times without stopping. With so little time available, I didn't memorize lyrics; I taped a large-type copy of them to the tripod right near the lens so I could read it.

Saturday, 6 to 8 P.M.: Logging footage. Before capturing footage to my laptop, I logged everything I had shot, writing down time codes and descriptions of each scene, along with notes about which scenes were usable and which had technical problems or were otherwise messed up.

Saturday, 8 to 11 P.M.: Editing main sequences. Once I'd logged all my footage on paper, I connected my camera to the computer, fired up Vegas, marked the scenes I'd selected for batch capture, and pulled them into the computer. Now I could pick which takes of each song worked best visually and marry them to the soundtrack I'd created earlier. To create credible lip sync, I opened the WAV file in the Vegas trimmer, located a syllable that's easy to lip-read on the screen (the T sound in the word "Take") and placed a marker on it. Then I marked that same spot in the video track and dragged the two tracks so that the markers matched. Now the video and audio tracks looked perfectly synchronized, although they were created at different times.

Saturday, 11 P.M. to Sunday, 5 A.M.: Sleeping.

Sunday, 5 to 10 A.M.: Shooting cutaways. I'll admit it's a bit embarrassing to be seen recording a video of yourself in public. But with only 48 hours to finish, you can't be



ADD CUTAWAYS for visual variety with Vegas.

fussy. That's why I prefer to shoot at sunrise on weekends—the light is great and almost nobody's around to gawk.

Sunday, 10 A.M. to noon: Assembling cutaways/rough cut. Now I could add the goofy takes I had shot Sunday morning. Few were essential to the movie, but they added visual variety and a sense of pace.

Sunday, noon to 2 P.M.: Editing the finished cut. All entries had to be between 4 and 8 minutes long. Shorter is usually better. I'd shot far more footage than I needed, but I wanted to trim it as tightly as possible.

The oldest rule in show business is "Always leave 'em wanting more."

Sunday, 2 to 5 P.M.: Creating titles and credits. Contest rules limit films to a 30-second credit roll, but how many credits does a one-man moviemaker need? Plenty! I added a full credit roll (one more chance for a cheap laugh). I also used Ulead Cool 3D Production Studio (\$129, www.ulead.com) to add a grandiose opening title.

Sunday, 5 to 6 P.M.: Burning to tape. All that was left was to burn the final result to tape. Burning to tape is easy—except when it's not. We know how computers love to crash when you're on deadline. This time mine didn't. In about 20 minutes, my 4¹/₂-minute film was ready to go.

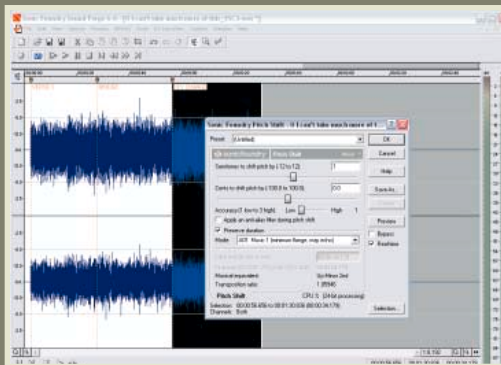
Sunday, 6 to 7 P.M.: Racing to turn in the tape by the deadline.

What's my secret? Knowing my limits and tools, and not overreaching. A simple story, well executed, can usually satisfy an audience better than an ambitious film that falls short. Some acting experience was essential in my case, as I was also the cast. If you know people who have appeared on stage, even in high school or college, maybe you can persuade them to star in a custom-made movie that you knock out over a weekend.

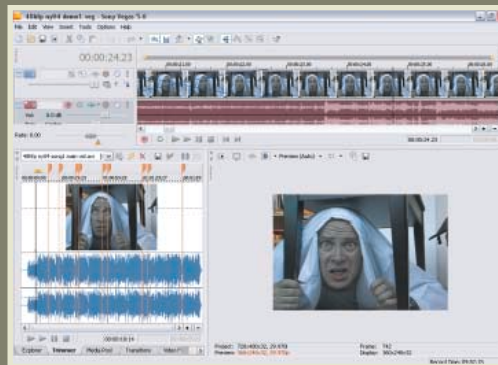
For help in making anything you shoot work better for your audience, see "Make Digital Videos Worth Watching" (go.pcmag.com/watchabledv).

You can do a lot with the digital-video tools that you may already own. Even if you have to resort to some weird workarounds, as long as the audience has fun, all is forgiven.

Bill Dyszel is the author of 17 books, including Microsoft Outlook for Dummies (John Wiley & Sons) and PalmPilot for Dummies (John Wiley & Sons).



SHAPE UP the score with repeats and key changes in Sound Forge.



CREATE LIP-SYNCD video tracks by adding markers and matching them on the timeline in Vegas.

OFFICE

Ease into XML with Microsoft Word 2003

Office 2003 is XML-aware, and Word is a good place to get your feet wet. **BY RICHARD V. DRAGAN**

Often what's easy for machines is difficult for humans, and the eXtensible Markup Language (XML) is no exception. But XML lets you reuse documents and content and helps you automate business processes, so developing some expertise is worth the effort. Luckily, that has gotten much easier with Microsoft Office 2003. Here's how to get started.

Open Word 2003 and type a line of text in a new file. Save it with *File | Save As*, but select XML as the document type. Locate the file with Explorer, right-click on it, select *Open With*, then select Notepad. This reveals that Word 2003 is XML-aware down to its roots. Word documents saved in XML format use a schema, defined by Microsoft, called WordML (see the third line of your XML file), which describes the organization of the XML and the set of permissible tags. (All schemas define the shape of the data, the order of elements or tags, how many, and whether the tags are required. For a tutorial, see "Structuring XML Documents" at <http://go.pcmag.com/structuringxml>.) If you browse through your WordML document you'll see that everything a Word document contains—fonts, styles, preferences, and actual text—is stored between the *w:wordDocument* and */w:wordDocument* XML tags.

Viewing WordML is one thing, but you'll need other schemas to shape your data to your own needs. Luckily, Word 2003 lets you import XSD files to help build and edit new XML documents. Let's assume our organization wants to allow users to import news articles in the preferred XML format for use with a content management system. We'll use a sample schema file named *Article.xsd* and a sample XML document based on its structure named *SampleArticle.xml*. (See <http://go.pcmag.com/samplexmldocs>.) This article entity has fields suitable for a content

management system for online articles, such as headlines, keywords, and photos.

We must let Word 2003 know we want to use our custom XSD file. Select *File | New* and choose XML Document. In the XML Structure pane on the right, click on *Templates and Add-Ins* and then click on the new *XML Schema* tab. Next, click on the *Add Schema* button and browse to *Article.xsd*. Finally, choose a URI name for

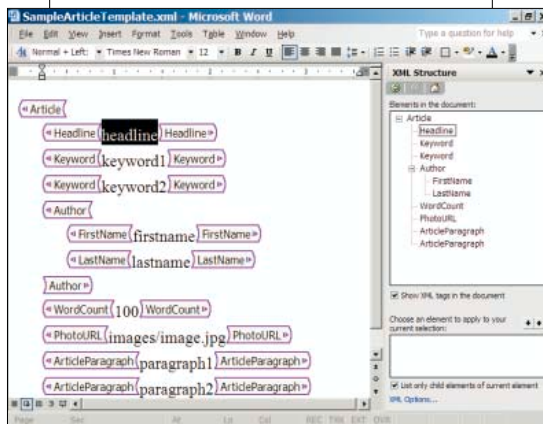


FIGURE 1: By using a sample XML document with placeholder text for required fields, users can easily edit or create new XML documents with Microsoft Word 2003.

this schema. Here, we'll use "Article" as the type, which lets us "register" a new XML type with Word.

The best way to work with XML is to start with a sample document of the type you'd like to create that conforms to your XSD file, such as our *SampleArticle.xml*. As a basic XML editor, Word 2003 does a fine job of highlighting XML tags with very visual field markers. Click on any field and you'll see that you can quickly select the inner contents of any tag or field (including embedded fields containing hierarchical tags). You can hide or show these fields by clicking on *Ctrl-Shift-X*, and you can also insert or delete tags.

If you right-click and then select *View*

XML Structure, you'll see that Word parses out the known tags inside your XML document file and lists them down the right side of the screen in the XML Structure pane.

When the XML elements in a document are reconciled against an XSD schema, that file is known as a valid XML document. We don't recommend that you add new tags in Word 2003 helter-skelter, because you'll likely break existing, valid XML. But if your XML document is simple enough and you have a printout handy of the tags and fields it should contain, it's very possible to tag content by relying on this XML Structure feature.

XML attributes are another facet of XML design, and by right-clicking on a field, then selecting *Attributes*, you can view and edit these extra items associated with fields. Note, though, that extensive use of attributes in an XML schema makes the XML much more difficult for the ordinary user to edit.

Figure 1 shows a sample XML article file built with the same XSD but containing only placeholder data. If you make a sample document like this that has been created according to an XSD "template," with placeholder data for each field, you turn ordinary Word 2003 into an XML-based form editor. Almost any user can use Word as a data-entry tool with solid results. You need only type the actual data in the corresponding field over the placeholder text inside each tag (and save the file to a new filename). By filling in the content between the tags with the required information, you can create

new XML documents that conform to previously established standards.

While you can't design new XSDs in Word 2003, you can import existing schemas. According to Microsoft (http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dno2k3ta/html/ODC_OFXML_in_Office2003_jrd.asp), just about everyone will work with XML data in the future, but most users will rely on schemas created by others. If you don't create your own, there should eventually be plenty available from industry groups, vendors, and power users.

Richard V. Dragan is a contributing editor of PC Magazine.

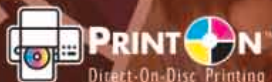


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INTERNET

Cut URLs Down to Size

Long URLs can be unwieldy. Here's how to make them easy to use. **BY JAY MUNRO**

How many times have you sent a long URL to a friend only to have it break when it's put in his e-mail client? It's not rocket science to cut and paste the portions of the link into a browser, but many nonexpert users just don't get it. So how do you make that long catalog link easy for your mom? A URL-rediretor service does the job.

A rediretor service takes a long URL, stores it in a database, and returns it as a short address. When the short address is used, the service redirects the user to the page the long address points to. The link is usually a short domain, such as TinyURL or SnipURL, followed by a unique identifier. Some services, such as MakeAShorterLink, URLCut, and TinyURL, assign a random identifier, while others, like MetaMark Shorten and ek.dk, let you choose a word or code. In a few cases, such as with MakeAShorterLink, you may actually have a longer name for the link, but the service may confer other benefits, such as tracking clicks.

Several services can automatically copy the created URL to the clipboard for Internet Explorer users. IE allows this by default. Though this is convenient, it is a security risk, since it works both ways: A malicious site can try to read your clipboard. We prefer to set IE to prompt us when this happens. In IE, click on *Tools | Internet Options*, then select the *Security* tab and click on the *Custom Level* button. Scroll down to the *Scripting* section and click on *Prompt* under the "Allow Paste Operations via Script" selection.

Longevity can be another problem. The services we looked at were free and, as such, may last only as long as the owner feels altruistic. If the link is something you won't care about for very long, don't worry. But none of the sites guarantee they'll be there forever, which can be a problem if you

plan to use the link in a blog or mailing list that's likely to be archived. What you can do in this case is make both the short link and the long one available. And many sites make the source code readily available, so a developer or company that wants better guarantees could set up their own service.

You need to watch out for your privacy as well. Some of the sites, such as qURL.net

#	HITS (*)	SNIPPED LINK	NICKNAME	DATE
1.	25,018 (23,078)	http://snipurl.com/9xdt <small>http://www.biennus.com/index.php?option=co...</small>		20 Oct, 2004
2.	10,170 (9,822)	http://snipurl.com/9w41 <small>http://cgi.ebay.co.uk/ws/ebaySAPi.dll?Vie...</small>	joolsholland	19 Oct, 2004
3.	20,655 (9,525)	http://snipurl.com/9xda <small>http://www.cutandpaste.com/cgi-bin/...</small>		20 Oct, 2004

SNIPURL can show you its most popular links, or those that are weird or funny.

and URLCut, display popular links or the last ones loaded. SnipURL even puts the sites it does links for into categories such as "weird," "irritating," or "funny." This lets anyone visiting the site see the links you've entered. URLCut and several others let you set passwords to keep URLs private.

The services available range from simple to feature-packed. MakeAShorterLink offers a basic short URL with a random identifier, while EK.DK lets you pick your own names. Most of the sites are based on similar code, which is available through the CPAN Perl code-search site. Most offer

URL Rediretor Services

EK.DK	http://add.redir.ek.dk
MakeAShorterLink	http://makeashorterlink.com
Metamark Shorten	http://metamark.net
notlong.com	http://notlong.com
qURL.net	http://qurl.net
shorl.com	http://shorl.com
SnipURL	http://snipurl.com
Tinylink.com	http://tinylink.com
TinyURL	http://tinyurl.com
URLcut	http://urlcut.com
BabyURL	http://babyurl.com

APIs (usually in Perl) for Web site developers and bookmarklets for average users. (Bookmarklets are snippets of JavaScript code. See <http://go.pcmag.com/bookmarklets> for more information.)

We looked at 11 sites (see table), and since they're all free, it's worth trying them all. A couple, however, had either interesting features or a better interface. SnipURL has one of the slicker interfaces. Registering (free) gets you the MySnipURL control panel where you can view, test, edit, share, e-mail, or delete all your snipped URLs. You can also see click statistics for the various URLs. Unlike some of the simpler services, SnipURL has a search feature, which is especially useful if you've got a lot of stored clips.

NotLong.com offers shorter URLs with statistics, as well as custom or random names. Unlike with SnipURL, you need a password to check statistics. NotLong tracks total clicks, unique browsers, and unique IP addresses for each link, though you can only view one URL's stats at a time. The site also offers a table of links to other redirection sites and a pretty good comparison chart.

Shorl is a simple site with an interesting twist. It tags short URLs with random IDs that are created from a phonetic language that represents the numbers from 0 to 127, or in binary, 7 bits (0 to 1111111). The language is called Koremutake, and uses two- or three-character syllables such as "BO" (3) or "TRE" (127). The syllables were selected to be easy to remember. The short URLs look like this: <http://shorl.com/hydrydestefuda> (the Internet Movie Database listing for *The Stepford Wives*, www.imdb.com/title/tt0327162). Shorl assigns a password (also in Koremutake) that, when combined with the link name will display the statistics.

In all, a short-URL service can be quite handy. Short URLs also can be used to hide the true link (at least before the user clicks on it). In addition, the tracking feature on several of the sites can be useful, even if you don't need to shorten a link.

Jay Munro is a frequent contributor to PC Magazine.

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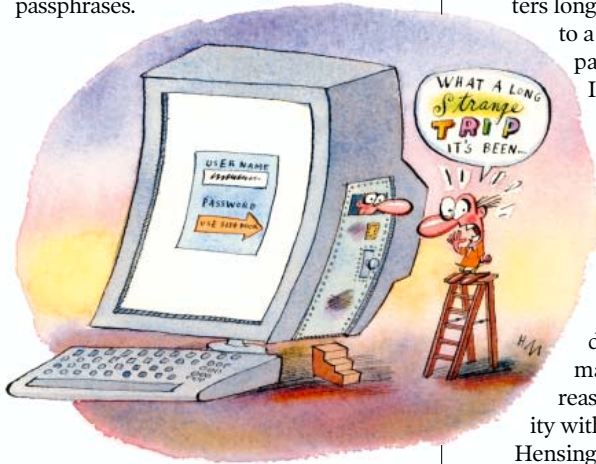
Are Pa55.W0rd5 Dead?

Passphrases are more complex but easier to remember. Are they better protection than passwords? **BY LARRY SELTZER**

How long and complex should a password be? At what point does it become effectively uncrackable?

Time out: Look at that opening paragraph. It's 87 characters long, but it could be your password to your Microsoft Windows system. Yes, even with the spaces in it. Technically, this has become known as a "passphrase."

Robert Hensing, a member of Microsoft's Security Incident Response Team, has written in his blog (http://blogs.msdn.com/robert_hensing/archive/2004/07/28/199610.aspx) that you shouldn't use passwords any more for Windows systems; you should use passphrases.



The blog entry has generated a lot of interest on security lists. Many agree with Hensing, and there's a lot I like about the idea. The discussions also raised my awareness that there are cracking tools for Windows passwords which do things you might not believe possible.

That first paragraph might not make a good passphrase because it's not very memorable. But let's say you're a Deadhead: "It's just a box of rain, I don't know who put it there" is very strong and it's pretty easy to remember. It also has upper- and lowercase letters, punctuation, and 58 characters. The downside relative to a more conventional password is that it has upper- and lower-case letters, punctuation, and 58 characters. It takes a while to type,

and you're more likely to make mistakes.

As Hensing points out, Windows has supported passphrases of up to 127 characters since Windows 2000. But boilerplate password advice from people like me has always focused on bizarre words that we kid ourselves are easy to remember, like "Ih8m0d3rnART!" ("I hate modern art"). Take a phrase you can remember and distort it into a password. Hensing asks, why not just use the phrase?

In fact, the "Ih8m0d3rnART!" example is instructive in another way. It looks long and complex and is relatively impervious to certain types of attacks, but it's only 13 characters long, and is therefore vulnerable to a weakness in Windows 2000 password hash methodology.

I'll get into it more in a future column, but if you have local-administrator access to the system, it's possible to reverse-engineer Windows passwords up to a particular length. As I understand it, this problem has been eliminated in Windows 2003 domains, but it remains in Windows 2000 for reasons of backward compatibility with third-party programs.

Hensing also notes that a large number of malware programs carry embedded dictionaries of common passwords to try on systems they attack. Many have hundreds of passwords, most of them real sucker material like "password" and "asdf." But over time, these dictionaries should get better, and brute-force cracking programs will be able to try more possibilities.

Also, not everything is as security-conscious as Windows (yes, my tongue is in my cheek). For example, Barnes and Noble's password policies (www.barnesandnoble.com/help/password) require you to have a 6- to 12-character password composed of "letters, numbers, or Shift/numeric characters only; spaces cannot be used." But the message is getting around; I just set my Amazon.com password to a 129-

THE LOOKOUT

E-MAIL SCAM DUPES LINUX USERS

In late October, Red Hat warned users of an e-mail scam designed to plant malicious code on users' systems. The malicious e-mail poses as a security update from the vendor, a technique that has become familiar to Windows users but is a novelty in the Linux world.

The e-mail says it originates from the "Red Hat Security Team" and urges users to download a patch fixing vulnerabilities in the `ls` and `mkdir` file-system utilities. The scammers used an authentic-seeming domain name, `fedora-redhat.com`, to host the malicious download. Fedora is Red Hat's Linux distribution for technology enthusiasts; the company maintains an authentic Fedora site at `fedora.redhat.com`.—*Matthew Broersma*

character passphrase with punctuation and mixed cases.

Whether long and effective passphrases would be more acceptable to users is a matter for research. But if longer, more complex passwords are better, surely passphrases are better than passwords, right? I saw two basic arguments against this in the discussions below Hensing's blog and another on the Full-Disclosure list (<http://seclists.org/lists/fulldisclosure/2004/Oct/0578.html>).

The first counterargument says that if brute-force password crackers work by trying combinations of characters, a passphrase cracker would work by trying combinations of words. I have a hard time believing this would be a practical way of cracking, especially if you consider the possibilities for mixed case and punctuation.

The second argument is related to the first but raises the issue of "entropy," which refers to the randomness of the bits in the password. I don't fully follow this argument (especially the incoherent ramble I just linked to). I'm more persuaded by Hensing's position that the greatly increased length of a good passphrase trumps any weaknesses in the randomness of its bits.

I'm on board with this, and I've already begun to move my own passwords over to passphrases, but it's going to be a tough sell to nonprofessionals. Will the only people willing to use passphrases be the ones who were willing to use complex passwords?

Larry Seltzer, a frequent contributor to PC Magazine, writes the Security Watch newsletter for pcmag.com.

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USER TO USER

PC MAGAZINE'S COMMUNITY OF EXPERTS AND READERS

Lying to Windows Cures Time Stamp Problem

In an earlier article about the problem of NTFS file time stamps changing due to daylight savings time ("File System Causes Time Stamp Problem," <http://go.pcmag.com/timestamp>) you say, "Since the problem is caused by the nature of the file system, there is no solution short of reformatting the drive using FAT32." My solution is quite simple: Lie to the OS about your location. Tell it you are in the Greenwich Mean Time zone, and that you don't want to use daylight time. Then set your clock according to your actual local time zone. The time stamps on ISO, NTFS, and FAT file systems will agree, and will not change just because of the date.

They also will not change if you look at the same file systems from a different OS. Unix (and the Mac is now a Unix derivative), Linux, and Solaris store time stamps in GMT and assume that time stamps on ISO media (CD-ROMs, for example) are in GMT. Windows, on the other hand, assumes that CD-ROMs use local time stamps. If you want a CD-ROM to show the same time stamps under Microsoft Windows and on any other OS, you have to use GMT as your "local" time zone.

Of course, this does make moot the purpose of storing dates in GMT in the first place, which is so that you can take them to any local time zone and have monotonic time for files created both locally and remotely. (This is supposed to apply to e-mail, too.) Windows hasn't quite got the hang of this yet, though, since the most transportable media are the ones on which it stores local time with no time-zone indication. By setting the computer clock to GMT and telling Windows I'm in the GMT time zone, I can get consistent time stamps regardless of file system and which OS views the files. I prefer to have time flow monotonically when attempting to identify the actual origin of a file. It makes life easier.

MARK FISHMAN

For some less-experienced users, the fact that the computer "knows" when to switch

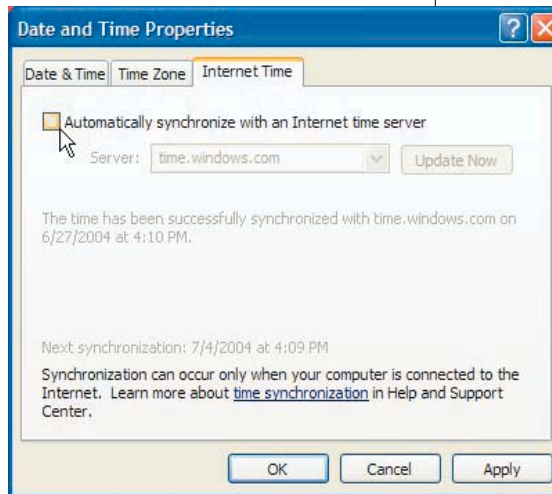


FIGURE 1: Make sure your system is not configured to get the current time automatically from the Internet.

to and from daylight savings time is a small miracle—like a VCR that can set its own time. But as noted in the earlier article, the NTFS file system treats the switch to daylight time as a change to the actual time zone. File time stamps are stored in Greenwich Mean Time and converted to local time for display, so a change to daylight time actually changes the displayed time stamp. You can indeed eliminate this problem if you're willing to give up automatic handling of daylight time and lie to Windows about your time zone.

If your computer is connected to a domain, though, its system time may be automatically controlled by a network time server. In that case, the time server may reset the system time to match your stated time zone of GMT. In a domain situation, check with your administrator before considering this solution. If the system is not a domain member, Windows XP users will still need to make sure it is not configured to automatically get the current time from the Internet. Double-click on the clock in the system tray, click on the *Internet Time* tab, and uncheck the box "Automatically synchronize with an Internet time server."

Changing your system's time zone to GMT will wreak havoc on your Microsoft Outlook appointments. As noted in the article "Outlook Time Zone Problem"

(go.pcmag.com/timezone), Outlook adjusts all of your appointments to match the new time zone. If you switch from Eastern to Pacific time, Outlook will change a 9 A.M. appointment to 6 A.M. The big change to GMT may even move your appointments to a different day. But if you do switch to GMT for good, you'll only have to repair all your appointments once. Thereafter, if you travel to a different time zone, you'll just reset the clock.—Neil J. Rubenking

Windows Explorer Loses Menu, Toolbar

The main menu and toolbar have gone missing from Windows Explorer on my Windows 2000 Professional system. This seemed to occur after I uninstalled some spyware. I contacted Microsoft, but the advice they gave me did not work. I then tried using utilities like FreshUI and TweakUI, but they did not restore the functionality. How can I restore the menu for Windows Explorer? Internet Explorer is working just fine, and according to Microsoft they share much of the same code.

REGINALD W. BAILEY

A missing main menu and toolbar can be caused by corruption in the Registry values that control toolbar placement. This is easily fixed by deleting those values—Windows will recreate them as needed. Close all Windows Explorer and Internet Explorer windows before you start. Select *Run* from the *Start* menu and enter the command *RegEdit*. Navigate to the Registry key *HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\Toolbar*. There should be up to three subkeys below the *Toolbar* key named *Explorer*, *ShellBrowser*, and *WebBrowser*. For each of these subkeys you see, select it, find a value named *ITBar-Layout* in the right-hand pane, right-click that value, and choose *Delete*. Now close

Changing your system's time to GMT will wreak havoc on your Microsoft Outlook appointments.

Printer inks in general are not opaque like wall paint; they're transparent.

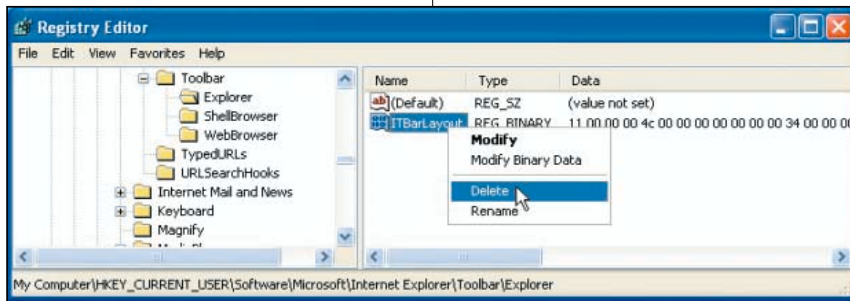


FIGURE 2: Missing menus and toolbars can be restored by deleting their Registry values and letting Windows recreate them.

RegEdit and launch Windows Explorer.

Now that the main menu is back, you can easily adjust which toolbars are displayed. Right-click the restored menu bar for a menu of available toolbars; visible toolbars have a check mark. Select any toolbar in this menu to toggle its checked state from on to off or vice versa. Occasionally the check mark state gets out of sync with the actual toolbar. If a toolbar is checked but not visible, click it to remove the check, then right-click the menu and click the same toolbar again. That should set things straight.—*NJR*

Recover a Deleted Outlook Contact

I just deleted an important Outlook e-mail address by mistake. How do I get it back?
MARTHA J. GAVAGHAN

You're fortunate that you use Microsoft Outlook—in Outlook Express you'd be out of luck. In Outlook, the Deleted Items folder holds deleted items of all types, including Contacts. If you haven't emptied it recently, that contact is probably still around. Start by opening the Deleted Items folder. Point the mouse at the column header that contains a bent-corner document icon. A ToolTip should appear saying "Sort by: Icon." Click on this column header. From the menu select *View | Arrange By | Show in Groups*. Now the items are sorted by type, and you can hide all of a given type by clicking the boxed-minus icon

at the left of the Message Class header. When you hide the other types, it will be easy to find any deleted contacts. Click on the boxed-plus icon at left of the Contacts header if you don't see the individual deleted contacts. Then find the lost one and drag it back into your Contacts folder.—*NJR*

No Printing in White

I can't seem to find a printer that uses white ink, which I need for printing white letters on transparent decal paper. And without white ink, there's no way to print white letters on colored paper either. Every printer manufacturer seems to assume that everyone prints on white paper. Am I missing something or is this an area that has been ignored or just plain overlooked?

DAVE DIELS

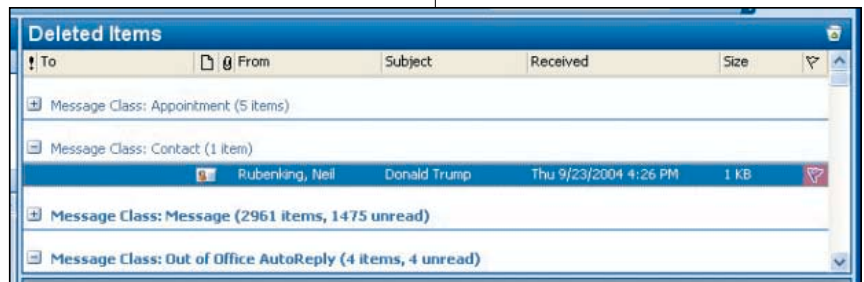


FIGURE 3: In Outlook, you can recover a deleted contact from your Deleted Items folder.

You aren't missing anything. The main issue is a technical one. Printer inks in general are not opaque like wall paint; they're transparent. (There are some very high-end printers that use opaque white ink for special purposes.) Think of gels used in the theater to turn a light with a white bulb into, say, a red light. The gel blocks the blue and green portions of the spectrum but is transparent to the red portion, so what you get on the other side of the gel is red. In this subtractive approach to producing color, there's no

way to turn red into white—either with a transparent gel or a transparent ink.

More important, there is good reason why inks are designed to be transparent and the paper is assumed to be white: It increases the number of colors printers have available to fool the eye into seeing all the colors that the printer can't print.

The transparency of the ink is what lets you print a red, green, blue, or black dot with a printer that has only cyan, yellow, and magenta inks. Print a cyan dot over a magenta dot and you get a blue dot. Similarly, cyan and yellow give you green, yellow and magenta give you red, and cyan, yellow, and magenta all together give you black. If you're using white paper, you get white by not laying down any ink.

This approach lets a bi-level printer—meaning one that prints each color dot either full on or not at all—produce eight different color dots—cyan, yellow, magenta, red, green, blue, black, and white (no ink). And this larger palette of colors makes it easier to trick the eye into seeing other colors. For printers that can print more than one level for each color, the number of possibilities for dot colors increases tremendously. For a thermal dye printer, for example, which can print in 256 shades for each color, there are 16.7 million possible colors for each individual dot.

If printers were to use opaque inks only rather than transparent inks, they would be

limited to printing with just the colors they had, which would make the job of faking other colors much harder.

You might try printing with a very pale color to see if you get the effect you want. Otherwise, the only solution is the high-end printers mentioned above, but they run into the high four-figure range or even higher.

—*M. David Stone*

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Butterfingers unite! Select IBM ThinkPad notebooks now include airbag-like technology to help protect your hard drive from some damage caused by drops and jolts.

NEW! Rescue and Recovery with Rapid Restore:

Lost your data because of a software crash or virus? Recover previously saved data in minutes with our one-button solution.

Access Connections:

Switch between wired and wireless connections.

Embedded Security Subsystem 2.0:

Hackers and thieves, beware. Our combined hardware and software solution is designed to protect user data and keep it private.

Access IBM:

Get the help you need, when you need it. One button on your ThinkPad notebook brings you a world of resources and assistance.

IBM ThinkPad R51

System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 715 (1.50GHz)²
- Intel® PRO/Wireless Network Connection 802.11b/g³
- Microsoft Windows XP Professional⁴
- 15" XGA TFT display (1024x768)
- 256MB DDR SDRAM⁵
- 40GB hard drive⁶
- Integrated Ethernet and modem
- IBM Ultrabay™ Enhanced CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength⁷
- 1-yr system/battery limited warranty⁸

NavCode 1836H7U-M419

THINK EXPRESS MODEL
PRICED AT: **\$1,449***

\$53/mo for 36 months
SuccessLease for Small Business⁹



IBM ThinkPad T42

System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 1.50GHz
- Intel® PRO/Wireless Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 1-yr system/battery limited warranty⁸

NavCode 2378DWU-M419

THINK EXPRESS MODEL
PRICED AT: **\$1,629**

\$59/mo for 36 months
SuccessLease for Small Business
ServicePac Service Upgrade¹⁰:
3-yr Depot Repair #30L9192 **\$132**

IBM ThinkPad T42

System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 735 (1.70GHz)
- Intel® PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 512MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 1-yr system/battery limited warranty⁸

NavCode 2378FZU

THINK EXPRESS MODEL
PRICED AT: **\$1,899**

\$62/mo for 36 months
SuccessLease for Small Business

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



IBM ThinkPad X40

System Features:

- Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor LV 1.20GHz
- Intel® PRO/Wireless Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- Intel Extreme Graphics 2
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM fullsize keyboard¹¹
- 7.5hr Li-Ion battery¹²
- 1-yr system/battery limited warranty⁸

NavCode 23866GU-M419

THINK EXPRESS MODEL
PRICED AT: **\$1,699**

\$61/mo for 36 months
SuccessLease for Small Business
ServicePac Service Upgrade:
3-yr Onsite Repair/9x5/Next Business Day
Response #30L9195 **\$243**

IBM ThinkPad X40 Solution Pack

IBM ThinkVantage Technologies:

- Longest standard battery life of any leading-brand notebook¹³

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 SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty⁸

Accessories Included:

- ThinkPad X4 UltraBase Dock
- IBM Ultrabay Slim CD-RW/DVD-ROM combo

NavCode 23826LU-M419

THINK EXPRESS MODEL
PRICED AT: **\$2,199**

\$78/mo for 36 months
SuccessLease for Small Business
ServicePac Service Upgrade:
5-yr Onsite Repair/9x5/Next Business Day
Response #69P9200 **\$449**



(Monitor not included)

Why IBM ThinkCentre PCs?

Only IBM offers these features to protect your users, connect them, and keep them working. Each ThinkCentre™ desktop featured here can give them the efficiency, productivity and edge they need with the following ThinkVantage Technologies:

Rescue and Recovery with Rapid Restore:

Lost your data because of a software crash or virus? Recover previously saved data in minutes with our one-button solution.

Access IBM:

Get the help you need, when you need it. One button on your ThinkCentre desktop brings you a world of IBM resources and assistance.

ImageUltra™ Builder:

Need to roll out new systems? Image and copy your operating system across your network in a flash. (Order separately)

IBM ThinkCentre A50

System Features:

- Intel® Pentium® 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Tower form factor
- 256MB DDR PC3200¹⁴
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Norton AntiVirus™ with 90 days of virus definition updates
- Lotus® SmartSuite® Millennium license
- 1-yr parts limited warranty with 1-yr limited onsite service¹⁵

NavCode 814821U-M419

THINK EXPRESS MODEL
PRICED AT: **\$649**

\$25/mo for 36 months
SuccessLease for Small Business
ServicePac Service Upgrade:
2-yr Onsite Repair/9x5/Next Business
Day Response #54P1859 **\$75**

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*Availability: All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. *Pricing: does not include tax or shipping and is subject to change without notice. Reseller prices may vary. Warranty: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. DJJA/B203. IBM makes no representation or warranty regarding third-party products or services. Footnotes: (1) Embedded security system: requires software download. (2) Mobile Processors: Power management reduces processor speed when in battery mode. (3) Wireless 11a, 11b and 11g: based on IEEE 802.11a, 802.11b and 802.11g, respectively. An adapter with 11a/b, 11b/g or 11a/b/g can communicate on either or any of these listed formats respectively; the actual connection will be based on the access point to which it connects. (4) Included software: may differ from its retail version (if available) and may not include user manuals or all program functionality. License agreements may apply. (5) Memory: For 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. (6) Hard drive: GB = billion bytes. Accessible capacity is less; up to 4GB is service partition. (7) Wireless capability: requires compatible wireless-enabled options, sold separately. (8) Limited warranty: Support unrelated to a warranty issue may be subject to additional charges. (9) ServicePac 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. Service levels are response-time objectives and are not guarantees. 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.

IBM recommends Microsoft® Windows® XP Professional.



(Monitor not included)

IBM ThinkCentre A50 Ultra small form factor

System Features:

- Intel® Pentium® 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Ultra small form factor — 74% smaller than a standard IBM desktop™
- 256MB DDR PC3200
- 40GB hard drive CD-ROM
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- Gigabit-Ethernet Integrated
- 1-yr limited warranty with limited onsite service¹⁷

NavCode 809021U-M419

THINK EXPRESS MODEL
PRICED AT:

\$799

\$29/mo for 36 months
SuccessLease for Small Business

ServicePac Service Upgrade:
3-yr Onsite/9x5/Next Business Day
Response #54P1861 **\$132**

IBM ThinkCentre A51p

(model not shown)

System Features:

- Intel® Pentium® 4 Processor 530 with HT Technology
 - Processor speed 3.0GHz
 - 800MHz FSB
- Microsoft Windows XP Professional
- Tower form factor
- 256MB DDR2 PC2-3200 • CD-ROM
- 40GB hard drive
- Gigabit Ethernet-Integrated
- IBM Embedded Security Subsystem 2.0
- 1-yr parts limited warranty with 1-yr limited onsite service¹⁷

NavCode 842721U-M419

THINK EXPRESS MODEL
PRICED AT:

\$799

\$29/mo for 36 months
SuccessLease for Small Business

ServicePac Service Upgrade:
3-yr Onsite/9x5/4-hr Response
#54P1862 **\$239**



IBM eServer BladeCenter

System Features:

- Flexible - full performance and manageability of traditional rack optimized platforms
- Infrastructure integration - help lower TCO and increase control
- Simplify - easy to deploy, easy to install, easy to manage
- HS20
 - Intel® Xeon™ 2.8GHz/533Mhz FSB
 - 40GB IDE/2GB DDR2 PC2100
 - 3-year limited warranty
- NavCode 8832LEX **Price 2,589**
- BladeCenter Chassis
 - 7U rack mount chassis—up to 14 blades per chassis
 - 2000W power
 - Cisco Ethernet switch module

NavCode 86773EU

EXPRESS MODEL PRICED AT: **\$7,289**

\$92/mo for 36 months
SuccessLease for Small Business

ServicePac Service Upgrade:
3-yr Onsite/9x5/4 hr Response
HS20 #69P9517 **\$279**
BladeCenter Chassis 41L2736 **\$600**

IBM eServer xSeries 336

System Features:

- Leading performance with Intel's EM64T technology - 32 and 64bit simultaneous computing
- High Availability with redundant power and hot swap fans - Calibrated Vectored Cooling enables density and performance
- Simple Management with on board service processors and optional remote management support - take control of your server environment
- Intel Xeon 2.8GHz/800Mhz FSB
- Two 73GB SCSI/2GB DDR2 PC3200

NavCode 88370EU

EXPRESS MODEL
PRICED AT: **\$3,349**

\$119/mo for 36 months
SuccessLease for Small Business

ServicePac Service Upgrade:
4-yr Onsite/9x5/4-hr Response
#69P9243 **\$609**



The IBM Infoprint® 1412

System Features:

- Monochrome Laser/200 MHz processor
- Speed: Print up to 27 pages-per-minute (ppm)²⁰
- First page-out time as fast as 8 seconds²⁰
- Print quality: up to 2400 image quality
- 32MB of memory
- Parallel and USB attachment and 10/100 Base TX Fast Ethernet interfaces
- 1-yr limited warranty¹⁷

NavCode 75P5759

PRICED AT **BASE = \$429**

NavCode 75P5760
NETWORK = \$519

250 Sheet Tray #75P6112 **\$92**

ServicePac Service Upgrade:
1-yr Onsite/9x5/Next Business Day
4-yr Response #29R5518 **\$47**

The Infoprint® 1422dn

System Features:

- Monochrome Laser/366 MHz processor
- Speed: Print up to 32 pages-per-minute (ppm)²⁰
- First page-out time as fast as 9 seconds²⁰
- Print quality: up to 2400 image quality
- Up to 64MB of memory
- Parallel and USB attachment and 10/100 Base TX Fast Ethernet interfaces
- Duplex capability
- 1-yr limited warranty¹⁷

NavCode 75P5984

PRICED AT: **\$799**

\$29/mo for 36 months
SuccessLease for Small Business



IBM Think Express Program:

We've designed and priced many of our products specifically for small and medium businesses. And best of all, they're available direct from IBM or through select IBM Business Partners.

IBM ThinkPad Accessories

Belkin Components Universal Notebook Travel Surge Protector
#22P712T **\$20**

Targus Wireless Optical Mini Mouse
#22P7438 **\$27**

IBM ThinkPad Carrying Case™ - Expander
#73P3597 **\$59**

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

ThinkPad Port Replicator II
#74P6733 **\$179**

IBM ThinkCentre Accessories

IBM UPS 500
#33L3477 **\$99**

IBM ThinkVision™ L150 15" Flat Panel Monitor with system purchase
#W9SPAB1 **\$379**

IBM Server Accessories

IBM S2-42U Standard Rack Cabinet
#930745X **\$1,499**

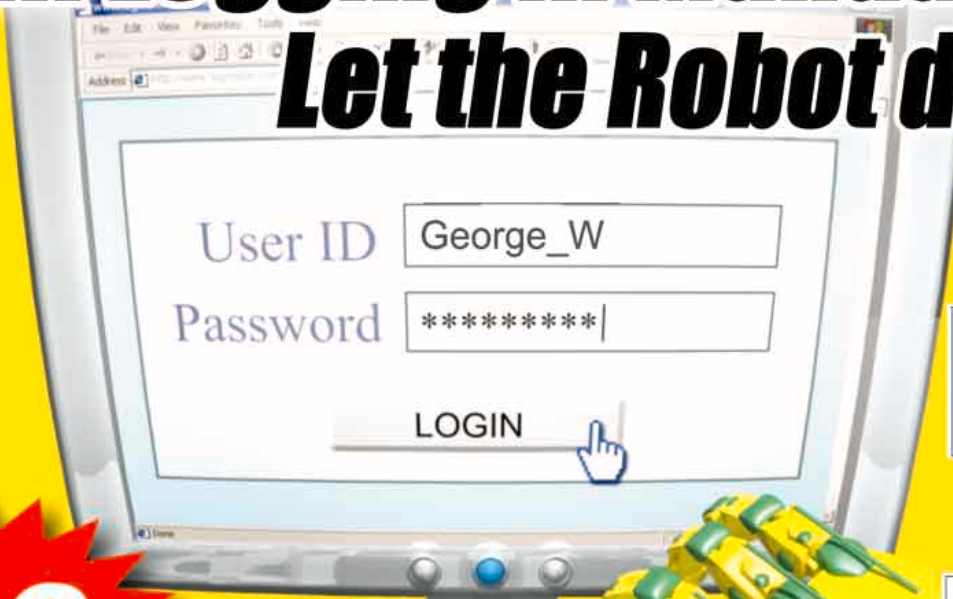
IBM Rackmount XLV 3000VA UPS
#2130R30 **\$1,799**



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repair center. Calls must be received by 5pm local time in order to qualify for Next Business Day Service. (14) **Full-size keyboard:** As defined by ISO/IEC 15412. (15) **Battery:** These model numbers achieved the Ziff Davis Media, Inc.'s Business Winstone® 2002 BatteryMark™ Version 1.0 Battery Rundown Time of at least the time shown. This test was performed without independent verification by the VeriTest testing division of Lionbridge Technologies, Inc. ("VeriTest") or Ziff Davis Media, Inc., neither Ziff Davis Media, Inc., nor VeriTest makes any representations or warranties as to these test results. Winstone is a registered trademark and BatteryMark is a trademark of Ziff Davis Publishing Holdings, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at ibm.com/pc/www/thinkpad/batterylife. Battery life (and recharge times) will vary based on many factors including screen brightness, applications, features, power management, battery conditioning and other customer preferences. (16) **Size claims:** are based on a comparison of chassis volume to the volume of IBM's standard desktop chassis. (17) **Systems with limited onsite service:** are 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. (18) **Certain IBM logo products:** are not manufactured, warranted or supported by IBM; IBM logos and trademarks used under license. Contact IBM for details. (19) **SuccessLease:** SuccessLease program, rates and terms are provided by third-party financiers approved by IBM Global Financing to credit-qualified business customers installing in the U.S. Featured monthly lease payments based on prespecified end-of-lease purchase option; documentation fee and first month's payment due at lease signing, taxes are additional. Options cannot be leased separately. IBM and IBM Global Financing reserve the right to alter product offerings, specifications or financing terms at any time, without notice. (20) **Print speed:** Exact speed varies depending on document complexity, system configuration, software application, driver and printer state. (21) **Battery Life:** Based on manufacturer's published figures or CNET.com results for the top 5 vendors in 2003 notebook sales based on IDC data as of 1/29/2004. **Trademarks:** The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, ImageUltra, Lotus, NavCode, Rapid Restore, Rescue and Recovery, SmartSuite, ThinkCentre, ThinkPad, ThinkVantage, ThinkVision, UltraConnect, UltraBase, Ultrabay and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium 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 other companies. © 2004 IBM Corporation. All rights reserved. Visit www.ibm.com/pc/safecomputing periodically for the latest information on safe and effective computing.

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and portability

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- Fills long registration and checkout forms
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- Generates Random Secure Passwords
- Sensitive data is 3-DES encrypted with Master Password
- Backup, restore, copy, and print your passwords
- Imports your Gator passwords
- Defeats keyloggers as you are not typing anything

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Financial Times

"Easy to use and without any hidden spyware... Innovative, lean, useful product."
Wall Street Journal

"Best of all, this program simply works well. We have yet to see a Web-based form stump it."
PC Magazine



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Best of the Year



2004 has been a year of “more.” More power, features, quality, versatility, portability, performance, and yes, in many cases, money.

From the editors of *PC Magazine*

OVER THE PAST YEAR, we’ve tested, reviewed, and reported on several thousand new and updated products—desktop and notebook PCs, handhelds, software, cameras, printers, networking equipment, games, phones, MP3 players, and much more. We carefully selected products worthy of our Editors’ Choice award and cultivated dozens of personal favorites. Then we nominated, debated, and finally settled on those hundred we’ll call the best of the year.

This year, the news is features and power: more and more. Desktop PCs are ridiculously powerful. Notebooks show a focus on multimedia, letting you bring your entertainment with you without sacrificing power or portability. Pocket devices do more than your first notebook did. Digital cameras have caught up with their film counterparts—and are a lot more fun. And this year’s software reminds you why you first got excited about computing.

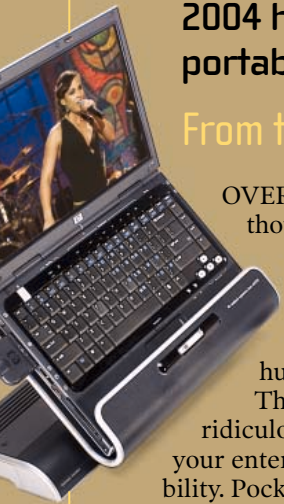
We’re also seeing convergence quickly becoming a reality, bringing your media library to your living room and sending your phone calls over broadband, with versatile networking options tying it all together. And weaving through all areas is security, an important issue that’s getting hotter all the time: Security products are a sine qua non of modern computing, and they’ve only gotten stronger and smarter.

It’s been an excellent year, technologically speaking. Read on to find out which products wowed us, simply by being the best.

Photography by Thom O’Connor

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Desktop PCs

MULTIMEDIA:

Dell Dimension 8400

3.6-GHz Pentium 4 560, 1GB DDR2 533 SDRAM, dual 250GB SATA (RAID 0) hard drives, 256MB ATI Radeon X800 XT, 20-inch LCD, dual-layer DVD±RW and CD-RW, eight USB 2.0 and one FireWire, \$2,999 direct. Dell Inc., www.dell.com. Reviewed: 11/10.

A smokin' multimedia system that won't smoke your wallet, the Dell Dimension 8400 delivers great features—such as a dual-layer DVD burner and the 256MB ATI Radeon X800 XT graphics card (with PCI Express)—at a reasonable price. The included Dell Media Experience software

lets you use this system as a makeshift Media Center PC.

MEDIA CENTER

(RACK-MOUNTED):

Alienware DHS-511

2.2-GHz Athlon 64 3500+, 1GB DDR SDRAM, 160GB SATA hard drive, ATI Sapphire Radeon 9600 XT, DVD±RW, DVD-ROM, Creative Sound Blaster Audigy 2 sound card, Klipsch Promedia 5.1 speakers, eight USB 2.0 and one FireWire, Microsoft Windows XP Media Center Edition 2005, \$2,380 direct. Alienware Corp., www.alienware.com. Reviewed: 10/12.

For the future of Media Center PC design, look to the Alien-

ware DHS-511. Its chassis would be a seamless addition to any home theater. The black, horizontal case houses an AMD Athlon 64 3500+ processor and an ATI Sapphire Radeon 9600 XT graphics card. The keyboard is wireless, and you can hold the Gyration mouse in midair to control cursor movement. The slot-loading optical drive, media card reader, and USB and FireWire ports are covered by a flip-down panel that preserves the system's sleek, clean look. The DHS-511 ushers

in the age of home theater-friendly design in PCs.

MIDRANGE: Velocity Micro Vector SX-V

3.2-GHz Pentium 4 540, 512MB DDR400 SDRAM, 120GB SATA hard drive, 128MB eVGA GeForce 6600, 17-inch CRT, dual-layer DVD±RW, six USB 2.0 and three FireWire, \$999 direct. Velocity Micro Inc., www.velocitymicro.com. Reviewed: 11/10.

The Velocity Micro Vector SX-V has raised the expectations of what a midrange system can be. Its components provide a little something for everyone: a beefy 128MB eVGA graphics card, booming Creative Inspire 5800 6.1 speaker system, dual-layer DVD±RW, and a slew of connectivity ports—all for less than a grand. With the Vector SX-V, Velocity Micro has thrown down the gauntlet to the major midrange system vendors.

SMALL BUSINESS:

IBM ThinkCentre A50p

2.8-GHz Pentium 4, 512MB DDR333 SDRAM, 120GB hard drive, integrated Intel Extreme Graphics 2, 17-inch CRT, CD-RW, DVD-ROM, eight USB 2.0, \$1,299 direct. IBM Corp., www.ibm.com. Reviewed: 5/25.

The IBM ThinkCentre A50p is the ideal system for most small businesses. It has a rich



GAMING: Polywell Poly 939N-FX55

2.6-GHz Athlon 64 FX-55, 1GB DDR400 SDRAM, dual 74GB SATA (RAID 0) hard drives, 256MB eVGA GeForce 6800 Ultra, 19-inch CRT, dual-layer DVD±RW and DVD/CD-RW, six USB 2.0 and two FireWire, \$2,995 direct. Polywell Computers Inc., www.polywell.com. Reviewed: 11/10.

When it comes to gaming PCs, performance at a reasonable price is always welcome. Underneath the Polywell Poly 939N-FX55's unassuming exterior lie power and features you wouldn't expect to get for under \$3,000. The computing specs impressed us, as did the Creative Inspire T7700 7.1 speakers. The 939N-FX55 is definitely a good bargain, and if you can live without a flashy gaming box, it's an excellent choice.

OS: Windows XP Service Pack 2

Free. Microsoft Corp., www.microsoft.com. Reviewed: 8/6.

It's not just a service pack; SP2 for Windows XP is closer to an OS upgrade. Call it Windows XP.5. Adding significant new layers of security to the OS and its native browser and e-mail client, SP2 forces users to make active choices about downloading programs or allowing scripts to run. The new Security Center helps users ensure their antivirus and firewall are active and up-to-date, and it brings the Windows Update settings, which some users have a tough time finding, right into their line of sight.



MEDIA CENTER: HP Media Center Photosmart PC m1050y Series

3.6-GHz Pentium 4 560, 1GB DDR SDRAM, 400GB SATA hard drive, 256MB ATI Radeon X600 Pro, DVD±RW, DVD-ROM, Creative Sound Blaster Audigy 2 ZS sound card, six USB 2.0 and two FireWire, Microsoft Windows XP Media Center Edition 2005, \$2,390 direct (23-inch HP LCD monitor, \$2,200). Hewlett-Packard Development Co., www.hp.com. Reviewed: 11/16.

For a feature-rich system that melds the PC and entertainment worlds, look to the HP Media Center Photosmart PC m1050y Series. With its Hyper-Threaded Pentium 4 560 processor, 400GB SATA hard drive, flash card reader with a zillion slots, and dazzling 23-inch widescreen LCD, this is one hot Media Center system. If you add the HP Media Center Extender (\$299), you can put the 802.11g-equipped m1050 anywhere in the house and still access your music, pictures, and video in the living room.

feature set, including a CD-RW drive, a software bundle of Microsoft Office and other useful programs, and a multi-function keyboard with two USB ports built in. The Access IBM button on the keyboard launches a helpful set of IBM utilities, including Rapid Restore, which can restore your system after a crash without requiring a boot disc.

CORPORATE:

IBM ThinkCentre S50

2.8-GHz Pentium 4 processor, 512MB DDR SDRAM, 80GB hard drive, integrated graphics, CD-RW, 15-inch LCD, six USB

2.0, \$1,199 direct. IBM Corp., www.ibm.com. Reviewed: 5/20.

IBM's ThinkCentre corporate line is a cut above the rest; its comprehensive management tools are just the beginning. The ThinkCentre systems are guaranteed to support the same software image for a full two years, and you can now use an image across four different form factors. The ultrasmall ThinkCentre S50's cover is reinforced with steel, so you can set a full-size monitor on top of the system without ever bending the chassis.

OS: Microsoft Windows XP Media Center Edition 2005

\$500 and up in new PCs. Microsoft Corp., www.microsoft.com. Reviewed: 10/12.

Third time's the charm, and never is this truer than with Microsoft products. With its Windows XP Media Center Edition 2005 operating system, Microsoft may have unleashed the perfect OS for a home PC. Built on top of Windows XP Home, MCE 2005 layers on an attractive interface that gives you easy access to all your digital content—music, photos, video, FM radio, and even TV—from the comfort of your couch. You can turn your digital images into a slide show (complete with background music) with just a few clicks of the remote, and use your TV tuner-equipped Media Center PC as a digital video recorder—without the monthly fee that other services charge for the channel guide. For virtually anyone buying a new PC for home use, we can't think of a reason not to go with an MCE 2005 box.



ALL-IN-ONE: Apple iMac G5

1.8-GHz PowerPC G5, 512MB DDR SDRAM, 160GB SATA hard drive, 64MB nVidia GeForce FX 5200 Ultra, 802.11g, 20-inch LCD, DVD-R/CD-RW SuperDrive; three USB 2.0, two USB 1.1, and two FireWire; \$2,103 direct. Apple Computer Inc., www.apple.com. Reviewed: 9/21.

Apple again leads the pack in all-in-one design innovation with the iMac G5. All the hardware components, including the powerful G5 processor, nVidia GeForce FX 5200 Ultra graphics card, DVD-R/CD-RW SuperDrive, and plentiful multimedia ports, are housed in the sleek white 20-inch widescreen display. The only cable you have to deal with is the power cord. If you're ready to jump off the Windows ship for the coolest-looking system possible, you can't go wrong with the iMac G5.

OS: Mac OS X 10.3 (Panther)

\$129 direct. Apple Computer Inc., www.apple.com. Reviewed: 10/31/03.

Sleek and elegant, Panther (the code name for Mac OS X 10.3) delivers enough useful and eye-catching improvements over the previous version—like Exposé for managing open windows, fast user switching, and iChat AV—to warrant the upgrade. Other improvements, such as better Windows compatibility, are simply too numerous to list.

Notebooks



a HIGH-END MULTIMEDIA:
Toshiba Qosmio E15

1.7-GHz Pentium M 735, 1GB DDR SDRAM, 80GB hard drive, 64MB nVidia GeForce FX Go5200, DVD±RW, 802.11g, 15.1-inch LCD, 7.8 pounds, \$2,899 direct. Toshiba America Inc., www.toshiba.com. Reviewed: 9/20.

If you, like so many of us lately, have multimedia fever, look to Toshiba for the cure. The Qosmio E15 is a true entertainment center in a

sleek, 7.8-pound notebook, with very good speakers, numerous AV connections, a TV tuner, Windows Media Center, and the best display we've seen on a laptop. The real thrill is its Instant-On feature—you can enjoy your movies, photos, and music *without* having to boot up your system.

ULTRAPORTABLE:
IBM ThinkPad X40

1.3-GHz Pentium M, 512MB RAM, 40GB hard drive, 64MB Intel 82855 GME, 802.11g, DVD/CD-RW, 12.1-inch LCD, 3.2 pounds, \$2,274 direct. IBM Corp., www.ibm.com. Reviewed: 2/5.

Hands down, the IBM ThinkPad X40 is the ultimate

ultraportable. It's incredibly light, at just 3.2 pounds, and sports a crisp 12.1-inch screen and a fantastic full-size keyboard. The X40 gets nearly 6 hours of battery life—ideal for road warriors who spend every minute of their cross-country flights working.

VALUE:
eMachines M5405

1.6-GHz Sempron 2800+, 512MB RAM, 60GB hard drive, 64MB SiS760, 802.11g, DVD/CD-RW, 15.4-inch widescreen, 6.6 pounds, \$999 direct. eMachines Inc., www.emachines.com. Reviewed: 11/1.

The M5405 is one of the best bargains around. For less than \$1,000, the M5405 gives you a beautiful 15.4-inch widescreen display with

impressive viewing angles, a sizable 60GB hard drive, three USB ports, and 802.11g wireless connectivity. On top of all that, it delivers strong performance. eMachines continues to raise the bar in the value market.

b MAINSTREAM:
HP Pavilion dv1000

1.8-GHz Pentium M 745, 512MB RAM, 80GB hard drive, 64MB Intel 82855 GME, 802.11g, DVD/CD-RW, 14.1-inch widescreen, 5.5 pounds, \$1,699 direct. Hewlett-Packard Development Co., www.hp.com. Reviewed: 8/27.

For the ultimate combination of style, mobility, and multimedia features, look no farther than the HP Pavilion dv1000. This light, 5.5-pound notebook



a INPUT DEVICE:
Logitech MX1000 Laser Cordless Mouse

\$79.95 direct. Logitech Inc., www.logitech.com. Reviewed: 8/31.

A new mouse might not make you jump out of your seat in anticipation. But the revolutionary Logitech MX1000 Laser Cordless Mouse is unquestionably a step ahead. The MX1000 can track movement on just about any surface, from a cluttered desktop to shiny, light-colored wood, and it is precise enough to keep even gamers happy. Logitech didn't neglect design, either: This ergonomic mouse feels very comfortable.



b NETWORK COLOR LASER:
HP Color LaserJet 4650n

\$2,099 direct. Hewlett-Packard Development Co., www.hp.com. Reviewed: 7/13.

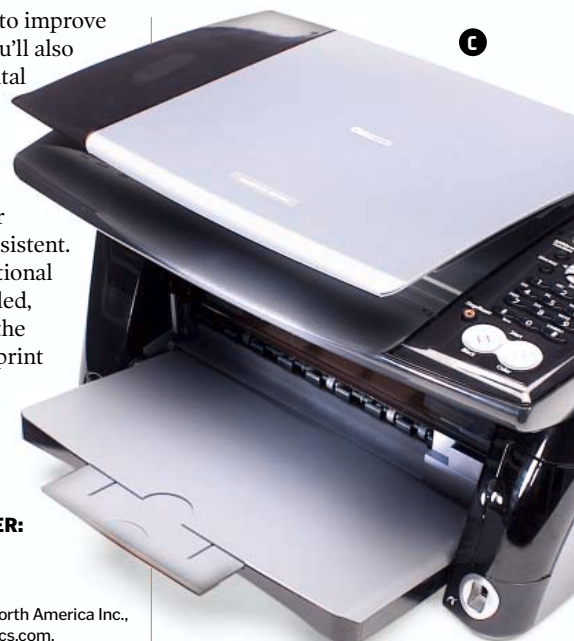
The HP Color LaserJet 4650n offers a boost in engine speed over the Color LaserJet 4600 (which was also an Editors' Choice winner), as well as a

faster processor to improve performance. You'll also find environmental sensors that adjust printing for temperature and humidity, to make color output more consistent. And with the optional hard drive installed, the 4650n gains the ability to hold a print job for proofing, private printing, and other useful functions.

DVD REWRITER:
Pioneer DVR-A08XL

\$149.99 list. Pioneer North America Inc., www.pioneerelectronics.com. Reviewed: 10/27.

The Pioneer DVR-A08XL initially caught our attention by being the first DVD rewriter to combine blazing 4X dual-layer recording with 16X single-layer DVD+R and DVD-R performance. But it also boasts a top-notch Ulead



PC



d GAMING: Dell Inspiron XPS (*updated)

3.4-GHz Pentium (with HT), 1GB DDR SDRAM, 60GB hard drive, 256MB ATI Mobility Radeon 9800, 802.11g, DVD±RW*, 15.4-inch widescreen, 9.8 pounds, \$3,554 direct. Dell Inc., www.dell.com. Reviewed: 2/12.

Ready to get your game on? Dell has taken the portable gaming notebook to new levels this year with its cool new QuickSnap covers (like the dual-skull "Skullz" cover shown here), extreme high-end graphics (the ATI Mobility Radeon 9800 with 256MB of DDR memory), and dual-format DVD±RW drive. The system has a brilliant widescreen display and even an effective subwoofer. And though portable in this case means 9.8 pounds, it's still mobile enough to take to your next gaming party—sans dolly.

includes a gorgeous BriteView 14.1-inch widescreen display, and like the Qosmio, it has an Instant-On feature for immediate DVD and music playing. Upgrade the optical drive to a DVD±RW unit (\$99) for the full multimedia experience. Bonus: The system even comes with a remote control.

c BACK-TO-SCHOOL: Apple iBook G4 (12-inch) (*updated)

1.2-GHz PowerPC G4*, 256MB RAM, 30GB hard drive, 32MB ATI Mobility Radeon 9200, Airport Extreme 802.11g*, DVD/CD-RW, 12-inch LCD, 4.9 pounds, \$999 direct*. Apple Computer Inc., www.apple.com. Reviewed: 8/17.

To get an A+ in school, a student's notebook needs perfor-

mance, portability, and style. The Apple iBook G4 excels at all three. And now, with a faster processor, standard wireless, and a lower price, it's even better than when we last reviewed it. For study breaks, there are fun extracurricular activities by way of iMovie, iPhoto, and iTunes.

software bundle, solid construction, a host of sophisticated error-reducing features, and unbeatable performance when recording DVD±RW and DVD+R DL media.

c ALL-IN-ONE: Canon MultiPass MP390

\$200 street. Canon U.S.A. Inc., www.usa.canon.com. Reviewed: 3/2.

With borderless printing, eight memory card slots, and some of the best photo output we've seen, the Canon MultiPass MP390 excels with photos and leaves little to be desired as an all-in-one. The front-panel buttons and LCD-based menu allow for direct printing, as well as copying, faxing, and scanning. The

MP390 even manages to keep costs reasonably low: 3.2 cents per page for monochrome and 11.9 cents for color on our tests.

b BUSINESS DISPLAY: NEC MultiSync LCD1960NXi

\$730 street. NEC-Mitsubishi Electronics Display of America Inc., www.necmitsubishi.com. Reviewed: 5/6.

The slim and attractive 19-inch NEC MultiSync LCD1960NXi with a 1,280-by-1,024 native resolution delivers full value for the money. Its excellent image quality and extra features go way beyond those of most other LCDs. It has a thin bezel case, with a simple, narrow, black plastic border, and the base has tilt, swivel, and

height adjustments with wide ranges of motion—a rare combination.

d PROJECTOR: Sony VPL-CX85

\$3,700 list. Sony Electronics Inc., www.sony.com/projectors. Reviewed: 6/8.

The Sony VPL-CX85 is practical and portable and a veritable cannon of light compared with smaller units. The integral lens cover, focus, zoom, and even tilt adjust-

ment are all motorized and can be controlled with a remote. Even better, you don't need to connect any cables (aside from the power cord), thanks to a Wi-Fi adapter for the projector and a USB 2.0 Wi-Fi adapter, provided in case your computer isn't Wi-Fi-equipped.

a PERSONAL ALL-PURPOSE INK JET: Canon Pixma iP4000

\$149.99 direct. Canon U.S.A. Inc., www.usa.canon.com. Reviewed: 11/16.

The Canon Pixma iP4000's five inks include both a pigment-based and a dye-based black, with the latter aimed primarily at improving photo output. But the iP4000 also delivers an impressive combination of speed and output quality for standard business applications. It has both a USB 1.1 and a parallel port for connection to your computer, as well as a second USB connector in front for printing from a PictBridge-enabled camera.

Peripherals



SLIDE SHOW SOFTWARE: ArcSoft DVD SlideShow 1.0

\$49.99 list. ArcSoft Inc., www.arcsoft.com. Reviewed: 9/7.

Want to create a professional-looking show and burn it to DVD? ArcSoft DVD SlideShow does it all, with the best pan-and-zoom features we've seen and the unique ability to rotate images and apply an effect for a portion of the slide's duration. You can import audio files as well and auto-fit slide duration to song duration.

CAMRECORDER—SUB-\$1,000: Canon Optura 400

\$999 list. Canon U.S.A. Inc., www.usa.canon.com. Reviewed: 10/6.

Shooting sharp video with accurate colors, the Optura 400 keeps details in highlights and shadows well defined, and

the auto-focus is very responsive. The Optura 400 offers many manual controls, adjustable audio levels, an adequate miniature video light, as well as still-image features like burst mode, AE bracketing, panoramic stitch assist, and a built-in flash. We were pleased with the Optura 400's still captures, which were acceptable for a 2MP sensor.

CAMERA—ENTHUSIAST: Olympus C-8080 Wide Zoom

8.0 megapixels, 5X optical zoom, \$1,000 street. Olympus America Inc., www.olympusamerica.com. Reviewed: 4/19.

Other models have longer zoom lenses and more intuitive menus, but the Olympus C-8080 Wide Zoom's excellent picture quality, deep feature set, and solid construction make it a great

choice for enthusiasts. It boots up and recycles very quickly. In testing, flash shots showed well-saturated colors and strong, balanced illumination. Exposure and colors were good in our simulated daylight shots.

CAMERA—ENTHUSIAST: Leica Digilux 2

5.0 megapixels, 3X optical zoom, \$1,850 list. Leica Camera AG, www.leica-camera.com. Reviewed: 6/8.

Digital photographers can—for a hefty premium—own a camera made by one of the most storied names in photography: Leica (in conjunction with Panasonic). Superb image quality, good recycle time, fast focus, and responsive zoom combine to prove that the Leica name translates very well from film to digital. A 2.5-inch LCD and bounce flash are among this camera's many great touches.

CAMERA—D-SLR: Nikon D70

6.1 megapixels, 18- to 70-mm lens, \$1,299.95 list; body only, \$999.95. Nikon Inc., www.nikonusa.com. Reviewed: 5/24.

The fast-shooting, reasonably priced D70 is Nikon's response to the Canon EOS Digital Rebel (a *PC Magazine* "Best of the Year" pick last year). It is easy to operate, with sensible menus, very quick boot-up time, negligible recycle time, shutter speeds as fast as 1/8000 second, and the ability to shoot at 3 fps until the

memory card is full. The images it produces (in RAW or JPEG format) are extremely crisp if slightly underexposed using the default settings.

CAMERA—D-SLR: Canon EOS 200

8.2 megapixels, 18- to 55-mm lens, \$1,599 direct; body only, \$1,499. Canon U.S.A. Inc., www.usa.canon.com. Reviewed: 9/27.

Excellent construction and design, high-end performance, and razor-sharp images make this our favorite sub-\$3,000 D-SLR. The camera is fast—it boots up in just 0.2 seconds and can shoot at 5.4 fps for up to 23 frames—and the images it captures have balanced exposure and illumination. The 18- to 55-mm lens Canon offers as part of a kit isn't quite up to the 20D's standards; better lens kits are now available, so shop around.

OPTICAL CORRECTION SOFTWARE: DxO Optics Pro 2.0

8-bit/JPEG version, \$34 list; 16-bit/RAW, \$89; \$34 to \$169 for each camera-body profile and \$49 to \$89 for each lens profile. DxO Labs, www.dxo.com. Reviewed: 12/28.

Many problems caused by digital cameras and their lenses—from barrel distortion to chromatic aberration—can be fixed in Photoshop, but not



Digital Imaging



THE MOST LETHAL THREATS...

Digital Imaging

quickly. DxO Optics Pro profiles camera/lens combinations to find the common deficiencies in each. With a single click, this indispensable program can fix these issues before the image is even imported into Photoshop.

IMAGE MANAGER: ACDSee 7.0

\$49.99 direct. ACD Systems, www.acdsystems.com. Reviewed: 11/15.

The latest version of ACDSee isn't simple, but it is powerful and has a rich set of tools for organizing, editing, and sharing digital photos. You have deep control over EXIF and keyword data. And even with large image libraries, the app is strikingly fast.

VIDEO EDITING—PRO: Adobe Video Collection 2.5 Professional

\$1,499 direct. Adobe Systems Inc., www.adobe.com. Reviewed: 7/21.

Adobe Video Collection 2.5 contains Adobe Premiere 1.5, Adobe After Effects 6.5 Professional, Adobe Audition 1.5, Adobe Encore DVD 1.5, and Adobe Photoshop CS. Each is excellent on its own; add Adobe's tight integration and you get the best professional-level package for video editing, DVD authoring, audio editing, and special effects.

VIDEO EFFECTS—HIGH- END: Apple Motion

\$299 direct. Apple Computer Inc., www.apple.com. Reviewed: 11/1.

Designed for adding professional-looking titles and animations to digital videos and DVDs, Apple Motion is powerful and flexible—and intuitive enough for most novices. Most operations are displayed in real time, and you can even mix and match effects and behaviors.

IMAGE EDITING— SERIOUS HOBBYIST: Paint Shop Pro 9

\$99 direct. Jasc Software Inc., www.jasc.com. Reviewed: 10/4.

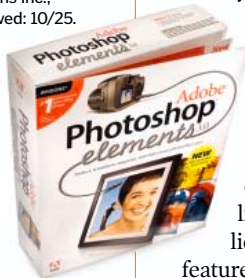
Paint Shop Pro 9 goes beyond simple image editing, with impressive new tools and capabilities. Serious hobbyists will appreciate the "painting" features, reminiscent of Corel Painter's. Adobe Photoshop CS is still number one for prepress work, but Paint Shop Pro 9 is excellent for digital photo editing.



IMAGE EDITING— CONSUMER: Adobe Photoshop Elements 3.0

\$99 direct. Adobe Systems Inc., www.adobe.com. Reviewed: 10/25.

Adobe Photoshop Elements 3.0 delivers robust image editing and some of the best image management we've seen—with a great blend of power and ease of use. It inherits the amazing Healing Brush from Photoshop CS, for removing imperfections, as well as support for camera RAW files.



VIDEO EDITING— CONSUMER: Pinnacle Studio Plus 9

\$99 direct. Pinnacle Systems Inc., www.pinnaclesys.com. Reviewed: 9/23.

Pinnacle Studio continues to impress. The current release, Pinnacle Studio Plus 9, fills some important gaps with a picture-in-picture feature and pan-and-zoom controls for still images, a second timeline, and improved audio

capabilities. Accessible for newbies, this editor also offers fine control for advanced users.

IMAGE EDITING—PRO: Adobe Photoshop CS

\$649 direct; upgrade, \$169. Adobe Systems Inc. www.adobe.com. Reviewed: 12/8/03.

Photoshop remains the standard for advanced image editing. The latest version, Adobe Photoshop CS, keeps pace with advances in digital imaging; the new version has built-in support for camera RAW files and improved 16-bit image processing.

DVD AUTHORING: MyDVD Studio 6

\$69.99 direct. Sonic Solutions, www.sonic.com. Reviewed: 9/16.

MyDVD Studio 6 is the easiest-to-use DVD-creation package we've tested—ideal for novice filmmakers. The app's video-editing features are limited; its real power lies in its intuitive, feature-rich DVD-authoring capabilities.

PHOTO PRINTER: Canon i9900 Photo Printer

\$499.99 direct. Canon U.S.A. Inc., www.usa.canon.com. Reviewed: 5/21.

For high-quality photos up to 13 by 19 inches, the Canon

i9900 Photo Printer is our choice. The addition of red and green to the six standard photo-printer colors pays off in true photo quality.

PHOTO/VIDEO SHARING: ShareGear 2004

\$49.95 direct. Xformx Inc., www.sharegear.com. Reviewed: 9/21.

Not limited to photos, ShareGear 2004 lets you share any type of files easily. Without monthly fees or company servers for uploading files to share, this peer-to-peer application lets you share right from your desktop. Just place items you want to share in a folder and send a Web link to people you want to share with.

DEDICATED PHOTO PRINTER: Epson PictureMate

\$200 street. Epson America Inc., www.epson.com. Reviewed: 11/16.

Designed for portability, the compact Epson PictureMate produces true photo-quality output from a memory card, PictBridge or USB-Direct Print camera, CD or ZIP drive, or USB memory key, or via an optional Bluetooth adapter.

FLATBED SCANNER: Canon CanoScan 8400F

\$149.99 direct. Canon U.S.A. Inc., www.usa.canon.com. Reviewed: 12/14.

Most flatbed scanners that offer slide and film scanning do so as a convenience feature, not for serious scanning. The Canon CanoScan 8400F is the exception—its scans rival those of dedicated film and slide scanners.





ARE OFTEN THE MOST DIFFICULT TO SEE.



Spyware is lurking. It invades your privacy. It takes control of your PC. It steals your system resources. Worst of all, you probably don't even know it's there. Webroot Spy Sweeper and Spy Sweeper Enterprise protect home and business users by eliminating existing spyware and actively preventing future attacks. Find out how big of a threat spyware is to you. **Run a free spyware audit on your PC or your network at www.webroot.com/hunted**



September 7, 2004
Spy Sweeper 3.0
Webroot Software, Inc.



Security & Networking

BUSINESS SECURITY SOLUTION:

Astaro Security Linux 5

\$1,499 list per 10-user license (including Intrusion Protection, Virus Protection for Email, Virus Protection for the Web, and Surf Protection). Astaro Corp., www.astaro.com. Reviewed: 11/4.

Recipe for top-notch network perimeter security: Take any relatively fast dedicated PC or server with 256MB of RAM or more and turn it into a security gateway appliance within minutes, simply by adding Astaro Security Linux. After configuring the gateway to meet your networking needs, it will provide antivirus, intrusion detection, spam filtering, firewalling, and content filtering. In addition, Astaro delivers complete NAT capabilities, including one-to-one, one-to-many, and many-to-one NAT, and a complete VPN end point. Excellent reporting and automated updating complete this well-rounded product.

SERVER APPLIANCE:

EmergeCore IT-100

533-MHz Transmeta Crusoe processor, 128MB RAM, 20GB nonremovable hard drive, \$1,395 list. EmmergeCore Networks LLC, www.emmergecore.com. Reviewed: 4/30.

The EmmergeCore IT-100 is a compact, feature-rich server appliance that can meet the needs of almost any small business. It includes an 802.11g access point, an easy-to-use setup wizard, an SPI firewall, VPN client and end-point capability, and support for POP3 and

IMAP e-mail. And EmmergeCore has added a CRM software package with a simple Web-based interface to integrate contacts, calendars, and e-mail.

SOHO VoIP:

VoicePulse

\$14.99 direct for basic plan, \$24.99 for unlimited. VoicePulse Inc., www.voicepulse.com. Reviewed: 8/03.

This system is as good as VoIP currently gets. The sound quality and easy installation are impressive, but the oodles of surcharge-free extras are what boost VoicePulse above the competition. Not only are basics like call transfer, return call, and three-way calling included, but there are also customizable filters and voice mail options. Want to get rid of an unwanted caller? Give him a not-in-service message. In a meeting? Check voice mail using the Web.



802.11g WIRELESS

CLIENT ADAPTER:

Buffalo AirStation 54 Mbps Wireless USB 2.0 Keychain Adapter (WLI-U2-KG54-A1)

\$80 street. Buffalo Technology (USA), www.buffalotech.com. Reviewed: 10/22.

Wireless adapters make your Internet connection more portable, but how portable are the wireless adapters themselves? With the AirStation, you can finally install the client and driver without a CD, simply by plugging in the key. The AirStation, which even includes a 2-foot USB extension cable, outperformed most of its competitors on our tests. For that reason, plus its secure connection and auto-installation, this product is a clear winner among wireless adapters.

802.11g WIRELESS

HOME ROUTER:

Linksys Wireless-G WRT54GS

\$99 list; WPC54GS PC Card, \$69; WUSB54GP USB adapter, \$79. Linksys, www.linksys.com. Reviewed: 5/18.

Both the router and PC cards are easy to configure with this Linksys solution. Its clean and simple interface, myriad features, and strong performance make wireless home networking a breeze. The bundled (trial) Parental Control Service is also superb, letting you tailor preferences with time-of-day access restrictions, as well as content and e-mail filtering.

WIRELESS TRAVEL ROUTER:

3Com OfficeConnect Wireless 54Mbps 11g Travel Router

\$89.99 list. 3Com Corp., www.3com.com. Reviewed: 9/13.

3Com has produced the most well-rounded device among a whole new class of products, the pocket-size travel router. It acts as a traditional wireless access point and router, or simply as an Ethernet device that lets you connect using an existing wireless network. The 3Com OfficeConnect is easy to configure, has strong throughput, and offers some added features like DMZ and DDNS capabilities, making it a better buy than the rest.

BUSINESS-CLASS

ACCESS POINT:

Cisco Aironet 1200 Series

\$1,399 list. Cisco Systems Inc., www.cisco.com. Reviewed: 9/21.

Yes, it's expensive, but with the Aironet 1200 Series, you get what you pay for. With its combination of solid features and performance, and plenty of security options, this is clearly the best access point in its class. And for businesses already invested in a Cisco infrastructure, the 1200 Series is a no-brainer.

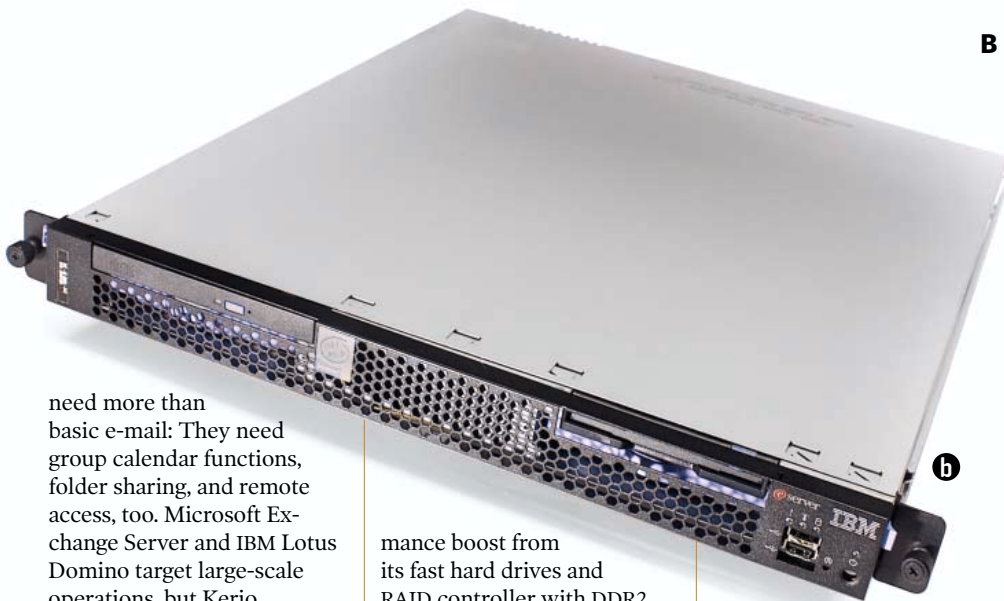
SMALL-BUSINESS

MAIL SERVER:

Kerio MailServer 6

\$449 list (20 users). Kerio Technologies Inc., www.kerio.com. Reviewed: 9/17.

Small and midsize businesses



need more than basic e-mail: They need group calendar functions, folder sharing, and remote access, too. Microsoft Exchange Server and IBM Lotus Domino target large-scale operations, but Kerio MailServer 6 is the best choice for SMBs that want affordable, full-featured groupware. KMS impressed us with its effortless installation, robust Web client, and comprehensive administration options, and it integrates nicely with Microsoft Outlook for local e-mail functions.

b ENTRY-LEVEL SERVER: IBM eServer xSeries 306

3.0-GHz Pentium 4 with SSE3 (Prescott), 512MB DDR333 SDRAM, 80GB 7,200-rpm SATA hard drive, integrated ATI Radeon 7000 graphics, CD-ROM, integrated sound card, \$1,485 direct (without OS); add \$799 for Windows Server 2003 Standard Edition. IBM Corp., www.ibm.com. Reviewed: 5/26.

The small business or branch office often needs the power and dedicated use of a server for tasks like front-end database development, intranet hosting, and domain/DNS serving. The IBM eServer xSeries 306—a 1U rack-mounted unit with a single 80GB, 7,200-rpm SATA hard drive—is an ideal solution. Included is the powerful IBM Director network-management software.

ENTERPRISE SERVER: Dell PowerEdge 2850

3.6-GHz Xeon processor, 1GB DDR SDRAM, three 36GB 15,000-rpm hard drives with RAID 0, 1, and 5, 8MB ATI Rage XL graphics, \$6,341 direct. Dell Inc., www.dell.com. Reviewed: 8/2.

The Dell PowerEdge 2850 is just the server for enterprises that require high availability, 24/7. The 2850 gets a perfor-

mance boost from its fast hard drives and RAID controller with DDR2 memory, and its Intel Gigabit NICs with PCI Express are a nice touch. Lindenhurst memory mirroring allows you to keep an extra set of memory modules preinstalled in spare memory banks, ready to cut over automatically if the

primary set fails. Unique among new Xeon servers, the 2850 has an LCD panel on the front to display messages from the system or the Dell OpenManage software suite.

Personal Security

SECURITY SUITE: Norton Internet Security 2005

\$69.95 direct. Symantec Corp., www.symantec.com. Reviewed: 10/18.

NIS's antivirus, antispam, and firewall modules work well separately, but together, they're dynamite. The suite's Privacy Control keeps sensitive data from leaving your system, and Browser Privacy suppresses unnecessary details in outbound communications. Parental control blocks inappropriate content in multiple categories on a per-user basis.

SECURITY SUITE: ZoneAlarm Security Suite 5.5

\$69.95 direct for one year; \$24.95 per year thereafter. Zone Labs LLC, www.zonelabs.com. Reviewed: 6/1 (Version 5.0).

The popular ZoneAlarm Pro has evolved into a one-stop security solution. ZoneAlarm Security Suite 5 enhances ZoneAlarm Pro's protective



features (see next page) and rolls in solid virus protection, built-in security for instant messaging, and blocking of undesirable Web sites in nearly three dozen categories.

ANTIVIRUS: Norton AntiVirus 2005

\$49.95 direct. Symantec Corp., www.symantec.com. Reviewed: 9/15.

Antivirus isn't enough protection anymore, but it remains

ENTERPRISE ANTISPAM: Brightmail Anti-Spam 5.1

\$57.50 list per user per year for 10-24 users (2 years, \$100; 3 years, \$127.50). Symantec Corp., www.brightmail.com. Reviewed: 11/11/03.

Brightmail is our top choice for antispam filtering because it returned no false-positives on our tests: Not one legitimate message was marked as spam. Symantec offers Brightmail Anti-Spam 6.0 via resellers; it's also embedded in several e-mail appliances and ISP offerings. Brightmail's thorough mix of whitelist/blacklist features, centrally updated and customizable rules-based filtering, and heuristic analysis helps keep your in-box spam-free.

essential. Norton AntiVirus 2005 remains our top pick for antivirus. In addition to excellent virus protection and seamless virus-signature updates, including a preinstallation scan that foils existing infections, NAV stays competitive this year with its new Internet Worm Protection.

PERSONAL FIREWALL: Norton Personal Firewall 2005

\$49.95 direct. Symantec Corp., www.symantec.com. Reviewed: 10/1.

Norton Personal Firewall 2005 thwarted every attack we threw at it: inbound port-scan attacks, Trojan-style leak test attacks, and manual attacks on the firewall process itself. It can auto-block an IP address after an attack, stopping denial-of-service attacks. With privacy control and ad blocking as well, this package is hard to beat.

Personal Security

PERSONAL FIREWALL: ZoneAlarm Pro 5.5

\$49.95 direct; \$19.95/year thereafter. Zone Labs LLC, www.zonelabs.com. Reviewed: 6/1 (as part of ZoneAlarm Security Suite).

Every decent personal firewall can “stealth” all but one of your PC’s ports against outside attack; ZoneAlarm Pro 5 also protects that last one. Its Program Control keeps unauthorized programs off the Internet and can’t be fooled by leak test techniques used by Trojans, and its Automatic Program Configuration minimizes those annoying confirmation pop-ups that cause many of us to give up on our firewall in disgust. ZA Pro is hardened against termination by another program, but if it is terminated, it takes down all network access. This is one tough firewall.

ANTISPYWARE: Ad-Aware SE Plus 1.02

\$26.95 direct. Lavasoft, www.lavasoft.usa.com. Reviewed: 9/13.

With its SE series, Lavasoft has expanded the capabilities of its seasoned Ad-Aware antispyware utility, a longtime favorite of *PC Magazine*. Ad-Aware SE boasts improved real-time blocking and greater configurability for power users. Although its spyware prevention and removal aren’t perfect, no one’s is (yet). Ad-Aware SE Plus 1.02 makes an excellent effort, though, and is an effective choice for combating an ever-growing problem.

ANTISPYWARE: Spy Sweeper 3.0

\$29.95 direct. Webroot Software Inc., www.webroot.com. Reviewed: 7/23.

Prevention is the best cure, and Webroot’s Spy Sweeper 3.0, another antispyware utility, excels at preventing spyware’s installation entirely. But for the already afflicted (and that’s most people, it seems), there’s none better than Spy Sweeper for spyware detection and removal—and particularly, real-time spyware blocking. This version is easy to use as well, with an enhanced interface that makes Spy Sweeper’s comprehensive options more accessible.

PERSONAL ANTISPAM: Cloudmark SafetyBar 4.0

\$39.95/year. Cloudmark Inc., www.cloudmark.com. Reviewed: 11/3.

Though it’s notoriously difficult to define with filters, we all know spam when we see it. Cloudmark SafetyBar 4.0 (previous versions were called SpamNet) leverages this to great effect, relying on its million-strong group of

subscribers to define what is and isn’t spam. Separate versions support Microsoft Outlook and Outlook Express. As long as you’re using one of those two e-mail clients, it’s an excellent choice. New in this version: a promising antiphishing scheme.

PERSONAL ANTISPAM: MailFrontier Desktop 4.0

\$29.95 direct. MailFrontier Inc., www.mailfrontier.com. Reviewed: 7/8.

Another fine choice for Outlook and Outlook Express users, MailFrontier Desktop boasts excellent accuracy in distinguishing good mail from spam. It also offers a well-developed challenge/response system, as well as optional collaborative filtering based on other users’ marking a particular message as Junk. As a bonus, MailFrontier filters out phishing scams separately from other spam.

Software

FREE PRODUCTIVITY APP: OpenOffice.org 1.1.3

Free. OpenOffice.org., www.openoffice.org. Reviewed: 10/27.

An open-source suite that can easily replace Microsoft Office on most systems, OpenOffice.org 1.1.3 contains mature word processing and spreadsheet apps, and image and presentation editors. They’re all chock full of features resembling those in Office, and they handle Office documents smoothly. The suite can also convert documents to PDF. And unlike many freeware applications, which are free for personal use only, this suite is free no matter what you use it for.

ACCOUNTING: QuickBooks: Simple Start

\$99.95 direct. Intuit Inc., www.intuit.com. Reviewed: 9/30.

With an emphasis on simplicity rather than new features, Intuit’s new QuickBooks: Simple Start creates a new entry-level market for small-business accounting. An online version is also available (\$9.95 per month for up to two users), and it is actually more powerful than the desktop version. Despite screens loaded with ads, it retains the ease of use of the desktop version and includes additional useful tools and navigational features.



DESKTOP SEARCH: X1 Search 4.0

\$99 direct. X1 Technologies Inc., www.x1.com. Reviewed: 3/23 (Version 3.0)

The truth is, we at *PC Magazine* are addicted to X1. Some of us were excited to try it, others skeptical—and some were downright reluctant to install it, claiming that they didn’t need a search tool, no matter how fast, to help them

find their assorted files, contacts, appointments, and e-mail messages. It may be the unobtrusive interface, the instant results, the simple, effective search refinements: We were all hooked inside of a week.

PRODUCTIVITY/ ORGANIZATIONAL APP: Keyhole 2 PRO

\$599 a year per license. Keyhole Inc. Images, www.keyhole.com. Reviewed: 11/19.

Keyhole 2 PRO provides access to over 6 terabytes of satellite and aerial imagery, covering the entire world, along with a wide variety of topographical and socio-economic data. The mapping client lets you place your own data on top of the images, and an add-in allows you to save

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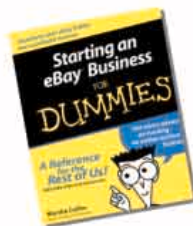


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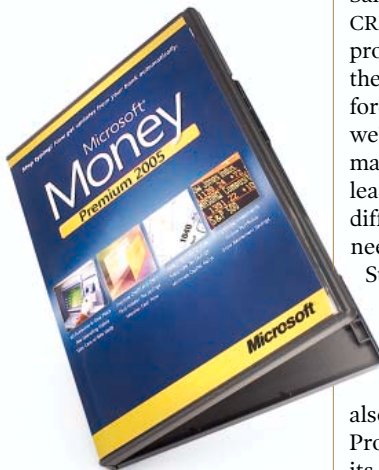
Software

flyovers as videos. Google recently bought the company and lowered the price of the consumer version, Keyhole LT, to \$29.95 a year.

PERSONAL FINANCE: Microsoft Money Premium 2005

\$79.95 list. Microsoft Corp., www.microsoft.com. Reviewed: 8/13.

This year's release of Microsoft Money is the company's most ambitious to date. It features two interfaces geared toward different types of



users: The Essential view provides a simplified look at a user's financial information, while those requiring more detail can use the Advanced view. We like the power and features of the .NET Passport strategy, though some users may have reservations about Money's storing personal data on centralized servers.

CD/DVD BURNING: Roxio Easy Media Creator 7

\$99 direct. Roxio Inc., www.roxio.com. Reviewed: 2/13.

Roxio Easy Media Creator 7 is far more than just a CD- and DVD-burning program. In fact, it's hard to find something this suite doesn't do. It provides video-editing, DVD-

creation, and audio tools, as well as a good selection of entry-level image-editing tools. It lets you easily copy CDs and unencrypted DVDs, or back up the data on your hard drive. It even lets you create photo slide shows. And despite this exhaustive selection of features, the suite is tightly integrated, offering a smooth workflow.

CUSTOMER RELATIONSHIP MANAGEMENT: salesforce.com Enterprise Edition

\$125 per user per month. salesforce.com Inc., www.salesforce.com. Reviewed: 6/14.

Sales professionals who use CRM tools make better, more profitable relationships with their customers, and salesforce.com is the best tool we've reviewed. You can manage sales campaigns and leads, import files, and set different pricing structures as needed. The included Sforce Studio enables companies to build customized features on the powerful platform without programming. salesforce is also available in lower-priced Pro and Team versions, and its Personal edition with basic lead- and account-management capabilities is free for a single user.

WEB DESIGN/ MAINTENANCE: Macromedia Contribute 3

\$149 direct. Macromedia Inc., www.macromedia.com. Reviewed: 9/9.

When you're designing a Web site to showcase your company's wares or promote your group's activities, Macromedia Contribute 3 is the tool you need to create, edit, and



publish online. It's easy to use, providing helpful page templates and even image-editing tools and a spell-checker. In short, it's the right choice for group-maintained sites. Contribute 3 also includes Macromedia's FlashPaper tool, enabling you to convert nearly any document into a Flash file.

SMB DATABASE: FileMaker Pro 7

\$299 list; upgrade, \$149. FileMaker Inc., www.filemaker.com. Reviewed: 3/12.

Small-business users know that FileMaker is the go-to database program that's easier to use than Microsoft Access. Version 7 pushes FileMaker's appeal toward larger companies as well, with enhanced data relationships, more elaborate administrative controls, and exceptional ease of use. You can build databases and simple applications from dozens of templates or



from scratch, and new security settings enable tight access control. Add-on products let you serve FileMaker databases to large groups and to mobile users.

ONLINE CONFERENCING: WebEx Meeting Center

Standard version, \$100 per seat per month; Pro version, \$200 per seat per month. WebEx Communications Inc., www.webex.com. Reviewed: 1/20.

WebEx is the 800-pound gorilla of Web conferencing, but it has earned the title. Its winning combination of features, including smooth videoconferencing, robust application sharing, and superb Outlook integration, makes it the right choice for companies looking to cut down on travel expenses and move more meetings to the Web. WebEx also offers Training Center for educational webinars, Support Center for technical reps, and Event Center for large webcasts.

IDE: JBuilder 2005 Enterprise

\$3,500 direct. Borland Software Corp., www.borland.com. Reviewed: 10/20.

Java developers need to stay abreast of the latest standards and capabilities for their platform, and Borland's JBuilder 2005 Enterprise stands out as the most versatile and powerful tool for Java projects. The latest version packs impressive security and performance enhancements, with a special focus on collaborative programming. Built-in auditing tools make sure your code is stylistically clean and free of security holes.

MORE ON THE WEB For links to full reviews of all the products in this story, visit <http://go.pcmag.com/bestof2004>.

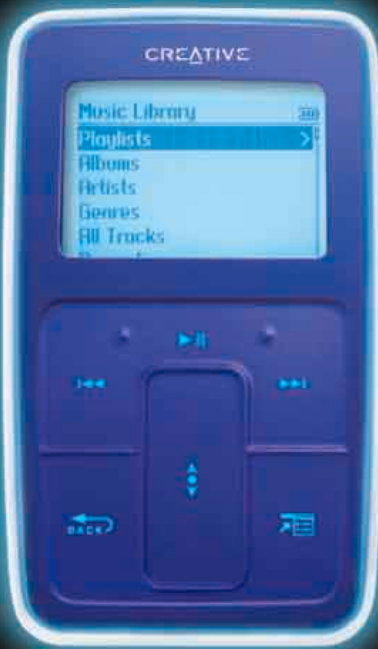
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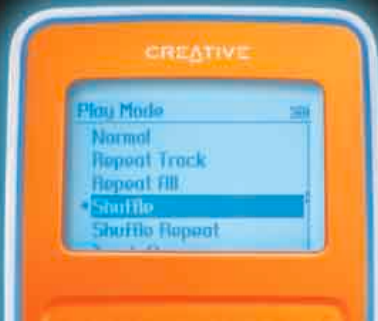
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Mobile

BUSINESS PDA: **HP iPAQ** **hx4700**

\$649 direct. Hewlett-Packard Development Co., www.hp.com. Reviewed: 7/23.

The star feature of the HP iPAQ hx4700 is its spacious, gorgeous, 4-inch VGA screen. To drive such a demanding display, the hx4700 sports a powerful 624-MHz processor, and for wireless connectivity on the road, it

includes applications that make hooking up to Wi-Fi networks and Bluetooth devices a breeze. This PDA is so powerful and robust, we're still waiting for the software to catch up.



PERSONAL PDA: **Palm Zire 72**

\$300 street. palmOne Inc., www.palmone.com. Reviewed: 4/28.

The Palm Zire 72 is the top choice for anyone who wants more than basic PIM applications. It includes an MP3 player, a 1.2-megapixel camera (no flash), and Bluetooth. To store all those music and photo files, there's 32MB of built-in memory and an SD Card slot. All of this is packed into a sleek, lightweight PDA with a handsome screen.

SMART PHONE **(WITH KEYBOARD):** **RIM BlackBerry 7100t**

\$299 list (\$199 with plan). Research In Motion Ltd., www.blackberry.com (Carrier: T-Mobile USA, www.tmobile.com). Reviewed: 10/5.

It's a BlackBerry for the masses. The RIM BlackBerry 7100t looks, acts, and feels like a phone without compromising its renowned BlackBerry e-mail appeal. The strange QWERTY keyboard looks daunting at first—with two letters per key—but RIM's

SureType (the best predictive text we've ever seen) makes it surprisingly easy to use.

SMART PHONE **(WITHOUT KEYBOARD):** **Audiovox SMT5600**

\$319 list (\$199 with plan). Audiovox Corp., www.audiovox.com. (Carrier: Cingular, www.cingular.com). Reviewed: 11/30.

The Audiovox SMT5600 with Windows Mobile for Smartphones 2003 SE has great syncing capabilities, easy e-mail, and long battery life. But the real thrill is the multimedia power of Windows Media Player 10. Just drag and drop a WMA, MP3, or video file and you're ready to roll. The mini-SD slot under the battery can take a 256MB card; larger cards are coming soon.

NO-FRILLS PHONE: **Kyocera SoHo**

\$179.95 list (\$99.99 with plan). Kyocera Wireless Corp., www.kyocera-wireless.com (Carrier: U.S. Cellular, www.uscc.com). Reviewed: 10/18.

For some of us, a phone should just be a phone. The stylish SoHo flip phone is a durable little device with easy-to-press buttons, a two-line monochrome outer display with time, date, signal strength, and caller ID, and a loud, clear speakerphone.

PORTABLE IN-CAR TURN-BY-TURN GPS RECEIVER: **TomTom GO**

\$899 list. TomTom BV, www.tomtom.com. Reviewed: 10/26.

The TomTom GO has the most intuitive GPS interface around, and the touch screen and large icons make for no-fuss destination entry. Turn-by-turn instructions display in text and perspective-mimicking 3D, and they're delivered clearly through a speaker as well. With its Assisted Satellite Navigation feature, this device keeps working even in tunnels.

Gaming



SIMULATION GAME: **The Sims 2**

\$49.99 direct. Electronic Arts Inc., <http://thesims2.ea.com>. Reviewed: 9/13.

The Sims lets you create characters and live their lives for them, guiding their careers, looking for romance, and upgrading their homes. It's amazingly addictive. The Sims 2 takes a virtual leap forward, adding dramatic new cinematic graphics. Creating new Sims is a blast—you can get the exact look and personality you want, and kid Sims inherit genetic traits from their parents. Sims now grow

old and eventually die. Bring on the expansion packs!

EDUCATIONAL GADGET: **a V.Smile TV Learning System**

\$60 street; Smartridges, \$20 each. VTech Electronics, www.vtechkids.com. Reviewed: 8/17.

In the guise of a gaming console, the V.Smile TV Learning System helps early learners, preschoolers, and kindergartners acquire basic reading and math skills. The V.Smile comes with Alphabet Park, a single Smartridge; the ten additional cartridges include the Junior Thinkers series for ages 4 to 6 and MasterMinds for ages 5 to 7. The V.Smile is



easy to set up and use, and it's fun to play.

SPORTS GAME:
Madden NFL 2005

\$49.99 street. EA Sports, www.easports.com. Reviewed: 11/16.

The 15th season of this superlative series is now available on just about every gaming platform you can think of. Many other developers have tried, but no one can top Madden NFL for football fun—and every year, EA Sports works hard to make the game even more entertaining and realistic-looking. Controls and AI are always top-notch. Franchise mode lets you run the team yourself, and your decisions affect the way players play. You can even customize your fans in the crowd.

idyllic landscape, guides introduce you to meditative exercises, and you attempt to master on-screen activities like juggling and archery by becoming calmer or more alert. Wild Divine is innovative and fun, and even better, it's very effective.

MMORPG:
City of Heroes

\$39.99 list, plus a \$20 per month subscription. NCsoft Corp., www.cityofheroes.com. Reviewed: 6/22.

Hey, comic book fans: Forget dragons and ogres. City of Heroes may just be the most inventive MMORPG (massively multiplayer online role-playing game) yet. You play as a superhero of your own design, and creating your character is almost as much fun as playing the game. Are

the best squad-based tactical action game we've encountered. You play as a squad leader who needs to fight and win battles in urban environments. Advanced AI lets your soldiers act and respond in near-lifelike ways, and the game's precision controls are complex but intuitive.

ACTION GAME:
Halo 2

\$39.99 list. Microsoft Game Studios, www.xbox.com. Reviewed: 11/8.

When the Microsoft Xbox launched in 2001, Halo: Combat Evolved was nearly everyone's favorite game for the platform. Sophomore efforts in the gaming world are often disappointing, but Halo 2 proves even better than the original. Game play is notably more immersive and unpredictable, graphics and audio are significantly improved, and NPC AI (non-player character artificial intelligence) is enhanced, making your enemies more difficult to defeat.

HIGH-END GRAPHICS CARD:
ASUS V9999 Ultra Deluxe

\$600 street. AsusTek Computer Inc., www.asus.com. Reviewed: 10/19.

The top-of-the-line nVidia card from AsusTek performs at the same stellar level as most other GeForce 6800 Ultra cards, and the card's requirements are mainly similar. One exception: Most other cards require two slots, but the ASUS needs just one. Unique to the ASUS is its GameFace software for putting a webcam video overlay into your games, and AsusTek even supplies the webcam.

MIDRANGE GRAPHICS CARD: **ATI All-In-Wonder 9600 XT**



\$249 direct. ATI Technologies Inc., www.ati.com. Reviewed: 8/6.

ATI has steadily improved its All-In-Wonder products since their introduction in 1996. The 9600 XT's better 3D performance, the media application suite's polished interface, and the new and improved remote control combine to make the 9600 XT a winner. The included Pinna- cle Studio SE lets you make DVD menus and discs in a soup-to-nuts solution.

GAMING SPEAKERS:
Creative GigaWorks S750

\$500 Street, Creative Labs, Inc. <http://us.creative.com>. Reviewed: 2/17.

The GigaWorks S750 is a 700-watt THX-certified behemoth speaker system, the only choice for gamers who want no-holds-barred high-volume 7.1-channel sound. It can be used with any 2-, 4-, 5.1-, or 6.1-channel sound card with analog outputs, but it shines brightest when paired with the Creative Audigy 2 ZS boards, which produce stunning 7.1 output from any EAX-compatible game. The S750 isn't our first choice for audiophiles, but if your idea of a satisfying gaming experience is to be completely enveloped by ear-splitting, floor-shaking sound, this is the system for you.



GAME THAT'S MORE THAN A GAME:
The Journey to Wild Divine

\$159.95 direct. The Wild Divine Project, www.wilddivine.com. Reviewed: 4/20.

The goal of The Journey to Wild Divine is to teach you how to control your body's alertness and relaxation levels consciously, through biofeedback.

You connect your hand to included hardware that measures your heart rate and skin conductivity (both stress indicators). As you wander through an

you a mutation, or the result of a science experiment gone awry? There are millions of possibilities. Graphics are terrific, and the developer adds new content regularly.

ACTION GAME:
Full Spectrum Warrior

\$50 street. THQ Inc., www.fullspectrumwarrior.com. Reviewed: 10/19.

It may not be for everyone, but Full Spectrum Warrior (for PC and Microsoft Xbox), an intensely realistic implementation of U.S. Army training principles, is a must for the military-minded—it's



Entertainment

MEDIA HUB: **a Roku HD1000**

\$300 list. Roku LLC, www.rokulabs.com.
Reviewed: 1/20.

The Roku HD1000 isn't just another digital media hub. Sure, it can play your PC multimedia files on your TV and stereo, but it also displays digital photos and videos in true HD resolution—up to 1,080 video lines, twice what standard-definition media hubs deliver. Since we first reviewed the HD100, it has bulked up its feature set (it now supports MP3, WMA, and WMA DRM formats) and cut \$200 off its price.

DVR SOFTWARE: **SnapStream Beyond TV 3**

\$69.99 direct. SnapStream Media Inc.,
www.snapstream.com. Reviewed 4/20.

If your PC already has a TV tuner card, then SnapStream Beyond TV 3 is the best (and cheapest) way to do digital video recording. And even if you have to add a tuner card, the Beyond TV 3 software is still the way to go, considering how close it comes to the TiVo or Media Center PC experience. The server-like nature of the program is both liberating and impressive. You can easily log on to the program to stream a recorded file or schedule a show to record remotely via the Web.

VALUE HDTV: **Sharp Aquos LC-37G4U**

\$5,499.99 list. Sharp Electronics Corp.,
www.aquos.com. Reviewed: 12/14.

Sharp has quietly gone about the business of having some of the best LCD-based HDTVs on the market, and the com-

pany's latest 37-inch set stays true to that pedigree. Out of the box, the Aquos delivered vivid color and bright images, both on HDTV and DVD content; a light sensor dynamically adjusts picture settings depending on the ambient light level.

HIGH-END HDTV: **Pioneer Elite Pro-1110HD**

\$15,500 list. Pioneer North America Inc.,
www.pioneerelectronics.com. Reviewed:
12/14.

At \$15,500, the 49-inch Pioneer Elite Pro-1110HD is the most expensive HDTV we've tested, but its image quality really sets it apart from the competition. On our tests, video picture quality from standard- and high-definition sources was outstanding—color rendition in particular.



MUSIC-DOWNLOAD SERVICE: **iTunes Music Store**

99¢ per song. Apple Computer Inc.,
www.apple.com/itunes. Reviewed:
11/11/03.

Apple's iTunes Music Store has made big strides since it launched, with 99¢ downloads, no fees, and few restrictions on usage. Using the iTunes software, you can access the well-stocked store, which provides 30-second samples of every song. The files you download are in Apple's proprietary AAC format, but at least you can play them in both Mac and Windows versions of iTunes.

MEDIA PLAYER: **Windows Media Player 10**

Free. Microsoft Corp.,
www.microsoft.com. Reviewed: 7/26.

Windows Media Player has really come into its own this year. The most prominent enhancement in Version 10 is its completely overhauled interface. Far more than an afterthought thrown in with the Windows OS, WMP has grown into a truly useful application. It provides easy access to your music, photos, and videos, and it helps you manage all those files.

MUSIC-STREAMING SERVICE: **Musicmatch On Demand**

\$9.95 monthly, \$26.85 quarterly, or
\$95.40 annually. Musicmatch Inc.,
www.musicmatch.com. Reviewed: 9/21.

Musicmatch On Demand currently has over 700,000 tracks you can stream right to your PC. Tracks are added to your Musicmatch library, and you access them just as you would locally stored songs. Subscribers can

log on to their accounts from any computer and can e-mail their Musicmatch playlists to friends. Music is streamed at 64 Kbps in MP3 Pro format, which the company claims is comparable to MP3s streaming at 128 Kbps.

CAR-AUDIO DEVICE: **b Delphi XM Rody2**

\$130 street. Delphi Corp., www.shopdelphi.com. Reviewed: 6/28.

Until now, to make satellite radio work in your car, you had to buy a new car radio or an add-on kit that took up a



lot of room on the dash. Delphi offers a complete 100-channel XM Satellite Radio receiver packed into a case roughly the size of an iPod and 2 ounces lighter. This satellite radio tuner can be easily mounted anywhere on the dash or console of your car. You don't even need to connect an audio cable to the car radio or cassette player, because an FM modulator is integrated.

SMALL-CAPACITY MP3 PLAYER: **Apple iPod mini**

\$249 direct. Apple Computer Inc.,
www.apple.com. Reviewed: 2/17.

The Apple iPod has long been the digital music player by which all others are judged, and the 4GB iPod mini does not disappoint. The mini's screen, though smaller than that of the original iPod, still makes you wonder why other manufacturers can't produce displays this readable. The controls do exactly what you expect, and the mini does the right thing even when you don't expect it to: turning on when you plug in the headphones, for example.

MP3 PLAYER FOR AUDIO- PHILES: **iRiver H140**

\$370 street. iRiver America, www.iriveramerica.com. Reviewed: 7/13.

With superlative sound and a multitude of special features, the 40GB iRiver H140 goes far beyond the typical player, offering voice and audio recording as well as FM radio. Recording quality is superb and can be analog or optical/digital, in either MP3 or WAV. Even better, to load the H140, you don't need special drivers: You can drag folders of ripped songs to it via Windows Explorer. ☰



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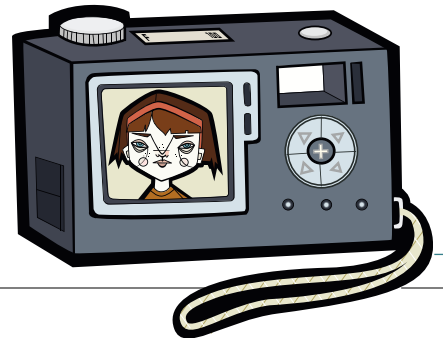


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17th Annual

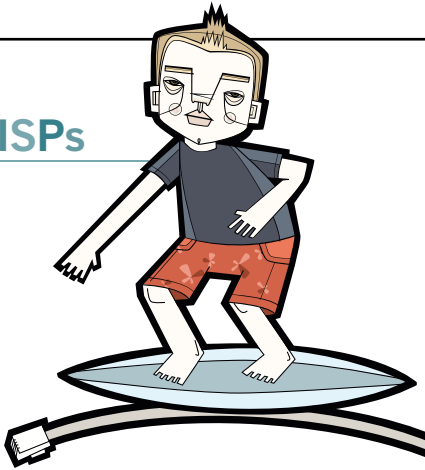
Reader Satisfaction Survey | Part 2

Readers'



CHOICES

ISPs



Our readers have spoken. Again. This past summer, thousands of *PC Magazine* readers told us about their desktops, notebooks, and servers ("17th Annual Reader Satisfaction Survey," August 17, 2004). In our latest reader satisfaction survey, they take us beyond PCs, telling us about digital cameras, Internet service providers (ISPs), premium-content providers, printers, home-networking routers, and, for the first time, cell phones and cell-phone service providers.

Which vendors make the grade and which ones are leaving users out in the cold? In part two of our annual survey, our readers make their voices heard. By Cade Metz Illustrations by Julie West

Nearly 9,000 *PC Magazine* subscribers responded to our survey, rating over 44,000 products and services in all. They tell us not just what they like and dislike, but also how they put these products and services to use. They tell us how often things break down as well as how manufacturers and service providers do on technical support and repairs.

Why does it matter what our readers think? Our readers can tell us what we can't find out from testing and reviewing products: how well they will stand up over time and how well the manufacturers and service providers stand behind their products. And it matters because

our readers are not only early adopters and tech geeks, they're also techno-evangelists. As with our August survey, readers rate products on a 10-point scale. Each step along the scale is clearly defined: 1 to 2 means *poor*, 3 to 4 is *fair*, 5 to 6 is *good*, 7 to 8 is *very good*, and 9 to 10 is *excellent*. On the whole, people are surprisingly pleased with their experiences. Vendors of cameras, printers, broadband access, and routers all receive an "overall rating" score of 7.6 or above, and only one category, cell-phone services, scores below a 7.0.



ROUTERS

120 ISPs 122 Printers 123 Home-Networking Routers 125 Digital Cameras 126 Cell-Phone Handsets and Service Providers 119 Readers' Choices Premium-Content Providers 122 Survey Results: Home Printers 124 Survey Results: Home-Networking Routers 125 Survey Results: Digital Cameras



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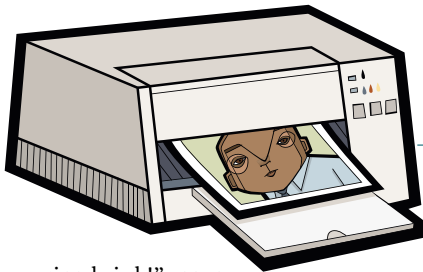
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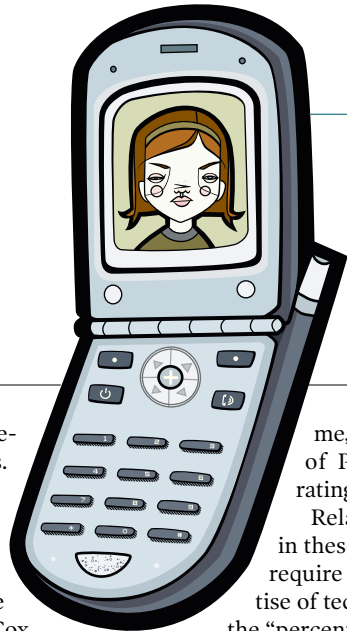
Of course, some brands receive more praise than others. Readers are particularly complimentary toward Canon cameras and printers, HP printers, Verizon Wireless and Virgin Mobile cell-phone service, Linksys routers, and Cox, Optimum Online, and Road Runner broadband services. All receive significantly better-than-average scores within their respective product categories.

Readers are less enthusiastic about some aspects of these markets, however. The first is price. They score phone service fees at just 6.2, broadband Internet prices at 5.5, and the cost of printer ink and toner at a dismal 5.3. "Great printer—over-



priced ink!" says Robert Wincek from New Berlin, Wisconsin, of his Epson color ink jet printer—a complaint we heard many times, for all brands of printers.

Technical support is another touchy subject. On this measure, most products score below 7.0, with cell phones at 6.3 and printers and cell-phone services tied at a depressing 5.9. Repairs scores are similarly low, particularly where printers and cell phones are involved. "It's very hard to find a service tech (in the store or via phone) who knows enough to help



CELL PHONES

me," says Brian Masters of Portland, Maine, in rating his Nokia phone.

Relatively few products in these categories actually require the hands-on expertise of technicians—generally the "percent needing repairs" in these categories is in the 5- to 6-percent range. But, according to our survey, 14 percent of all cell phones needed repairs in the past year, and 22 percent of all broadband connections required service repairs. Clearly telecoms need to address this issue.

Want to learn more about each individual market or vendor? Read on. We slice the survey data more ways than you'd probably think possible.

But first, a word about methodology: Our latest survey was in the field from October 12 to October 21, 2004, and the results are calculated using answers from 8,821 *PC Magazine* subscribers.

Scores are reported only for vendors rated by at least 50 respondents, because that is the minimum needed to be statistically reliable.

Furthermore, a formula known as a "t-test" is used to calculate significant difference between a vendor's score and the industry average. Scores are classified as average, better or worse than average, or significantly better or worse than average. Note, however, that t-tests may give different meanings to identical scores. In the printer category, for example, both HP and Konica Minolta received scores of 8.1 for reliability, but the t-test indicates that HP's score is significantly above average, while Konica Minolta's is only average.

PRINTERS



ISPs:

Broadband: Cox, Optimum Online, Road Runner

Dial-up: EarthLink

Premium Content: MSN Premium

Home Printers: Canon, HP

Home-Networking Routers: Linksys

Digital Cameras: Canon

Cell Phones:

Service Providers: Verizon Wireless

Handsets: On AT&T Wireless, Nokia; on Cingular Wireless, Motorola; on Sprint PCS, palmOne and Sanyo; on T-Mobile, Samsung; on Verizon, LG and Samsung.

Readers' Choices from Part One*

Desktop PCs: Apple, Dell

Notebook PCs: Dell, IBM

Servers: Dell

* Results from the first half of this year's survey are printed in our August 17 issue.

MORE ON THE WEB

To take a look at the part one of this year's reader survey (and previous years' surveys), visit us online at www.pcmag.com.

READERS' CHOICE

ISPs



When it comes to broadband Internet service providers, familiarity is clearly breeding contempt. Eighty-six percent of our respondents have broadband connections, up from 75 percent last year. And as you'd expect, these people are happier with their broadband ISPs than their dial-up counterparts, giving

them an "overall rating" score of 7.6 compared with 7.1. But this compares with an "overall rating" score of 7.8 for broadband users in 2003 and 8.0 in 2002.

What's at the heart of this decline? It's money, money, money, and that's nothing new. Our readers are grumbling loudly over broadband costs, and especially cable ISP prices. Satisfaction with fees drops to a very low score of 5.5 after receiving a 6.0 last year and a 6.1 in 2002. Customers can't shake their addiction to broadband, and with so little competition among providers in many regions, prices show few signs of dropping. You have no option but to pay. "More choices, lower prices would be a good thing," says A. Michael

Uhlmann, a Road Runner customer in Austin, Texas.

In general, readers are happier with the price of DSL in comparison with cable. They rate DSL fees at an average of 6.3, and cable fees at 5.3. "Fifty dollars a month is too much to pay for home use," says Bruce Dimon of his Post Falls, Idaho, Adelphia cable connection.

Of course, ISPs aren't judged on price alone. Despite higher fees, readers still prefer cable to DSL. Cable services receive an overall average of 7.8, compared with 7.6 for DSL. What is it people like about cable? Ease of setup and—more important—connection speed. Readers score cable speeds at an average of 8.2, while

SURVEY RESULTS: BROADBAND ISPs

PRIMARY CONNECTION TYPE	OVERALL RATING ¹	OVERALL RATING ¹					INITIAL SETUP ²	FEES	CONNECTION SPEED	CONNECTION RELIABILITY	ISP-PROVIDED E-MAIL	CUSTOMER SERVICE	TECHNICAL SUPPORT	REPAIRS	PERCENT NEEDING REPAIRS	LIKELIHOOD OF RECOMMENDING
		POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)										
Adelphia (303 responses)	Cable	7.2					7.3	4.9	7.9	6.9	7.0	6.5	6.3	6.1	29%	7.3
BellSouth (272)	DSL	7.6					7.9	5.8	7.8	7.8	7.8	7.2	6.5	6.6	23%	7.9
Charter (364)	Cable	7.5					8.2	5.5	8.0	7.5	7.5	6.9	6.6	6.7	29%	7.6
Comcast (1480)	Cable	7.6					7.1	4.8	8.3	7.7	7.6	6.9	6.5	6.6	27%	7.8
Cox (507)	Cable	8.0					7.4	5.7	8.2	7.9	7.6	7.5	7.1	7.0	28%	8.2
DirecWay (53)	Satellite	6.3					—	4.4	6.2	5.9	—	—	—	—	17%	6.4
EarthLink (379)	DSL	7.9					7.6	5.9	7.8	8.0	7.8	7.3	6.6	—	13%	7.8
Insight Broadband (54)	Cable	8.0					—	5.7	8.0	7.9	—	—	—	—	26%	8.2
Mediacom Online (70)	Cable	7.7					—	5.0	8.2	7.6	8.1	7.0	7.0	—	21%	7.6
Optimum Online (259)	Cable	8.2					—	4.7	8.7	8.3	7.8	7.2	6.9	—	15%	8.3
Qwest (114)	DSL	7.2					7.4	6.3	7.1	7.2	7.3	7.3	7.0	—	18%	7.1
RCN (52)	Cable	7.6					—	—	8.2	7.5	—	—	—	—	29%	7.8
Road Runner (782)	Cable	8.1					7.6	5.4	8.4	7.9	7.9	7.4	7.0	7.0	30%	8.3
SBC/SBC Yahoo! (702)	DSL	7.5					7.3	6.7	7.4	7.7	7.8	7.1	6.2	5.9	15%	7.6
Verizon (534)	DSL	7.6					7.1	6.6	7.4	7.8	7.5	7.2	6.5	7.2	12%	7.8
AVERAGE		7.6					7.5	5.5	7.8	7.6	7.6	7.1	6.7	6.6	22%	7.7
OVERALL CABLE (4382)³		7.8					7.4	5.3	8.2	7.7	7.6	7.1	6.7	6.7	26%	7.9
OVERALL DSL (2291)³		7.6					7.3	6.3	7.5	7.7	7.7	7.3	6.6	6.5	15%	7.7

RED denotes Readers' Choice. Except as noted, scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this ISP?" It is not the average of the other scores. ²Applies only to setup experiences in the past year. ³Includes companies for which we received fewer than 50 responses, not charted here. In this section of the table an ○ represents a score that is significantly better at a 95 percent confidence level.

SURVEY RESULTS: DIAL-UP ISPs

PRIMARY CONNECTION TYPE	OVERALL RATING ¹	OVERALL RATING ¹					INITIAL SETUP ²	FEES	CONNECTION SPEED	CONNECTION RELIABILITY	ISP-PROVIDED E-MAIL	CUSTOMER SERVICE	TECHNICAL SUPPORT	LIKELIHOOD OF RECOMMENDING
		POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)								
AOL (165 responses)		6.5					7.4	4.9	5.6	6.8	7.4	6.7	5.7	6.4
AT&T Worldnet (76)		7.4					7.8	7	6.1	7.9	8.2	7.2	—	7.5
EarthLink (144)		7.7					7.7	6.5	6.6	7.9	8	7.5	6.5	7.9
MSN (115)		7					7.3	6.3	5.9	6.9	7.6	7.2	6.6	7.3
AVERAGE		7.1					7.5	6.2	6.1	7.4	7.8	7.1	6.3	7.3

RED denotes Readers' Choice. Scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give the company a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this ISP?" It is not the average of the other scores in this table.

SURVEY RESULTS: PREMIUM-CONTENT PROVIDERS

- Significantly better than average*
- ◐ Better than average**
- ◑ Worse than average**
- Significantly worse than average*

	VARIETY OF CONTENT	QUALITY OF CONTENT	VALUE	CUSTOMER SUPPORT
AOL for Broadband (434 responses)	7.0 ◐	7.0 ◐	5.9	6.4 ◐
MSN Premium (451)	7.6 ◐	7.7 ◐	7.3 ◐	7.2 ◐
RealOne SuperPass (59)	7.4	7.2	6.6	6.9
Yahoo! Plus (339)	7.4	7.4	7.3 ◐	6.8
AVERAGE	7.3	7.3	6.8	6.8

RED denotes Readers' Choice. Scores are on a scale of 1 to 10, where 10 is best. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average.

DSL speeds get a 7.5. Reliability scores, however, are a wash.

Naturally, some providers fare better than others. Readers are impressed with the speed and reliability of cable providers Road Runner, Optimum Online, and Cox, and despite average to significantly worse-than-average scores for price, these three sit atop our broadband survey. EarthLink and Insight Broadband also fare well on the broadband side. Adelphia and Qwest score poorly, with satellite provider DirecWay singled out for particularly harsh criticism. On the dial-up side, EarthLink is all alone at the top—and AOL at the bottom.

How big of a problem is price? On a scale of 1 to 10 (where 10 is best), readers score dial-up fees an average of 6.2, and broadband tops out at 5.5. Last year, these scores were 7.1 and 6.0, respectively. In rating broadband vendors, readers are particularly critical of fees charged by Adelphia, Comcast, and Optimum Online; all three fail to reach a score of even 5.0 and barely qualify as *good* on our 10-point scale. All three, it's worth noting, are cable providers. Among dial-up providers, AOL comes up similarly short.

Four vendors do stand out from the crowd on price. In dial-up, AT&T Worldnet fees receives respectable ratings. Among broadband vendors, readers are pleased with SBC, Verizon, and, to a lesser degree, Qwest and EarthLink. Again, it's worth noting that all the broadband

providers who get better-than-average scores on price are DSL providers. (EarthLink also offers cable Internet access in some areas, as well as satellite.) Joe Sisler of Cleveland, Ohio, says his SBC Yahoo! DSL service is \$30 a month cheaper than his previous provider, AOL, which briefly provided broadband access under a pilot program. And that was before SBC lowered the price of SBC Yahoo! to a mere \$19.95 a month.

The trouble with broadband is that so many people still have only one local provider available to them. Time and again, readers complain that, although they'd love to switch vendors, they can't. If there's no competition, they feel, providers have little incentive to lower prices or even maintain high-quality service. "In the last five years, my Internet speed has been reduced from 6 megabits per second to 3 Mbps, and my charges doubled from \$25 to \$50," says Woody Feffer, an Asheville, North Carolina, Charter subscriber. "I'm not happy with them at all, but I have no other options."

Readers are also severely critical of the customer service and technical support provided by companies like Adelphia and Comcast, but many seem resigned to it. "They are bottom of the barrel in reliability and support," says Todd Murchison of Adelphia's service in Brattleboro, Vermont. "However, in the rural area we are in, they have us as captive customers."

Satellite, of which DirecWay is the dominant provider, is the primary alternative to cable and DSL, but it's apparently not a very satisfying alternative. Satellite is still inordinately pricey, and its survey scores are among the lowest of the lot. "Expensive. Stormy weather knocks it out. Poor technical support," says Carroll Wilson, of his StarBand satellite service in New Gloucester, Maine. "If I had a choice, I wouldn't choose it."

None of these results are particularly surprising. Compared with prices in Asia, Internet prices here in the U.S. are still ridiculously high, largely because of the immaturity of the market and, as we've indicated, the lack of competition. Our survey can certainly tell you which vendors provide the best Internet service. Unfortunately, there's a good chance you might have to stick with the one you have, depending on your location.

PREMIUM-CONTENT PROVIDERS

This year, we also asked users to rate so-called *premium-content providers*—companies like AOL that supplement broadband connections with exclusive software, games, music, videos, chat rooms, and other perks. Of the four vendors in this category, Microsoft's MSN Premium service receives the highest ranking and AOL for Broadband the lowest.

Is a premium service worth the cost? The jury's still out. Readers score the variety and the quality of their premium content an average of 7.3 each, indicating they are generally pleased with both. But they

Internet Service Providers



Broadband: Cox

Users like Cox for its speed and reliability, as well as the technical support and customer service it provides.

Broadband: Optimum Online

While they're unhappy with its fees, users like Optimum Online's speed and reliability and the low rate of repairs the service requires.

Broadband: Road Runner

Road Runner needs far too many repairs, but it beats or ties all comers in just about every other measure.

Dial-up: EarthLink

For those with no broadband options, our readers like EarthLink's reliable and (relatively speaking) fast connections.

Premium Content Provider: MSN Premium

Value and high-quality, varied content put MSN Premium over the top.

aren't as happy with customer support for these services, and they score the overall value of the services a tepid average of 6.8.

MSN Premium receives better-than-average scores in each of these categories. AOL for Broadband receives nothing but worse-than-average scores. AOL's service, which at \$14.95 per month is the most expensive of the lot, receives significantly worse-than-average scores when it comes to value.

Some users apparently subscribe to these services to maintain existing e-mail accounts and not for the additional content. "The only reason I keep AOL is the e-mail addresses my family has had for years," says one anonymous reader.—Cade Metz

OUR CONTRIBUTORS: Cade Metz is senior writer of *PC Magazine*. Sebastian Rupley is a senior editor. Executive editor Ben Z. Gottesman and associate editor Sean Carroll were in charge of this story.

READERS' CHOICE

Home Printers

Hewlett-Packard printers have earned top ratings for the past 12 years in our survey.

And they remain at the top again this year, but they share the spotlight with co-Readers' Choice winner Canon, which continues a meteoric climb that we first noted in last year's survey (www.pcmag.com/sr).

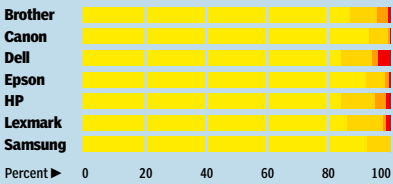
Our two co-Readers' Choices just edge out Brother and Samsung in "overall rating" scores. But a deeper look into the numbers shows our winners scoring better across a wider spectrum of printers. The high-profile color ink jet printer category shows Canon and HP in a dead heat. In the even hotter all-in-one ink jet category, HP still holds a respectable lead over Canon; the next nearest competitor in this category is Epson.



INITIAL SETUP EXPERIENCE

Printers purchased within the past year

- Everything worked the first time.
- Not everything worked, but I solved the problems myself.
- Not everything worked, but tech support solved my problems.
- There were major problems, and the machine had to be replaced.



All-in-one printers (also called multi-function printers) have rapidly grown in popularity, becoming one of the hottest categories. As in our previous surveys, they receive lower "overall rating" scores than workhorse printers like monochrome lasers. Still, most all-in-one printers score in the *very good* range, though they tend to need too many repairs. (They do have more moving parts and features than other models.) HP receives significantly better-than-average scores for both "overall rating" and "likelihood of recommending" in this category, and Epson also gets better-than-average scores in the same areas. At the other end of the spectrum, when it comes to monochrome lasers, only Samsung gets worse-than-average scores in both "overall rating" and "likelihood of recommending," which is disappointing

SURVEY RESULTS: HOME PRINTERS

- ⊖ Significantly better than average*
- Better than average
- Within the average range
- Worse than average
- ⊖ Significantly worse than average

	OVERALL RATING ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)	EASE OF USE	RELIABILITY	TECHNICAL SUPPORT	PERCENT NEEDING REPAIRS	LIKELIHOOD OF RECOMMENDING
ALL PRINTERS											
Brother (241 responses)	8.0						8.1	8.1	—	6.2%	8.0
Canon (949)	7.9						8.2	8.1	6.6	4.3%	8.3
Dell (135)	7.3						7.8	7.5	—	3.7%	7.0
Epson (1,220)	7.6						7.9	7.7	6.2	5.2%	8.0
HP (4,273)	7.9						8.2	8.1	6.0	4.3%	8.4
Konica Minolta (84)	7.8						7.9	8.1	—	4.8%	7.7
Lexmark (685)	6.9						7.7	7.2	4.9	4.2%	7.0
Samsung (133)	8.0						8.4	8.3	—	3.8%	8.1
Xerox (55)	7.7						8.1	7.8	—	18.2%	7.0
AVERAGE	7.7						8.0	7.9	5.9	1.8%	7.7
PRINTERS LESS THAN ONE YEAR OLD											
Brother (106)	8.0						8.1	8.1	—	7.5%	8.1
Canon (334)	8.5						8.6	8.7	—	3.0%	8.8
Dell (103)	7.2						7.7	7.4	—	3.9%	6.8
Epson (397)	8.0						8.1	8.0	—	4.8%	8.2
HP (951)	8.2						8.3	8.2	6.2	3.9%	8.6
Konica Minolta (50)	8.1						8.2	8.5	—	2.0%	8.2
Lexmark (196)	7.3						7.9	7.5	—	4.6%	7.4
Samsung (53)	7.8						8.2	8.0	—	5.7%	8.1
AVERAGE	7.9						8.1	8.1	6.2	4.4%	8.0
INK JET PRINTERS											
Canon (574)	7.7						8.1	8.0	—	3.7%	8.1
Epson (695)	7.4						7.9	7.5	6.0	5.2%	7.8
HP (1,797)	7.7						8.1	8.0	6.0	2.8%	8.3
Lexmark (293)	6.5						7.4	6.9	—	3.1%	6.7
AVERAGE	7.3						7.9	7.6	6.0	3.7%	7.7
INK JET (ALL-IN-ONE) PRINTERS											
Brother (53)	7.0						7.2	7.0	—	15.1%	7.3
Canon (109)	7.8						7.9	8.0	—	9.2%	8.2
Dell (91)	7.5						8.0	7.7	—	2.2%	7.3
Epson (188)	7.7						8.0	7.9	—	6.4%	8.0
HP (1210)	7.9						8.0	8.0	5.8	5.7%	8.3
Lexmark (321)	7.2						7.7	7.3	—	5.6%	7.3
AVERAGE	7.5						7.8	7.6	5.8	7.4%	7.7
MONOCHROME LASER PRINTERS											
Brother (168)	8.2						8.5	8.5	—	4.2%	8.4
HP (802)	8.4						8.7	8.8	6.2	5.9%	8.9
Samsung (128)	8.0						8.4	8.3	—	3.1%	8.1
AVERAGE	8.2						8.5	8.5	6.2	4.4%	8.4
PHOTO PRINTERS											
Canon (234)	8.5						8.6	8.6	—	3.8%	8.7
Epson (291)	8.2						8.0	8.1	—	5.2%	8.5
HP (345)	8.1						8.3	8.2	—	3.2%	8.5
AVERAGE	8.3						8.3	8.3	—	4.1%	8.6
PORTABLE PRINTERS											
Canon (64)	8.1						8.2	8.2	—	7.8%	8.5
Epson (67)	7.6						8.1	7.7	—	3.0%	7.8
HP (194)	7.9						8.1	7.9	—	1.0%	8.2
Lexmark (60)	7.2						8.0	7.4	—	6.7%	7.3
AVERAGE	7.7						8.1	7.8	—	4.6%	7.9

RED denotes Readers' Choice. Except as noted, scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give the company a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this printer?" It is not the average of the other scores.

DVD±R/RW

HOT DEALS!

Components

Notebooks

TFT Displays

Plasmas

Printers

TOSHIBA Satellite A45-S121



Celeron 2.8GHz
With CD-RW/
DVD COMBO

- Microsoft Windows XP Home
- Intel Celeron 2.8GHz Processor
- 256MB PC2100 DDR Memory
- 40GB Hard Drive
- 15" XGA TFT Active Matrix Display
- CD-RW/DVD Combo Drive
- Integrated 32MB AGP Intel 852GM Graphics Controller
- Integrated Digital Audio, Direct 3D Sound
- Integrated V.90 56Kbps Modem
- Integrated LAN
- 10/100 Mbps NIC
- Weighs 7.7 Lbs.
- Dimensions:
13.2" Width x 1.9" Height x 11.75" Depth



The Satellite A45 Series with Microsoft Windows XP Home Edition provides a rich blend of power, performance and multimedia at a great value price. Don't be surprised to find lots of features at a great price on this Toshiba notebook PC. It has everything you need to stay productive and entertained without breaking your budget. The DVD-ROM/CD-RW drive is perfect for backing up files and burning CDs. Enjoy your favorite DVDs on the 15" screen, and blast MP3s through the built-in stereo speakers. Get online with the integrated Ethernet port and modem, and download tons of files to the 40GB hard drive. Hook up some peripherals and get started!

POWERED BY **DDR MEMORY** **CD-RW DVD COMBO DRIVE**
#T24-S121 **\$899⁹⁹**
ADD TO CART

*Factory Refurbished

TOSHIBA Satellite A75-S206



Pentium 4 2.8GHz
With CD-RW/
DVD COMBO

- Microsoft Windows XP Home
- Intel Pentium 4 2.8GHz Processor
- 512MB PC2700 DDR Memory
- 60GB Hard Drive
- 15.4" WXGA Widescreen TFT Display
- CD-RW/DVD Combo Drive
 - Integrated ATI Mobility Radeon 9000 Graphics Card
- Integrated Digital Audio, Direct 3D Sound
- Integrated V.90 56Kbps Modem
- Integrated Wireless LAN
- 802.11b/g Wireless Networking
- Weighs 8Lbs.
- Dimensions:
10.8" Width x 1.8" Height x 14.4" Depth



The Satellite A75 Series combines a host of multimedia features with a series of productivity applications to create a complete mobile computing experience perfect for PC digital media enthusiasts, young adults, families and consumers. Be productive! This system includes Microsoft Office OneNote, a digital note-taking program. Microsoft Works provides word processing, spreadsheet, calendar, and address book functions. Toshiba's research and development efforts are supported by the company's commitment to quality. Toshiba's ability to deliver the highest quality and best designed products has contributed to the company's leading position in mobile computing.

POWERED BY **DDR MEMORY** **CD-RW DVD COMBO DRIVE**
#T24-S206B **\$1199⁹⁹**
ADD TO CART

*Factory Refurbished

TOSHIBA Wireless Powerhouse!

P4 3.2GHZ CPU WITH HT TECHNOLOGY. 802.11B-G WIRELESS CONNECTIVITY

The Toshiba Satellite A65-S1762 boasts more speed and power than most of the higher-end desktop powerhouses, yet travels compact and light — ideal for the mobile executive. With a price tag that makes even the most budget conscious notebook buyer sit up and take notice, the Satellite A65 Series is fully equipped and ready to go for home and business users alike. This notebook features a 3.2GHz Mobile Intel Pentium 4 Processor, large 60GB hard disk drive and a half gig of fast DDR RAM — plenty of memory for users to create, edit and save their computing jobs quickly and easily.



Pentium 4 3.2GHz
With CD-RW/
DVD±RW

- Microsoft Windows XP Home
- Intel Pentium 4 3.2GHz Processor
- 512MB PC2100 DDR Memory
- 60GB Hard Drive
- 15" XGA TFT Active Matrix Display
- CD-RW/DVD±RW Combo Drive
- Integrated Graphics
- Integrated Wireless LAN
- Integrated V.92 56Kbps Modem
 - Integrated Digital Audio
 - Li-ion Battery
- Weight: 7.7 lbs
- 802.11 a+b Wireless Networking
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- Multimedia Keyboard
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With its fast, productive AMD Athlon XP 3000+ processor, a half-gig of lightning-quick DDR RAM memory and a huge 160GB hard drive, the T3025 cruises smoothly while effortlessly handling a variety of tasks, ranging from sophisticated, graphics-intensive programs to routine word processing. Boasting superb DVD±Drive and CD-ROM drives, this outstanding, feature-rich PC delivers an incredible array of entertainment possibilities! You can create your own customized music library, view DVD movies, check out photographs and store tons of digital data. All systems are optimized by the incomparable Microsoft XP Home operating system.

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eMachines T2885

CELERON 2.8GHz
With DVD-ROM/CD-RW Drive

- Intel Celeron 2.8GHz Processor
- 512MB DDR Memory
- 80GB Hard Drive
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Athlon XP-M 2400+
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- AMD Athlon XP-M 2400+ Processor
- 512MB DDR Memory
- 40GB Hard Drive
- 15.4" WXGA Widescreen Display
- CD-RW/DVD-ROM Combo Drive
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Windows XP Home/15.4" WXGA Screen
512MB RAM/60GB HD/CD-RW/DVD Combo



54g

Athlon 64 3000+
With CD-RW/DVD Drive

- Microsoft Windows XP Home
- AMD Athlon 64 3000+ Processor
- 512MB DDR Memory
- 60GB Hard Drive
- 15.4" WXGA Widescreen Display
- CD-RW/DVD-ROM Combo Drive
- Integrated 56Kbps V.92 Modem
- Integrated Fast Ethernet
- USB And Firewire Interface
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The eMachines M6805 brings full-bore, powerhouse performance to the notebook format. With its awesome 64MB ATI Mobility RADEON 9600 Graphics Controller and outstanding PC2001 Compliant AC'97 audio, the M6805 will make a huge splash at gaming conventions! And the M6805's 802.11g wireless LAN, gives you instant access to the Internet at hot spots worldwide. Plus, you'll be ready to take on the next generation of 64-bit software applications with the Mobile AMD Athlon™ 64 processor — the most advanced PC processor for notebook computing. The M6805 also includes 512 MB memory, a massive 60 GB hard drive, built-in Ethernet, 6-in-1 digital media reader, CD-RW/DVD combo drive and an ultra-wide 15.4" screen.

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Pentium 4 2.6GHz D220 Desktop PC

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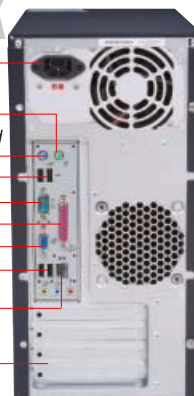
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- USB Ports
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- VGA Port
- USB Ports
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- PCI Slots



HP/Compaq D220

Pentium 4
CD-RW/DVD
Combo Drive

2.6GHz

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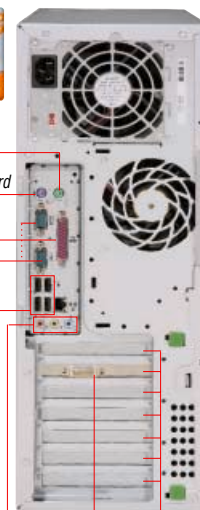
Pentium 4
DVD+RW Drive

3.0GHz

- Microsoft® Windows® XP Professional
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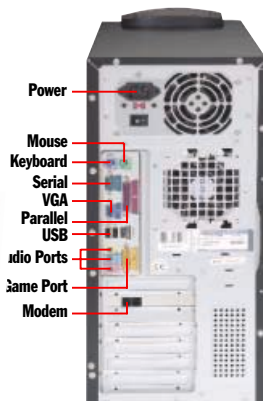


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- 4 USB 2.0 Ports
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- Mid-Tower ATX with 300 Watt Power Supply



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- 52x32x52 CD-RW Drive
- 16X DVD Drive
- 6 USB 2.0 Ports (2 Up front)
- 2 Firewire IEEE 1394 Ports
- GeForce FX5200 8X 128MB w/TV Out
- Onboard 6-Channel Audio
- 56K Fax Modem
- Logitech Internet Keyboard and Optical Mouse
- Mid-ATX Case with 350 Watt Power Supply
- Genuine Intel 865G Motherboard

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- 16x DVD±R/RW Dual Layer Drive
- 6 USB 2.0 Ports (2 Up front)
- 2 Firewire IEEE 1394 Ports
- GeForce FX5200 8X 128MB with TV Out
- Onboard 6-Channel Audio
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- DVD-ROM Drive
- 6 USB 2.0 Ports (2 Up front)
- 2 Firewire IEEE 1394 Ports
- ATI Radeon 9200 256MB Video with TV Out
- Onboard 6-Channel Audio • 56K Fax Modem
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- Integrated Sound
- Systemax Keyboard and Mouse
- Micro ATX Case with 300 Watt Power Supply

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- 256MB PC2700 DDR
- 80GB 7200RPM HD
- 52x32x52x CD-RW
- 4 USB 2.0 Ports (2 Up front)
- Integrated Video
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- Systemax Keyboard and Mouse
- Mid Tower ATX Case with 350 Watt Power Supply

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- 512MB PC2700 DDR
- 160GB 7200RPM HD
- 16x DVD±R/RW Dual Layer Drive
- 4 USB 2.0 Ports (2 Up front)
- GeForce FX5200 8X 128MB with TV out, Integrated Sound
- Logitech Keyboard and Systemax Mouse
- Mid Tower ATX Case with 350 Watt Power Supply
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S226-2604	LC26GD6U	26"	1366 x 768	800:1		26.1" x 21.9" x 11"	\$2,999.99
S226-3200	LC32G4U	32"	1366 x 768	800:1		38.6" x 22.3" x 12.1"	\$3,999.99
S226-3202	LC32GD44	32"	1366 x 768	800:1		31.3" x 25.1" x 12.1"	\$4,499.99
S226-3702	LC37GD4U	37"	1366 x 768	800:1		36.1" x 27.8" x 12.1"	\$5,999.99
S226-4502	LC45GD4U	45"	1920 x 1080	800:1		42.7" x 31.6" x 12.1"	\$7,999.99

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- 640 x 480 (VGA) Resolution
- Low reflection coated screen
- 500:1 Contrast Ratio
- 430 cd/m² Brightness
- 170 degree Viewing Angle
- Built in 181-Channel TV Tuner



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Item #	Model	Screen Size	Resolution	Contrast Ratio	Dimensions (w/Stand) (W x H x D)	Price
S226-1304	LC13S1U-W	13"	640 x 480	500:1	12.7" x 11.4" x 5.8"	\$449.99
S226-1504	LC15S1U-B	15"	640 x 480	500:1	14.3" x 12.6" x 6"	\$599.99
S226-1506	LC15S2U-S	15"	640 x 480	500:1	14.3" x 14.5" x 8"	\$649.99
S226-2020	LC20S1U-S	20"	640 x 480	500:1	18.6" x 15.9" x 6.7"	\$999.99
S226-2024	LC20S2U-S	20"	640 x 480	500:1	18.6" x 18.5" x 8.6"	\$1099.99

Panasonic TH-42PWD7UY 42" EDTV Plasma Television



Display Area: 42"
Aspect Ratio: 16:9
Contrast Ratio: 3000:1
Resolution: 1024 x 768
Unit Dimensions (WxHxD):
40.2" x 24" x 3.5"

JUST
\$2099⁹⁹

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Sharpest, Most Exciting Images For Your Home

The TH-42PWD7UY, Panasonic's newest 42" high definition plasma display panel, offers the industry's highest contrast and exceptional gradation and colorimetry, giving you the sharpest, most exciting images for your home theater or business display. New Features like an Advanced Real Black Drive System, flexible Picture-in-Picture Modes, and Super Real Gamma System combine to deliver the absolute cutting edge of plasma display innovation.

New Bounded Structure HD Panel

TH-42PWD7UY features a newly-developed Bounded Cell Structure panel in which wall-like ribs are used to wrap each individual cell. This dramatically improves both light-emitting efficiency and intensity. As a result, brightness level of TH-42PWD7UY is boosted by more than 40% compared with the previous TH-42PWD5UY model.

New Real Black Drive System

Reduces black level even further and achieves a greater than 3000:1 contrast ratio for the TH-42PWD7UY.

ADD TO CART

Item #	Description	Price
P333-4212	Panasonic TH-42PWD7UY 42" EDTV Plasma Television	\$2099.99
P333-4216	Panasonic Plasma Stand	\$159.99
P89-4216	Panasonic Peerless 42"-50" Flat Mount	\$159.99

Watch DVDs on the GO! from \$149⁹⁹



Malata's 5.6 inch TFT Portable DVD Player The industry leading engineers at Malata have created one of the great mobile entertainment products of the young millennium with this superb portable DVD player with 5.6-inch TFT display and built-in stereo speakers.

Malata DVD-50V 5.6" Wide Screen

- Plays DVD, CD, MP3, CD-RW
- Built-in Dolby Digital Decoder
- ESP Function • Remote Control

JUST **\$149⁹⁹**

ADD TO CART

Item #	Description	Price
M50-1000	Malata DVD-650V	\$149.99



The AudioVox D1620 slim portable DVD player features a built in high capacity rechargeable battery which provides a long life for those high distance trips, digital audio is provided through the built in speakers for a theater like sound.

AudioVox D1620 6.2" Wide Screen

- Plays DVD, VCD, CD, MP3
- Dolby Digital, DTS, Q-surround Sound
- 720 x 480 Resolution • Remote Control

JUST **\$199⁹⁹**

ADD TO CART

Item #	Description	Price
A299-1004	AudioVox D1620	\$199.99



The SD-P2600 portable DVD player is designed to take full advantage of the DVD format in both video and audio. The device offers a high-resolution 8.9-inch LCD screen (1,024 x 768) and Toshiba's exclusive direct digital solution, which sends the DVD information to the LCD driver directly from the MPEG decoder in its original format.

Toshiba SD-P2600 8.9" Wide Screen

- DVD, VCD, CD, MP3 Playback
- 1024x600 Resolution
- Built-in Dolby Digital and DTS
- Remote control

JUST **\$399⁹⁹**

ADD TO CART

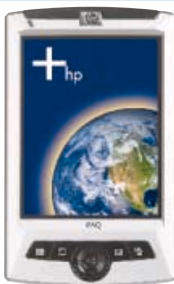
Item #	Description	Price
T24-9006	Toshiba SD-P2600	\$399.99

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hp iPAQ rz1710

- Mobile Media Companion**
- Samsung S3C2410 processor 203MHz
 - Microsoft® Windows® Mobile 2003 Second Edition for Pocket PC Professional
 - Up to 25MB user-available memory
 - 3.5" transfective screen with portrait and landscape modes
 - SDIO slot • 1000 mAh battery
 - Five-way navigation button, four application launch buttons
 - HP Image Zone

JUST
\$279⁹⁹

Check Web For Details!



hp iPAQ h4350

- HP iPAQ h4350 Pocket PC, with an integrated keyboard and built-in wireless capabilities including Bluetooth technology and WiFi (WLAN 802.11b), lets you access the Internet, e-mail and corporate data at home, at work, or on the go—a stylishly communications tool for the mobile professional.
- Intel Xscale Processor
 - 400MHz Speed
 - 64MB SDRAM Memory
 - 3.5" transfective TFT with 64,000 colors
 - Integrated Wi-Fi (IEEE 802.11b)
 - Integrated Bluetooth and IrDA

NOW JUST
\$449⁹⁹

Check Web For Details!

hp iPAQ h6315

Pocket PC/Phone

- Texas Instruments™ processor 168MHz
- Microsoft® Windows® Mobile 2003 for Pocket PC (phone edition)
- 64MB SDRAM, 64MB Flash ROM
- Quad-band GSM/GPRS, WLAN 802.11b, Bluetooth®, IrDA, and USB
- 3.5" transfective screen
- SDIO slot
- 1800 mAh battery

JUST
\$599⁹⁹

Check Web For Details!



hp iPAQ hx4700

- Intel® processor 624MHz
- Microsoft® Windows® Mobile 2003 Second Edition for Pocket PC (Premium)
- Up to 135MB user-available memory
- WLAN 802.11b, Bluetooth®, Fast IrDA, USB, and Serial
- 4" transfective VGA screen with portrait and landscape modes
- Integrated SDIO and CF slots
- 1800 mAh battery
- Touchpad navigation with mouse-like cursor

JUST
\$649⁹⁹

Check Web For Details!

Pocket PCs

SKU	Model	Processor	Battery	Slot	RAM	Operating System	WiFi	Price	Warranty	Extended Service Contract
H24-FA289A	iPAQ rz1710	203MHz	Li-Ion	SD	25mb	Pocket PC 2003	No	\$279.99	12-Month Replacement	\$44.99
H24-FA172A	iPAQ h4350	400MHz	Li-Ion	SD	64mb	Pocket PC 2003	Yes	\$449.99	12-Month Replacement	\$59.99
H24-FA239A	iPAQ h6315	168MHz	Li-Ion	SD	64mb	Pocket PC 2003	Yes	\$599.99	12-Month Replacement	\$99.99
H24-FA282A	iPAQ hx4700	624MHz	Li-Ion	CF/SD	135mb	Pocket PC 2003	Yes	\$649.99	12-Month Replacement	\$99.99

Get Portable With The World's Best GPS Units

MAGELLAN Roadmate 700



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\$1299⁹⁹

- True mobility easily transferred from car to car
- Exceptional GPS Accuracy and Reliability
- Built-in Tutorial
- Advanced points of interest database

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Item #	Description	Price
L251-980652-03	Magellan Roadmate 700	\$1299.99

GARMIN Street Pilot 2620

- StreetPilot® 2620 receiver with built-in GPS antenna
- Alphanumeric remote control
- External speaker with 12/24-volt adapter cable
- Features MapSource City Navigator



JUST
\$1199⁹⁹

CALL FOR LATEST PRICING

Item #	Description	Price
L251-010-00357-03	Garmin Street Pilot 2620	\$1199.99*
*Price After \$100 Mail in Rebate. Expires 1/15/05		

**NAVMAN PIN 100
Pocket GPS System plus PDA**

- Voice Prompting Navigation / Mapping and Route
- Includes word processor, spreadsheet, games, and an MP3 player
- Microsoft Windows Mobile 2003 for Pocket PC O/S
- 3.5" Color Transfective LCD Screen



JUST
\$499⁹⁹

CALL FOR LATEST PRICING

Item #	Description	Price
L251-AA005600	Navman PIN 100 Pocket GPS System	\$499.99

MAGELLAN Explorist 300

- Compact Mapping GPS, delivers like no other
- Built-in North American or European maps
- Barometer, Like carrying your own little weather station
- Choose from English, French, German, Spanish, Italian, Swedish, Finnish, Portuguese, Dutch or Norwegian.

JUST
\$199⁹⁹



ADD TO CART

Item #	Description	Price
L251-980771-03	Magellan Explorist 300	\$199.99

GARMIN GPSMAP® 60CS

- Electronic Compass: Displays accurate heading while standing still
- Barometric Sensor: Automatic pressure trend recording
- Internal Memory: 56 MB for storing map detail
- Geolocation Games: Virtual Maze, Nibbons, and Geko™ Smak



JUST
\$499⁹⁹

CALL FOR LATEST PRICING

Item #	Description	Price
L251-010-00322-30	Garmin GPSMAP® 60CS	\$499.99

NAVMAN iCN510 Compact Navigation System

- Slim design perfect for travel
- software includes the ability to import Points of Interests
- built-in rechargeable battery
- Easy to use touch screen interface



\$499⁹⁹

CALL FOR LATEST PRICING

Item #	Description	Price
L251-5100	Navman iCN510	\$499.99

PRINTERS: THIRD-PARTY PAPER

Do you use photo paper in your printer made by a company other than your printer's manufacturer?

		No	Yes
Canon	Overall printer rating	8.7	8.5
	Quality of photo output	8.8	8.7
Epson	Overall printer rating	8.2	7.9
	Quality of photo output	8.4	8.1
HP	Overall printer rating	8.3	8.1
	Quality of photo output	8.2	8.2

Scores are for color ink jets, ink jet all-in-ones, and photo printers less than one year old.
Results are limited to those companies with at least 50 responses in each category.
Scores are on a scale of 1 to 10, where 10 is best.

considering its better-than-average scores across the board last year.

Canon has taken the lead in the photo printer and our new portable-printer categories, both of which have heated up with the wide proliferation of digital cameras; HP has to settle for average in both categories. In fact, Canon was also the only manufacturer to receive better-than-average "overall rating" and "likelihood of recommending" scores in the photo printer category. Readers give Canon photo printers an *excellent* score in "quality of photo output." (Data not presented.)

The printer business has always worked much like the market for shaving equipment: Razors are cheap, but blades are expensive. The reader comments we received were littered with criticism about how much ink cartridges cost and how often they must be replaced. This trend is undoubtedly fueled by the increasing use of color and photo printers, especially as digital cameras and digital-imaging products have boomed in popularity. Printing photos quickly uses up expensive color ink cartridges.

"My major complaint about this printer is the price of ink cartridges; they're among the most expensive on the market," says reader Christine Richers from Greeley, Colorado, of her HP photo printer. That opinion was echoed by many users of both HP photo printers and color ink jets, though readers are upset about ink prices across the board. Lexmark, however, has far and away the lowest score—a 4.1, which doesn't even qualify as *good*. On the flip side, Brother and Canon get significantly better-than-average scores for ink (and toner) prices. It should be troubling to the industry, however, that Brother's survey-leading score is only a 6.2; the average among all vendors is a miserable 5.3. It's also worth noting that, among printers less than a year old, Canon continues its rise, scoring a signif-

icantly better-than-average 6.6 for its ink prices to HP's worse-than-average 5.2 (compare with an industry average of 5.4). It might also be troubling to the manufacturers, which make most of their money from consumables, to see that while satisfaction with print output drops off slightly among users of third-party inks, it's still respectably high. Third-party papers fare even better.

Lexmark printers don't do well in our survey, earning significantly worse-than-average scores in the majority of subcategories we evaluate. There were numerous other comments about Lexmark's unresponsive support. Lexmark's overall "technical support" score is worse than average, and its "overall reliability" score is significantly worse than average.

Dell, which is still relatively new to the printer business and has most of its printers and supplies made by other manufacturers, also gets worse-than-average "overall rating" and "likelihood of recommending" scores.

When it comes to support and reliability for older printers, HP definitely stands out. Many reader comments we received about older units praised HP print-

ers for their long-term reliability, and many readers cited that metric as the reason they wouldn't buy any other brand. "I purchased a newer HP printer over a year ago, but haven't used it yet," said one anonymous survey respondent with an HP color ink jet. "It's still in the box, stored in my garage, because [my] old printer is so reliable and refuses to call it quits." It's worth noting, however, that users score Canon printers less than a year old as being the most reliable of the bunch. Tune in next year to see how HP fights back. —Sebastian Rupley

Printers

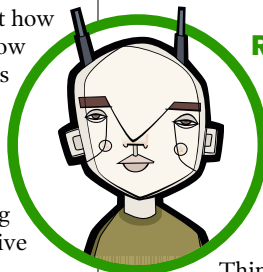


Canon

With its performance in the new, photo, and portable-printer categories, Canon joins HP at the top.

Hewlett-Packard

HP continues its 12-year streak of dominance, largely on the strength of its ink jet all-in-one, standard ink jet, and monochrome laser printers.



READERS' CHOICE

Home-Networking Routers

Think it doesn't matter whose router is the backbone for your home network? Our readers will tell you different. Nearly two-thirds of the people who responded to our survey use routers. And although they see few differences between many of the makers, they do rank one vendor head-and-shoulders above the rest: Only Linksys receives an "overall rating" score that's statistically better than the average—and it's significantly better at that. "I've tried several wireless routers," says Alan Buffington of Naples, Florida, in rating his new Linksys wireless router, "and this one has the best range and the best reliability."

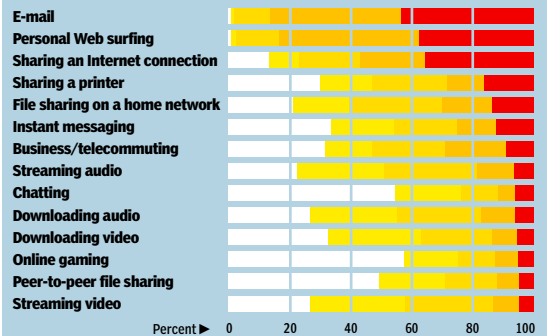
Readers also score one vendor slightly worse than the rest: Belkin. "The unit does not live up to the performance I expected and loses connection at least three times a day," Gary Patrick of Lafayette, California, says of his Belkin router. "I will be replacing the unit in the very near future." All other vendors receive good but unexceptional "overall rating" scores, hovering somewhere between 7.5 and 8.0.

What do readers like about Linksys? Just about everything, relative to its competi-

ONLINE ACTIVITY

How much of your time online is spent doing the following?

None Very little Some A lot All of it



Routers



Linksys

It's not even close in the router competition this year: Linksys outscores other makers overall and in nearly every subcategory—no matter how we slice the data.

D-link also does well on some measures, receiving the highest numerical scores for support. In some cases, D-Link's scores were statistically better than average.

Few other vendors really stand out. Dell, which actually seems to push other vendors' equipment more than its own on the Dell Web site, has the highest percentage of units needing repair and worse-than-average scores on "likelihood of recommending." Readers are least likely to recommend Microsoft routers, which is a good thing since the company has gotten out of the

network hardware market.

Netgear receives significantly worse-than-average scores for "technical support." And in "likelihood of recommending," D-Link, Netgear, and particularly Cisco (Linksys's parent company) score well.

Generally, wired routers still fare better on the survey than wireless models, scoring higher in "reliability" and "overall rating." One anonymous reader even complains that his wireless network malfunctions when he makes telephone calls from his cordless handset. Despite that, two-thirds of router owners surveyed now use wireless models, likely for the convenience such devices offer.

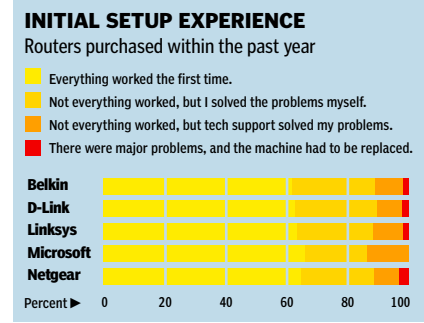
Our router survey also gives insight into the general makeup of readers' home networks and how they're put to use. Not surprisingly, the number one use for a router is to share Internet access over a home network. Eighty-seven percent of our respondents use it for this purpose. Seventy-seven

They give Linksys significantly better-than-average scores for "performance," "security," "user interface," "documentation," "overall reliability," and "likelihood of recommending." And in all but that last category, no other vendor scores nearly as high. Linksys scores are also high—if less so—in "technical support."

SURVEY RESULTS: HOME-NETWORKING ROUTERS

	OVERALL RATING ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)	OVERALL RELIABILITY	TECHNICAL SUPPORT	PERCENT NEEDING REPAIRS	LIKELIHOOD OF RECOMMENDING
ALL HOME-NETWORKING ROUTERS										
Belkin (275 responses)	7.5						7.8	6.7	2.9%	7.7
Cisco (56)	8.1						8.3	—	3.6%	8.6
Dell (65)	7.4						7.5	—	12.3%	7.1
D-Link (1,054)	7.7						8.0	6.8	4.6%	8.0
Linksys (2,525)	8.1						8.2	6.7	4.7%	8.6
Microsoft (185)	7.5						7.8	—	3.2%	7.0
Netgear (834)	7.8						7.9	5.7	4.6%	8.0
SMC Networks (164)	7.7						7.9	—	6.1%	7.4
U.S. Robotics (56)	7.7						7.7	—	8.9%	7.9
AVERAGE	7.7						7.9	6.5	5.7%	7.8
ROUTERS LESS THAN ONE YEAR OLD										
Belkin (162)	7.5						7.9	—	3.7%	7.6
D-Link (570)	7.8						8.1	6.8	4.2%	8.0
Linksys (1,143)	8.1						8.2	6.6	5.2%	8.6
Microsoft (92)	7.5						7.8	—	4.3%	7.1
Netgear (444)	7.9						8.0	5.5	2.9%	8.1
AVERAGE	7.8						8.0	6.3	4.1%	7.9
WIRED ROUTERS										
Belkin (90)	7.6						8.0	—	3.3%	8.0
D-Link (297)	7.8						8.3	6.7	2.7%	8.2
Linksys (864)	8.2						8.5	6.8	4.2%	8.7
Netgear (247)	7.9						8.1	—	5.3%	8.2
SMC Networks (59)	8.1						8.2	—	5.1%	7.7
AVERAGE	7.9						8.2	6.8	4.1%	8.2
WIRELESS ROUTERS										
Belkin (185)	7.4						7.7	—	2.7%	7.6
Dell (64)	7.4						7.5	—	12.5%	7.1
D-Link (757)	7.7						7.9	6.8	5.4%	7.9
Linksys (1,655)	8.0						8.1	6.7	5.0%	8.5
Microsoft (160)	7.5						7.8	—	3.1%	7.0
Netgear (585)	7.8						7.9	5.6	4.3%	7.9
SMC Networks (105)	7.4						7.8	—	6.7%	7.3
AVERAGE	7.6						7.8	6.3	5.7%	7.6

RED denotes Readers' Choice. Except as noted, scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give the company a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this router?" It is not the average of the other scores.



percent say they share local files, and 67 percent say they share access to printers.

Far fewer users actually connect printers directly to their routers. (If a printer is attached directly to a PC, you can still share it with other machines on the network.) Thirty-four percent of router owners attach printers to their home networks via Ethernet cables, and only 11 percent attach them wirelessly.

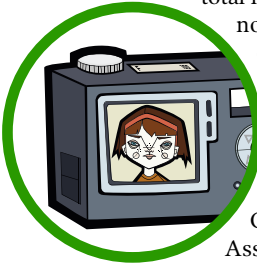
Just 6 percent of our respondents attach a VoIP device to their router, but this is actually quite impressive, considering how young the VoIP market is. Indeed, many routers are now specifically designed for VoIP, such as the Linksys models equipped with embedded Net2Phone technology.

Routers are fast becoming ubiquitous among our readers—even if you don't have a network, they can provide an inexpensive layer of security between you and the outside world—and, for the most part, they work like they're supposed to. Overall, our survey shows that this is especially true of Linksys models.—Cade Metz

READERS' CHOICE

Digital Cameras

There's nothing hotter than digital cameras. Market research predictions for their total holiday sales are astronomical; the number one planned consumer electronics gift item for this year is the digital camera, displacing DVD players, according to the Consumer Electronics Association. Our survey bears this out: 25 percent of respondents who own a digital camera plan to replace it within the next year. Camera makers are racing to stake out positions in the many niches of this rapidly expanding market. Our readers show a corresponding level of enthusiasm about their cameras in this survey. But they also share some camera gripes, especially when it comes to speed and battery life.



Evaluating cameras has come to mean focusing on specific product categories; this year, our survey includes analyses of budget, compact, ultracompact, enthusiast, superzoom, and digital SLR (D-SLR) subcategories.

We award Canon our Readers' Choice for its consistently high scores. The company, along with Nikon, earns the highest "overall rating" score. Canon gets the highest "overall reliability" score, and it fares better in more subcategories, which gives it the edge over Nikon, whose products also need more repairs than Canon's. Both companies' D-SLRs receive high scores; but in this category Nikon holds the lead, likely driven by the release in 2004 of the affordable D70, a slightly higher-end competitor of the very popular Canon Digital Rebel, which shipped late last year. Sony and Olympus also score well in the overall

DIGITAL CAMERA: REPLACEMENT

Why are you planning on replacing your current digital camera?

I want a camera that's higher resolution.	70%
I want a camera that's faster.	47%
I want a camera that takes better pictures.	40%
I want a camera with more features.	40%
I want a camera that's smaller.	21%
I want a camera that's easier to use.	8%
I want a camera that's more reliable.	7%
I want a camera that's hipper.	4%
I have another reason.	20%

Results represent only respondents who say they plan to replace their camera within the next year.

Multiple choices are allowed, so total does not equal 100 percent.

table, but not quite as strongly as Canon in the subcategories. Although HP has positioned much of its momentum behind digital imaging, its "overall rating" score in the digital camera category is tied for last with Toshiba (which currently does not even sell cameras in the U.S., having recently pulled out of the market). HP also receives a particularly low "likelihood of purchasing again" score.

Budget models remain an important category. Canon, Kodak, and Olympus earn the best satisfaction scores for budget cameras, and along with Fujifilm, they get high "ease-of-use" scores. But Kodak cameras receive the highest "ease-of-use" score for budget cameras—in the category

Digital Cameras



Canon

Check the subcategory you're shopping for to be sure, but Canon scores the best overall and very well in many subcategories.

where that metric arguably matters most. On the other hand, budget-camera buyers also care about technical support, and Kodak's rating trails in that area.

Size matters for many camera users, and many of them tote a digital camera at all times. Canon and Sony receive impressive

SURVEY RESULTS: DIGITAL CAMERAS

	OVERALL RATING ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10)	EASE OF USE	OVERALL RELIABILITY	TECHNICAL SUPPORT	PERCENTAGE NEEDING REPAIR	LIKELIHOOD OF RECOMMENDING
ALL DIGITAL CAMERAS											
Canon (1,351 responses)	8.3						8.1	8.7	7.1	4.1%	8.7
Casio (96)	7.5						7.9	8.0	—	3.1%	7.5
Fujifilm (502)	7.4						7.8	8.0	—	7.6%	7.7
HP (343)	6.8						7.6	7.5	—	6.4%	7.3
Kodak (880)	7.4						8.1	8.0	5.9	5.2%	7.8
Konica Minolta (240)	7.8						7.9	8.3	—	7.9%	7.9
Nikon (692)	8.2						7.8	8.6	7.2	7.4%	8.6
Olympus (992)	7.9						7.6	8.3	6.4	4.4%	8.2
Panasonic (86)	7.8						7.9	8.3	—	7.0%	7.9
Pentax (94)	8.0						8.1	8.4	—	4.3%	8.1
Sony (1,057)	7.9						8.0	8.4	6.5	4.0%	8.4
Toshiba (66)	6.8						7.2	7.3	—	9.1%	6.4
AVERAGE	7.6						7.8	8.2	6.6	5.9%	7.9
DIGITAL CAMERAS LESS THAN ONE YEAR OLD											
Canon (598)	8.5						8.3	8.8	—	2.7%	8.9
Fujifilm (180)	7.8						8.1	8.3	—	3.9%	8.2
HP (124)	7.1						7.7	7.7	—	6.5%	7.5
Kodak (311)	8.0						8.4	8.4	—	2.9%	8.3
Konica Minolta (126)	8.0						8.1	8.5	—	7.1%	8.2
Nikon (270)	8.6						8.1	8.8	—	5.2%	8.9
Olympus (270)	8.1						7.9	8.4	—	3.0%	8.4
Panasonic (51)	8.4						—	8.6	—	5.9%	8.4
Pentax (53)	8.1						8.1	8.6	—	3.8%	8.1
Sony (353)	8.3						8.3	8.7	—	2.0%	8.7
AVERAGE	8.1						8.1	8.5	—	4.3%	8.4
BUDGET DIGITAL CAMERAS											
Canon (60)	6.9						7.2	7.6	—	3.3%	8.1
Fujifilm (127)	6.5						7.6	7.4	—	3.9%	7.0
HP (154)	6.1						7.3	7.1	—	6.5%	6.9
Kodak (199)	6.7						7.8	7.5	—	7.0%	7.3
Olympus (94)	6.7						7.3	7.3	—	4.3%	7.4
Sony (72)	6.6						7.3	7.4	—	4.2%	7.7
AVERAGE	6.6						7.4	7.4	—	4.9%	7.4

RED denotes Readers' Choice. Except as noted, scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this digital camera?" It is not the average of the other scores.

SURVEY RESULTS: DIGITAL CAMERAS

- Significantly better than average*
- Better than average**
- Worse than average**
- Significantly worse than average*

	OVERALL RATING ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10)	EASE OF USE	OVERALL RELIABILITY	TECHNICAL SUPPORT	PERCENTAGE NEEDING REPAIR	LIKELIHOOD OF RECOMMENDING
COMPACT DIGITAL CAMERAS											
Canon (390)	8.0 ○						8.0	8.4 ○	—	3.6%	8.5 ○
Fujifilm (96)	7.3						7.9	7.8	—	10.4%	7.6
HP (65)	7.1						7.6	7.7	—	4.6%	7.4 ○
Kodak (225)	7.5						8.2 ○	8.0	—	4.0%	7.8
Nikon (145)	7.4						7.7	8.2	—	4.8%	8.0
Olympus (203)	7.6						7.8	8.1	—	3.4%	8.0
Sony (203)	7.7 ○						8.0	8.3 ○	—	2.6%	8.3 ○
AVERAGE	7.5						7.9	8.1		4.8%	7.9
ULTRACOMPACT DIGITAL CAMERAS											
Canon (137)	8.4						8.4	8.7	—	4.4%	8.8 ○
Konica Minolta (62)	8.0						8.4	8.5	—	6.5%	8.0 ○
Sony (82)	8.3						8.6	8.8	—	6.1%	8.7
AVERAGE	8.2						8.5	8.7		5.6%	8.5
ENTHUSIAST DIGITAL CAMERAS											
Canon (435)	8.3 ○						8.0 ○	8.8 ○	—	3.2%	8.9 ○
Fujifilm (117)	7.8						7.8	8.4	—	8.5%	7.8
HP (52)	7.4 ○						7.8	7.9	—	9.6%	7.7
Kodak (219)	7.7						8.2 ○	8.1 ○	—	5.9%	7.9 ○
Konica Minolta (69)	7.8						7.7	8.4	—	8.7%	7.9
Nikon (267)	8.2 ○						7.5 ○	8.5	—	9.7%	8.5 ○
Olympus (332)	8.2 ○						7.7	8.6	—	6.0%	8.5 ○
Sony (345)	8.2 ○						8.1 ○	8.7 ○	—	3.2%	8.6 ○
AVERAGE	8.0						7.8	8.4		6.9%	8.2
SUPERZOOM DIGITAL CAMERAS											
Canon (60)	8.2						8.2	8.5	—	3.3%	8.5
Fujifilm (54)	8.0						8.1	8.4	—	7.4%	8.3
Kodak (105)	8.2						8.5 ○	8.6	—	3.8%	8.3
Olympus (217)	8.2						7.6	8.5	—	3.2%	8.2
Sony (117)	8.3						8.2	8.6	—	4.3%	8.5
AVERAGE	8.2						8.1	8.5		4.4%	8.3
DIGITAL SLR CAMERAS											
Canon (241)	9.0						8.4	9.1		5.4%	9.3
Nikon (163)	9.2						8.6	9.3		9.2%	9.5
AVERAGE	9.1						8.5	9.2		7.3%	9.4

Except as noted, scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give the company a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this digital camera?" It is not the average of the other scores in this table.

scores across the board for their ultracompact models as well as top "overall rating" scores for compact cameras.

Numerous respondents are unhappy with how long it takes for their cameras to start up, or boot—a known downside of many digital cameras. They are also irritated with *recycle times* (the time between

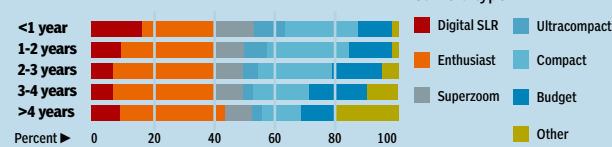
shots). Toshiba cameras get the lowest "overall rating" score for "speed," while Konica Minolta cameras earn the top spot in that area with a significantly better-than-average score.

There aren't many technologies fragmenting into more subcategories than digital cameras. Choosing the right category can have as much

to do with your satisfaction level as choosing the right camera within that category, so select carefully.

—Sebastian Rupley

AGE OF CAMERA



READERS' CHOICE

Cell Phones

Our Readers' Choice awards for mobile-phone service providers were easy to pick: Verizon Wireless and pay-as-you-go carrier Virgin Mobile have consistently better scores than the other providers overall and in many drill-down areas. Verizon excels in call quality and coverage, and Virgin has particularly good scores, relative to the competition, for fees charged and customer service. Readers are most likely to recommend these services.



Choosing the best handset brand is more difficult. Satisfaction with a given brand of phone can vary significantly by provider. Some companies, such as Nokia, have consistent "overall rating" scores for their phones, regardless of carrier. LG, on the other hand, is one of the top-rated phones with Verizon but is much less popular among Cingular Wireless users.

Because of this variability, we award Readers' Choices in handsets by each service. Nokia's phones do slightly better than the rest on AT&T Wireless and win, but on Cingular the nod goes to Motorola. Sanyo and palmOne have the top phones for Sprint PCS. It's more neck-and-neck on T-Mobile. Samsung wins, because it tends to have the highest scores. But the differences aren't statistically significant. They are, however, with Verizon where Samsung and LG lead the pack.

As we drilled into the data, we saw other interesting trends. Verizon customers seem more pleased with the service, scoring it a 7.4, than with the phones (7.1). On the other hand, Sprint users aren't nearly as pleased with their service, giving it a worse-than-average 6.7, but scoring the phones a 7.2. Two of the top-rated phone brands overall, palmOne—whose phones double as PDAs—and Sanyo, are mainly used by Sprint customers. The majority of readers with palmOne phones use them on Sprint's network and nearly all of the Sanyo phones are used on Sprint.

Among providers, Verizon and Virgin Mobile are followed by T-Mobile. AT&T Wireless brings up the rear, just behind Cellular One and Sprint. (Some possible good news for AT&T users: The company was recently bought by middle-of-

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SURVEY RESULTS: CELL-PHONE HANDSETS

- ⊕ Significantly better than average*
- ⊙ Better than average**
- ⊖ Worse than average**
- ⊖ Significantly worse than average*

	OVERALL RATING ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)	SOUND QUALITY	BATTERY LIFE	MENU NAVIGATION	TECHNICAL SUPPORT	REPAIRS	PERCENT NEEDING REPAIRS	LIKELIHOOD OF RECOMMENDING PHONE	OVERALL RATING ¹ OF SERVICE ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)	COVERAGE WITHIN HOME AREA	CALL QUALITY WITHIN HOME AREA
ALLTEL																					
Motorola (127 responses)	7.4 ⊙						7.3	6.3	6.7	—	—	20%	7.8	7.2						7.6	7.7
Nokia (53)	6.8						7.2	6.9	6.9	—	—	8%	7.4	6.7						7.4	7.4
AVERAGE ²	7.1						7.3	6.6	6.8	—	—	14%	7.6	7.0						7.5	7.5
AT&T WIRELESS																					
Motorola (213)	6.9						6.9	6.9	6.8	—	—	14%	7.4	6 ⊙						6.1 ⊙	6.3 ⊙
Nokia (620)	7.1						7.1	7.1	6.9 ⊙	5.6	5.5	9% ⊙	7.4 ⊙	6.6 ⊙						6.9 ⊙	6.9 ⊙
Samsung (50)	7.1						—	—	6.6	—	—	14%	7.4	6.5						—	6.6
Sony Ericsson (95)	6.8						6.9	6.8	6.5	—	—	11%	6.6 ⊙	6.4						6.5	6.7
AVERAGE ²	7.0						7.0	6.9	6.7	5.6	5.5	12%	7.2	6.4						6.5	6.6
CELLULAR ONE																					
Nokia (66)	6.6						6.4	6.7	6.6	—	—	18%	6.7	6.5						5.9	6.3
CINGULAR WIRELESS																					
LG (52)	6.1 ⊙						6.4 ⊙	6.7	6.3	—	—	12%	6.0 ⊙	5.9 ⊙						6.0	5.9 ⊙
Motorola (269)	7.3 ⊙						7.2	7.3	6.9	6.5	—	13%	7.7 ⊙	6.9 ⊙						6.8	7.0
Nokia (423)	6.9						7.0	7.1	6.7	5.8	5.4	14%	7.4 ⊙	6.8						6.8	7.0 ⊙
Samsung (83)	7.3						7.3	7.8 ⊙	7.0	—	—	13%	7.3	6.6						6.7	6.7
Sony Ericsson (109)	7.0						7.4	7.3	6.8	—	—	17%	7.0	7.0 ⊙						7.0	7.2 ⊙
AVERAGE ²	6.9						7.1	7.2	6.7	6.2	5.4	14%	7.1	6.7						6.7	6.8
NEXTEL COMMUNICATIONS																					
Motorola (221)	7.0						7.1	6.1	6.4	6.1	—	20%	7.4 ⊙	6.7						6.4	6.8
Nextel (77)	6.7						6.8	6.1	6.6	—	—	21%	6.4	6.5						6.1	6.3
AVERAGE ²	6.8						7.0	6.1	6.5	6.1	—	20%	6.9	6.6						6.3	6.5
SPRINT PCS																					
Nokia (68)	7.0						6.9	6.8	6.4 ⊙	—	—	7% ⊙	7.4	6.5						6.5	6.5
palmOne (55)	8.4 ⊙						7.8	7.6 ⊙	8.3 ⊙	—	—	36% ⊙	8.5 ⊙	7.1						7.3	7.4
Samsung (379)	7.1						7.2	6.5	6.9 ⊙	4.9	5.3	19%	7.1 ⊙	6.6 ⊙						6.5 ⊙	6.8 ⊙
Sanyo (255)	7.6						7.5	7.4 ⊙	7.3	—	—	7% ⊙	7.5	7.0						7.2 ⊙	7.3
Sprint (70)	7.1						7.3	6.8	6.9	—	—	10%	6.9 ⊙	6.9						7.2	7.4
AVERAGE ²	7.5						7.4	7.0	7.1	4.9	5.3	16%	7.5	6.8						6.9	7.1
T-MOBILE																					
Motorola (147)	7.2						7.4	7.1	6.7	—	—	16%	7.5	7.2						7.0	7.1
Nokia (219)	7.1						7.2	7.0	7.1	—	—	12%	7.5	7.1						7.1 ⊙	7.2 ⊙
Samsung (122)	7.4						7.5	7.2	7.2	—	—	7% ⊙	7.6	7.2						6.9	7.0
Sony Ericsson (89)	6.8						7.1	7.1	7.0	—	—	18%	6.9	6.8						6.0 ⊙	6.3 ⊙
AVERAGE ²	7.1						7.3	7.1	7.0	—	—	13%	7.4	7.1						6.7	6.9
TRACFONE																					
Nokia (99)	6.9						7.6	7.1	6.7	—	—	6%	7.4	6.9						7.6	7.7
VERIZON WIRELESS																					
Audiovox (151)	6.9						7.6	6.9	6.5	—	—	9% ⊙	6.7 ⊙	7.6						7.5	7.5
Kyocera (174)	6.9						7.4	6.3	6.7	7.0	—	20%	6.9 ⊙	7.5						7.6	7.5
LG (578)	7.3 ⊙						7.6 ⊙	6.8	6.9 ⊙	6.3	6.3	15%	7.4 ⊙	7.6						7.6	7.6
Motorola (537)	7.0						7.3	6.3 ⊙	6.8	6.7	6.7	22% ⊙	7.5 ⊙	7.3 ⊙						7.3	7.3
Nokia (120)	6.9						7.2	6.6	6.6	—	—	13%	7.4	7.2						7.3	7.3
Samsung (218)	7.3 ⊙						7.6	6.8	7.1 ⊙	—	—	11%	7.3	7.6						7.7	7.8 ⊙
Verizon (171)	7.1						7.2	6.6	6.7	6.7	—	15%	7.4	7.4						7.5	7.4
AVERAGE ²	7.0						7.4	6.6	6.8	6.7	6.5	15%	7.2	7.5						7.5	7.5

RED denotes Readers' Choice. Except as noted, scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give the company a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this handset?" It is not the average of the other scores in this table. ²Includes only handset manufacturers with 50 or more responses for this provider. The average is the average of these handset manufacturers for these services and may not be the same as the service's average when all handsets are included. Includes only service providers for whom we had 50 or more responses for 2 or more handset manufacturers.

SURVEY RESULTS: CELL-PHONE SERVICE PROVIDERS

	OVERALL RATING ¹	POOR (1.0-2.4)	FAIR (2.5-4.4)	GOOD (4.5-6.4)	VERY GOOD (6.5-8.4)	EXCELLENT (8.5-10.0)	FEES	PLAN OPTIONS	CHOICE OF HANDSETS	CUSTOMER SERVICE	TECHNICAL SUPPORT	COVERAGE WITHIN HOME AREA	CALL QUALITY WITHIN HOME AREA	VOICE MAIL	LIKELIHOOD OF RECOMMENDING
Alltel (243 responses)	7.0						5.9	6.7	6.4	6.5	5.8	7.4	7.5	7.2	7.2
AT&T Wireless (1,154)	6.4						5.9	6.5	6.5	6.3	5.6	6.6	6.7	7.1	6.5
Cellular One (137)	6.2						5.9	6.4	6.0	6.2	5.6	5.9	6.3	6.9	6.0
Cingular Wireless (1,008)	6.8						6.0	6.9	6.5	6.4	5.6	6.8	7.0	7.2	7.0
Nextel (319)	6.7						5.4	6.4	6.3	6.5	5.9	6.4	6.7	7.2	6.6
Sprint PCS (980)	6.7						6.1	6.8	6.9	6.1	5.5	6.8	7.0	7.5	6.7
T-Mobile (683)	7.1						6.7	7.3	6.9	7.1	6.5	6.8	6.9	7.4	7.2
TracFone (148)	6.9						6.9	7.1	5.3	6.3	6.3	7.5	7.6	6.6	7.3
U.S. Cellular (122)	6.8						6.0	6.4	6.2	6.6	—	6.8	7.1	7.1	6.9
Verizon Wireless (2,042)	7.4						5.9	6.8	6.8	7.0	6.7	7.5	7.5	7.5	7.8
Virgin Mobile (102)	7.4						7.3	7.2	6.3	7.8	—	7.4	7.4	7.4	7.6
AVERAGE	6.8						6.2	6.8	6.4	6.6	5.9	6.9	7.1	7.2	7.0

RED denotes Readers' Choice. Scores are on a scale of 1 to 10, where 10 is best. A dash indicates that we do not have enough survey data to give the company a score. * At least 2 confidence intervals from the average. ** 1 confidence interval from the average. ¹The "overall rating" score is based on answers to the question "Overall, how would you rate this service provider?" It is not the average of the other scores in this table.

the-road player Cingular. The companies will merge their networks over the next six months.)

On the whole, readers are slightly more content with their handsets than with their phone services. Handsets receive an average "overall rating" score of 7.1 (data not presented), and services get a 6.8. Where services are concerned, people are particularly critical of the technical support offered when things go wrong. And as you might have guessed, they're not happy about the fees either.

Readers seem satisfied with the basic design of today's cell phones. They scored "sound quality," "earpiece volume," and "address books," above 7.0. Scores were nearly as good for "speakerphone features," "battery life," "keypads," "menu navigation," and "overall comfort." Interestingly, phones on the Verizon network, which uses CDMA, tend to have worse battery life than their competitors.

Of all the handsets readers rate, about 22 percent require technical support, and about 14 percent eventually need repairs. Both numbers are high. In comparison, this year's survey reveals that repairs are needed on less than 6 percent of cameras, printers, and routers. Clearly, phones are either less durable or suffer more knocks and dings because of their portable nature.

Readers are more critical of their service providers than their phones. Reasonably pleased with call quality in their home areas and with voicemail features, they score each above a 7.0, but scores dip below 7.0 for almost every other aspect of

phone service. There are small grumbles about call quality outside home areas. And readers generally wish they had more choices when it comes to service plans.

The grumbles get louder when it comes to "handset choices," "customer service," "fees," and "technical support." All score a 6.6 or below, and "technical support" scores an unimpressive 5.9 overall.

"I had to make several phone calls to finally get to someone who could help with my problem," says T-Mobile customer Irwin Siegel of Staten Island, New York. "And they did not keep their word on how long it would take to ship a replacement to me."

Also worth noting is that readers are more likely to call about service problems than handset problems. Nearly 40 percent of respondents make at least one call to their provider for technical sup-

port with their service.


When it comes to "call quality" and "coverage," readers are most upset with AT&T, Cellular One, and Cingular. In these areas, AT&T scores significantly worse than average across the board. The only provider whose call quality and coverage readers really rave about is Verizon, though they also give decent scores to Alltel, TracFone, and Virgin. That said, Verizon receives one of the worst scores for "fees," alongside Nextel. Unlike the other providers, Virgin and TracFone offer only prepaid service.

In terms of "customer service" and "technical support," AT&T, Sprint, and to a lesser degree Cingular are the main targets of criticism. "Customer (dis)service at AT&T Wireless is horrific," says Lowell Markins from Clover, South Carolina. "Sometimes, I would be on hold in excess of 30 minutes just waiting to speak to a human being."

Readers are critical of specialized tools such as e-mailing, Web browsing, and gaming—a sign that these features are still maturing. All receive average scores of 6.5 or below, with Web browsing and gaming below 5.4. Carol Greenstone of Chatsworthy, California, sums it up when she says, "Web browsing is a waste on this phone," speaking about her experiences with her Samsung handset using T-Mobile's service.

This section of the survey may be more complicated than the rest, but so are your choices. Our readers know their stuff, though, and their opinions should be a good guide when you're buying a cell phone and choosing a service.—CM

Cell Phones



Service Provider: Verizon
Verizon dominates in every category but "fees" and "plan options."

Service Provider: Virgin Mobile
For the budget conscious, Virgin is the clear winner.

Handsets:
On AT&T Wireless, **Nokia**; on Cingular Wireless, **Motorola**; on Sprint PCS, **palmOne** and **Sanyo**; on T-Mobile, **Samsung**; on Verizon Wireless, **LG** and **Samsung**.



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A No-Hassle Server

Simple networking in one box, that's what a new generation of appliances promises. Is one right for your small business? We explore your options.

By OLIVER KAVEN & DAVIS D. JANOWSKI

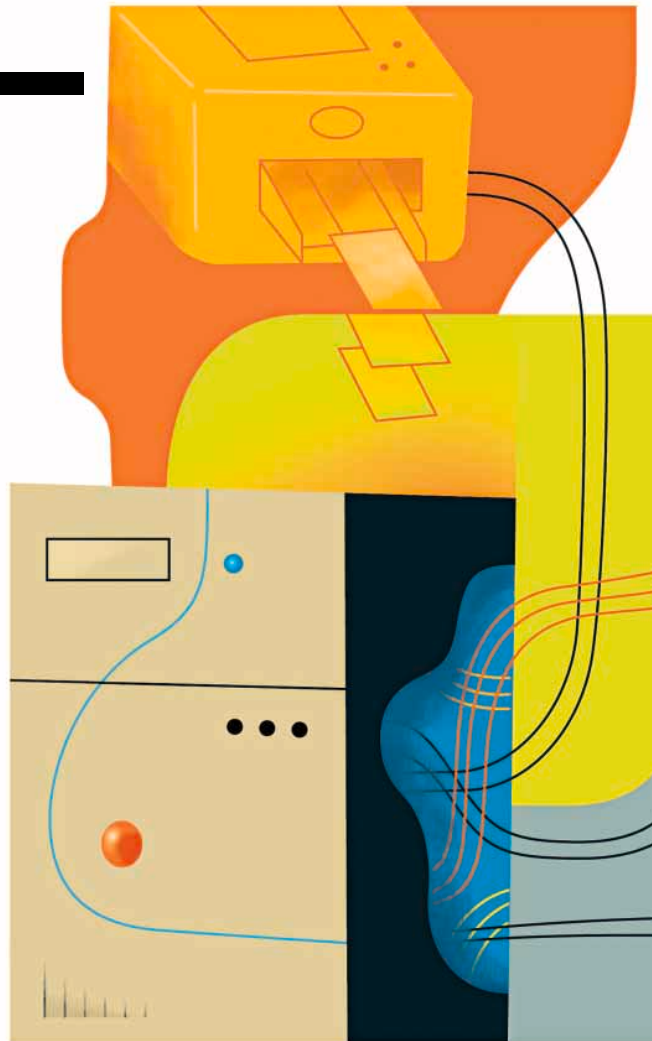


ILLUSTRATION BY DOUG ROSS

So you're an entrepreneur or small business owner just getting started. Or perhaps your business is already in motion and you're realizing that SneakerNet and Yahoo! Mail just aren't cutting it anymore. You need a network, but what's the right way to go?

You have several options but need to weigh a few things before you can decide. A lot depends on the type of company you are, what kind and volume of network traf-

fic you expect to have, what types of applications you need to use, and what your resources are, budgetwise and IT-wise. Once you've considered all the relevant circumstances, you'll know which of the three main options—a server appliance, a dedicated server, or a hosted service—suits your business best.

ALL-IN-ONE SERVER APPLIANCES

If you have a small business of fewer than 50 people, very basic networking needs, and little IT expertise, we believe a server appliance is the best answer. These all-in-one solutions made a splash a few years ago, though the idea never quite caught on. A new crop of appliances has reinvented the model, however, bringing greater simplicity to their configuration and maintenance and a higher level of sophistication to their interface design. In turnkey fashion, server appliances can quickly provide a host of core applications on a network.

Our roundup focuses on three server

appliances: the Axentra Net-Box SOHO 400, the EmergeCore IT-100, and the Net Integrator Mark I. All three offer the following core network services: a file server for sharing files with coworkers on the local network, an SMTP e-mail server (which often includes mail retrieval using POP3 or IMAP—two other common mail protocols to be aware of), a Web server for intranet and public Web pages, an FTP server for sharing larger files with people not on your network, and a DNS server for resolving local host names on your network into IP addresses.

The server appliances reviewed here include stateful packet inspection or NAT-based firewalls. They can also supply integrated directory services and authentication, so users can take advantage of several services without constantly having to reauthenticate.

For value-added resellers (VARs) and system integrators, server appliances are an attractive option because they're a small,

in this story

- 132** Axentra Net-Box SOHO 400 ●●●●○
- 132** EmergeCore IT-100 ●●●●○
- 133** Net Integrator Mark I ●●●●○
- 132** Scorecard
- 133** Editors' Choice
- 133** Performance Tests
- 134** Running Windows SBS 2003



portable solution that's easy to set up and maintain for their customers. In fact, we had each of the three appliances up and running in less than an hour. That type of performance can make a consultant, integrator, or VAR look like a miracle worker.

APPLIANCE CONSIDERATIONS

A few words of caution: Of these three appliances, only the Net Integrator device offers fail-over or an easy restore solution in the unit itself. Guaranteeing your network a speedy recovery with the other two products means having either a second device in the closet or a consultant who can bring one to the rescue.

Although most server appliances include a firewall, we strongly suggest that you add a second firewall to your network. We believe it's risky to hold all your security and data in the same box; a separate firewall should exist on the perimeter of your network to block in-

more on the web

Visit <http://go.pcmag.com/serverappliances> for a detailed summary of features and guidance on outsourced services.

truders and harmful content before it actually hits the system where your company's critical data is stored.

Another key to safeguarding your data is backing it up regularly. Make sure that you understand how your appliance's internal backup application works. You may choose to attach a USB hard drive to hold your backed up data, because it's perhaps the easiest solution. But whatever method you choose—whether external hard drive, tape, or DVDs—we strongly recommend that you keep a recent copy at an off-site location. A fire or other disaster befalling your office will certainly not spare the backup drive sitting next to your server.

WHEN THEY DON'T MAKE SENSE

So, who are server appliances not right for? For starters, businesses whose needs are farther ranging and require a mix of specialty third-party applications—say a CRM package or design software—that must be served up via the network to multiple employees. It's not that you can't run such applications on appliances but that they're built with simplicity in mind. Because of this, they're largely locked down so other applications won't conflict with their core duties. They're also a poor fit for companies that plan to host a full-blown Web server and Web site. Heavy Web traffic will max out the capacity of an appliance quickly.

Finally, companies with more than 50 employees, or smaller companies that ex-

pect to grow significantly in the near term, may outgrow an appliance sooner rather than later.

For all of these types of companies, two other options make more sense: the traditional route of purchasing the application software and running it yourself on dedicated server hardware, or using an online service to deliver these applications.

DEDICATED SERVERS, OUTSOURCING

If you decide to dedicate an inexpensive server to these applications, just make sure you have the IT or consultant resources required. A server will be more complex to set up and maintain than an appliance, and you'll also need to have the budget to cover the costs of the server's OS.

Dedicated servers come in all shapes and sizes, whether desktop tower models or rack-mountable. Multidrive units provide fail-over in case a drive fails. And while a server running a Microsoft operating system ensures that you have the largest number of third-party applications available to you, the many flavors of Linux continue to gain in popularity.

Outsourcing is another appealing option because it hands off the IT headaches to someone else, and unlike with purchasing and hosting your own software applications, there's typically no up-front license fee. But there is almost always a start-up cost, which varies widely (\$50 to \$1,000), to cover setup and front-end customization. You then pay a monthly fee, usually with a one-year contract.

If you're leaning toward outsourcing, make sure you ask vendors how you can get your data if their system goes down. Also ask whether there is a client-side application that can be used off-line.

For an overview of specific service options available to small businesses, go to <http://go.pcmag.com/serverappliances>. Also see our stories "Small-Business Survival Guide" (November 30) and "Business IT: Rent or Buy?" (October 19).

For more on the dedicated server approach—specifically, Microsoft Windows SBS 2003—see our sidebar on page 134.

The reviews that follow should help you decide which appliance suits you best.



ONLY THE NET INTEGRATOR (center) resembles a beefy tower server.

ALL REVIEWS BY OLIVER KAVEN

Axentra Net-Box SOHO 400

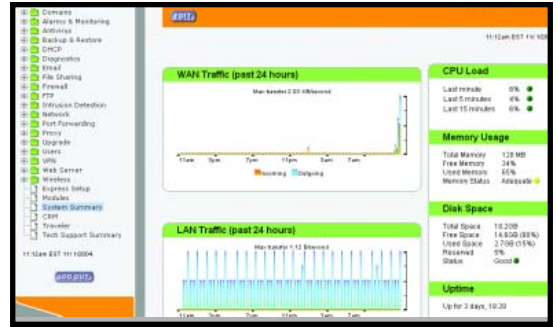
AMD Sempron 2600+ processor, 512MB of RAM, single 200GB nonremovable hard drive, \$899 list. Axentra Corp., www.axentra.com. ●●●●○

Axentra has taken a user-friendly approach with the Axentra Net-Box SOHO 400, an inexpensive desktop-size appliance for small businesses. This turnkey solution offers a browser-based interface, and it's also the only device here available in retail stores.

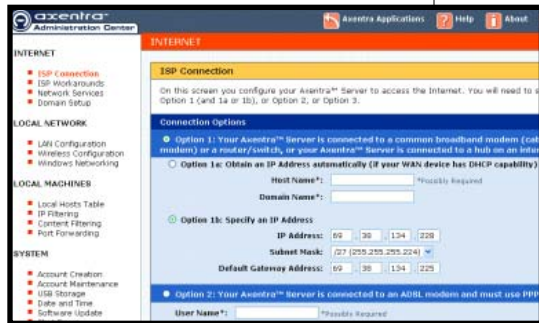
Experienced network administrators, however, may feel frustrated that the

security features, Axentra has since added antivirus and a site-to-site VPN, which were not available at the time of our testing.

Setting up the SOHO 400 is extremely simple, though the interface is a bit slow. Just connect a PC via Ethernet to the LAN side of the unit and point your browser to <https://AxentraServer>. From there just follow the detailed and intuitive setup wizard, and within 5 minutes you have a basic working server.



THE IT-100'S detailed statistics and superior interface distinguish it from the others in our roundup.



SETTING UP an Internet connection with the SOHO 400 is easy and well documented.

user-friendly interface leaves them with fewer control and configuration options. That's because Axentra has effectively hidden many of the configuration settings. Also, this device isn't designed for scalability, so it probably doesn't make sense for growing companies.

Though our testing device falls short on

Three network adapters (two LAN and one WAN) are found in the unit, as are four USB connectors. In addition, the SOHO 400 can function as an 802.11g access point for wireless clients. The device also supports WAN-side DHCP (Dynamic Host Configuration Protocol), static IP addressing, and PPOE (Point to Point over Ethernet) for Internet connection.

Those who must make do with dynamic IP addresses will like the extensive list and support for the most common dynamic DNS providers. We especially like the integration of TZO's new DNS service, which registers a new domain in minutes.

The SOHO 400 lets you enable network services, such as IMAP (Internet Message Access Protocol) mail, a Web server, and remote access over either SSL (Secure

Socket Layer) or an unencrypted connection; you can also disable network services altogether. Other network services include Windows networking and SMB file sharing, IP filtering for outgoing traffic and basic content filtering, and port forwarding. You can also back up system and user data to a local folder or an attached USB hard drive.

Businesses that plan to grow or prefer control over minute configuration details may not like this box. But for those who would gladly trade control and scalability for simplicity, this is the right appliance.

EmergeCore IT-100

Transmeta Crusoe TM5600 processor, 128MB RAM, one 20GB nonremovable hard drive, \$1,395 list. EmmergeCore Networks LLC, www.emmergecore.com. ●●●●○

The EmmergeCore IT-100 is by far the smallest device in our roundup—barely larger than a notebook PC—but it still provides nearly all the IT functions that a small company needs. This appliance has reinvented itself since we first reviewed it in 2003, and for its many features and simplicity, it earns our Editors' Choice.

The unit has four 10/100 switched Ethernet ports and a built-in 802.11g wireless access point. It comes with either a single 20GB or 60GB hard drive. The operating system is nicely equipped, providing all standard network services, including DNS, FTP, e-mail, and Web. Thanks to EmmergeCore's excellent setup wizard and an intuitive and well-designed management interface, you can be up and running with a single domain configuration in less than 10 minutes.

The IT-100 also acts as an Internet router with a built-in stateful packet inspection (SPI) firewall, basic intrusion detection capabilities, AV filtering, and integrated VPN. We were pleased to see that the IT-100 can function as either a

SCORECARD



We evaluate the **setup and configuration** process from unpacking the box through basic configuration. The **administration** rating reflects interface and integrated help facilities, as well as the ease of use for ongoing administrative chores. For **logging and reporting**, we examine the comprehensiveness, format, and value of logged and reported events. The **features** category reflects the appliance's breadth of options and capabilities. We base the **security** rating on the product's ability to preserve data in case of emergency. Based largely on the backup and internal data security features, this rating does not reflect the performance of any integrated firewalls. (We recommend a standalone stateful packet inspection firewall instead.) Finally, the **overall** rating is not an average but an aggregate based on evaluation and testing by PC Magazine Labs staff.

- - EXCELLENT
- - VERY GOOD
- - GOOD
- - FAIR
- - POOR

	Setup and Configuration	Administration	Logging and Reporting	Features	Security	OVERALL
Axentra Net-Box SOHO 400	●●●○	●●●○	●●●	●●●●	●●●	●●●●
EmergeCore IT-100	●●●●	●●●●	●●●●	●●●●	●●●○	●●●●
Net Integrator Mark I	●●●○	●●●	●●●○	●●●●	●●●●○	●●●●
RED denotes Editors' Choice.						

VPN client or endpoint.

The IT-100 supports both POP3 and IMAP e-mail. Users who lack VPN access can check e-mail through the Web interface. Incoming and outgoing mail is scanned by a server-based antivirus tool, and basic antispam capabilities are included.

On the WAN side, the IT-100 can be set up with a static IP address or with a dynamic DNS service, such as TZO.com's DDNS. Setting up multiple domains is surprisingly easy.

A new addition to Version 3.30 of the EmergeCore firmware is the ability to allow for several layers of administration. This is easy to set up, and it comes in handy for those who want to delegate some but not all administrative tasks or place restrictions on what basic users can access. Also new is a feature EmergeCore calls its CRM (customer relationship management) package, which is a very simple yet helpful Web-based integration of contacts, calendaring, and e-mail.

In 2005 EmergeCore plans to introduce the IT-500, geared toward small companies that need a bit more horsepower. A reproduction unit we've seen boasts a 733-MHz VIA processor, 256MB of RAM, and dual full-size RAID-capable 60GB hard drives. Perhaps most impressive—and unique in the appliance market to date—is the ability to

EmergeCore IT-100



The EmergeCore IT-100 strikes the right balance of features and flexibility for creating a secure small business network with the least effort—but with lots of control. For example, you can set different levels of administrative rights with ease, making it simple to lock down and prevent the changing of configuration settings. You can also customize user permissions and rights.

Though both the Axentra and Network Integrator appliances performed better on our tests, the IT-100's performance is more than adequate for small businesses. Simplicity and solid features are what matters most to this market, and these are the criteria that set the IT-100 ahead of the pack.

An honorable mention goes to the Net Integrator Mark I. We remain impressed with this appliance because of its data backup, network intelligence engine, and beefy hardware—though you pay a premium for such features.

terminate a T1 connection directly inside the box, as opposed to using a traditional CSU (channel service unit). This is basically an additional device that's required to convert the digital signal of computers to the type of digital signal that telephone service equipment can understand.

The IT-100 has it all, combining the ease of use found in the Axentra device with some of the more advanced features of the Net Integrator unit. Its performance, though slower than that of the other two, is more than sufficient for a small office using standard productivity applications.

Net Integrator Mark I

AMD Athlon XP 2500+ processor, 512MB of RAM, dual 120GB hard drives, \$2,699 list. Net Integration Technologies Inc., www.net-itech.com. ●●●●○

The feature-rich Net Integrator wowed us the first time around. Two years and a hardware update later, it wows us again.

An AMD Athlon XP 2500+ processor with 512MB of RAM and two 120GB removable hard drives are found in the current model. Our unit included Net Integration Technologies' Nitix server OS. Unlike other solutions, the Net Integrator appliance can provide access to

PERFORMANCE TESTS

Appliances Make the Grade in Throughput



For this roundup, we ran NetBench 7.0.2 to determine each system's file-sharing performance. NetBench measures how well a file server handles read-and-write operations initiated from 32-bit Windows clients. Each of the 28 test client PCs came with a 2.8-GHz Pentium 4 processor and 512MB of RAM and ran Windows XP with Service Pack 1. All devices used Samba as the file-sharing service.

On our tests, the client PCs bombard each server with requests for network file operations. Each client registers how many bytes of data it moves to and from the server and how long the process takes. It then uses this information to calculate its throughput. NetBench totals throughput of all the clients to produce an overall throughput in megabits per second.

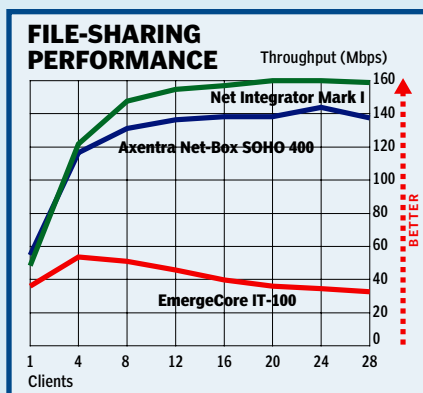
In the NetBench graph below, you can see that the Net Integrator Mark I and the Axentra Net-Box SOHO 400 out-

performed the EmergeCore IT-100 by a large margin. But NetBench performance should not be the primary concern when buying an appliance. The IT-100's lesser performance is due to its notebook hard drives, which have much lower spindle speeds than the full-size drives in the other products.

All three appliances are more than adequate for a typical small business. Faster file-sharing performance is certainly a plus, but traffic generated by office applications and your e-mail client will be efficiently handled even by the IT-100. In fact, every one of the 28 NetBench clients produces more traffic in 10 minutes than your office network might see in a day.

So if you plan on using only common productivity applications, rest assured that all three appliances are well-suited for the job. Only if your business depends on moving oversized files often should the differences in our results become a factor in your decision.

—Analysis by Oliver Kaven



Microsoft Outlook groupware features such as team tasks, schedule management, and calendaring, but to do this you must purchase an optional Outlook connector.

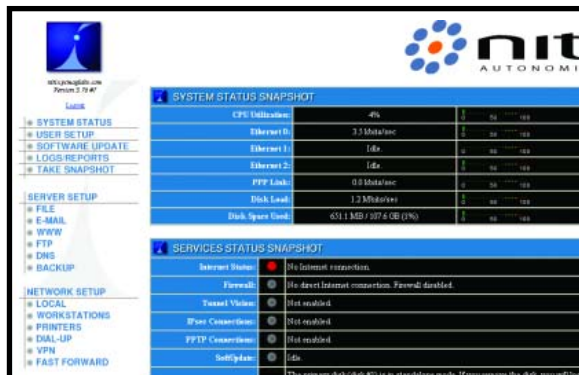
On the networking and services side, the Mark I is a marvel in automation. Using Net Intelligence, a discovery and setup system, Nitix automatically identifies the subnet connected on your LAN and WAN and configures itself with a valid IP address. Existing IP addresses on your network are avoided to prevent IP address conflicts.

Nitix is designed to function as your core infrastructure server, delivering file sharing, e-mail, Apache Web server, an FTP server, and a DNS server. And Net Integration provides free dynamic DNS listings for customers, so you can host your own domain. The unit provides a built-in firewall and handles automatic setup for VPN users, security, and any needed firewall changes for the IPsec (IP Security) VPN.

Configuring Nitix is straightforward, though more complex and a bit less intuitive than configuring the other two products. Also unique to Nitix is the DoubleVision feature, which provides load balancing across multiple WAN links. If one link fails, the feature reroutes traffic to a working connection.

One of the most impressive parts of the Mark I is its integration of data security and backup. With two hard drives, the device automatically stores incremental backups onto the second hard drive every 15 minutes. Should the first hard drive fail, you simply replace it, and the system rebuilds itself automatically.

Though the Mark I isn't as easy to set up as the EmergeCore device and lacks the ex-



THE NET INTEGRATOR MARK I's interface lists detailed system statistics but isn't quite as attractive, intuitive, or streamlined as those of the Axentra and EmergeCore products.

tremely user-friendly interface of the Axentra appliance, it has both beat in the area of automatic network configuration and data security. From its sturdy case to its impressive OS, this is one solid appliance. ■

Running Windows Small Business Server 2003

SBS has everything a small business needs and more. But is it too much more?

Small-business owners looking for basic collaboration and e-mail services will be satisfied with a simple server appliance. But for those who seek a highly customizable solution that can scale as their business grows and allow them to load additional third-party applications, Microsoft Windows Small Business Server (SBS) 2003 may be the only practical choice.

Although much less expensive, server appliances offer simplicity via a more rigid, locked-down configuration. SBS, on the other hand, is at heart Windows Server 2003, a server OS that supports many applications.

SBS is a combination of server OS and applications rolled into one package. A winner of our Editors' Choice (February 3, 2004), SBS is easy to install and configure, and it's targeted at small businesses with less than 75 employees. SBS brings to the table a multitude of core services, such as Exchange Server for running your e-mail system, fax, file and printer sharing, remote access, backup, and SharePoint portal services. Its familiar Windows look and feel will reassure many end users.

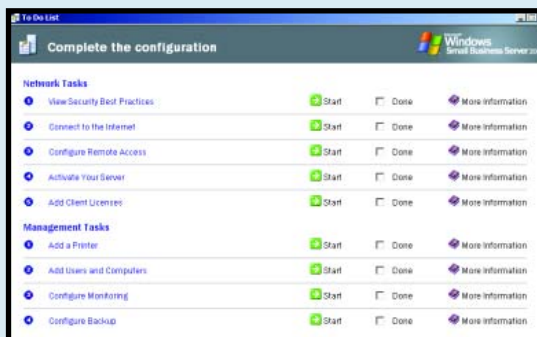
Under the hood, SBS is comprehensive, but a system running it does not come cheap. Our review system, the Dell PowerEdge 800 server, costs \$3,582 direct—\$3,083 for the hardware and \$499 for SBS with a five-user license. While Dell's pricing was not finalized yet for add-ons to the server in question, an additional SBS 20-pack license costs \$1,799.95 at Dell's Web site.

Grand total for a 25-employee office: \$5,381.95.

Our review server came preloaded with Windows SBS 2003 Standard Edition and was powered by a 3.8-GHz Pentium 4 processor, 1GB of RAM, and three 80GB hard drives configured for RAID 5. Even with a large part of the OS preinstalled, we spent 4 hours configuring our system. We ran multiple setup wizards for various services, including the e-mail and Internet connection wizard, as well as downloading the latest Microsoft patches, among other things.

Even so, team collaboration was extraordinarily easy to configure via SBS's SharePoint portal services. Within minutes we had built a small employee portal that allowed us to share documents, tasks, calendars—all with full version control. This is far more comprehensive than anything found in a server appliance.

Microsoft has done an excellent job of hiding the complexity of the OS and included applications behind well-designed wizards, but the wizards also mask what is really going on behind the scenes. For example, we enabled remote-access services through a wizard, but the system never clearly stated what those services were. We were left wondering if we had merely enabled RDP or installed some more robust VPN solution. Because of these types of uncertainties, we recommend that only a knowledgeable IT person or VAR configure your system.—*Matthew D. Sarrel*



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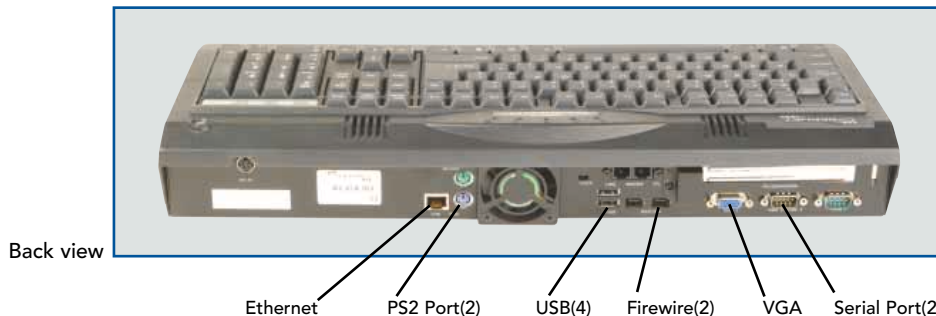
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TECHNOLOGY ON YOUR TIME

Mobile Entertainment

BY PETER SUCIU

Mobile phones offer other ways to pass the time besides gabbing and texting, but that doesn't mean you should have to play yet another Tetris clone over and over again. Here's a look at some of the latest games and services. Cost and availability vary across carriers, but prices are typically in the \$2-to-\$6 range. For smart phones, they tend to be higher. Some games and services also require low monthly subscription rates, again depending on the carrier.



Baldur's Gate

This fictional land becomes the setting for a robust role-playing adventure. Game play has been streamlined for the mobile-phone platform but remains surprisingly full of depth, following the classic Dungeons & Dragons formula. You create your character, then take part in an adventure in seven rich chapters, with sub-chapters and side quests to add to the fun. The only downside is that this single-player game doesn't let you share the journey.

Sorrent Inc., www.sorrent.com. ●●●●●

FOX Sports Mobile

If you can't stay home to see the big game, this is the next best thing. The service offers up-to-the-minute news, scores, statistics, schedules, and odds for the major professional and college sports—including the NFL, NCAA, and NASCAR—along with individual pages for your favorite teams, with one-click shortcuts and bookmarks. You can view picture highlights, real-time graphical displays of live games, and play-by-play results. The FOX Sports Mobile store is also accessible from the service, so you can download other mobile games and applications directly.

Sorrent Inc., www.sorrent.com. ●●●●●

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R A

Global Advisor

If you're taking a Pocket PC smart phone along on your world tour, don't forget this software package. It offers cultural etiquette for 61 countries and helps you avoid culture shock when traveling abroad. It covers

a range of topics, from proper address formatting to guides on tipping. While the program does gloss over some things, the biggest concern might be learning you did someone wrong after the fact. But at least you'll know for next time.

Handmark Inc., www.handmark.com. ●●●●●

Lord of the Rings: Return of the King

The epic trilogy has concluded on the big screen, but on portable displays the action is just getting started. Lead the gallant fellowship, including Aragorn, Frodo, and Gandalf, through Middle Earth in this side-scrolling, hack-and-slash game. Each of the eight levels features increasingly difficult opponents, such as the menacing spider Shelob, the King of the Dead, and the Lieutenant of the Black Gate, as you journey to destroy the one ring of power.

Jamdat Mobile Inc., www.jamdat.com. ●●●●●



Midtown Madness 3

Ready to take a spin around town? How about the City of Light? Steer a Mini Cooper through Paris's winding streets in this single-player game. It features four different game play modes, including point-to-point rallies and races against AI drivers.

WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

You can even take the role of ambulance driver or delivery person and catch key sights: the Arc de Triomphe, Notre Dame, and of course the Eiffel Tower. With 16 levels of play, you can get that Paris vacation—at least until the phone rings.

In-Fusio, www.in-fusio.com. ●●●○○



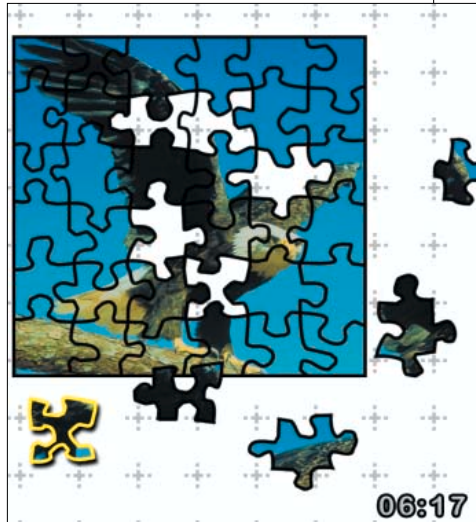
NY Times Word Challenge

If the *New York Times* crossword puzzle isn't tough enough for you, or if you just want a different

task to sharpen your wits, try NY Times Word Challenge, a mobile game designed to test your knowledge and word play skills. The thinking and concentration that this game requires might be too much for casual gamers. But dedicated word-smiths will be challenged as they unscramble words and link together letter tiles. We found, though, that the game appears rather small on some displays.

Sony Pictures Digital Inc., www.sonypictures.com.

●●●○○



Sennari Jigsaw Club

This subscription-based app lets you download as many puzzles as you want from seven categories, including animals, flowers, military, and outer space, as well as a unique Puzzle of the Day. New downloadable cut patterns alter the shape of the pieces to offer further challenges, and three levels of difficulty will provide more brain-teasers to tackle. Master puzzle solvers can have their names entered into the Sennari Jigsaw Club Hall of Fame. The biggest downside is that this BREW-based application requires some squinting at times.

Sennari Games Inc., www.sennarigames.com.

●●●○○



Spider-Man vs. Doc Ock

He can do whatever a spider can—unfortunately, that means doing it over and over again. Each time you finish the three levels, which include train tunnels, rooftops, and a final confrontation with Doc Ock in his lair, the adventures start over, but with increased difficulty. The game looks truly fantastic, though, and uses a simple interface to make Spider-Man swing from building to building and sling some webs. After completing the Story mode, you can replay each level in Arcade mode—but by then, even Spidey will probably be ready to call it a day.

Sony Pictures Digital Inc., www.sonypictures.com. ●●●○○

Track & Field '04 by CBS SportsLine.com

Let the games begin! Go for the gold in seven individual events, including hurdles, discus, javelin, the long jump, and the 100-meter dash. Choose which of seven countries you want to represent and one of five language options. The game's retro feel reminds us of classic arcade games, where rapid button mashing and timing simulate the athletic efforts.

You can play against AI opponents or “pass and play” to have your own mini-Olympics with up to four friends. And after, you can compare best scores online with players from around the world.

Mforma, www.mforma.com.

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Warfare Incorporated

Here's a game that might have you upgrading your phone just so you can play. This stunningly rich real-time strategy game features 20 story-driven, single-player missions and lets up to four players engage in battle over Wi-Fi or Bluetooth on 21 battlefields. The sci-fi theme centers on a newly discovered planet, where each faction fights for control over vast mineral wealth and mysterious alien relics. Cross-



platform gaming is supported, so players with Palm OS and Pocket PC devices can decide who has the better handheld device on this field of honor.

Handmark Inc., www.handmark.com/warfare. ●●●○○

Zoo Tycoon 2

Mobile-phone games have tended to stay away from the traditional building simulations, in part because phone displays haven't been able to provide enough detail to keep things

manageable. Running a zoo on your handset—trying to remain profitable while still caring for the animals—is actually doable, though it still isn't the best experience and doesn't come close to the fun of the PC version. But you can create a photo album of your animals to upload online, and best of all, after completing key tasks in the mobile version, you can unlock content in the PC game.

In-Fusio, www.in-fusio.com. ●●●○○



GEAR + GAMES



Geek Chic

The **SCOTTeVEST Solar SeV Finetex System** attaches to the back of some of the company's multipocket jackets. Sunlight (or a strong lamp) charges the included battery; you then plug your gadgets into that via USB. We found the panel and jacket surprisingly unobtrusive to wear. But the panel charges only in strong light, so getting a full charge takes a while. It's fun for early adopters, but the rest of us will probably stick with wall outlets for now.—*Troy Dreier*

\$225 direct (jacket not included). SCOTTeVEST Inc., www.scottevest.com. ●●●○○

Transparent iPod Protection

Looking for a hard case to protect your new 4GB iPod, but don't want to cover up its pastel beauty (or the HP tattoo, as on the model shown here)? Check out the **Speck Products 4G FlipStand**, which comes with a filler pad for 20GB models. The innovative "flip" covers the click wheel, while allowing easy access to controls. You can't use the iPod's dock when the iPod is in the FlipStand, though the docking cable alone works fine.—*Joel Santo Domingo*

\$29.95 list. Speck Products, www.speckproducts.com. ●●●○○



Flash Your iPod Around

The iPod is a terrific music player, so it makes sense that it would also be a terrific flashlight. Okay, maybe not, but that doesn't stop the **Griffin iBeam** from being a fun and unexpectedly useful product. You get two plug-in attachments that turn your iPod into a flashlight and a laser pointer, and two caps so that you can carry them on your keychain. Both lights have strong beams and don't take much of a hit off the iPod's battery.—*TD*

\$19.99 direct. Griffin Technology, www.griffintechnology.com. ●●●○○

Lap Saver

A padded, sturdy platform that fits most laptop sizes, the **Lapinator** not only protects the user's lap but also keeps the computer at a reasonable temperature: Its non-heat-conducting polyethylene surface and adhesive bumpers create ventilation. It worked well for us, and though it doesn't bend or fold for easy portability like LapLogic's pads, it is light and thin enough to fit in a messenger bag.—*Tim Gideon*

\$24.95 list. Lapinator Inc., www.lapinator.com. ●●●○○



Digital Note Takers

BY MOLLY K. MCLAUGHLIN

If you're a student, doctor, or reporter, taking notes is part of your life. But it's impractical to carry a laptop around, and tablets are pricey. How do you organize your handwritten notes? Each of these note-taking products captures text and converts it into an electronic file, eliminating the need for scanning or retyping.

Logitech io2 Digital Writing System

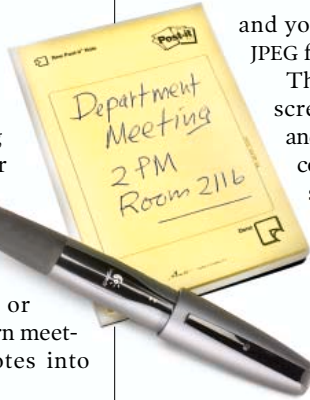
PC MAGAZINE EDITORS' CHOICE
The Logitech io2 pen is the second generation of an amazing tool. It captures your handwritten notes into an electronic pen, converts them to text, and exports them to word processing or e-mail programs, so you can turn meeting, interview, and other notes into editable documents.

The electronic pen, somewhat bulky and uncomfortable to hold after long periods of use (though slimmer than the original), can write up to 25 pages without recharging and will hold up to 40 pages at a time. A variety of compatible electronic paper is available. Upload notes to your PC in minutes by placing the uncapped pen in the included docking cradle. Logitech has added a lengthy but intuitive training session, in which you complete several writing exercises and verify that the software correctly recognizes your handwriting (it even read our scrawls). Resulting documents usually require only a few tweaks.

\$199.95 list. Logitech, www.logitech.com. ●●●●●

NexConcepts Mobile Notetaker

Clip a piece of paper to the 2MB Mobile Notetaker, start writing with the included electronic pen, and the unit immediately begins to capture your notes and drawings. Your notes are saved automatically by date and time and can be accessed easily if you need to make any handwritten additions. When you're back at your PC, attach the Notetaker to the computer with the included USB cable



and your notes download as JPEG files.

The Notetaker's small screen is difficult to read, and navigation can be a bit confusing. But the biggest shortcoming is that you can't convert your notes to text. Still, this device is handy if you're looking to store and share meeting minutes or other notes or to add hand-drawn illustrations to your documents.

\$149 list. NexConcepts, www.nexconcepts.com.

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QuickLink-Pen Elite

With the QuickLink-Pen Elite, you can electronically scan and store text and images (up to 1,000 pages) and save them on your PC. It works well—as long as you use it exactly as directed. Grip the pen as you would a regular one, but make sure it's at a 90-degree angle to the paper. The roller should move easily. Start scanning only when the pen's red light stops flashing and turns solid or you'll get an error message.

If you need a definition, don't bother with a dictionary: Just place the cursor within a word and hold down the Ent key. To transfer files, connect the Pen Elite to your PC with the USB cable, then select Send Stored Files to PC from the main menu. You can save your highlights as .txt or .doc files, handy for adding quotes to a paper or article or clarifying a point for your study notes. You can also convert the text to speech by placing the cursor within the paragraph you'd like to hear and pressing Ent. Also included on a CD are an address book, spreadsheet, and Internet applications. Multiple languages are available.

\$169.95 direct. WizCom Technologies Ltd., www.wizcomtech.com. ●●●●○

QUICK CLIPS



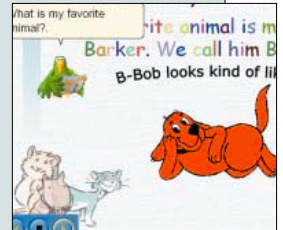
GunBound

The cartoon-like online game GunBound is free and surprisingly addictive. Players begin by choosing one of 14 tanks, each with its own strengths and weaknesses, and further modify their character's attributes by purchasing items from the in-game store. Firing from random locations on a 2D map, players adjust their shots for power, elevation, wind, and weather to obliterate opponents and earn gold and rank.—Ari Vernon

Free. Softnyx, www.gunbound.net. ●●●●○

Scholastic Keys

This add-in to Microsoft Office helps kids put a pretty face on school assignments, with templates, draw and paint, sound effects, and a text-to-speech reader. It also lets you import pictures, sounds, and video if you can't find what you want from the



800 images in its clip-art library. Better for classroom use than for home, it does little more than similar programs that don't mess with your Office setup.—Carol Ellison

\$59 list. Tom Snyder Productions Inc., www.tomsnyder.com. ●●●●○

Warhammer 40,000: Dawn of War

Dawn of War is based on the Warhammer 40K tabletop game. Players can choose to play on one of four sides: the Imperial Space Marines, the Chaos Space Marines, the technologically advanced Eldar, or the brutal Orks. You can customize the weaponry your squads employ and assign special command units to them to increase their combat effectiveness further. Graphically, DoW shines with detailed landscapes and unit animation.—John Blazevic



\$49.99 list. THQ Inc., www.dawnofwargame.com. ●●●●○

BACKSPACE

SPAMWARE, SPYWARE, ADWARE...EVERYWHERE!

Edited by Don Willmott

How to pick up and carry your iMac G5

Don't know how to pick up and carry your iMac G5? It's easy.

Before moving your computer, make sure all cables and cords are disconnected.

Pick up the iMac G5 by grasping both sides of the computer. Carry it to wherever you wish.

« **Hmm...looks like Mac users need as much help as they can get.** (Apple.com)

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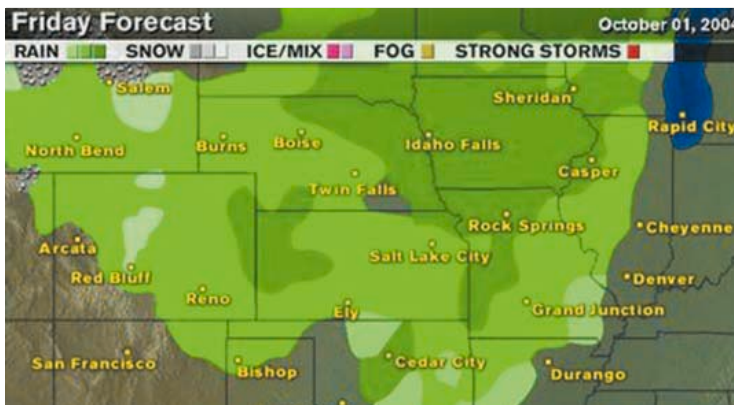
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» **Proxy the golden retriever demonstrates yet another use for PC Magazine: doggie drool catcher.**



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Winners this issue: Oded Cohen, Randal Fernandez, Brandon Hyman, Dena Price, Mark Ryan, and Daniel Williams.

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