

PC

MAGAZINE

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SPECIAL ISSUE!

FALL 2004

The Essential Guide to Your

DIGITAL HOME

Over 130 Product Reviews

Reality TV

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Your Own
Movies

Fast Forward

Look at
Your
Future
Home

Let the Music Play

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MP3s,
Wirelessly

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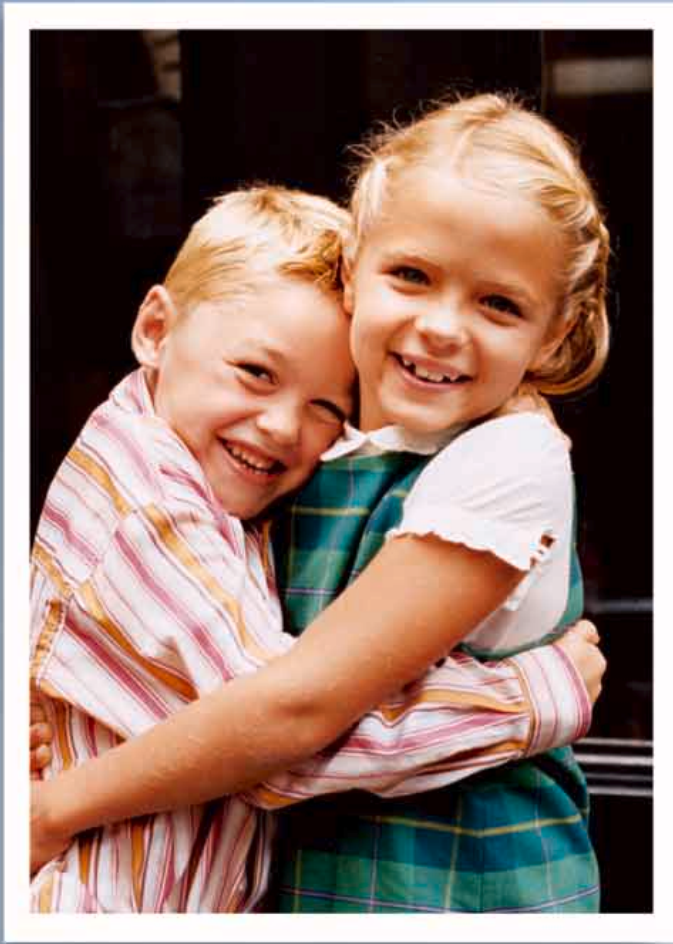


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To get the full study, visit microsoft.com/getthefacts



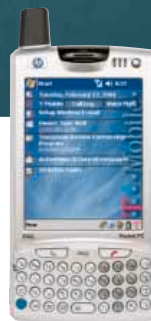


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Forward Thinking

My Digital Domain

The “digital home” means different things to different people. To some, it’s a dream home complete with futuristic gadgets and gizmos that look completely different from anything we see today. To others, it comprises the digital entertainment equipment that’s already available. Whether the digital home will revolve around the PC or the home theater is up for grabs. My guess is that no one model will win, since everyone has different needs.

In my household, photography has gone completely digital with the help of digital cameras, editing software, and photo printers. Now we even send photos on CDs to family members. But we still have lots of old photos that we really should get around to digitizing some day. Our home video has gone digital too. We take material from our digital camcorder, edit it on the computer, and create our own Video CDs or DVDs.

Of course we have a DVD player, but we get more use from a Media Center PC that lets us watch TV shows whenever we choose. We still get TV via analog cable, but that’s likely to change soon, especially as the prices of HDTVs drop.



I still have a turntable and a bunch of vinyl records that my kids call antiques, but every CD we buy ends up ripped to a computer so we can create playlists and burn our favorite music on CDs. More recently, we’ve turned to on-demand streaming music services. These services are truly changing the way we find new music.

The transition to digital means that content is cleaner, more flexible, and just plain easier to work with. I’m looking forward to being able to move music and video throughout my house wirelessly. I haven’t found a solution I really like yet, but within the next year or so, someone will get it right.

In the future, I expect to have all my photos, music, video, and e-mail available at my fingertips wherever I go. But not everything is going digital. I spent one recent weekend attending a local play and relaxing on the couch with a good novel. While it’s likely that the authors of each used a word processor and that digital technology was involved in their production, both the play and the book looked much like they would have even a couple of hundred years ago. In our digital life, there’s something comforting about that.

I’m looking forward to being able to move music and video throughout my house wirelessly.

Challenges of the Digital World

Here are some of the biggest challenges facing us as we adopt even more digital entertainment:

- **Faster connections:** For video on demand over the Internet, better VoIP, and richer online games, we’ll need much faster connections than your typical cable modem or DSL. The government may play a role in this transition, as the rules defining broadband are an issue in just about every country.
- **Simpler digital rights:** I understand the desire of the movie studios and record companies to prevent piracy, but I’m afraid digital rights will become so confusing that they’ll never make sense to typical consumers. Already, some of the digital music that I legally down-

loaded won’t play on some devices. And TV signals are beginning to come with “broadcast flags” that prevent you from recording a show or tell you the show must be watched within a day or even 90 minutes. Some equipment manufacturers are following the rules; others aren’t. But I’m concerned that the voice of the consumer is lost. Most of us don’t want to steal content, but we also don’t want a lot of restrictions.

- **Easier-to-use systems:** I love all the controls and flexibility I get with my PC, but manufacturers need to make the basics much easier to use. How successfully manufacturers rise to that challenge will determine how quickly consumers adopt the technology.

Forward Thinking

MICHAEL J. MILLER

Presidential Candidates Talk Tech

Although technology is hardly the central issue of the presidential campaign, government policy has had a significant impact on the development of many of the technologies we use today. I recently asked President Bush and John Kerry a series of technology questions.



The Kerry campaign responded to these questions directly; the Bush campaign referred me to its Web site instead. Below are excerpts of Kerry's answers and the information I culled from GeorgeWBush.com. For full responses to these and other questions, check out pcmag.com/interviews.

MM: *Should the federal government do more to restrict the outsourcing of technical jobs to foreign countries? If so, how?*

Kerry: Our economic strategy begins with an all-out effort to jump-start the growth of high-paying jobs. It will simplify and reform international taxation to reduce taxes for businesses that create jobs here in the United States, while eliminating tax incentives to move jobs overseas. It calls for investing in our manufacturing, scientific, and technological future, and for restoring fiscal discipline. As president I would cut the corporate tax rate by 5 percent, eliminate "deferral" so that companies are taxed the same whether they invest abroad or at home, and eliminate abusive international tax loopholes that encourage companies to shift income and jobs to low-tax havens.

Bush: In his second term, President Bush will focus on building a more prosperous, competitive economy. The essential elements of his plan include: taking the next bold steps in reforming education; building a skilled and effective workforce; encouraging a pro-growth, fair, and simpler tax system; promoting research and development in both the public and private sectors; opening markets for American goods around the globe; meeting our energy needs and lessening our energy dependence; reducing the regulatory burden; and reforming government to be smaller and more efficient, responsive, and effective.

MM: *What should be the federal government's role in expanding broadband usage?*

Kerry: I believe that U.S. leadership in broadband networks is critical for economic growth, job creation, and quality of life. Although it is the private sector that must invest in these networks, government should create an environment that encourages this investment. As president, I would: (1) provide tax incentives for companies that invest in the next generation of high-speed broadband and that extend broadband to underserved rural and inner-city markets; (2) increase the spectrum available for new licensed and unlicensed wireless services. My plan would accomplish this by completing the transition to digital television and accelerating the return of valuable spectrum that is currently being used for broadcasting the analog

television signal; (3) invest in R & D that will stimulate demand for broadband networks, such as grid computing and rich, interactive content for online learning.

Bush: President Bush has made it a goal to provide every American with access to affordable broadband by 2007. The President has a specific plan to accelerate broadband deployment: (1) Do not tax broadband access; (2) Reduce burdensome regulations that discourage broadband investment; (3) Provide consumers with more options for affordable broadband access. To accomplish this third goal, we need to promote two promising technologies—broadband over power lines and wireless access. The president is calling on Congress to pass the Commercial Spectrum Enhancement Act to free up more spectrum for wireless broadband.



MM: *What is your position on tax credits for companies investing in research and development?*

Kerry: Private-sector investments in R & D often have broader economic spillovers that individual firms do not capture. For this reason, I have long been a supporter of the Research and Experimentation Tax Credit. I would work with the Congress to extend it, with the goal of making it permanent. This would make it more effective, since companies would be able to rely on its existence.

Bush: President Bush wants to make the Research and Experimentation Tax Credit permanent to promote private sector investment in new technologies and manufacturing techniques.

MM: *How should the federal government do more to stop and prevent spam, viruses, and worms?*

Kerry: We need a president who will devote the energy of the White House to making our networks stronger and more secure. That means supporting a cybersecurity intelligence system ready to detect these threats. We must implement global standards and best practices so that weak links are strengthened. And we need a real partnership between the public and private sectors. Most of the infrastructure we need to protect doesn't belong to government—and neither government nor business can fix these problems alone.

Bush: We've established a national cybersecurity division to examine cybersecurity incidents, track attacks, and coordinate nationwide responses. America's infrastructure drives our economy and serves our people. We're determined to provide the infrastructure with the best possible protection.

MORE ON THE WEB: Join us online and make your voice heard. Talk back to Michael J. Miller in our opinions section, www.pcmag.com/miller.

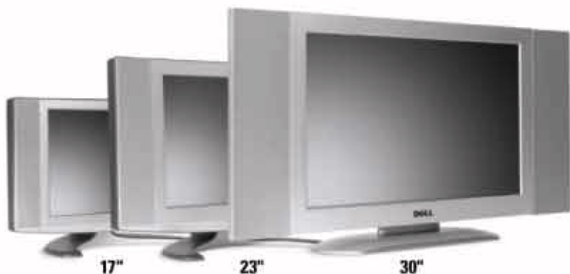
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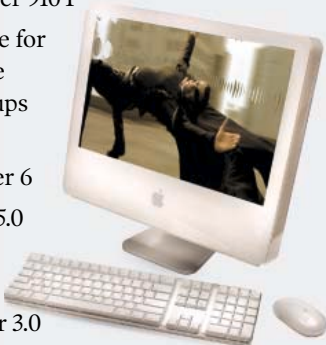
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29 Editors' Choices

A comprehensive list of our current picks in nearly 100 categories.

32 First Looks

- 33 Norton AntiVirus 2005
- 33 McAfee VirusScan 9.0
- 34 Apple iMac G5 ▼
- 35 Apple Power Mac G5
- 36 Adobe Premiere Elements
- 36 Pinnacle Studio Plus 9
- 40 HP iPAQ h6315
- 40 HP iPaq hx4700 ▶
- 45 Creative Zen Touch ▼
- 45 Roku SoundBridge M1000
- 46 BeInSync
- 46 McAfee SpamKiller 6.0
- 48 MyDVD Studio 6
- 48 Laplink Everywhere 3.0
- 50 SnapStream Firefly
- 50 Microsoft Wireless Optical Desktop Comfort Edition
- 52 Sharp LL-151-3D
- 52 Samsung SyncMaster 910T
- 54 QuickBase for Corporate Workgroups
- 54 Kerio MailServer 6
- 55 Integrity 5.0
- 55 Veritas Storage Replicator 3.0 for Windows

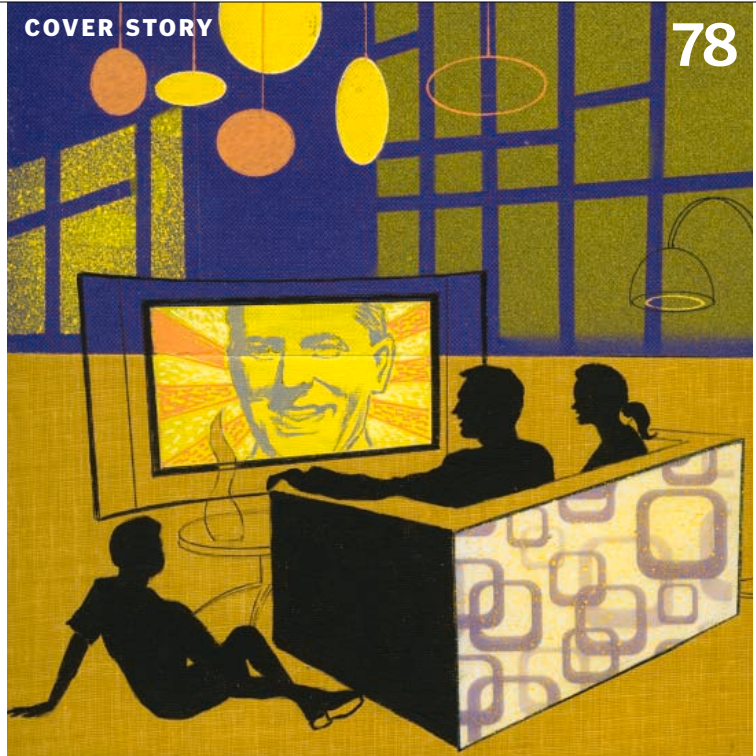


ALSO IN THIS ISSUE

- 57 **Feedback**
- 132 **Backspace**

COVER STORY

78



Your Digital Home

Enjoy your digital music in every room of the house, display your vacation photos on the living room TV, and record your favorite shows on the PC. Thanks to new devices and technologies, all of these things are now possible. With scores of tips and more than 90 product reviews, we show you how you can enjoy multimedia at home like never before.

- 85 Your PC | 91 Your Video | 101 Your Music | 105 Your Photos
- 113 Your Games | 117 Tying It All Together

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DIGITAL HOME

123 Your Future Home

How will the technology in today's digital home evolve in the next few years? Your house will be better connected, more efficient, and definitely a lot of fun.



23 Pipeline

- 23 WiMAX: Intel boosts wireless broadband.
 - 23 Calling for a new Internet.
 - 23 The first-ever cell phone with a hard drive
 - 24 Yahoo! joins the online music store fray.
 - 24 Cryptography: Is there a skeleton key?
 - 24 Film and games meet—Star Wars style.
- 26 **COMING ATTRACTIONS:** Konica Minolta Digital SLR Maxxum 7D, DiMAGE A200; MSN TV 2 Internet Player; Apex MP-2000 Portable Media Player; and more.

66 Solutions



- 66 **Do-it-Yourself DVR:** You can turn your PC into a digital video recorder that can do things a TiVo can't.
- 70 **Internet:** PAC files are a powerful and free tool to use in blocking distracting Web site ads.
- 72 **Security Watch:** The passwords you store on your computer are at risk; we present ways to safeguard them.
- 75 **User to User:** How to format fractions in Word, remove orphan MSCONFIG items, and more.

Opinions

- 9 Michael J. Miller: Forward Thinking
- 59 Bill Machrone
- 61 John C. Dvorak
- 63 John C. Dvorak's Inside Track
- 65 Bill Howard

128 After Hours

- 128 **Your Automated Home:** Press a button and control your house—lights, appliances, thermostat, and even the lawn sprinkler. We review four packages that can get you started.
- 130 **Gear + Games:** Software tools for golfers, Jakks Pacific arcade games that you play on your TV, Otterbox's rugged iPod case, and Manhunt for PC.

ON THE COVER



That's Entertainment page 66

The Essential Guide to Your Digital Home page 78

Reality TV page 91

Fast Forward page 123

Let the Music Play page 101



"Instead of putting out fires, we now focus on ways we can deploy new technologies that benefit our customer service."

Dave Chacon
Manager, Technical Services, PING

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WiMAX Gets Real

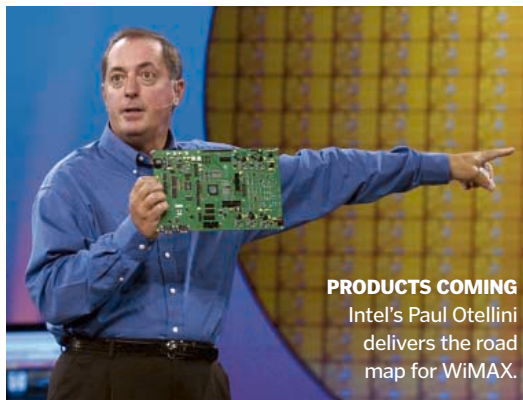
Intel shows off promising wireless broadband prototypes.

INTEL IS BEATING the wireless broadband drum. At September's Intel Developer Forum in San Francisco, president and COO Paul Otellini delivered a bright technology forecast, underscoring the impact of upcoming WiMAX technology. Earlier this year, Intel launched the WiMAX initiative, which is positioned as a wireless competitor to cable and DSL. WiMAX is governed by the IEEE 802.16 standard.

Emphasizing the theme of "pervasive wireless broadband," Otellini said Intel is taking steps to get WiMAX wireless broadband technology into shipping products and that there are now 140 companies in the WiMAX Forum. By 2008, he expects Wi-Fi technology to be in almost every notebook PC.

"We foresee the same kind of viral growth for WiMAX that we saw for Wi-Fi," he said. "WiMAX could be to DSL and cable what cellular was to landline—a disruptive, more convenient, lower-cost technology."

Until now, WiMAX has consisted mostly of talk. But Otellini showed a WiMAX development card with an Intel chip based on the 802.16 wireless standard, which has already shipped to customers. He also showed a rack of prototype products based on the card, which is called the Intel Pro Wireless 5116 broadband



PRODUCTS COMING
Intel's Paul Otellini delivers the road map for WiMAX.

interface, and said several products will ship in 2005. Starting in 2006, WiMAX chips will go into Intel's popular Centrino product line.

Intel executives also demonstrated Vanderpool, a technology that runs multiple operating systems on a single machine. And, in the first ever interoperability demonstration—with NEC, Texas Instruments, and Wisair—Intel showed the companies' prototype products wirelessly exchanging data with each other at high data rates using proposed Wireless USB and ultra-wideband (UWB) specifications. UWB products will arrive in 2005. Keep your eyes peeled.—*Sebastian Rupley*



Phone Your Hard Drive

Marking a milestone in portable storage, Samsung has released the first-ever mobile phone with an internal hard drive. In addition to a 1-inch 1.5-GB hard drive, the Samsung SPH-V5400 includes an MP3 player, a 1-megapixel camera, and a Korean/English dictionary. For now, the phone is on sale only in Korea.

Most major cell-phone providers plan to release phones with hard drives in 2005, and some are also focusing on digital-music features. With storage capacities that rival those found on popular digital-music players like the Apple iPod and with cachet in the eyes of young people, cell phones may become significant players in the rapidly growing digital music market.—*SR*

MEMORY ENGINE Amazon.com's Internet search service, A9.com, is pioneering new territory. Users can now save and edit bookmarks stored on an A9.com server, archive every link previously clicked on to a Web site, and save personal diary notes for later viewing.

PlanetLab: A New Net



WHILE MANY EXECUTIVES at the Intel Developer Forum waxed positive about the wireless future, others sounded warnings about the Internet. Intel CTO Pat Gelsinger cautioned that the Internet's growth is leading to "architectural limitations" as computer users from developing nations join the fray.

Gelsinger called for a new network to run on top of the Internet and handle Web services, traffic congestion, and more. Intel has been funding a prototype, dubbed PlanetLab, with over 190 global sites. Now Hewlett-Packard is joining forces with Intel to grow and commercialize PlanetLab. Stay tuned.—*SR*

Generation Y Rules the IM Roost

Forty-two percent of all U.S. adults who use the Internet also use instant messaging (IM). And 24 percent of instant messengers say they use IM more frequently than e-mail. As the user base has grown, it has remained heavily skewed toward the young.

Percentage of survey respondents in each age group who use IM



Gen Y (ages 18-27)	62%
Gen X (ages 28-39)	37%
Trailing Boomers (ages 40-49)	33%
Leading Boomers (ages 50-58)	29%
Matures (ages 59-68)	25%

Source: Pew Internet & American Life Project, September 2004.

Musical Renaissance

As if the digital-music scene weren't already packed with competition, Yahoo! is ratcheting things up with its \$160 million purchase of the Musicmatch online service. The news came on the heels of Microsoft's launch of its MSN Music store.

"Yahoo! is committed to being a major player in digital music," said CEO Terry Semel. He confirmed that Yahoo! will invest further in digital music



this year. Yahoo!'s Launch music service, which includes music videos, streaming radio, artist bios, and articles, already attracts a healthy audience: 12.9 million users in August, according to Nielsen//NetRatings.

Musicmatch offers an array of innovative services. Its Musicmatch Jukebox software goes beyond standard download offerings and includes many useful ways to organize music collections and share them with friends. Its new Musicmatch On Demand music subscription service has over 700,000 songs available to stream.

By comparison, Microsoft's MSN Music service is slated to include over 1,000,000 tracks by the end of the year, and Apple's market-leading iTunes store already has that many. But the services—and Real Networks' offerings—are all likely to compete fiercely with each other.—SR

Encryption Skeleton Key?

THE POLITICS OF presidential elections may seem like a polite game of give and take compared to the latest math debate. The issue: Has the Riemann Hypothesis been proven, and if so, could it defeat current online encryption schemes?

The debate revolves around a puzzle of pure mathematics known as the Riemann Hypothesis. Proposed by German mathematician G.F.B. Riemann in the 1800s, the hypothesis involves prime numbers—those divisible by only themselves and one. Riemann believed—without a proof—that the distribution of prime numbers could be described by his Riemann Zeta function. Now, Louis de Branges de Bourcia, a math professor at Purdue, claims to have a proof.

So what's the big deal? For starters, there's a cool \$1 million prize at stake, offered by the Clay Mathematics Institute. More important, some analysts claim that a proof would allow hackers to break encryption techniques used in e-commerce. "Prime numbers do play a role in public-key cryptography," admits RSA Security's chief scientist, Burt Kaliski. For secure connections, for example, Web sites often present the product of two prime numbers as their public keys.

So would a proof help hackers break such codes? Kaliski doesn't think so. "Cryptographers have always assumed that the Riemann Hypothesis is correct; you don't have to worry about shopping on Amazon.com."—John R. Quain



YOU GOT IT Their digital dreams came true, but it wasn't luck. Thousands of contestants entered PC Magazine's Digital Dream Makeover Contest in the Home, Home Business, and Dorm Room categories. They explained in essays what kinds of technology would improve their lives and why they were deserving.

The winners were: Home: Julie Baron and Stephen Baker, a budding opera singer and a programmer, respectively; Home Business: Zack and Laila Robbins, who are starting a video production business; Dorm: Jon Mealer, who is pursuing a degree in computer-aided design.

Playing the Movie Game

FILM AND GAMING remain on a high-profile collision course. While George Lucas prepares "Episode III: The Revenge of the Sith" for movie audiences next year, the Star Wars juggernaut spread out in September with the simultaneous release of the long-awaited classic Star Wars Trilogy DVD set from Lucasfilm and the Star Wars Battlefront videogame (shown) from LucasArts.

The synergy between the theatrical and interactive arms of the Lucas empire has never been more of a focus, said Jim Ward, producer of the Trilogy DVD set, at a Los Angeles press event. As president of Lu-



casArts and VP of marketing at Lucasfilm, Ward oversees cross-pollination of film and gaming content. Unlike many gaming studios that buy licenses from movie studios and then hope they will have access to movie assets, LucasArts is squarely situated to draw from theater releases.

Included in the DVD set is a

trailer and playable demo of the Battlefront video game as well as a look at the making of the Episode III video game. Battlefront allows users to join the climactic battles they have seen on the big screen. "Sharing assets is a huge advantage economically, technically, and creatively," said Ward.

As for the future of film and gaming cross-pollination, Ward confirmed that George Lucas has been interested all along in the interactive side of his galaxy and in the years to come "is looking to gaming as a leading growth market for Lucasfilm."—Karen Jones

BALDERDASH Tired of false ads in the presidential race? At www.factcheck.org the Annenberg Public Policy Center is analyzing the accuracy of political advertising. Both Bush's and Kerry's campaign organizations have quoted the site to try to establish when lies are being told.

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COMING ATTRACTIONS



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features zone matching, a new technology that allows the precise reproduction of tonal gradations in highlights and shadows. The 8-MP DiMage A200 features a rotating 1.8-inch Vari-Angle LCD viewfinder and a high-performance GT APO lens to produce incredibly faithful colors.

Prices not yet determined.
Konica Minolta Photo Imaging U.S.A. Inc.,
www.konicaminolta.com.



Couch Surfing

Microsoft and Thomson have partnered to develop a broadband- and home-network-enabled version of the Microsoft MSN TV Internet receiver, the **MSN TV 2 Internet Player**. It's easy to use: Simply connect it to a television and existing broadband modem or phone line (for dial-up users). MSN TV subscribers can then surf the Web, write e-mail, instant message, and view photos and online videos all from the comfort of their couches.

\$199 list. MSN TV subscription, \$9.95 to \$21.95 per month or \$99.95 to \$199.95 per year. Microsoft Corp., www.msntv.com.



Media Hubs from ViewSonic

ViewSonic's new wireless media adapter, the **ViewSonic WMA100**, lets you stream audio and video from your PC to a connected home entertainment system. When the WMA100 is combined with either the company's 80GB WMG80 or 120GB WMG120 wireless router/storage gateways, consumers can store and deliver digital content to one or more displays in the home. Both gateways are easy to set up and offer two USB ports.

WMA100, \$300 street; bundled with WMG80, \$700; bundled with WMG120, \$800. ViewSonic Corp., www.viewsonic.com.



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\$399 list. Apex Digital Inc., www.apexdigitalinc.com.



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OCTOBER 19–NOVEMBER 1, 2004



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- Roxio Easy Media Creator 7

DVD AUTHORIZING

- NEW** 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

- Delphi XM Roady2

- iRiver H140

- Samsung Yepp YP-T5V

SOUND CARD

- Creative Sound Blaster Audigy 2 ZS



HP iPaq hx4700

SPEAKERS

- Creative Gigaworks S750
- Klipsch ProMedia GMX D-5.1

PC MEDIA PLAYER

- Microsoft Windows Media Player 10

MUSIC STORE

- Napster 2.0

WEBCAM

- Logitech QuickCam Pro

MOUSE

- Logitech MX1000 Laser

PRINTERS

PERSONAL PRINTERS

- Brother HL-5140 (laser)
- HP Deskjet 5150 (ink jet)
- Lexmark C510n (color laser)

PERSONAL AIOs

- Brother MFC-3420 (ink jet)
- Brother MFC-8420 (laser)
- Canon MultiPass MP390 (ink jet)

PHOTO PRINTERS

- Canon i9900 Photo Printer
- Epson Stylus Pro 4000
- HP Photosmart 7960

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 PROJECTOR

- Sony VPL-CX85

GAMING GRAPHICS CARD

- ATI Radeon 9800 XT

MAINSTREAM GRAPHICS CARD

- PNY Verto GeForce 5700 FX Ultra

DVD BURNERS

- BenQ DW830A 8X DL
- HP DVD Movie Writer dc4000

- Memorex True 8X External Dual Format Recorder

- Pioneer DVR-A07XL

EXTERNAL DRIVES

- Transcend 1.8" Portable Hard Drive
- Western Digital Media Center

- WiebeTECH Fire800

REMOVABLE STORAGE

- Iomega Rev 35

EDITORS' CHOICES

OCTOBER 19–NOVEMBER 1, 2004

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

WEB SITE CREATION

- NeoVerve StoreSense

WEB RESEARCH

- Amplify
- enLighter Retriever
- 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

DATABASE

- FileMaker Pro 7

BLOG/WIKI TOOLS

- EditMe
- Socialtext Workplace 1.0
- TypePad

UTILITIES

ANTIVIRUS

- NEW** Norton AntiVirus 2005

FIREWALLS

- Norton Personal Firewall 2004
- ZoneAlarm Pro 5

SECURITY SUITES

- Norton Internet Security 2004
- ZoneAlarm Security Suite 5

ANTISPYWARE

- Ad-Aware SE Plus 1.0.2
- SpySweeper 3.0

ANTISPAM

- Cloudmark SpamNet 2.5
- MailFrontier Desktop 4.0
- Qurb

POP-UP BLOCKER

- PopUp Cop

INSTANT MESSAGING

- MSN Messenger 6.1

FILTERING/MONITORING

- Cybersitter 9.0
- Spector Pro 5.0
- The Children's Internet

FILE COMPRESSION

- PKZip 8.0 for Windows
- Stuffit Deluxe 8.0



X10 ActiveHome Professional

BACKUP

- IBackup
- Retrospect Pro 6.5

ROLLBACK

- Norton GoBack 3.0

DISK IMAGING

- Symantec Ghost 9.0

PARTITIONING

- PartitionMagic 8.01

DEFRAGGERS

- Diskeeper 8.0 Pro
- PerfectDisk 6.0

REMOTE ACCESS

- NEW** 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

- BrightMail Anti-Spam 5.1
- 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 9
- 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

VULNERABILITY SCANNER

- WebTrends 7 Enterprise
- Retina Network Security Scanner

NETWORKING

SERVER OS

- Microsoft Windows Server 2003 Enterprise Edition

WIRELESS INFRASTRUCTURE

- Cisco Aironet 1200
 - D-Link DCS-5300G 802.11g Internet Camera
 - Hawking HWPS12UG (print server)
 - Linksys Wireless-G WRT54GS (802.11g)
 - Netgear ProSafe-FWAG114 (802.11a/g)
 - 3Com Office Connect Wireless 54Mbps 11g Travel Router
- ### SECURITY APPLIANCE
- ServGate EdgeForce
- ### REMOTE-ACCESS APPLIANCE
- Neoteris Access 1000

GEAR & GAMES

HOME AUTOMATION

- NEW** X10 ActiveHome Professional

SIMULATION

- Microsoft Flight Simulator 2004
 - The Sims 2
- #### ACTION/COMBAT
- Battlefield Vietnam
 - Far Cry
 - Halo: Combat Evolved
 - Orbz 2
 - Savage: The Battle for Newerth

SPORTS

- Madden NFL 2004

REAL-TIME STRATEGY

- Rise of Nations: Thrones and Patriots

VIRTUAL WORLD

- Second Life

ONLINE GAME

- EverQuest: Evolution

MOBILE GAME

- Bejeweled

EDUCATION

- eMedia Beginner Guitar Method 3.0
 - Math Mission: The Race to Spectacle City Arcade, The Amazing Arcade Adventure
 - Vtech V.Smile Learning System, Smartbridge Library
 - Zoombinis Island Odyssey
- #### REFERENCE & HOBBIES
- Coin Collector's Assistant Plus

- Microsoft Encarta Reference Library 2005
- Visual Thesaurus



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without anti-shake



with anti-shake



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F I R S T

- 34 Apple iMac G5
- 35 Apple Power Mac G5
- 36 Adobe Premiere Elements
- 36 Pinnacle Studio Plus 9
- 40 HP iPAQ h6315



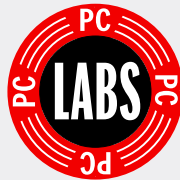
- 40 HP iPAQ hx4700
- 40 HP iPAQ rx3715
- 40 HP iPAQ rz1715
- 40 Sprint PCS Vision Multimedia Phone MM-A700 by Samsung

- 45 Creative Zen Touch
- 45 Roku SoundBridge M1000, M2000
- 46 McAfee SpamKiller 6.0, BelnSync
- 48 MyDVD Studio 6
- 48 Laplink Everywhere 3.0

Beyond Virus Protection

THE MAGAZINE
WORLD'S LARGEST
COMPUTER-TESTING
FACILITY

BY NEIL J. RUBENKING

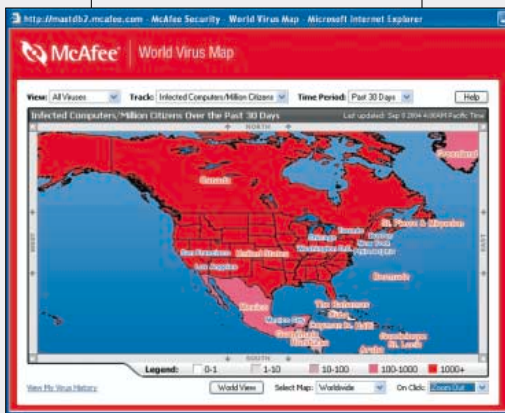


The better antivirus programs have evolved to become more and more alike: They pass all the tests and respond quickly to new virus outbreaks. But the best distinguish themselves by adding features outside the ordinary, features that give them additional power against attack by viruses, worms, or Trojan horses. • Two in the latter category include the venerable McAfee VirusScan and Norton AntiVirus. The newest versions of both provide unrivaled protection against

viruses while also addressing other common types of threats. We can recommend both without reservation, but the Norton entry merits Editors' Choice, thanks to its extra firewall protection and comprehensive log of its activities.

McAfee VirusScan 9.0

The latest build of McAfee VirusScan enhances the program's efficiency and level of protection. Specific areas of improvement include better handling of large e-mail attachments and blocking of what McAfee calls potentially unwanted programs (PUPs)—what others might call spyware. VirusScan scans inbound e-mail, outbound e-mail, and files received via IM, and also provides detailed information on individual viruses and



VIUSSCAN'S INTERACTIVE World Virus Map aggregates outbreak data from thousands of VirusScan users worldwide.

worldwide virus trends. VirusScan 9.0 has received certification from the ICSA, caught 100 percent of viruses "in the wild" in the most recent study by AV-Test.org (www.av-test.org), and was rated number one by AV-Comparatives.org (www.av-comparatives.org).

The majority of modern viruses and worms propagate via e-mail, so VirusScan filters

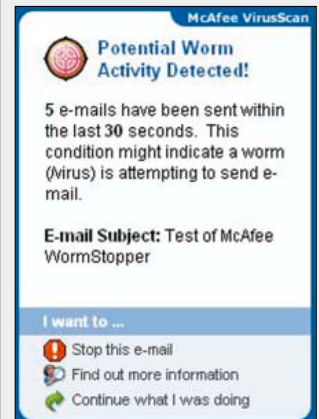
both inbound and outbound e-mail in Microsoft Outlook, Outlook Express, Netscape, Eudora, and Pegasus Mail. This e-mail filtering works only for POP/SMTTP accounts, but the program scans attachments coming to other types of accounts when you access them. In addition, VirusScan checks files transferred through AIM, Yahoo! Messenger, or MSN Messenger.

In addition, the WormStopper feature (introduced in the previous version) protects against unknown worms by blocking suspicious activity, such as the sending of a message to more than 50 recipients or the sending of more than five e-mails in less than 30 seconds. Most users will be glad for such protection, but e-mail fanatics be warned: You must

respond to a pop-up for every single message that overruns these limits.

In our tests, VirusScan's initial full scan showed that our test system was clean, but interestingly, it identified four firewall "leak test" programs as PUPs, though its online database did accurately note that the files are harmless. We sent the EICAR antivirus test file via AIM, and VirusScan picked it up immediately—even with AIM's "Check file for virus after transfer" option turned off.

Each virus or other unwanted item found by VirusScan invokes a clickable link to McAfee's online database, which provides detailed information about thousands of viruses and hoaxes. Unfortunately, the program does not keep a log of viruses it has cleaned or deleted. Another online resource, the interactive



VIUSSCAN'S WORMSTOPPER feature can detect behavior that suggests an unknown e-mail worm is at work, such as sending more than five messages in 30 seconds.

LOOKS

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

- 50 SnapStream Firefly
- 50 Microsoft Wireless Optical Desktop Comfort Edition
- 50 Vizio RP56
- 50 BenQ FP231W



- 52 Sharp LL-151-3D
- 52 Samsung SyncMaster 910T
- 52 Philips 170S5
- 52 iiyama Vision Master Pro 514
- 54 QuickBase for Corporate Workgroups

- 54 Kerio MailServer 6
 - 55 Integrity 5.0
 - 55 Veritas Storage Replicator 3.0 for Windows
- RED type denotes Editor's Choice.

World Virus Map, illustrates the prevalence of viruses worldwide. You can choose all viruses or just the top ten; view results from the past 30 days, 7 days, or 24 hours; and zoom in for more detail. (The information comes from Virus-Scan users who have agreed to share outbreak information with McAfee.)

VirusScan is a fine choice for antivirus protection, especially for those using other McAfee products, because of its integration with McAfee Security Center. It performs well in testing and goes beyond simple virus removal with its behavior-based Worm-Stopper and detection of possibly unwanted programs.

\$49.99 direct. McAfee Inc., www.mcafee.com. ●●●●○

Norton AntiVirus 2005

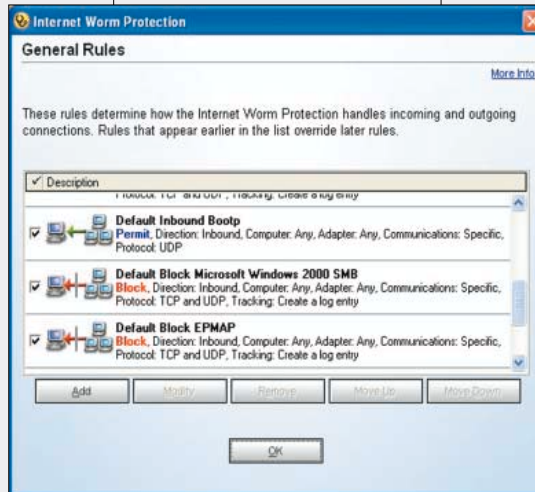


Norton AntiVirus 2005 offers both antivirus protection and (new in this version) a simple firewall. A new Pre-install Scan works around infections that attempt to prevent NAV's installation. It automatically and silently downloads and installs virus signature updates and can run a quick scan of vulnerable files immediately afterward.

By default, NAV blocks spyware, adware, and other malicious nonvirus applications. It scans e-mail going in and out of the system as well as

IM file transfers. NAV is certified by ICSA and got its 17th consecutive 100 percent rating from Virus Bulletin this year. In the latest study from AV-Test.org, it caught 100 percent of viruses and worms in the wild.

NAV's Internet Worm Protection feature blocks unsolicited inbound data packets just like Windows Firewall (which it replaces by default). It got a near-perfect score on Gibson Research's ShieldsUP! test. It specifically blocks known Trojan horses and temporarily prevents all connections from any IP address that attempts illicit access. Like Windows Firewall, NAV offers protection even before Windows has loaded. It does not attempt to block multiple e-mails sent in a short period, but it does



NORTON ANTIVIRUS 2005'S Internet Worm Protection is actually a simple firewall, roughly equivalent to the Windows Firewall in Windows XP SP2.

watch for programs attempting to e-mail themselves as attachments. We still recommend users install a dedicated firewall (such as Norton Personal Firewall or ZoneAlarm Pro), but NAV's antiworm feature does offer some degree of protection. And we prefer it to the Windows Firewall, as inbound-only firewall protection integrated with the antivirus agent is a step up from inbound-only separate protection.

NAV, like the McAfee product, uses the Windows Task Scheduler for scheduled full scans and looks at all file types by default. NAV examines inbound and outbound e-mail for any POP3/SMTP account. Under its de-

fault settings, detection of a virus halts all e-mail processing until the user responds. We quickly changed the settings to have the program fix problems automatically, but the program does include an option to prevent the e-mail program from timing out when it's waiting for a response.

On our test system, NAV found over 100 threats in a set of 2,000 messages. All but a handful, however,

had already been neutralized by a server-side antivirus package. NAV quickly deleted the EICAR virus test file when it was received as an AIM file transfer. It can also filter file transfers through Yahoo! Messenger and MSN Messenger.

NAV keeps a detailed log of all blocked threats, each with a link to a detailed description on Symantec's Security Response Web site and an indication of the threat's disposition. It also reports on a variety of other security events, including incoming and outgoing connections, with IP address, port used, bytes sent, and duration.

Norton AntiVirus 2005 remains our top choice for virus protection. Its AV features are excellent, and the new Internet Worm Protection feature gives added security to those not using a separate firewall.

\$49.95 direct. Symantec Corp., www.symantec.com. ●●●●●



NORTON ANTIVIRUS 2005'S Log Viewer lists every threat detected by the program, along with the action taken to neutralize that threat.

Apple iMac G5: An iPod Writ Large

BY JOEL SANTO DOMINGO



When we first saw the G4-generation iMac, with its dome base and trick swing-arm, we thought “wow.”

The latest incarnation of Apple's design standard-bearer, the **Apple iMac G5**, is no less sublime, but a lot more subtle. This iMac G5 will have you nodding your head and saying, “It's about time they designed a computer like this.”

Most all-in-one desktops with LCD panels (the Sony VAIO and Gateway Profile systems come to mind) are two units permanently connected together: the part of the case housing the motherboard and drives, and the monitor. But the iMac G5 has the CPU, motherboard, and drives mounted in the same 2-inch-thick chassis as the monitor. The result is the clean look of an iPod music player, supersized and placed on an elegant anodized aluminum stand.

The 17-inch model (configurations start at \$1,299 direct) weighs just 18.5 pounds, and the 20-inch one (\$1,899 and up) is 25.2 pounds, so moving one from room to room is easy. The pricing is as attractive as the units. A multimedia-centric desktop-replacement Windows notebook with a 17-inch widescreen, such as the HP Pavilion zd7000, starts at \$1,299. And if you really want a large screen in an all-in-one in the Windows world, pretty much your only choice is the 19-inch Gateway Profile 5XL-C, which starts at \$1,999 direct.

If you opt to have Bluetooth and AirPort Extreme installed, the power cord is the only cord that you will need to plug in. Taking design cues from previous Mac products, the iMac G5 presents a front panel devoid of speakers, control buttons, or ports. The ports—USB 2.0, FireWire 400, Ethernet, and

modem jacks—are lined up vertically on the back panel. The audio-out port doubles as a standard iPod-style headphone jack, or it can be used with a mini optical cable and connected to speaker sets and A/V receivers with SP/DIF inputs. A VGA/video-out port is present, but requires a dongle adapter.

Last year's iMac G4 had a quiet, single-fan design. The G5 processor in the iMac G5 runs a little hotter, and the new slim shape requires a few fans in the chassis. The fans are intelligently placed, pulling in air from the bottom and letting the warm air rise and exhaust out the top. In normal use, they are quiet, and blend easily into the background noise even of a quiet bedroom.

The downward-firing speakers are in the bottom of the chassis. We were skeptical at first, but they work well, provided you aren't in a cavernous space. The bass is predictably weak, but the quality of the speakers and the stereo separation are fine for routine music and computing use.

The 20-inch screen seems a little large at first, especially at typical PC-viewing distance. But you quickly grow accustomed to it, and get spoiled by the vast amount of screen real estate. The base works well as a cubby where you can stow the keyboard to reclaim desk space. You can remove the foot and install an optional VESA mount (for wall- or swing-arm mounting) in its place, which gives you myriad setup choices, especially if you miss the old iMac's arm.

Like other Apple PCs, the

iMac G5 comes with a very good software package that includes the iLife multimedia suite, Zinio Reader, and Quick-en 2004. For those who already own a Mac that runs Mac OS X 10.1 or later and

drive (spinning at 7,200 rpm) can be had in capacities up to 250GB. This handily outclasses desktop-replacement notebooks, which are currently limited to 80GB, space that today's video files and other large downloads can eat up quickly.

The integrated nVidia GeForce FX 5200 Ultra graphics chipset means that the iMac G5 can play fairly strenuous 3D games, like Unreal Tournament 2004 and Halo. The iMac G5 won't match the performance of a high-end Windows PC or PowerMac dual G5 (with their higher-powered Radeon X800XT or GeForce 6800 Ultra graphics processors), but it should prove to be a capable gaming box.

But as with other all-in-one PCs, you can't upgrade the graphics card. The sleek, compact design is LAN party-friendly, but be sure to bring a wired keyboard and mouse along. The Bluetooth keyboard wasn't quite as precise as a wired one when playing games; the cursor seemed to jump around, instead of smoothly moving along with mouse movements.

With the iMac G5, Apple has given Mac fans yet another reason to stay in the fold. And its unparalleled execution, ease of use, and software bundle should attract would-be Windows PC buyers, as well.

Apple iMac G5

With 1.8-GHz PowerPC G5 processor, 512MB DDR SDRAM, 160GB SATA hard drive (7,200 rpm), nVidia GeForce FX 5200 Ultra graphics, 20-inch widescreen LCD, DVD-RW optical drive, AirPort Extreme (802.11g) wireless, Bluetooth, Mac OS X 10.3.5, \$2,103 direct. Apple Computer, www.apple.com. ●●●●●
Music: 86 (out of 100); Photos: 81; Video: 74; Gaming: 79



IF THE IPOD GREW

into a full-size computer, it would look a lot like the new iMac G5.

supports FireWire disk mode (as do most Macs made in the past three years), the new Mac OS X Setup assistant will interest you. Connect your old Mac system up to the iMac G5 with a standard FireWire cable, boot the old computer up in FireWire disk mode, and follow the on-screen prompts to transfer all your documents, user accounts, settings, and apps (it'll even keep the serial numbers intact).

Thanks to its faster processor, the iMac G5 delivers a noticeable speed boost over the iMac G4, completing three of our four Adobe Photoshop operations more quickly (the last test was a tie). And the iMac G5's desktop-class SATA hard

Apple's Über-Computer, Take Two

BY JOEL SANTO DOMINGO

Through the latest **Power Mac G5's** sleek, perforated tower doesn't look much different from previous models, the new system has a few new tricks under its hood. Chief among them are dual 2.5-GHz G5 processors—a noticeable step up from the 2.0-GHz processors of the previous top-end Mac. And Apple's brilliant new Cinema Displays (a 23-inch in our bundle) knocked our socks off.

Last year, only the highest-end Power Macs had dual processors. Now, all Power Macs do, including the entry-level 1.8-GHz model. The 2.5-GHz G5 processors use a new heat-pipe system that uses thermally conductive liquid to carry heat from the processor surface to heat-dissipating fins, much like a car's radiator and coolant system. The heat sinks are passive, with a dedicated fan blowing cool air over each radiator, one per processor. And the Power Mac G5 is still a case study in intelligent cable and airflow management. There are separate air channels for the CPUs, the memory and cards, and the hard drives.

The Apple design team again took aesthetics into account while putting together the latest Power Mac G5: If you look through the front mesh of the tower while the system is in operation, the CPU cooling fans seem to spin in slow motion, like the languidly turning wall-mounted fans in the shadows of a film noir.

The new Power Mac G5's performance is an improvement on the dual 2.0-GHz model's.

Adobe Photoshop tasks run faster than ever, to the point where they're almost instantaneous with our standard 58MB test file. There is also room to configure the Power Mac G5 upwards. Our bundle came

6800 Ultra are the tops. The GeForce 6800 Ultra DDL is available as a \$450 upgrade.

The 160GB SATA hard drive included has a lot of

silver coloring of the Power Mac G5 perfectly. The smaller bezel helps "blend" images together if you are lucky enough to be using two displays side-by-side. The monitor has the same balanced "foot" design as the new iMac G5, and supports an optional VESA mount for wall or suspension-arm mounting. And if cost is no object, consider the huge 30-inch Cinema Display (\$3,299, plus \$599 for the required nVidia GeForce 6800 Ultra DDL graphics card), with its 2,560-by-1,600 resolution.

The Cinema Display's power/video/FireWire/USB 2.0 cable is a nice touch: A shared cable connects to the Power Mac G5, feeding the built-in USB 2.0 hub and the FireWire 400 hub on the back of the display. The power button on the Cinema Display controls the Power Mac's power functions, so you don't have to stoop down to wake up your Mac (or put it to sleep). With a 16-ms pixel response rate, the Cinema Display is perfect for viewing video and even playing 3D games.

Most users with recent-vintage G5 machines (especially dual-2.0GHz models) don't need to jump on this upgrade. But graphics pros and media outlets that need the fastest available speed will want to move to the new configuration, as will G4 users who make a living on the Mac; the time savings realized from the performance boost justifies the expense.

Apple Power Mac G5

With dual 2.5-GHz PowerPC G5 CPUs, 1GB 400-MHz DDR SDRAM, 160GB SATA hard drive (7,200 rpm), ATI Radeon 9800XT graphics, DVD-RW drive, 23-inch widescreen LCD, Mac OS X 10.3.5, \$5,448 direct. Apple Computer, Inc., www.apple.com. ●●●●○

Music: 78 (out of 100); Photos: 87; Video: 76; Gaming: 86



WHEN PAIRED WITH ONE OF APPLE'S CINEMA DISPLAYS, the Apple Power Mac G5 makes a stunning high-performance workstation.

with the ATI Radeon 9800XT graphics card. Sure, this is a high-end 256MB card that until recently was the best of its brand, but today the ATI Radeon X800XT and nVidia GeForce

space, but not quite as much as the optional 250GB drive (only a \$100 upgrade). If you're considering the Power Mac G5 as a serious video workstation, we highly recommend the dual 250GB SATA drive upgrade, which costs \$425 extra. With a dual-drive configuration, you can set the drives up for software RAID through Mac OS X and gain better performance in video-editing tasks.

The 23-inch Cinema HD Display (\$1,999) that Apple sent with our review unit is gorgeous: bright, sharp, and extremely high-resolution. At 1,920-by-1,200 native resolution, there isn't much out there that can't be displayed at 100 percent on this monitor. The monitor's bezel is much thinner than on previous Cinema Displays, and matches the



GOOD-LOOKING

inside and out, the Power Mac G5 is a study in efficient cooling.

Video Editors Bring Power to Non-Pros

BY JAN OZER

Following years of growth in the video-editing software market, we're now seeing the emergence of a new class of software aimed at sophisticated home PC users. Though earlier consumer-level packages shunned such advanced concepts as multitrack editing and chroma-key capabilities, software developers have recognized that many early adopters are ready for more powerful software—but aren't ready or willing to tackle the \$500-and-up packages intended for professional videographers. The newest entries in this upper-entry-level segment are Adobe Premiere Elements and Pinnacle Studio Plus 9.

Adobe Premiere Elements

To create **Premiere Elements**, Adobe essentially placed a friendlier interface on top of the powerful Premiere Pro. Premiere Elements includes a taskbar that guides you through the workflow, from capture to exporting. Adobe added a number of customizable presets for common operations, such as picture-in-picture effects and still-image pans and zooms.

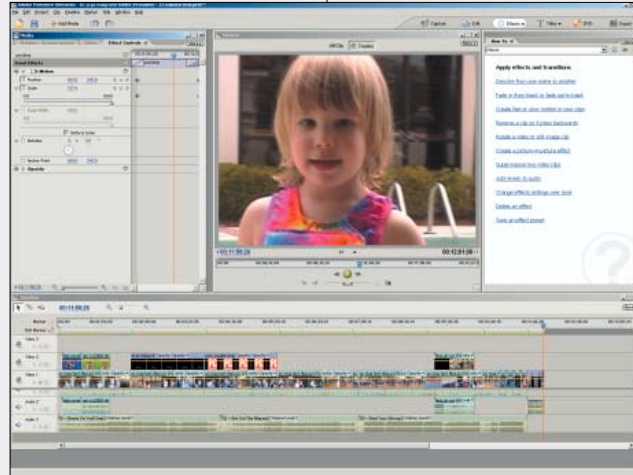
If you stick to the presets, operation remains fairly simple. But if you venture beyond that into the Effects Control palette, you'll see the same intimidating screens found in Premiere Pro. Complicating matters, Premiere Elements scatters controls over multiple palettes, making them more difficult to find and apply.

In many cases, borrowing abilities and features from Premiere Pro is a good thing. Premiere Elements' titling tool and chroma-key capabilities are the best in its class. Unfortunately, Adobe didn't borrow enough from Premiere Pro's audio mixer. Rather than using the real-time mixer, Premiere Elements forces users to set

volume levels on the timeline manually via "rubber-band" controls. This is a slower and less accurate approach.

Integration with Photoshop Elements is quite handy. You can use Photoshop Elements to edit any image on the Premiere

Creating a DVD in Premiere Elements is extremely simple, and the templates are stunning. But customization options are minimal. You can't, for example, substitute a different background image on a menu or even change the font. Premiere



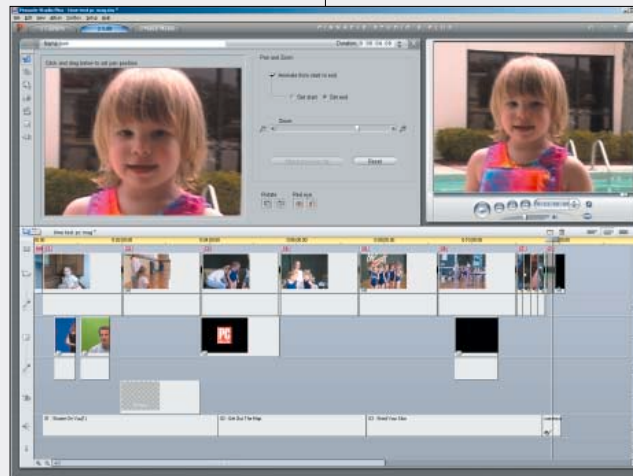
MOTION CONTROLS, like those on the upper left here, may be intimidating to novice users who try Adobe Premiere Elements.

Elements timeline, and the image on the timeline is updated automatically. But when using Premiere Elements to create slide shows from our image library, we noticed significant flickering in the final projects, particularly when we had used pan and zoom effects.

Elements lacks common features like motion menus and background audio. So Pinnacle Studio Plus is far more versatile as an all-around video-editing and DVD-authoring solution.

Pinnacle Studio Plus 9

\$99 direct. Adobe Systems Inc., www.adobe.com. ●●●●○



PINNACLE STUDIO PLUS 9's new pan and zoom capability and extra audio/video timeline track round out an already feature-rich editor.

Pinnacle Studio Plus 9

Pinnacle Studio, one of the pioneers in the category, has long been an impressive consumer-level video editor—though of late we've bemoaned its lack of PiP capabilities and pan and zoom control for still images. **Pinnacle Studio Plus 9** addresses those deficits and also adds a second timeline and useful audio options. The result is a fantastic product that stands out in the competitive consumer video-editing market.

Studio Plus's new PiP controls are comprehensive. You can place a customizable border around the inset picture, defining its color, edge softness, shadow color, and transparency. Output quality of PiP effects is very good. And Studio Plus has robust chroma-key controls, though output quality here is just so-so.

The new still-image pan and zoom tool, which includes both red-eye reduction and image-rotation features, is very easy to use. To create the pan and zoom motion, you set the start and end points within a window. A zoom slider lets you intuitively control magnification.

Studio Plus adds Dolby Digital Stereo encoding, a plus for serious DVD producers. Audiophiles will appreciate Studio Plus's new surround-sound capabilities, which can precisely position each audio track within a 5.1 speaker configuration. We found Studio Plus's color correction more effective than that of Premiere Elements. Its DVD-authoring capabilities are also far more flexible.

All told, Pinnacle Studio Plus is an approachable video editor for novices, while offering the depth experienced video enthusiasts won't find in other packages at this price.

Pinnacle Studio Plus 9

\$99 direct. Pinnacle Systems Inc., www.pinnacle.com. ●●●●○



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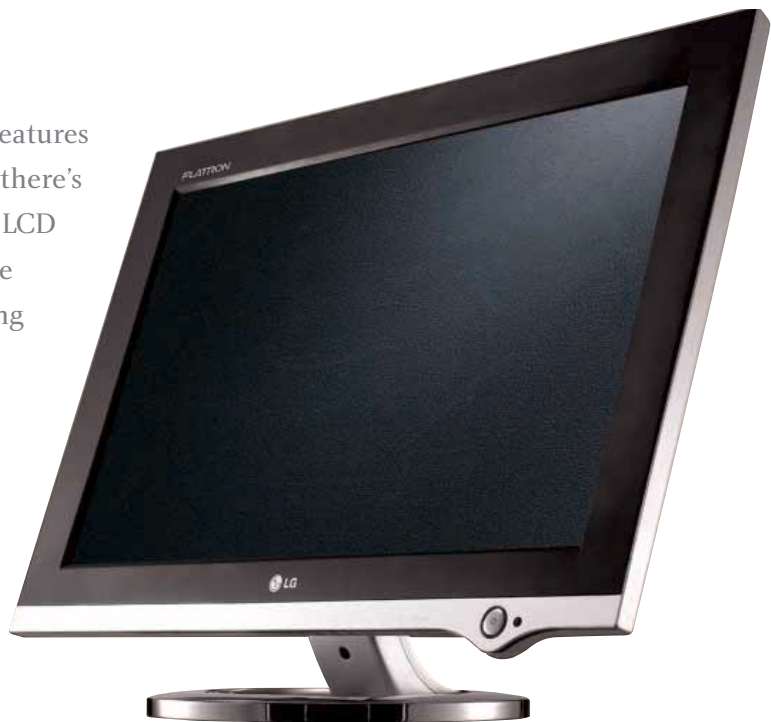
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HP's Take on the PDA/Phone

BY SASCHA SEGAN

The HP iPAQ h6315 will keep you connected pretty much anywhere and anytime. This Wi-Fi-equipped cell phone combines a camera phone and a full Pocket PC PDA, hooking you up via Bluetooth, Wi-Fi, or T-Mobile's GSM network.

At 4.7 by 2.9 by 0.7 inches (HWD) and 6.7 ounces, the h6315 feels like a PDA; its 3.5-inch screen ensures it looks the part. It has a snap-on keyboard with tiny but usable keys, about on a par with the PalmOne Treo 600.

HP put effort into its networking software, and it shows. If you're using GPRS and a Wi-Fi network comes into range, a dialog box will pop up asking you if you want to switch. If the Wi-Fi fades, the iPAQ will try to redial your GPRS connection. This worked for us, though

when you switch networks you have to restart streaming connections.

We had spotty results with T-Mobile's push e-mail system. The free, Web-based service checks your POP3, IMAP, or Outlook Web Access ac-

count to see when new messages arrive, and pings your handheld to pull down the e-mail independently. It didn't work at all with one POP3 account we tried; with another, there was a 10-minute delay between sending a message and the alert arriving on the handheld. The 6315's Inbox program, on the other hand, worked fine, and it conveniently combines SMS, MMS, POP3, or IMAP e-mail and ActiveSync messages in one handy application.

The h6315 works just fine as a phone, with a loud-enough internal speaker (but no speakerphone.) The built-in VGA camera wasn't great; images appeared jagged and in somewhat soft focus. In low light, you're pretty much guaranteed blurry pictures.



THIS PHONE AND PDA combo is made more attractive with Wi-Fi.

HP iPAQ h6315
 \$599.99 direct. Hewlett-Packard Development Corp., www.hp.com.
 OVERALL RATING ●●●●○
 PIM ●●●●○ Entertainment ●●●●○
 Mobile Professional ●●●●○
 Enterprise ●●●●○

HP iPAQ rx3715

Pros: Lots of memory. Only Pocket PC with 1.2-megapixel camera. Dual networking. Excellent battery life.
Cons: Expensive. Only streams unprotected WMA files. No flash for camera.

Bottom line: The HP iPAQ rx3715 is a solid, flexible Pocket PC with intriguing multimedia features.

\$499.99 direct. Hewlett-Packard Development Corp., www.hp.com.
 OVERALL ●●●●○
 PIM ●●●●○ Entertainment ●●●●○
 Mobile Professional ●●●●○
 Enterprise ●●●●○



HP iPAQ rz1715

Pros: Thin and light.
Cons: Very little memory. Poor battery life. Overpriced.

Bottom line: HP's latest low-end handheld offers too little for your money.

Corporate fleet buyers who can cut deals might be interested, but others can do better.
 \$279.99 direct. Hewlett-Packard Development Corp., www.hp.com.
 OVERALL ●●○○○

PIM ●●●●○ Entertainment ●●○○○
 Mobile Professional ●●○○○
 Enterprise ●●○○○



An iPAQ to Grow With

BY SASCHA SEGAN

PC MAGAZINE EDITORS' CHOICE
 The HP iPAQ hx4700 is a gorgeous and powerful handheld. At 6.6 ounces, and clad in a magnesium chassis, it feels solid and professional in your hand. The star feature is the screen, a 4-inch VGA LCD that looks positively huge, with rich, deep colors (though it's a bit dim under direct light). A tiny touchpad replaces the usual four-way navigation button.

The hx4700's 624-MHz Intel processor simply blows away previous-generation iPAQs. That said, both we and HP strained to find any applications that take full

advantage of the processor and VGA screen. We settled on two, PDF viewing and remote access to our desktop PC (through GoToMyPC). Over a Wi-Fi connection, we manipulated our desktop screen with minimal scrolling; the processor ensured that the system felt responsive.

PDF viewing is similarly exciting; in landscape mode it's easy to view the full width of an 8.5-by-11 page. But we were stymied by the ClearView PDF browser we used; it crashed on or refused to open several PDFs. In our

testing, we also managed to crash Pocket Word, Mapopolis, and the Pocket PC version of Skype—though not the Pocket PC OS itself.

HP did throw in some other useful utilities. A new Today screen shows battery life, free memory, and brightness. Also included are the award-winning Pocket Informant PIM application and an easy-to-use wireless application that makes hooking up to Wi-Fi networks and Bluetooth devices a breeze.

The hx4700 is an investment in the future. HP has supplied the hardware for the next-generation Pocket PC experience. Now it's time for vendors to come out with software that's worthy of this machine.



THE HIGH-RES screen on the hx4700 is gorgeous.

HP iPAQ hx4700
 \$649 direct. Hewlett-Packard Development Corp., www.hp.com.
 OVERALL ●●●●○
 PIM ●●●●○ Entertainment ●●●●○
 Mobile Professional ●●●●○
 Enterprise ●●●●○

Sprint PCS Vision Multimedia Phone MM-A700 by Samsung

Pros: 1MP camera. Streaming video content.
Cons: Tiny memory. No USB or Bluetooth. Streaming video is poor quality.

Bottom line: Overly compressed video content and miniscule memory make for an uninspiring multimedia experience.

\$399.99 list (as low as \$219.99 with contract). Sprint PCS, www.sprintpcs.com. ●●○○○



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Great-Sounding Player

BY BILL MACHRONE

The **Creative Zen Touch** invades Apple's formerly exclusive territory of touch-driven music-player interfaces with a finger-wide, vertical touch pad in the center of the player instead of the iPod's well-known touch wheel. Anyone who's used a hard drive music player knows you do a lot of scrolling, and scrolling is where buttons and rocker switches are at their worst. But is the Zen Touch's inch-long pad the equal of the iPod's loop?

The short answer is no, not quite. Touch wheels are better for continuous scrolling, because linear sensors require you to make multiple strokes or to hold your finger at the top or bottom of the pad in order to engage auto-repeat. In practice, though, the Zen Touch is one of the easiest players to operate,

and it's certainly better than the rocker-driven ones.

Creative is justifiably proud of the audio features of the Zen Touch. The signal-to-noise ratio is the best we've yet seen on a portable player, with nearly 100 dB of headroom. Frequency response is flat across the audio spectrum, and harmonic distortion is way below audibility, even when we pushed the player to its painfully loud maximum output. The MP3 and WMA codecs are well implemented and wring out all the fidelity the formats are capable of. We wish that the Zen Touch supported one of the lossless codecs; the audio quality of the device certainly justifies it. And the provided earbuds are better than average but not up to the player's audio quality.

With the Zen Touch, you can create playlists and even delete



TOP-NOTCH AUDIO and a host of thoughtful features make the Creative Zen Touch worth a look.

tracks when you're not docked to your PC, but the process is slightly intrusive. When you click on an album, you get a menu that lets you choose

among Play, View Tracks, Add to Selected, or Find, so it takes a second click to start playing. And if you're viewing tracks, you get a similar menu: Play, View Details, Remove Track, Clear Selection, and Save as Playlist. If you just want the music, however, you can click on the Play button to bypass these menus. Our only other ergonomic complaint is that the backlight could be brighter.

The Zen Touch is a very strong value. FM and recording are extra-cost add-ons, but if you're just interested in playing your digital tracks, the combination of 20GB, easy navigation, extra-long battery life, and excellent audio quality is compelling.

Creative Zen Touch

\$270 street. Creative Technologies Ltd., www.creative.com. ●●●●○

Great-Looking Music Hub

BY BILL HOWARD

Most digital media hubs look like the dull networking gear they were spawned from. Not so the **Roku SoundBridge M1000**. Beauty has its cost, and in this case it's \$249.99 (direct) for the M1000 unit we tested and \$500 for the larger M2000—the upper limits of what users will pay, especially since the product does not transfer photos or video, makes you go get the software separately, and has a gaping hole in its iTunes music support.

The M1000 is a 2.4-inch cylinder 10.5 inches wide; it has a two-line vacuum fluorescent display (VFD) comprising 280- by 16-pixel elements. (The bigger M2000 is 2.8 by 17 inches with a 512- by 32-pixel display.) Removable black-plastic end

caps hide the connectors: 10-Mbps wired Ethernet and a CompactFlash Wi-Fi slot on the left, and power, analog, coaxial digital, and optical digital on the right.

No software ships with the M1000 or the M2000. Roku wants you to use Apple iTunes, which you can download, or you can download the

company's free SlimServer software, which Roku pointedly says it won't support if you have problems. iTunes music fans will be thrilled that somebody built an audio hub with them in mind—and frustrated when they learn that Apple's licensing deal with Roku did not include the right to play secure music downloaded from the iTunes Music Store. iTunes plays MP3, unprotected AAC, AIFF, and WAV files, but not WMA. SlimServer plays MP3, WMA, FLAC, Ogg Vorbis, AAC, and WAV files.

Setting up SlimServer can be a challenge, especially if XP Service Pack 2 is installed, but the reward is versatility: You can control the M1000 from a PC (if you don't mind SlimServer's smallish fonts) as well as from the 18-button remote. In a trib-

ute to *Spinal Tap*, SlimServer's volume control goes to 11. The remote has a pause button and volume control, but no stop or mute buttons.

Roku's closest competitor in the realm of serious audio-only players is the Turtle Beach Audiotron (\$275 street). Both have front-panel displays rather than TV outputs. Turtle Beach makes you work to add Wi-Fi to the integrated wired Ethernet, but the Audiotron doesn't require software running on a PC.

You'll love the looks and sound of the M1000. But with such a premium-price product, it's hard to ignore the quirks—particularly that you can't play iTunes-resident tracks you purchase from Apple. Add the fact that you have to download the software yourself and that Roku pledges to deliver no customer support for its utility, and the beauty remains only skin deep.

Roku SoundBridge M1000

\$249.99 direct. Roku LLC, www.rokulabs.com. ●●●●○



BEAUTIFUL DESIGN meets so-so functionality in Roku's M1000.

Like Having One Machine in Multiple Locales

BY CADE METZ

Each afternoon, you frantically e-mail several important files to yourself or copy them to a USB key, so you can get back to work at home after dinner. Well past midnight, you rub your eyes and send them back to the office. Day by day, you waste countless minutes attaching and detaching file after file. And with duplicate copies floating around, there's always the danger you'll overwrite the newer file with the older one.

You could use a remote-control application such as GoToMyPC or LapLink Everywhere, accessing your office PC from home and vice versa. But you may be better off with **BeInSync**, a new P2P service. BeInSync automatically synchronizes your important files—as well as your e-mail messages, contacts, bookmarks, and Windows desktop—across up to three different machines. If you change a file on one machine, it is automatically changed on the others. Delete a file or bookmark and it's delet-

ed on the others. It even lets you quickly share and synchronize data with other BeInSync users.

The service is surprisingly easy to set up and use. First, you install a small app on one system, check the items you'd like to synchronize, and sign up for a user name and password. Then you simply set up the same app on one or two other machines and log on with the same user name and password. From then on, the service will automatically synchronize all your chosen items.

The app looks a lot like Windows Explorer. It displays a Windows folder tree divided into five subdirectories: Documents, Emails, Contacts, Favorites, and Shares. The first four contain all the items being synchronized among your PCs; the Shares subdirectory contains items you want to share

with other BeInSync users.

Synchronization occurs on the fly and, as long as your systems remain online, around the

clock. All data passing over the Internet is encrypted, and you don't have to worry about accidentally deleting files across all your systems or causing file conflicts when PCs are between synchronizations: BeInSync makes a local backup each time you change or delete an item, and a dialog box pops up when there's a conflict, asking you which version of the

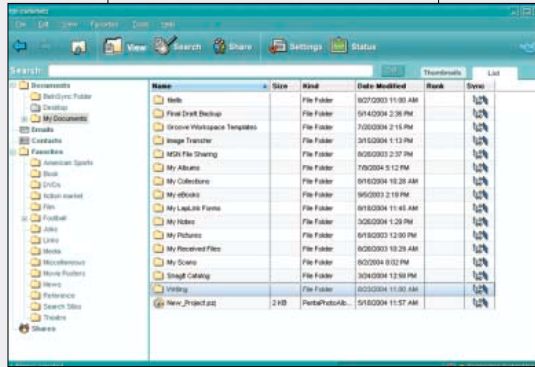
file you'd like to keep. The only problem we found is that the service may not work properly if you're trying to synchronize too many items or files that are unusually large (you get an error message if synchronization fails).

If you want remote access to data on any of your registered systems from yet another PC, you simply visit the BeInSync Web site and log on with your user name and password. An HTML version of

the app, linking to all your shared and synchronized items, will pop up in your browser. With its unmatched ease of use and remote access that is probably just enough for most users, BeInSync is worth a look for those tired of the file-shuffle routine.

BeInSync

\$9.95 per month. BeInSync Ltd., www.beinsync.com. ●●●●○



BEINSYNC AUTOMATICALLY UPDATES the files on up to two other PCs when you make a change on one system.

McAfee SpamKiller Still Subpar

BY NEIL J. RUBENKING

The new **McAfee SpamKiller 6.0** delivers an improved ability to distinguish valid mail from spam compared with previous versions. But the utility is still not up to the performance of our current Editors' Choices in the category, Cloudmark SpamNet 2.5 and MailFrontier Desktop 4.0.

Installation is a snap. In most cases, SpamKiller can automatically configure an existing e-mail

account. The program offers to import your address book into its Friends list, and mail from these addresses will not be

filtered. SpamKiller employs over 300 built-in global filters, each of which contains one or more rules (such as, "The subject contains 'win a FREE' "). Special-purpose filters block messages with invisible text, deliberate misspellings, or too many images. Users can define personal filters using a well-designed Filter Editor.

We ran ten days' worth of mail from a real, spam-infested account through SpamKiller with default (High) filtering

and all non-Western character sets blocked. Counting only messages that were clearly spam or clearly valid, we found that it blocked about 4 percent of valid mail and let a quarter of the spam into the in-box.

That's quite a bit better than the previous version (which blocked half of the valid mail and accepted a third of the spam), but it is still not on a par with the best products. So while we like its nifty features, in the end SpamKiller falls short where it counts most.

McAfee SpamKiller 6.0

\$39.99 direct (includes updates for one year). McAfee Inc., www.mcafee.com. ●●●○●



SPAMKILLER'S SUMMARY pane provides an overview of the number and type of spam messages it has blocked.

**This is the company that develops the technology,
that encrypts the data,
that's critical to your business,
so the right people get in,
and the wrong people don't.**



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APPLICATIONS - AUTHENTICATION - REMOTE ACCESS - ANTI-PIRACY - LICENSE MANAGEMENT - VPN/SSL

Top-Tier DVD Authoring

BY JAN OZER



MyDVD Studio 6, from Sonic Solutions, is the most intuitive application we've tested for quickly producing high-quality DVDs. Though its limited video-editing features will leave more ambitious filmmakers looking elsewhere, MyDVD is ideal for users who simply want to convert raw footage to DVD without doing much editing.

MyDVD Studio 6 is the core app in a line of Sonic products, ranging from the basic MyDVD Studio 6 (\$69.99 direct), which includes MyDVD and CinePlayer (a software DVD player) to MyDVD Studio Deluxe Suite 6 (\$149), which adds a system backup utility, CD/DVD premastering, and disc-labeling features.

Our tests focused on the MyDVD authoring software. Like Ulead DVD MovieFactory

and Pinnacle Instant CD/DVD, MyDVD offers limited editing abilities. You can capture and trim scenes; add transitions, titles, and some special effects. In this version, you can adjust color and tint and employ pan and zoom effects. But there is no timeline view, and the audio mixing capabilities are very basic.

MyDVD's strengths lie in its DVD-authoring operations, which are straightforward and full of handy features. When creating menus, you can customize backgrounds, include audio, and add motion menus and buttons. You can position video thumbnails manually on the menu and apply different styles to different menus. MyDVD now imports



MYDVD STUDIO 6 features an intuitive, uncluttered interface that makes getting through projects a snap.

MPEG-4 and DivX content, as well as video from non-copy-protected DVDs. The new, very handy fit-to-disc function automatically computes the compression parameters necessary to fit all of a project's content onto the media you're using.

The new release offers 16:9 support, which we tested with both DV footage and a down-

loaded movie trailer. With DV source video, MyDVD's output quality was comparable to Pinnacle Studio's. MyDVD proved slightly faster, producing a disc with 8 minutes of content in 7 minutes 52 seconds, compared with 8:35 for Pinnacle Studio. We then made a DVD with a *Matrix Revolution* trailer in QuickTime, and the quality was stunning.

If you're looking for a total editing/authoring suite, you're better off with a product such as Ulead Video Studio 8 or Pinnacle Studio 9. But those packages don't offer the power and ease in their DVD-authoring components that MyDVD does.

MyDVD Studio 6
\$69.99 direct. Sonic Solutions,
www.sonic.com. ●●●●○

Laplink Goes Where GoToMyPC Cannot

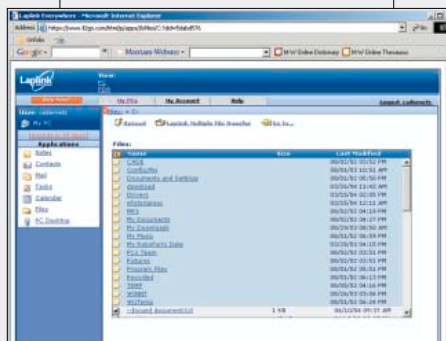
BY CADE METZ



Users who need access to a remote PC but not full-blown remote control of the entire OS should consider the impressive **Laplink Everywhere 3.0**. Laplink Everywhere can access certain important parts of your PC—including your e-mail in-box, calendar, and file tree—without establishing a full remote-control connection.

Once you install the Laplink Everywhere 3.0 client on your host PC, you can access that machine from any standard browser on the Internet. When logging on through the Laplink Web site, you get a menu of seven system links: Notes, Con-

tacts, Mail, Tasks, Calendar, Files, and PC Desktop. The first six can be used from almost any Web-enabled device, including



WITH LAPLINK EVERYWHERE, you can access important files and Outlook data on a remote PC, even over dial-up or with a PDA.

PDAs, cell phones, and PCs whose browsers do not support Java. The Mail, Contacts, Calendar, Notes, and Tasks links tie

into the host system's Outlook client, letting you do everything from sending and receiving e-mail to checking your latest to-do list, and the Files tool provides access to the system's file tree, letting you upload and download documents.

The last link, PC Desktop, provides full remote control, à la GoToMyPC. Unlike the other links, it requires a Java-enabled browser and broadband connection. You'll have to download an extra bit of software on your host system to use this tool. Although it's not nearly as fast or as slick as GoToMyPC, it's nice to have on hand for emergencies.

The 3.0 release adds a few

new perks to this arrangement. You can now schedule and accept events in your calendar. You can receive alerts when new mail hits your in-box or when one of your calendar events is imminent. And it's much easier to look through your Outlook data: You can sort e-mail by subject, date, recipient, or sender and view your calendar by day, week, or work week.

The only significant problem with the application is that it doesn't work with any e-mail client or PIM other than Outlook or OE. Unless you're dead set on doing full remote control, you'll be more than pleased with Laplink Everywhere.

Laplink Everywhere 3.0
\$9.95 per month direct, or \$89.95 per year. Laplink Software Inc.,
www.laplink.com. ●●●●○

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RealPlayer and Intel-based PCs – bringing you the big picture

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Make Your Own Media Center

BY BILL HOWARD

Microsoft won't let you add the Windows Media Center Edition OS to existing Windows XP PCs, but for about \$50 you can come tantalizingly close with a PC-based remote control and companion big-font on-screen interface. The best and most polished of these products we've yet seen is the **SnapStream Firefly**. It's a class act all the way, from its idiot-proof setup to the reasonable emulation of the interface used by Media Center PCs.

The Firefly consists of a 48-button RF remote control, a USB receiver that plugs into your PC, Beyond Media Basic control software, and SnapStream Spotlight music and information services. Because the remote and receiver use a high radio

frequency (433.92 MHz), you can be in an adjacent room, up to about 30 feet away, and still control your PC.

When you press the Firefly button on the remote, the Beyond Media Basic software menu pops up, showing multimedia options in big white letters on a blue background: Music, Photos, DVD, Video, and (if you have a tuner) TV. You can add any other application you wish to this main menu; about 80 multimedia apps are supported, including Apple's iTunes and Musicmatch JukeBox.

For the basics of browsing and playing photos



THE FIREFLY remote gives full access to your PC.

and video, Beyond Media Basic is fine; for music it's adequate. Music that is already playing can be used as background to a slide show. Dig a little deeper, though, and you'll find several minor problems. The music player doesn't show album art or artist and song information. If you use a third-party application, you can't enlarge the fonts on, say, Musicmatch Jukebox so you can read the information from the couch. And the Firefly is not a universal remote: It controls your PC, but not the TV or stereo to which you're sending the media.

If you have a PC you want to use as a multimedia hub—and cost is an issue—the SnapStream Firefly is the way to go. It's easy and affordable, and it works as advertised.

SnapStream Firefly

\$49.99 direct; Beyond TV 3 module, \$69.99 direct. SnapStream Media Inc., www.snapstream.com. ●●●●○



Vizio RP56

Pros: Competitively priced. Nice extra features.

Cons: Narrow range of optimal vertical viewing angles. Audio subsystem is so-so. Black-level uniformity is not good. Front panel causes some image distortion.

Bottom line: The Vizio RP56 is a bargain-priced rear-projection HDTV. It has some thoughtfully designed features, but there are too many problems with its image quality.

\$3,299 list. V Inc., www.vinc.com.

●●●●○



BenQ FP231W

Pros: Good gray-scale linearity. Easy assembly. Good ergonomics. Generally solid video playback.

Cons: Inconsistent dark-tone response, especially at the upper corners. Contrast-ratio uniformity suffers as a result.

Bottom line: The BenQ FP231W is another entry in the growing LCD TV/PC monitor category.

This 23-inch model is a good bet if you're looking primarily for a big Windows desktop monitor and also want to watch some DVDs and HDTV content in a near-field viewing environment.

\$2,500 street. BenQ Corp., www.benq.com. ●●●●○

New Shape in Ergonomic Keyboards

BY ROBYN PETERSON

With its latest keyboard suite, Microsoft has mastered the art of subtle ergonomics. The **Microsoft Wireless Optical Desktop Comfort Edition**, with its mildly arced keypad, allows for easy typing while providing some relief for your wrists. By arcing the keypad, Microsoft created an ergonomic input device that's easy to use and less intimidating than the split keyboards already on the market.

An array of helpful buttons adorns the top ridge of the keyboard, including Play, Pause, Forward, and Back media-player buttons; volume controls; and program-

mable shortcut keys. A slider, mounted to the left of the keypad, lets you zoom in or out on your currently active document quickly. Preset shortcut keys lie further out on the left edge of the keyboard. A slick F-Lock feature allows you to convert the standard F keys into even more shortcut keys.

The mouse, sporting 400-dpi resolution and 6,000-frames-

per-second accuracy, offers acceptable performance for business activities. The chassis is gray and black, matching the keyboard, and it's built with the standard left and right mouse buttons. The scroll wheel, equipped with Microsoft's Tilt Wheel Technology, allows easy horizontal scrolling, which makes it handy if you spend your workday perusing oversized spreadsheets. But all told, the mouse is not the most elegant one on the market (or even in Microsoft's arsenal).

If you're interested in protecting your wrists but are scared to jump onto a split keyboard, give the Comfort Edition a try.

Microsoft Wireless Optical Desktop Comfort Edition

\$80 street. Microsoft Corp., www.microsoft.com. ●●●●○



EASY TO USE, easy on the wrists describes the Comfort Edition.

www.pcmag.com/guides

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SEE MORE.™



See 3D Without Goggles

BY ALFRED POOR

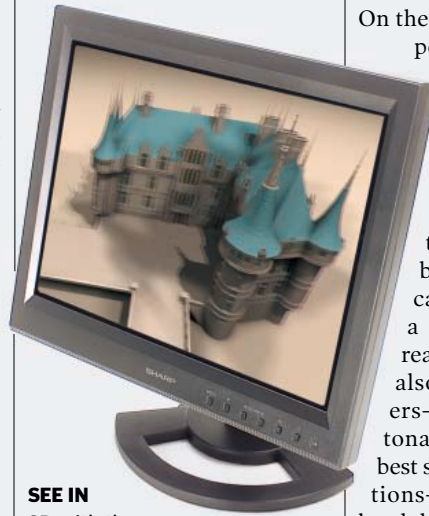
The Sharp LL-151-3D looks like a typical 15-inch LCD monitor—until you peer more closely at the front-panel controls. Next to the power button, you'll find one marked "3D." If you have supporting software and a compatible graphics adapter, just press this button and the image on the panel will leap out toward you, even if you aren't wearing any special glasses or goggles.

The 3D imaging is created by a switchable parallax barrier behind the LCD panel. When it's off, all the light passes through the pixels and you see a 2D XGA image. When it's on, it creates a vertical grid that blocks the light precisely so that your left eye sees only one set of vertical lines of pixels and your right eye sees the other set of vertical lines. By pairing images that are slightly offset, your brain reassembles

the images and perceives three-dimensional objects.

The results are dramatic. Using a standard nVidia GeForce graphics adapter and sample stereo images (provided by Sharp to use for our tests), we used the standard Microsoft Windows Picture and Fax Viewer to show the images as a slide show. The display drew a small crowd in PC Magazine Labs, and everyone could see the 3D effect clearly (though it took some users more time to adjust). The included utility lets you set the strength of the effect; dialing in less "depth" makes it easier to see. Many OpenGL scientific and graphics apps already support this 3D feature, as do dozens of games compliant with the nVidia 3D rendering engine (including Madden NFL titles and any in the Quake series).

On our DisplayMate tests of the monitor in 2D mode, the LL-



SEE IN
3D with the Sharp LL-151-3D monitor.

151-3D performed fairly well. The auto-sync feature worked well, though you have to use the on-screen menu to actuate it. Color tracking and dark-gray response were good, and we saw no apparent pixel defects.

On the other hand, light-gray performance was weak, color ramps had some banding, and the viewing angle was significantly limited.

The LL-151-3D has a single DVI-I connection but comes with both analog and digital cables. The connector is a bit more difficult to reach than average. You'll also find built-in speakers—though their limited tonal qualities make them best suited for office applications—and a convenient headphone jack on the side of the panel.

The Sharp LL-151-3D costs a lot more than a standard 2D 15-inch LCD display. But if you can use 3D effects for work or play, this is an impressive monitor.

Sharp LL-151-3D

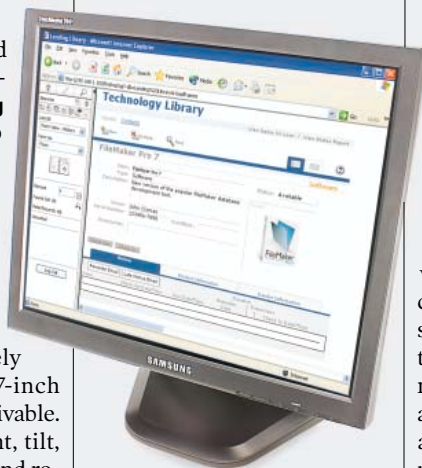
\$1,499 direct. Sharp Electronics Corp., www.sharp3d.com. ●●●●○

A Good Value for a 19-Inch Monitor

BY ALFRED POOR

Samsung designed the thin-bezel 19-inch Samsung SyncMaster 910T LCD monitor for high-end applications targeted to corporate, financial, and government settings. It has some premium features—and also some small flaws. But since it's priced so aggressively as to compete with 17-inch models, its flaws are forgivable.

The base offers height, tilt, and swivel adjustments and rotates the panel into landscape mode. This last feature is supported by the bundled Pivot Pro software from Portrait Displays. The 910T comes with Samsung's MagicTune utility, which lets you control the monitor's settings from your



AN AGGRESSIVE PRICE makes the 910T's few flaws forgivable.

computer's keyboard. You'll appreciate this utility, because the icons on the front-panel buttons—tiny symbols embossed in the black plastic—

are nearly impossible to read. Only the source signal-select button, which lets you toggle between the analog and digital connections, is well marked.

Two other welcome features are the company's MagicBright utility, which provides presets for brightness and contrast; and Natural Color, designed to help color-calibrate the display. The printed documentation was limited, and although the bundled CD had a better manual online, no documentation for MagicTune was available (aside from the program's Help files).

We saw good results on our image quality tests using DisplayMate software (www.displaymate.com). The auto-sync feature worked with precision. We saw uniform

brightness and no apparent pixel defects. Image quality at extreme viewing angles was above average. But we saw noticeable ghosting on high-contrast images from the analog signal. Light-gray performance was good with a digital signal but poor with analog.

The specified 25-ms average pixel response speed is relatively slow in this day of 16-ms panels. In our testing, we observed moderate smearing of moving images. If video or gaming is your bag, you may want to look elsewhere.

But all told, the Samsung SyncMaster 910T is a solid performer and a good choice for general office applications. It's priced the same as some 17-inch models, making it all the more attractive.

Samsung SyncMaster 910T

\$600 street. Samsung Electronics America Inc., www.samsungusa.com/monitor. ●●●●○



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Take a Friendly Database to Work

BY RICHARD V. DRAGAN

Designed to get your workgroup sharing data without involving your IT department, **QuickBase for Corporate Workgroups** offers an appealing and versatile online database solution. QuickBase provides an impressive array of prebuilt databases for applications such as project management, marketing, and sales.

This fully hosted solution works with any JavaScript-enabled browser, no installation required. Getting started is simple; a 30-day free trial lets you try the service. You invite other users to a group via e-mail, with embedded links to sign up with QuickBase.

The service lets you create a database from scratch or borrow one of several dozen prebuilt apps. These are prepopulated with sample records

such as data entry screens, helpful views, and fairly extensive reports. You can customize database apps by adding fields to any view or report. QuickBase adds strong security features, such as the ability to lock down individual fields and limit user activity to approved roles.

You can also add calculated (or summary) fields using an array of over 160 Excel-like functions. You can even call QuickBase functions via an HTTP API. Unfortunately, there are no hooks to existing corporate databases via ODBC or Web services, though you can export and import data to and from the application via text files.



WITH SEVERAL DOZEN prebuilt applications, QuickBase can get a workgroup up and collaborating without having to rely on IT.

The project management module is one of the richest applications in the service, letting you keep track of tasks and work assigned to users on multiple projects. The application can generate e-mail alerts for particular events, like urgent tasks or problems.

Though not nearly as deep as dedicated services like Salesforce.com, the sales module offers a useful, lightweight solution for tracking leads throughout the sales process. The smaller apps are a good deal easier to implement than a custom database solution created in Microsoft Access, for example.

And since QuickBase is an online solution, it comes with data sharing automatically enabled and does not require client software, as does FileMaker Pro.

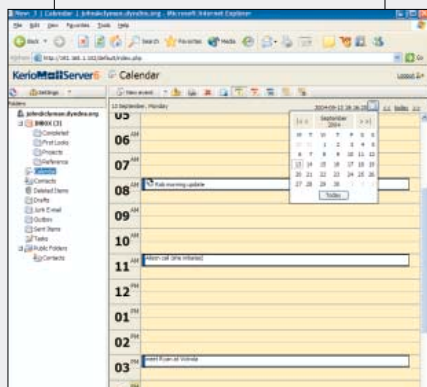
QuickBase for Corporate Workgroups
For 10 users, \$249 monthly (includes 5MB data and 100MB for file attachments). Intuit Inc., www.quickbase.com.

Kerio Offers Compelling Groupware Server

BY JOHN CLYMAN

Small businesses that may have shied away from adopting a groupware solution now have an appealing option: **Kerio MailServer 6**. With easy installation and administration, a full-featured Microsoft Outlook integration, and attractive pricing, KMS provides a hassle-free way for companies to provide collaboration capabilities beyond e-mail.

KMS isn't a new product, but Version 6 supports basic groupware features such as meeting invitations and support for public and shared folders. That makes it more of an alternative to products like Microsoft Exchange Server and IBM Lotus' Domino Server—though



KERIO MAILSERVER 6 offers basic groupware features, such as meeting invitations, and includes a sophisticated Web-based client.

it doesn't claim to have the higher-end groupware capabilities and programmability that Domino in particular offers.

From the start, we found KMS far easier to work with than most groupware products we've tested (such as Domino

or Novell GroupWise). It has no prerequisites and installs in moments. Once it's running, basic administration tasks are easy to handle through a GUI admin console, which you can also run remotely. We were pleased to find that Kerio selects sensible defaults for security choices, like disabling relaying except for authenticated senders. Going beyond typical security settings, KMS offers options such as bandwidth throttling and directory harvest attack prevention.

Your employees will find Kerio's Web-client interface to be appealingly similar to Microsoft Outlook. Features like right-click context menus, well-integrated spell-checking

and recipient name checking, and widespread support for drag-and-drop give the client an almost native feel. The Web client does have a few limitations, though: You can't compose rich-text e-mail, and you'll encounter glitches editing appointments that don't start and end at even, half-hour intervals.

In addition to its built-in spam filter, embedded anti-virus scanning from McAfee is available at an additional charge, and KMS also supports other AV add-ons. Although the KMS Web client is capable enough that you might not need a local client, you can still use Outlook against a KMS server if you install a client-side plug-in.

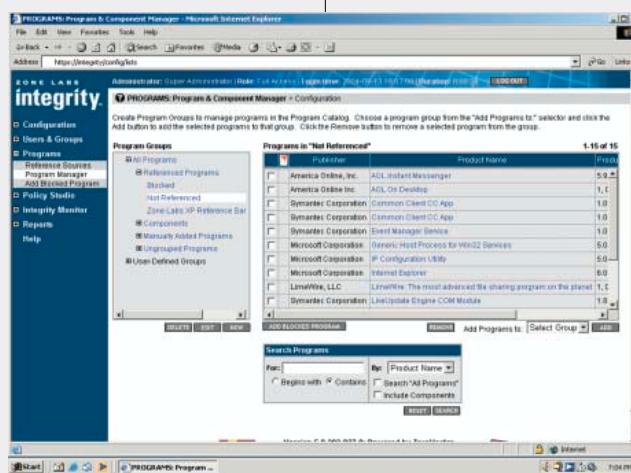
Kerio MailServer 6
\$449 direct (for 20 users). Kerio Technologies Inc., www.kerio.com.

Lock Down Every Desktop

BY SAHIL GAMBHIR

Today's corporate employees are Internet-dependent and highly mobile, and they often expose themselves unwittingly to malicious intruders when they access the network outside of their tightly controlled corporate network environment. **Zone Labs Integrity 5** from Zone Labs is an endpoint solution offering the same granular firewall protection as the company's ZoneAlarm 5 home solution, but for the enterprise.

The Policy Studio module is the central nervous system of Integrity, and it distributes firewall rules to client PCs. Out of the box, Integrity delivers eight policies with varying levels of protection, logging, and user notifications. It is flexible enough to let you apply different policies to specific users and groups, and you can customize, create, or delete policies.



INTEGRITY AUTOMATICALLY DETECTS the applications in use on your network and lets administrators control how those applications can be accessed by client machines.

Integrity shines when protecting applications from inappropriate Internet use. But don't expect the same level of granular port control out of the box. The policy engine does allow an administrator to hide

ports and block common hacks that employ ping, UDP, and TCP, and with a little more sleeve-rolling, you can create your own policies on port and protocol behavior. For a WLAN environment, Integrity en-

forces policy compliance for 802.11 x devices as a requirement to network access.

Another noteworthy feature is antivirus enforcement. If you have an antivirus package running, Integrity can integrate with the AV engine and enforce compliance based on a reference source. We also liked the IM security feature that lets administrators encrypt and filter traffic over AIM, ICQ, MSN, and Yahoo! protocols.

Administrators can monitor firewall activity and policy compliance status through a dashboard. But beware: The Spartan interface is nothing to write home about. Still, if you need a standalone firewall solution and are operating in a Windows-centric environment, consider this an additional layer of protection.

Zone Labs Integrity 5.0
\$7,500 direct (100 seats). Zone Labs LLC, www.zonelabs.com. ●●●●●

Protecting Remote-Office Data Conveniently

BY ROBERT P. LIPSCHUTZ

Branch offices usually lack the on-site expertise to handle their own data protection, and are often too removed from headquarters to receive adequate on-site support from central IT. Hence, workers at these remote sites often forget to change the tape in the server backup and rarely actually test file restores. To solve this problem, **Veritas Storage Replicator 3.0 for Windows** replicates server data from remote sites to a central site, where the data can be preserved on disk or backed up to tape.

The technology in play here is smart replication, not to be confused with traditional full, incremental, or differential backups at the file level, VSR copies only the blocks of

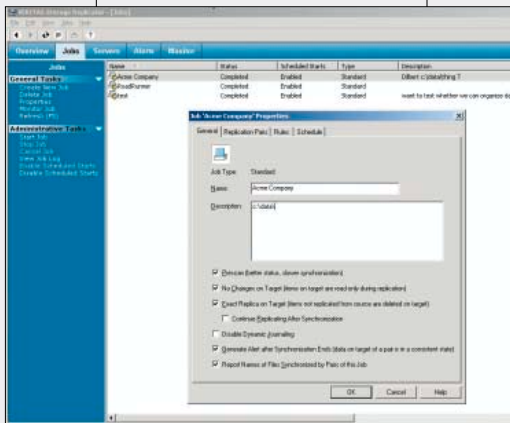
data that have changed. Such changes amount to far less data crossing the relatively slow WAN link. Administrators can choose continual or scheduled updates between the remote office and central site.

The Replication Service Agent (RSA) can be installed locally or, conveniently, pushed out to remote servers that reside within accessible Windows domains. Once installed, it tracks which data blocks have changed. VSR replicates all types of data files including e-mail repositories, and SQL Server databases. It has no problem with the open files com-

mon on e-mail or database servers, since the agent includes an open-file manager and has journaling functionality to ensure data integrity. The administrator can set rules to exclude undesirable files (such as MP3s or pictures).

Note that VSR is a targeted data-backup offering, not a complete disaster recovery tool. It doesn't back up the operating system or installed applications. And the lack of any transport encryption means companies will need their own VPN solution in place. Still, for many administrators, the critical data protection and convenience that VSR provides will be the right solution.

Veritas Storage Replicator 3.0 for Windows
\$1,495 direct. Veritas Software Corp., www.veritas.com. ●●●●●



ADMINISTRATORS CAN EASILY create jobs to specify replication servers, files, and schedules in VSR.

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ALL CITY RECORDS
1120



Napster running on Intel processor-based PCs equals the best way to enjoy music.

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FEEDBACK

“John Dvorak’s column is a vastly entertaining piece of highly opinionated fiction.”

DOOM 3: THE PLOT SICKENS

It was with great interest I read your review of Doom 3 (September 21, page 34). I had long awaited this new installment in the Doom legacy, and I share most of the reviewer’s disappointment. I’ve had the game for 2 weeks, and in that time I have played it possibly three times, while firing up the Microsoft Windows XP free-ware loader and playing the original DOOM and DOOM II many more times, using wads downloaded from the Internet for variety.

I had hoped for the same great, open-ranging game play of the previous versions, coupled with the newest generation of graphics capabilities. Plain and simple. If it moves, you shoot it. If it doesn’t move, you pick it up, all on the path to finding the exit from that level.

Instead, we get a plot we have to follow. If I wanted plot, I’d read a book or watch a movie! The reviewer was disappointed because he had hoped for more. I had hoped for less. A lot less!

DAVID H. BAILEY

PC MAGAZINE: CHANGING WITH THE TIMES

This is in response to the reader from the early 1990s who now finds that *PC Magazine* is not informative enough about computers and has too much about digital cameras, telephones, etc. Well, I’ve been a reader since the mid-1980s, and I think your magazine is great. It has just the kind of info I want. Sure, I remember the days when you had assembly-language tutorials and C code for software utilities, but I don’t think that’s what people look for anymore. When I need to buy a PC-related accessory or peripheral, or am just interested in what’s out there, I can find out about it here.

BRIAN CAMENKER

WORD DESERVES A REPRIEVE

In “Kill Microsoft Word” (September 7, page 59), John Dvorak complains that Microsoft Word often prompts for the install CD. I was able to fully resolve these prompts by dragging the entire install CD for Microsoft Office to a hard-drive folder, then installing from that folder instead of from the CD.

As an IT tech, I found this valuable in setting up dozens of end-user machines. When Word or any Office application finds the full install where it was installed from, it resolves virtually all its



own issues without prompting for the CD. With today’s large hard drives, it’s no big deal to dedicate a couple gigabytes to the installs in exchange for dramatically improved behavior. Another benefit is having the user’s full, licensed copy right on the machine should a reinstall be necessary. Also, all the clip art is right there where the clip-art gallery expects it.

I always set the install folder’s security to “read only” for everyone to prevent accidental tampering, and this works fine, since CDs are read-only anyway. I also compress the folder to save space (Windows XP Pro).

Once the install is done this way, the rest of Office settles down and behaves quite nicely.

ROBERT M. ROSENKRANTZ

SOCKING IT TO SPYWARE

I have been frustrated for months trying to figure out why my Linksys WRT54GS router keeps cutting out, and I keep getting those cable-unplugged messages on my laptop. I regularly remove adware, spyware, etc. So when I read Bill Machrone’s article regarding his setup at the Jersey Shore (September 21, page 75), I tried his suggestion for WinSock XP Fix. It worked beautifully!

SHEILA BARDEN

D IS FOR DUMMY

Here’s proof positive that John Dvorak is the complete idiot that I’ve believed him to be all these years. The “D” in Class D amplifier doesn’t stand for “digital” (September 7, page 61). A simple search on the Internet would have told him that the D was chosen by the IEEE because it was the next letter in the alphabet (after C, John!) when they were designating amplifier types. Class D amps have been around for decades, way before “digital” became a buzzword.

Oh, and just because John’s an idiot doesn’t mean I don’t look forward to reading his column each month. John’s column is a vastly entertaining piece of highly opinionated fiction.

JOE RUSSO

Corrections and Amplifications

- A review of the V Bravo D2 DVD Player (October 5, After Hours) ran with some incorrect information. The price is \$199 direct, the company is V Inc., and its URL is www.vinc.us.
- The article on the wireless office (September 21, page 148) contained some incomplete pricing information on the Symbol WS 2000 Wireless Switch. It should have read “switch, \$999 list; AP 200 802.11a/b access port, \$489 each; www.symbol.com.”
- The photos on pages 11, 27, and 44 of the October 5 issue are not of the new T-Mobile Sidekick II but of an older Sidekick model that looks quite different. A photo of the correct product can be seen at go.pcmag.com/sidekick2, or in the October 19 issue, pages 94 and 104.
- In “Road-Ready Notebooks” (July, page 143), we mistakenly stated that the Acer TravelMate 8000 has a 7,200-rpm hard drive. The correct speed is 4,200 rpm.

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Bill Machrone



More Corruption, Hot Laptops

Readers responded enthusiastically to my September 21 column, “Corruption at the Jersey Shore,” which detailed the Winsock corruption caused by adware and spyware. The symptoms were being unable to connect to some sites, dropping connections randomly, and reporting that a cable was unplugged when the connection being used was wireless and no wired connection was present. I referred to two Microsoft Knowledge Base articles, 811259 and 299357 (this is the right number; the one in the original column was incorrect), and to a freeware utility program that backs up the registry and resets the Winsock.

Many readers had great success with the utility, WinSock XP Fix, but it appears to be incompatible with Windows XP Service Pack 2. A reader wrote:

I backed up my registry (of course). Then I downloaded WinSock XP Fix and ran it. Unfortunately, it hosed up Microsoft's firewall. I guess it was written prior to SP2's release, and now I wouldn't recommend it to anyone with SP2. I restored my registry and tried the Microsoft fix. Although it was more complex, it did work on my system. I only had to do the first fix.

At press time, this reader still had an unresolved problem: a 60-second delay from the time his icons appeared to the time he could successfully load an Internet page. He said the TCP/IP stack seemed to be searching for something it couldn't find and slowing down the works. I'll report back on his progress.

Another reader wrote:

I used the program WinSock XP Fix 1.2 in an attempt to fix wireless problems with my Windows XP Pro notebook (updated with SP2). After the reboot, Windows was not able to open my personal settings files. I ended up rebuilding the entire operating system.

Freeware programs always carry some element of risk. WinSock XP Fix does back up the registry before resetting the Winsock, but it's prudent to do your own backup too. In the meantime, if you've installed SP2 and are having the Winsock-related connectivity problems, stick to the Microsoft Knowledge Base techniques to correct them.

HOT GAMES

My daughter, Stephanie, is pretty self-sufficient when it comes to PCs, and she likes to play computer games for relaxation. Her Toshiba notebook has been a solid, reliable machine, but she recently loaded a game that gave her fits. She would get a good way

into it, the action would get heavy, then the computer would shut down. We haven't gotten to the bottom of the problem yet, but it appears that the computer is simply overheating.

Games are the most taxing application for any computer, and they're especially hard on notebooks. All modern notebooks vary their processor speed based on how busy they are. The transistors in microprocessor chips consume meaningful amounts of power only when they switch states, and the faster the clock speed, the greater the power consumption—and the waste heat.

Unfortunately, you can force the processor to use lower speeds only when it's running on battery. When plugged in, it runs at full speed, although many SpeedStep processors let you select variable speed or automatic mode. This would seem to be a solution, but while the processor idles at half speed and jumps up to three-quarter speed for light tasks, it immediately goes to full speed when it gets busy; maximum heat is unavoidable.

The graphics processor makes the heat load even worse, which is why games exact such a toll. You can hear the fan kick on or speed up in most notebooks when they get busy, and nothing makes them busier than the computational overload and graphics processing of games. So what do you do when the notebook's cooling systems can't handle the total heat load?

It would be inconvenient and possibly ineffectual to position the underside of the machine on a Peltier junction, a solid-state device that gets hot on one side and cold on the other when you pass an electrical current through it. Likewise, a big aluminum heat sink under the machine would probably only delay the inevitable; getting good heat transfer from the case to the sink would be a problem without thermal grease or a similarly messy solution.

A better approach might be to build a small centrifugal fan that could be positioned next to the cooling vents. Forcing some extra cool air through the machine might solve the problem, but you have to be careful not to overdo it. If you push too much air through those tiny axial fans, they spin too fast and sound like a child's siren whistle.

Games are the most taxing application for any computer, but they're especially hard on notebooks.

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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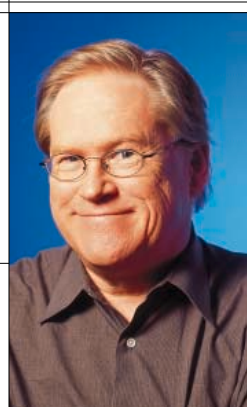
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John C. Dvorak



The Zeros vs. the Ones

After witnessing the latest Presidential election process, it's apparent to me that the Internet is turning into a bad dream. Nobody wants to admit it, but the Web's natural ability to remove normal interpersonal structures that prevent society from falling into chaos is not a benefit to anyone. Information revolution notwithstanding, the Internet will prove to be the undoing of society and civilization as we know it. It may not happen today, but it will happen sooner than we think.

Just look at politics. Thanks to the Net and the so-called New Media, the entire political scene has become one massive virtual Hyde Park corner filled with kvetching, squabbling bores. In the process, the dichotomous nature of binary communication has imposed itself on the public, forming two collectives with opposing and very rigid viewpoints. Call them the Ones and the Zeros: the conservatives and the liberals. Because of the Internet, these two crowds—or mobs—are each growing in size and becoming increasingly intolerant of the other. Since none of the purely liberal or conservative political parties are taken seriously in the U.S., these mobs have latched on to the major parties and hijacked them.

The best example of this is the recent sniping over the fabled George Bush memos in which he was told to take a military physical in 1972. It seemed as if the letter could not have been written on a 1972 typewriter but was some sort of hoax. The two political beehives swarmed over this, making all sorts of accusations against anyone who even suggested that their side might be wrong. The untenable Democratic position (which was the weaker) managed to save face by accusing Karl Rove of setting them up. As I was reading all this, I thought to myself, "So he was asked to take a physical. Who cares?" There were other documents, of course, but it was an eye roller to everyone except the Zeros and Ones, whose ranks continue to grow.

Rather than benefit from intelligent debate, the public is subjected to a lot of bickering fanned by the Internet. I used to think that everyone was entitled to his opinion, but no longer. Most opinions are worthless. As a culture, we are trained never to believe or say that opinions are worthless. For some reason, opinions are supposed to be revered because, uh, well, it's free speech! (No letters, please.)

I'm not suggesting that because most opinions

stink they should be censored in order for us all to think a certain way. Rather, thanks to the Internet, we are confronted with too many opinions from too many people—a large number of whom are seriously disturbed or feeble-minded. Before the Internet, these opinions would have been handed out in leaflet form to just a few people unlucky enough to bump into their purveyors. But now they're on the Net, accompanied by miles of commentary written by people who are frustrated pamphleteers themselves.

Almost everyone on the Net is anonymous. When you see someone on the street handing out a flyer, it is usually not hard to determine whether he or she is a lunatic. Not so with the haughty blogger who, by hiding behind a good online template, is actually taken seriously. A blogger who stays hidden long enough may even become famous. I know, not every blogger is a whack job—but that's the point. How can you tell?

Saying from behind a false identity what one otherwise wouldn't dare say is a practice that began long ago, and blogging has just made it worse. I first noticed it with alter egos cropping up in e-mail, newsgroups, and especially online chat rooms, where true dweebs are suddenly transformed into Don Juans. The persona thing sometimes goes into new dimensions as boys are turned into men, men pretend to be women, and women turn into sex fiends. Just keep the lights turned off.

Blogs are now the easiest way to remake oneself, as the tools for their creation are fantastic and easy to use. They have emboldened a lot of otherwise shy people. This is the New Media at work, creating false personas that are pumped up by other phonies. Under the right circumstances, virtual lynch mobs emerge like swarms of locusts—individual bugs may be easy to squish, but a swarm is dangerous. I think these online mobs, where one or two troublemakers rile up the frustrated, are just as dangerous.

If it were up to me, I'd shut down the Net tomorrow and make people get out of the house and mingle. By the time the liberal and conservative extremes, incensed by blog-driven blather, leave the house, it will be as two swarms of locusts hell-bent on revolution—or on battling each other: The Zeros versus the Ones.

Information revolution notwithstanding, the Internet will prove to be the undoing of society and civilization as we know it.

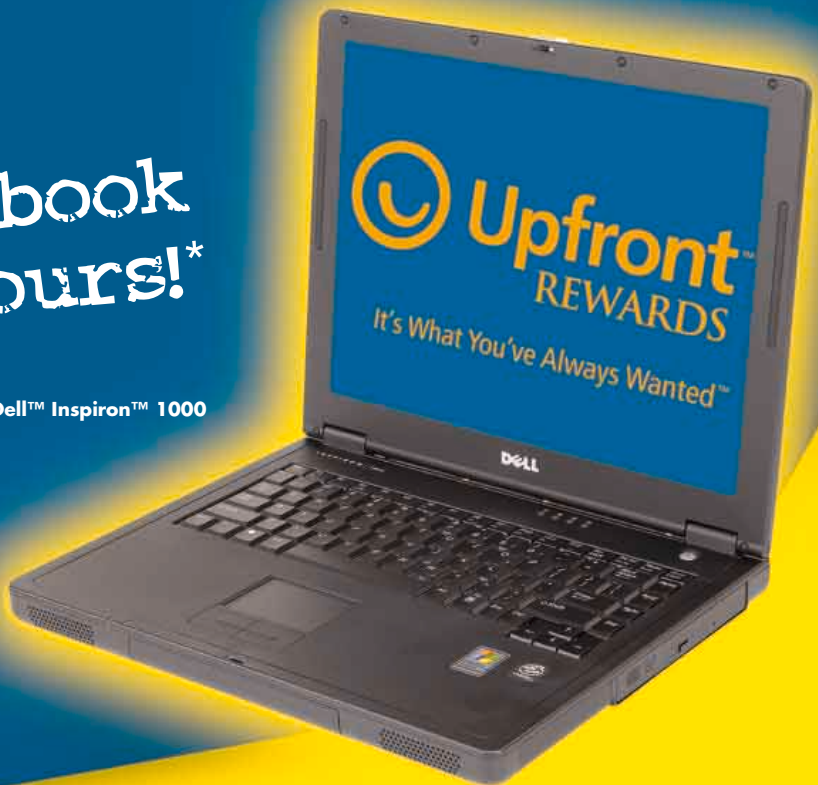
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Inside Track

Intel Developer Forum Dept.: This year's IDF was held in San Francisco, where the energy seemed extremely low. But it was actually the orientation of the show that got my attention. Someone said to me that "it looks as if Intel forgot how to do microprocessors." And there did seem to be an **overemphasis** on everything except microprocessors, resulting in **ultrafast** desktop computers taking a back seat to home electronics and wireless junk.

This **trend is everywhere** in the industry and is a partial reflection of the fact that the Consumer Electronics Show has superseded Comdex as the primary SOHO and business venue for desktop computing. For years CES had been trying to capture the lucrative segment of computer makers' marketing budget that is devoted to trade shows. It only managed to do it through attrition. Comdex kind of fell apart as a result both of **missteps** and of the fact that most of the newcomers to the desktop scene are companies based in either China or Taiwan. Both are historically **clueless about marketing** and **notoriously cheap**. If you ask any Taiwan-based company about its marketing strategy, they will all have the exact same answer, "Best price!" That's it. That is the entire strategy.

With the possible exception of BenQ, **none of the Taiwanese companies** conduct anything more than a sheepish ad campaign. Few go to the big trade shows. If they do go, you'll find them in hotel suites and other **inexpensive** venues. Many go to Computex Taiwan, a moderately big show, because they will not have to **spend too much money** traveling. The Korean companies, on the other hand, are very aggressive marketing and advertising companies, but there are too few of them to keep a Comdex afloat. The Japanese companies used to be more like American companies, but many of them have—like Intel—"gone Hollywood," and now they **prefer the jazzier venues** that push gizmos and home electronics. It would actually be a shame to see Intel fall into this trap.

The **one real development** that Intel announced, albeit as vaporware, was the dual-core processor. AMD had announced a similar device already. When I begin to see such initiatives I always think back to when there was something called **wafer-scale integration**. This entailed putting all of the different chips that comprise any sort of system onto one giant chip. Unfortunately, it took was a single flaw and the entire wafer was shot. There is more and more stuff being crammed onto the chip already. It seems to me that dual-core processors are just asking for trouble.

The concept of dual core might seem like a good



While I'm dubious about a lot of whacko uses for cell phones, I can see them being used as small TV receivers.

idea if you want to optimize the chip for two different microprocessors at once. This means an Itanium with an X86, perhaps. Anything to sell Itaniums to rationalize all the money that has been spent on a chip that nobody is buying. **I have a dual-core idea.** Combine the Itanium with an upgraded version of the 432 chip.

Historical Note: The 432, a **fiasco** from the 1980s, was developed by Intel as the next big thing. Its instruction set was actually the Ada programming language. Since then and every so often, someone tries to make a processor that has a programming language that's as high level as its instruction set. Pascal was used once. An engineer friend of mine once remarked that **if they'd only try Fortran**, they might have something.

Now Who's Ahead Dept.: It looks as if there will be trials of the DVB-H, the digital **video broadcasting** system for mobile applications. This new technology will use the part of the radio spectrum that was previously utilized by weather balloons. While I am personally dubious about a lot of **whacko uses** for cell phones, I can see them being used as small TV receivers. The little screens on many phones are just as big as early Video Walkmans. It would extra nice if there were no fee attached to watching the broadcasts.

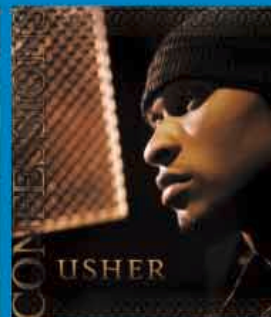
While the Europeans and the Japanese are always bragging about how great their respective cell-phone services are and how far behind we are in the U.S., mobile digital video would finally **give us some bragging rights**. But will it be free, as it should be? Right now the cell-phone situation is a nickel-and-dime-you-to-death sort of business. Allowing a cell phone to be used to receive a TV signal over the air without having to pay a dollar to watch would be great.

Genuinely Interesting Gizmo Dept.: There are now a slew of companies that are making Wi-Fi detectors that you can carry around in your pocket or put on a key chain. The one that I use is the Quick-Link Mobile Wi-Fi Seeker from Smith Micro Software (www.smithmicro.com). These cost \$29.95, and they're sure to get a **conversation started**. I like this device over the other Wi-Fi detectors that I've tried, because it's a little bit smaller and it does a Star-Trek kind of scan using the **LED light array** while it's seeking a signal. These devices are very handy to pull out when you're looking for a true hot spot, especially in a place like an airport, where you want to avoid using the laptop itself to find a connection point. Smith Micro's Wi-Fi detector fits nicely on a key chain, and it works perfectly—highly recommended.



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Bill Howard



A 21-Inch Salute

Somewhere back in the dark ages of computing (1990, say), a 21-inch CRT monitor was a mark of status and possibly self-indulgence. Such a display ran \$2,000 to \$3,500 and was adored by Wall Street traders and graphic designers. But at 20-plus inches deep, it filled up your desk the way Shaq fills up the free-throw lane.

If you spend long hours in front of your computer, a return to the 21-inch display is in order—this time in the form of an LCD panel less than 10 inches deep, with half that depth coming from the stand and swivel mount. I've been working with a couple that hover just over \$1,000, and they are flat-out dazzling.

The Windows native fonts are passably readable; you can comfortably tile two or three applications, and if you want just one app open, you will see a lot of data. In Excel, you can glance across a year and a half of numbers (19 columns) and go 50 rows deep. In a music jukebox, the view spans title, artist, album, genre, length, file size, audio code/sampling rate/bit depth, and there's room left over. No more hiding and revealing columns as you hunt for music by different parameters on a pixel-challenged 1,280-by-1,024 panel.

A 21-inch LCD panel is around 19 inches wide and about as tall, depending on how far you raise the tilt/swivel arm. The panel itself measures 17 by 13 inches. Two I used had 21.3-inch diagonals, the NEC-Mitsubishi LCD2180UX and the Samsung SyncMaster 213T. A third, the Sony SDM-S204, uses a 20.1-inch panel. These are traditional 4:3 displays with UXGA, or 1,600-by-1,200-pixel resolution. Want more screen real estate? There are a few widescreen 23- and 24-inch LCD panels that are wider but no taller (typically 1,920-by-1,200), and they cost more than \$2,000.

A 21-inch display at UXGA resolution correlates to 94 dots per inch (for the Sony, 100 dpi). By comparison, a mainstream 17-inch, 1,280-by-1,024 (SXGA) LCD that sells for \$500 is 97 dpi; a 14-inch notebook display resolving 1,400-by-1,050 pixels (SXGA+) is 124 dpi. With text, I find displays difficult to read above 125 dpi, borderline to passable at 100-125 dpi, pleasant below 100, and a sight for sore eyes when the dpi falls into the 80s.

The hot ticket for users with lousy eyesight is the 19-inch SXGA panel delivering 86 dpi for just \$150 more than the 17-inch LCD. Until Microsoft addresses the Windows XP font-scaling mess, a tighter dot pitch (meaning higher dpi) is a mixed blessing: Im-

ages always look better, but type gets smaller.

A 21-inch display is so big that leaving the Windows Taskbar displayed at the bottom of the screen won't bother you at all, not even a double-decker taskbar showing all your icons. You won't mind apps like Word's document map that strip a pane down the left side of the screen. When running Internet Explorer, I can always keep a left-side pane active for Onfolio, a Web page collect-store-and-share tool that's great for researching an article or a vacation.

If my apps want multiple toolbars and a ruler at the top of the screen, no problem. It's also easy to find space for AIM and a minimized audio jukebox. On my PC with a TV tuner, there's room for a video feed in the corner to show CNBC or, when the bell rings, the surveillance camera at the front door.

Who needs to conserve screen space when you have 1.92 million pixels on tap? For desktop publishing, you can actually have a two-page spread (11-by-17) open and scaled to 100 percent, meaning you could theoretically put a physical ruler across the screen, very gently, and measure margins. The panels can be turned 90 degrees and used as portrait displays, but I found the portrait mode blocks the view and strains the neck.

The other thing I've come to appreciate with these panels is the vast improvement that a digital signal (using the DVI connector) provides over analog (using the VGA connector). With analog, I saw slight softness and coloration. With digital, plug the displays in and you're ready to go; you can be excused for not running through the adjustment software NEC and Sony provide. (The 213T, a year-old design, doesn't support Samsung's useful MagicTune software.)

The three displays pleased me in different ways. The NEC was better for playing action games because of its 20-millisecond response time (compared with 25 ms for the others), but it currently costs around \$1,500, whereas the Sony is \$1,000 and the Samsung is \$1,100. If you spend 2 hours a day in front of a monitor that costs \$500 more than a vanilla 17-incher and lasts four years, the cost of dodging eyestrain runs 25 cents an hour. For some people, the essential daily luxury is Starbucks; for me, it's looking at the bigger picture.

Who needs to conserve screen space when you have 1.92 million pixels on tap?

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.

SOLUTIONS

MAKING TECHNOLOGY WORK FOR YOU

Do-It-Yourself DVR

Turn your PC into a digital video recorder, your music jukebox, and more. **BY DAVE SALVATOR**

A digital video recorder (DVR) can change your life. Well, your TV-viewing life, at least. TiVO is the most famous DVR on the market today, but there are plenty of PC-based hardware and software products that give you similar abilities and features and a lot more freedom.

For starters, you can now watch TV on your terms. No more staying up to the wee hours to catch an old movie or reruns of your favorite show. Instead, your DVR records it for you, and you can watch it whenever you choose. But a DVR is more than just a smarter VCR. It can also pause live TV and go into a time-shift mode, in which you can watch what was on the program a few seconds or minutes ago while the DVR continues to record in real time.

BUY OR BUILD?

You could just go buy a TiVO—they're very well designed, and easy for everyone in the family to use. Midrange models are priced at around \$200, plus \$12.95 per month for the electronic program guide (EPG). But despite some recently added features, the TiVO remains by and large a closed system, and for copyright reasons, recorded video content is pretty much locked in the box.

Taking an existing PC and converting it into a DVR costs up to around \$500, but before you run out and buy a TiVO, stop to consider how much more versatile a PC-based DVR will be. Along with letting you watch, time-shift, and record your favorite TV programs, a DVR system can also function as a media client or even a server on your home network. That means you can watch recorded TV programs from any PC on your home network. You can also show your digital photos on your TV, access your entire collection of ripped music, play PC games, surf the Web, and check e-mail. And

the EPG service for Beyond TV (our DVR application of choice) is free.

DESIGN AND COMPONENTS

For this project, we used a Dell Dimension 8200 system, which has a 2-GHz Pentium 4 CPU, 512MB of system memory, an ATI Radeon 9700 Pro 3D card, an Audigy 2 sound card, and a 30GB hard drive. This was a top-of-the-line system about two years ago, and is still competent today, even for processor-intensive chores. Part of what determines the minimum system requirements for a DVR system is whether you want to capture and time-shift HDTV content, which places more demands on the system (see "HD or Not HD").

To turn this PC into a DVR system, we added a TV tuner card, a remote control, a second hard drive, and DVR software. If your graphics card doesn't have a video output and you're connecting your PC-DVR to a standard-definition television, you'll need to upgrade your graphics card to one with good TV output. If you're not planning on playing games on this system, then you can opt for a modest \$100 graphics card. But if you want to use your system for games as well, you should consider a card with a bit more power.

If you already have a large hard drive in your system, you may not need to add another. We recommend allocating at least 40GB for recorded video; add more if you like to archive a lot of programs. You may even want to consider a DVD burner so you can catalog shows to watch later without using up all your disk space.

As a DVR, this system can be driven entirely using SnapStream's Firefly PC remote control, so you don't necessarily have to buy a wireless keyboard/mouse combo. But if Web-surfing or e-mailing from your couch or easy chair is in your plans, you should consider adding those components.

INSTALLING HARDWARE

Unless you want to use an external TV tuner box and an external hard drive, you will need to open up your PC to bring this project to fruition. If you take your time and don't apply excessive force to anything inside your PC, the installation process should come off without a hitch.

Locate the screws for your PC's side panel and remove them, then open the case's side panel. Not all cases are created equal. For instance, our Dell Dimension 8200 has a case that you first lay on its side and then open like the hood of a car. Once you're inside your PC, you'll need to locate a free PCI slot to install the TV tuner card. After you seat the card in a PCI slot, screw the card into the back panel, so it won't come unseated when you connect cables to it.

Putting in the new hard drive is trickier, since you need to figure out where it can be installed. Most PC cases have room for more than one hard drive, so find where your system's current hard drive is mounted, and see if there's a space for another drive. If there is, you'll want to leave the drive with Microsoft Windows on it as

What You Need

By adding some software and a few components to your computer, you can turn it into a digital video recorder that will do things a TiVO can't.



70 **INTERNET:**
Block ads with
PAC files.

72 **SECURITY
WATCH:**
Reveal and guard
passwords.

75 **USER TO USER:**
Tips and tricks.

the master drive, and set the new drive as the slave. This may require changing the jumpers on both your current and new hard drives.

Many hard drives are installed with jumpers set by default as if the drive were the only one on the machine. You may need to change your existing drive's jumpers to turn it into the master drive. Read through your new hard drive's documentation to determine the correct jumper settings to make it the slave. Next, connect the data ribbon cable and a power cable to your new hard drive.

Once those two items are installed, you can close your case back up. You'll need to connect a small patch cable that comes with the TV tuner card; it goes from the card's audio output to your sound card's line input. This is a crucial step, because without it you won't hear any audio, which needs to be routed to your TV's or sound system's speakers when you're watching live or recorded TV. Once you've connected this patch cable, you can reboot your system.

Before you connect the USB receiver for



WITH THE SNAPSTREAM FIREFLY, you can control the DVR and Web-surf from across the room.

the Firefly remote, you need to install its driver software. When that is done, plug the USB receiver into an available USB port.

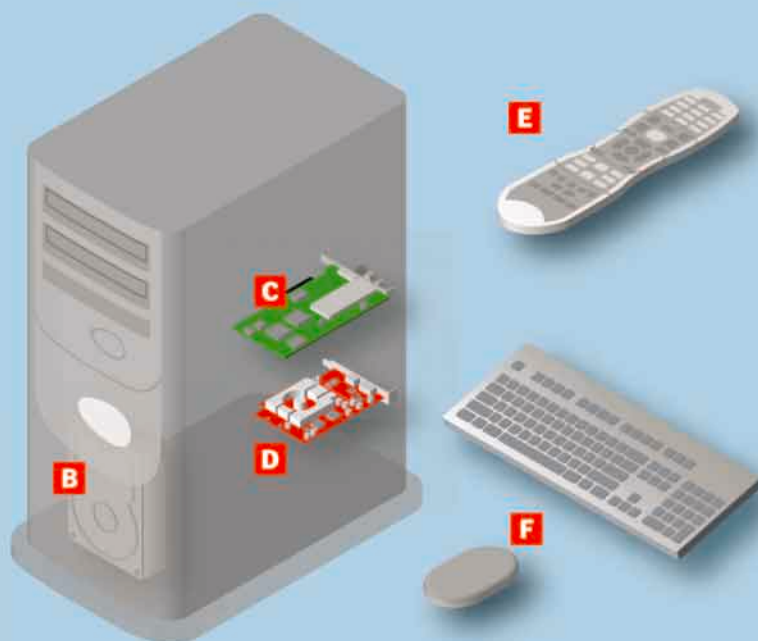
GETTING CONNECTED

Video: You have three options for video. If you have an HDTV, you can connect to it via either its VGA or DVI input straight from your graphics card. For a standard-definition TV, your choices are either the S-Video or composite video inputs of your

TV. S-Video is the better option, as it does a superior job of carrying the video signal and delivers higher-quality images. If you have analog cable TV, you can connect it—or a TV antenna—directly to the TV tuner card. If you have a cable or satellite box, you need to connect it to either the TV tuner card's S-Video or composite video input, again preferably to the S-Video input. You'll also need to route audio output from your cable/satellite box into the TV tuner card's audio input.

You will want to set your computer's resolution fairly low. If you're using a standard-definition TV, set your PC's resolution no higher than 1,024-by-768. This is because SDTV images have an approximate pixel resolution of 640-by-480, and you don't want to stretch them much, because the image will begin to get either blurry or somewhat blocky. If you have an HDTV, we recommend running at its native pixel resolution (check your HDTV manual). This will usually be something like 1,280-by-720.

Audio: Ideally, you should connect your PC



DVR SHOPPING LIST

A	DVR Software SnapStream Beyond TV 3	\$70
B	Hard Drive Western Digital Caviar WD1200JB Special Edition	\$80
C	TV Tuner Card Hauppauge WinTV-Theater ...	\$130
D	Graphics Card Standard	\$150
E	Remote Control SnapStream Firefly	\$50
F	Keyboard/Mouse Standard	\$100

TOTAL \$530

to your home theater receiver via a digital audio connection (called S/PDIF). This single wire can carry either two-channel stereo or multiple channels (5.1, 6.1, 7.1) of Dolby Digital or DTS.

If your sound card doesn't have a digital-audio output, you can connect its analog output to your receiver with a mini-jack-to-RCA patch cable. Your sound card probably came with one, but if not, they're inexpensive and easily found at a Radio Shack or other electronics stores. One note of caution: Some sound cards still put out a "DC thud," a noise burst when the PC is turned on and the sound card first gets power. When powering up your PC, either turn your receiver's volume down or select another input, as this noise-burst signal could damage your amp and speaker drivers. This DC thud only occurs when coming off a cold start; sound cards generally don't produce it when coming out of a sleep state.

CONFIGURING BEYOND TV

SnapStream's Beyond TV DVR is easy to use once you've run through its initialization wizard. There, you'll set an account up on SnapStream.Net so that you can receive the correct EPG grid, based on where you live and who your cable or satellite provider is. If you use antenna reception only, there's an option for that as well.

You can operate Beyond TV's user interface with either a mouse or the Firefly remote control. First, you need to configure the recording settings. With digital video, the tradeoff is usually between file size and video quality; higher quality will generally consume more hard-disk space. You get to choose between using MPEG-2 or the Windows Media Video file format.

HD OR NOT HD

High-definition TVs have become a hot consumer-electronics item, and some good-looking flat-panel HDTVs can now be had for less than \$2,000. If you've already invested in an HDTV, you may also be considering an HD-capable DVR. These are still very expensive (around \$1,000) to get from satellite or cable providers. The good news is that your PC-DVR can also be an over-the-air (OTA) HD personal video recorder for traditional broadcast-tower signals received via antenna if you want, and the card that can do it costs just under \$200.

The bad news is that you won't be able to record HD programs from your satellite or cable provider. Also, all of today's HDTV tuner cards for the PC come with quite a few rough edges. Beyond TV, our chosen DVR application, doesn't currently have HDTV support, so you'll either have to use the HDTV board's bundled software for all your TV viewing or have two different interfaces, one for HDTV and one for standard-definition TV watching.

OTA HDTV programming looks just as good, and in some cases better, than content you'll see from cable and satellite providers. A tricky thing about OTA, though, is that your reception of HDTV signals is highly dependent on where you live and where the nearest transmission tower is. If you're in a remote area, it's unlikely that you'll be able to get much in the way of OTA HDTV signals.

At this point, HDTV on a PC still involves a lot of tweaking and twiddling. HDTV cards—and more important, their bundled software—still have a way to go. But if you don't mind the extra legwork, and there's a good bit of it, you can have HD content on your PC.

Both formats have four quality levels; we suggest you test each at the Better level. At that level, MPEG-2 records at a constant bit rate of 5.22 megabits/second—it fills 2.3GB of hard-disk space per hour, or 57GB for 25 hours of video. WMV's Better setting, at a variable bit rate of 1.76 Mbps, uses only 792MB of disk space per hour, or 19.8GB for 25 hours.

From the main menu, select *Settings*, and from there, select *Recording Settings*. Either file format will deliver good video quality; WMV does better with lower bit rates, but MPEG-2 is easier to use for creating DVDs. You also have the choice of adding SmartSkip information to the recordings, which allows you to easily skip past commercials. You can even have

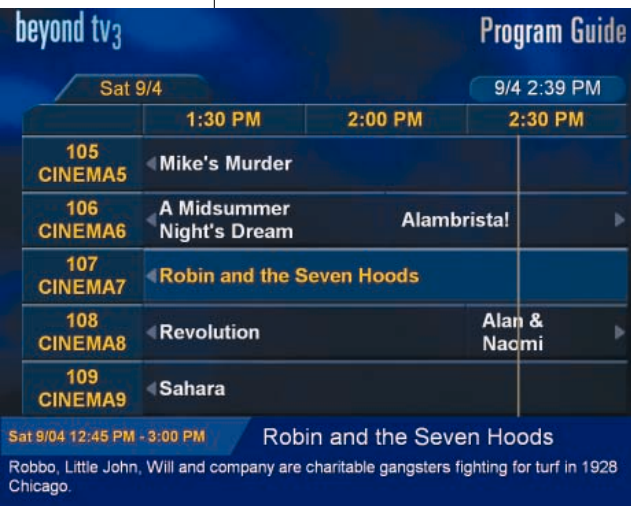
Beyond TV add this information after the program has been recorded.

UP AND RUNNING

Your PC DVR system should now be ready to record and play back TV shows and movies. The Beyond TV interface makes your PC DVR easy enough for the whole family to use. Even better, those recorded programs can now be played on any PC on your home network. And remember, the computer can still do everything a PC can do—play games, music, home videos and DVDs; view pictures; surf the Web; and check e-mail, all from the comfort of your couch. But be warned: Once you try a DVR, you will soon become one of the converted.



SNAPSTREAM'S BEYOND TV 3 lets you control the source, quality, and format of DVR recordings.



BEYOND TV 3'S program guide provides a convenient interface to select programs you wish to record.

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INTERNET

No-Cost Ad Blocking

PAC files are even better than HOSTS files for blocking Web site ads. **BY SHERYL CANTER**

You can block distracting, privacy-invading Web site ads with tools that come with your computer—no need to buy a thing. One way is by editing the Windows HOSTS file (see “Block Web Ads” at <http://go.pcmag.com/blockwebads>). A less-known but more powerful method is through a Proxy Automatic Configuration (PAC) file, a feature of all modern browsers. Why would you want to use these do-it-yourself methods rather than simply buy inexpensive software that does it automatically? One reason is you like getting your hands dirty and learning how things work. Another is you might find this gives you more configuration options, letting you more easily customize the ad blocking.

Both HOSTS and PAC files block ads by redirecting ad server requests, but HOSTS files can only block entire sites, while PAC files can block URLs within a site. This is important because some companies that serve ads also serve content you would not want to block. For example, the ad server akamai.com also provides streaming media for many Web sites, including Microsoft, for whom it handles Windows Updates. If you block akamai.com, you won't be able to access Windows Updates.

HOSTS files have other limitations. Because each ad server is listed separately, HOSTS files can get so long that they slow the system. PAC files can be much shorter because they support regular expressions (strings that describe whole sets of strings via wildcards and special characters). HOSTS files are bypassed on systems using proxy servers, but PAC files are not. If your computer is running a Web server, there are problems in redirecting ads with a HOSTS file that don't exist with a PAC file.

PAC files were introduced by Netscape with the release of JavaScript in 1996. They consist of a file saved with the extension .pac that defines the JavaScript function FindProxyForURL(). If your browser is configured to use a PAC file (we'll see how below), FindProxyForURL() is called for

every URL accessed, even if JavaScript is turned off. The idea of using PAC files to block Web ads was conceived by John R. LoVerso (www.schooner.com/~loverso/no-ads/) while he was documenting security flaws in the first release of JavaScript.

Luckily, you don't need to know JavaScript to use this trick; free ad-blocking PAC files can be downloaded from the Internet. You'll find a good one at www.sherylcant.com/articles/pac-file.zip. If you'd like to learn how an ad-blocking PAC file is constructed, take a look at the comments within this file. Open it in WordPad as NotePad won't show the line breaks.

The blocked sites in this PAC file are redirected to port 3421 of localhost (your own computer) so as not to conflict with any Web servers that might be running on port 80. Redirecting to an unused port like 3421 causes no problems for IE or Mozilla, but Opera will complain that there is no proxy at that address.

To appease Opera, you can run a small, single-purpose Web server that responds to ad requests with a transparent bitmap. This also serves to eliminate the unsightly error messages that appear when the ads aren't found and prevents delays in browsers that take a while to time out when content isn't found.

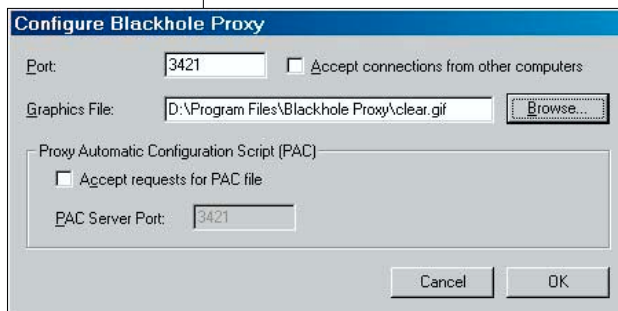
Blackhole Proxy, written by Larry Wang, does just this. You can download it free, with source code, at <http://s91363763.onlinehome.us/BlackHoleProxy>. Version 1.0, just released, features an install utility and a configuration program, so you don't have to learn command line options.

There is no transparent bitmap in the package, but one is included in www.sherylcant.com/articles/pac-file.zip. To use Blackhole Proxy with a HOSTS file, you must change the port from the default

of 3421 to 80. Blackhole Proxy is unique in its ability to configure the port. Also, since it can accept connections from other computers, it can be shared on a network.

Once you have Blackhole Proxy loaded, you can configure your browser to use the PAC file. In IE, open *Internet Options* from the *Tools* menu, select the *Connections* tab, then click on *Settings* or *LAN Settings*, depending on how you connect to the Internet. In the resulting dialog, check the box *Use automatic configuration script*, and enter the filename with a syntax like `file:///C:/PacFiles/ad-block.pac`. Then below that, check the box for using a proxy server. In the Address field, type `127.0.0.1` (the IP address for localhost), and for Port enter `3421`.

If you're using Internet Explorer, you have to change two additional settings.



TO CONFIGURE Blackhole Proxy for use with ad-block.pac, you need only specify a graphic to be served in place of the ads.

First, click on the *Security* tab, select *Local intranet*, click on the *Sites* button, and uncheck the box labeled *Include all sites that bypass the proxy server*.

Second, you must turn off the auto proxy caching mechanism, which prevents the restriction of some server content while allowing other content. Microsoft didn't provide an interface to this setting, but you can use a clever .REG (Registry) file, written by Bill Talcott (www.schooner.com/~loverso/no-ads/E-auto-proxy-cache.reg), that lets you change the option and add a check box for it on the Advanced page of the *Internet Options* dialog.

Last but not least, remember to clear your browser's cache after setting up your PAC file. If you don't, the ads will be retrieved from your cache.

Sheryl Canter is a contributing editor of PC Magazine.



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SECURITY WATCH

Revealing Passwords

The passwords saved on your computer are more vulnerable than you think. **BY NEIL J. RUBENKING**

When you type a password to sign into a Web site, your browser offers to save it for you, for easy entry next time. Those little “Remember password” checkboxes are similarly convenient. Without them, you’d have to type in a password every time you checked mail in Microsoft Outlook Express or every time you logged on to a dial-up connection. Your computer probably holds dozens of saved passwords, and that’s dangerous. Anyone can sit down at your computer and recall these saved passwords by guessing your user name. The password may be hidden by asterisks, but the Web site or program knows how to interpret them. What you may not realize is that an intruder can actually uncover and capture the passwords—and use them anytime from any PC.

New York-based KMGi has just released SeePassword (www.seepassword.com; \$19.99 direct), a virtual secret-decoder ring. When a password appears on screen as a series of asterisks or dots, you simply view it through SeePassword’s magnifying glass to reveal the actual password text. In our testing, SeePassword had no problem with passwords stored by Internet Explorer—all the sites we tried yielded their secrets. We could also see the password for the current mail account in Outlook Express. The vulnerability is not universal, and it affects only those passwords that are displayed on screen as dots or asterisks. But that’s bad enough.

Hackers have taken advantage of this vulnerability for years. By making the same technology that they use widely available—and attractively simple—KMGi hopes to force Microsoft to repair the problem. Microsoft, however, has no such plans, contending that if an intruder has access to your computer, it’s already too late to enforce protection.

KMGi focuses on Microsoft products, but we also found a bookmarklet (a piece

of JavaScript you save as a browser bookmark) that’s more brand-agnostic—and free. It’s called “view passwords” and is available at www.squarefree.com. “View passwords” exposes saved password text in IE, Firefox, Mozilla, and Netscape. The script also reveals hidden text in Opera, but the way that browser executes saved passwords—by filling in the user name and password, then activating the *Submit* button—prevents the bookmarklet from working, except on a very slow page load.

What can you do to protect your passwords? Secure your computer! SeePass-



SEEPASSWORD’s magnifying glass lets you view password text that is normally represented by dots or asterisks.

word and similar tools can’t see your Windows login password, so choose a strong one (see our “Password Dos and Don’ts” at www.pcmag.com/passwords). If you’ve configured Windows to log on without a password, change that setting. In Windows XP, enter “control userpasswords2” (no quotes) in the *Start* menu’s *Run* dialog. Check the box entitled *Users must enter a user name and password to use this computer*, and click on *OK*.

Make sure your screen saver is pass-

THE LOOKOUT

SP2—TROUBLE FOR AGENTLESS PATCHING?


Microsoft’s Windows XP Service Pack 2 has thrown patch management vendors into a tizzy. Ironically, SP2 will likely make it harder to keep computers up-to-date with the latest patches. The problem results from the new Windows Firewall, which will be installed by default when systems get SP2 through Microsoft’s update mechanisms. Patch management systems that use so-called agentless technology to roll out patches will find themselves powerless to patch newly firewalled Windows XP systems. For more, see www.eweek.com/print_article/0,1761,a=134133,00.asp.—Cameron Sturdevant

word-protected as well. Right-click on the desktop, choose *Properties*, and click on the *Screen Saver* tab. Check the box entitled *On resume, password protect*, and set the screen-saver timeout value to a low value, perhaps 5 minutes. And when you leave your desk, the key combination *WindowsKey+L* will lock the computer immediately. (This key combination works even if you don’t have a screen-saver password.)

For additional security, discard the passwords Windows has saved. (If you’re not sure you remember them, you can use one of the aforementioned tools to reveal them.) Select *Tools | Internet Options*, click on the *Content* tab, and click on the *AutoComplete* button. In the *AutoComplete Settings* dialog, uncheck the box entitled *User names and passwords on forms*, and click on the *Clear Passwords* button. Of course, now you’ll need to remember those passwords somehow. Tools like RoboForm Pro or *PC Magazine*’s own Password Profiler can help. Configure it with a strong master password and let it store your passwords in encrypted form.

If you use Outlook Express or another e-mail client whose log-on is vulnerable, you may want to reconfigure it to require entry of the log-on password. OE users can apply the technique described in “Password-Protect the Outlook Express In-Box” (<http://go.pcmag.com/oePASS>). And never leave your e-mail client open when you leave your desk.

Finally, run an antispyware utility regularly. (See “Spy Stoppers” at <http://go.pcmag.com/spystoppers>) Remember, an invisible spyware or Trojan-horse program can not only decode saved passwords, it can record them as you type.



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* As of April 2004, for 2.8X optical zoom digital cameras.



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USER TO USER

PC MAGAZINE'S COMMUNITY OF EXPERTS AND READERS

Beyond Halves and Quarters in Microsoft Word

How can I make Microsoft Word XP recognize fractions other than halves and quarters? If I type $1/2$ or $3/4$, Word will automatically format these into nice, neat-looking fractions like $\frac{1}{2}$ and $\frac{3}{4}$. But it will not do the same for other numbers, such as $\frac{3}{8}$ or $\frac{15}{16}$. Being in construction, I frequently need to send critical dimensions to suppliers or subcontractors and would like my entire document to look professional.

MARK GREGORY

The ANSI character set includes single characters representing the very common fractions $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{3}$. These are the ones that Word creates for you through AutoCorrect. If you're using a Unicode font, you can insert several more by choosing Symbol from the Insert menu— $\frac{1}{3}$, $\frac{2}{3}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{7}{8}$. To see these

characters, click the pull-down labeled Subset and choose "Number Forms." You can easily add AutoCorrect entries for these directly from the Insert Symbol dialog. Just highlight the character, click AutoCorrect, and enter the text that should be replaced by the fraction—for example, $\frac{1}{3}$.

Now you can handle halves, quarters, thirds, and eighths, but sixteenths are still out of reach. One possibility is to create them using an equation field. Suppose you want to create the fraction $\frac{5}{16}$. Press $\text{Ctrl}+\text{F9}$ to insert the curly braces that define a field. Between these braces enter "EQ\F(5,16)" (no quotes). With the insertion point between the curly braces, press $\text{Shift}+\text{F9}$. Then set the font size for the resulting equation to approximately one-half the size of the surrounding text. The result should look like this: $\frac{5}{16}$. Highlight the fraction and choose AutoCorrect from the Tools menu. Just below the middle of the resulting dialog you'll see two boxes labeled Replace and With. The With box should

contain your fraction, with "Formatted text" selected above it. Enter $\frac{5}{16}$ in the Replace box and click OK. Now when you enter $\frac{5}{16}$ you'll get the nicely formatted fraction. Repeat this process for all the other combinations—yes, it's tedious, but you only have to do it once.

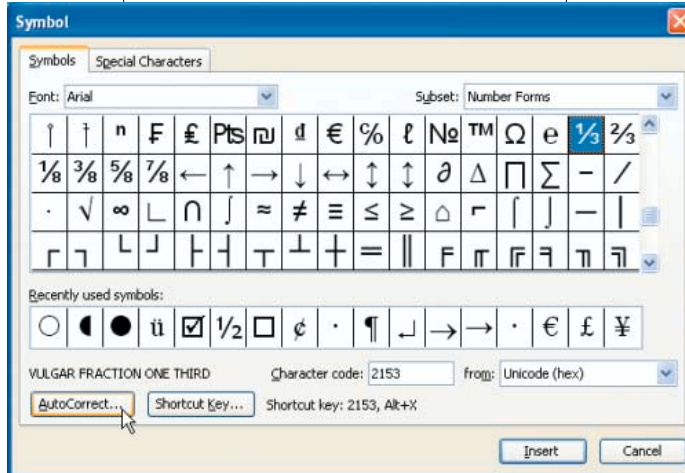


FIGURE 1: You can access many fractions in Word from the Symbol dialog, then add them as AutoCorrect entries to make using them easier.

If you prefer a diagonal-style fraction, you can type "EQ \s\up(5)\s\do(16)" (again, no quotes) between the braces instead. In either case, you'll want to replace the existing $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$ entries, since either type of fraction produced by the equation field doesn't look quite the same as these.

—Neil J. Rubenking

Removing Orphan MSCONFIG Items

I'd like to remove the unchecked entries that appear under the Startup tab of Windows XP's MSCONFIG utility. Can I do this without special software?

MARK VIA

The correct way to remove these entries is to uninstall the program, but there's a catch. The uninstall routine expects to find the program in the place it was originally installed. MSCONFIG disables start-up items by moving their entries to nonactive locations. So if you uninstall a program

while it's disabled by MSCONFIG, it will leave behind an "orphan" entry that has no purpose. One solution is to mark the item enabled in MSCONFIG, then reinstall and uninstall the program. If that's not an option, you'll have to do the cleanup manually.

Fortunately, Windows XP's MSCONFIG supplies the location of each enabled start-up item. The first step in removing an orphan is to reenable it, which puts it back into this standard location.

For items in the Registry, the root keys are abbreviated, with HKLM standing for *HKEY_LOCAL_MACHINE* and HKCU standing for *HKEY_CURRENT_USER*.

To remove one of these, launch Regedit from the Start menu's Run dialog and navigate to the specified key. In the right-hand pane, carefully locate the value that corresponds to

the orphan.

Note that the value name will not necessarily match the Startup Item name in MSCONFIG. To be sure, match the value's data with the Command column in MSCONFIG. Once you've verified the identity of the value corresponding to your orphan entry, right-click on it and choose *Delete*. Note that this change may not be reflected in MSCONFIG until you restart it.

Other start-up items are simple shortcuts marked either Startup or Common Startup. In either case, they are easy to remove. Just open the *All Programs* menu, select *Startup*, right-click on the offending item, and choose *Delete*. If this is a Common Startup item, Windows will warn that its removal affects all users and will ask for confirmation. Answer yes.

The MSCONFIG utility in Windows 95/98/Me doesn't give you the location information, which makes manual removal more difficult. *PC Magazine's* \$5.97 original Startup Cop utility (not the newer Startup

Windows XP's MSCONFIG supplies the location of each enabled start-up item.

Any decent slide scanner will provide the resolution that slides need.

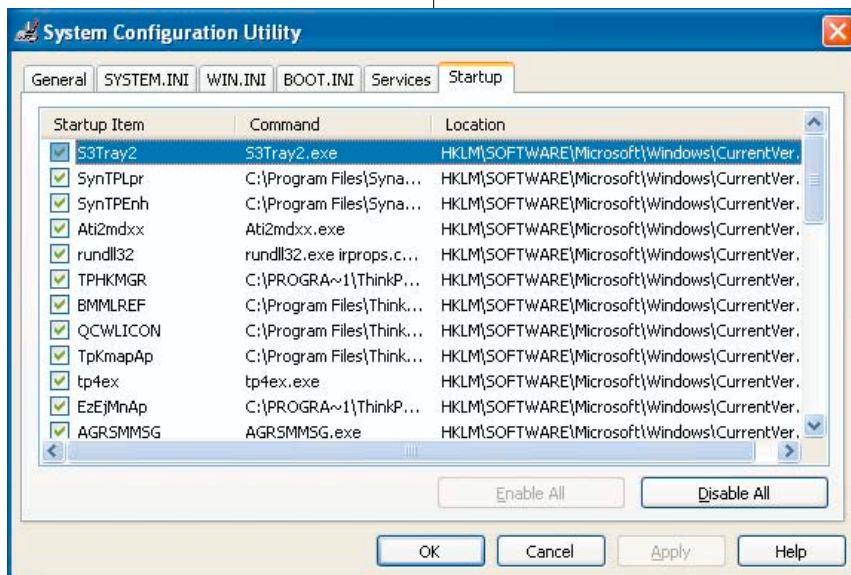


FIGURE 2: Windows XP's MSCONFIG supplies the location of each enabled start-up item.

Cop Pro) provides all of MSCONFIG's functionality and more, including the ability to delete orphaned items. Other free or low-cost utilities are also available for this purpose.

If you insist on manual removal, you have to check seven locations, listed in the order that their items launch at start-up:

1. HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Run
2. the "load=" line in the [windows] section in C:\Windows\WIN.INI
3. the "run=" line in the [windows] section in C:\Windows\WIN.INI
4. HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\RunServices
5. HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Run
6. C:\Windows\AllUsers\StartMenu\Programs\Startup
7. C:\Windows\StartMenu\Programs\Startup

—Neil J. Rubenking

HOW TO CONTACT US

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Scanning Slides

I have accumulated several thousand slides and 35-mm negatives that I'd like to digitize. Is there any good reason to invest in a slide scanner that I'll never use again, or does it make more sense to get a flatbed with high resolution and a slide-scanning feature? Also, what resolution should I be looking for?

HARVARD BAKER

Given the number of slides and negatives you have, I'd argue that a good slide scanner, also known as a film scanner, is worth getting. One reason is resolution. At the risk of oversimplifying, for best image quality you need an image resolution of at least 300 pixels per inch (ppi) at the size you're printing. For a 35-mm original printed as an 8-by-10 photo, that works out about 2,200 ppi for the scan. Scanning at higher optical resolution is even better, in case you decide you want to crop the image.

You can find flatbed scanners with sufficient claimed resolutions, but they often don't live up to their claims—typically because of the limitations of the optics. But any decent slide scanner will provide the resolution that slides need, because slides are its primary function, not an extra.

You also need to consider dynamic range—the scanner's ability to record details over the entire range from the darkest to lightest shades. Almost any slide scanner will do a better job on this than almost any flatbed scanner. Keep in mind, too, that slide scanners generally make the scanning procedure a little easier. With thousands of originals to scan, even the smallest convenience will make a big difference over the course of the project.

—M. David Stone

Shaded Fields

I created a form in Microsoft Word using Word's form fields. When I'm working on the system I created the form on, I see square brackets showing the position of each field. But when I move the file to another computer, the brackets disappear. I can't find a setting to turn the brackets back on at the second system. Can you tell me how to do this?

JERRY TAYLOR

To turn the brackets on on the other computer, choose *Tools | Options*, the *View* tab and, in the *Show* section of the dialog box, check the *Bookmarks* option. There's another option, however, that may be even better for you. You can set the fields to show

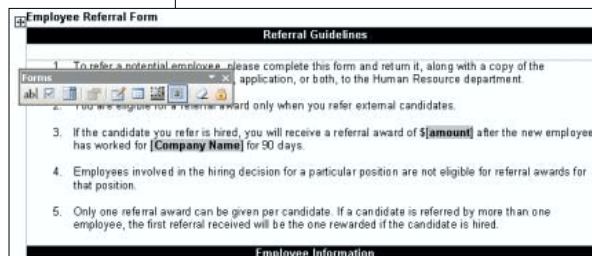


FIGURE 3: Add shading to form fields to make them easier to find on a document.

as shaded, and this setting goes with the file rather than with the particular installation of Word.

To set form fields to shaded, go to the Forms toolbar. If it isn't already showing, choose *View | Toolbars* and click on *Forms*. Find the *Form Field Shading* button, which is normally third from the right. To turn shading on or off, click on the button. If you save the file with shading on, the form fields will be shaded when you move the file to another computer.—MDS

See more tips online at www.pcmag.com/usertouser.

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Illustrations
by Anthony Freda

Your Digital Home

A new generation of multimedia devices and cutting-edge technologies breathe new life into home entertainment

BY CADE METZ

You could call it a digital paradise. Eric Clarke's three-bedroom home sits just off the bay in Panama City, Florida. Walk out back in the early evening, and you can see the sun setting over the Gulf of Mexico. Step inside, and you can see and hear digital media streaming from room to room. Music, movies, TV feeds, and photos bounce endlessly across a network spanning two PCs, a laptop, six televisions, and a good old-fashioned hi-fi.

One minute, you'll see Clarke sitting on the living room couch with his laptop, downloading new photos from a digital camera. The next, you'll find him stretched out on an upstairs bed, viewing those photos on his widescreen television. A second later, he'll tune the television to a satellite feed of the BBC and, with no more than a flick of the wrist, save an episode of *Fawlty Towers* to the PC down the hall. Later that night, with another flick, he might even stream a few jazz songs from the desktop downstairs and listen on the hi-fi.

The digital home is here, and it's here to stay. Eric Clarke, a 40-year-old maritime engineer, may be a bit ahead of the curve, but he's not the only one living this sort of audiovisual high life. According to NOP World's Roper Reports, a research organi-

zation that's been tracking consumer behavior since the Nixon administration, 34 percent of all Americans with PCs have, at some point, viewed digital photographs or videos on their PCs; 36 percent have played music; 55 percent have played games; and, believe it or not, 6 percent have actually used their PCs to watch TV.

Much like Clarke, a few brave Americans are even linking their PCs to traditional consumer electronics (CE) devices, freeing their digital media from the confines of CRT monitors and desktop speakers. Parks Associates, a firm that tracks the use of digital products, estimates that 15 million households now include some sort of computer network, and that roughly 8 percent of those—1.2 million—involve home stereos, digital audio receivers, televisions, or other CE devices.

Yes, turning your PC into an entertain-

ment hub requires some know-how and, more often than not, a little elbow grease. But equipment is improving little by little, and if you take the plunge, you won't be sorry. You can certainly continue to enjoy music, TV, photos, and movies in all the traditional ways, but the possibilities aren't nearly as broad or exciting.

Clarke's media wonderland revolves around the PC sitting in his upstairs home office. Equipped with a TV tuner card, the system is an entry point for two different television feeds: one from a local cable provider, and one from a Dish Network satellite receiver on the roof. A so-called *RF modulator* (radio frequency modulator) and some standard TV cable then connect this system to the six televisions spread throughout the house. "You can find an RF modulator at your local Radio Shack," Clarke says. "It just takes a signal from your computer and converts it to a feed you can distribute to so many of the other electronic devices in your house."

Thanks to a handheld remote control and software sold by SnapStream Media, he can navigate the PC's operating system from any of the six televisions, and not only tune in to his digital TV feeds from anywhere in the house, but also record programs to the PC's hard drive.

And that's just a start. A standard audio cable connects his widescreen television to his stereo system, and a wireless network connects his office PC to a downstairs desktop loaded with digital songs and a laptop loaded with digital photos. He can stream those songs all the way to his stereo and view those photos on any television. Then, of course, the wireless network links to the Internet, providing access to all sorts of other digital content.

IN THIS STORY

80 Jetsonize Your Home

85 Your PC

86 Desktops

87 Notebooks

88 Personal Printers

91 Your Video

92 Watching Video

92 DVRs and Media Center PCs

93 DVD-Playback Software

93 Online Movie Rental Services

94 TV Displays

94 Creating Video

96 Camcorders

97 DVD-Editing and -Authoring Tools

97 Converting VHS to Digital Video

101 Your Music

102 Portable Players

102 Media Hubs

103 Choosing Speakers

103 Jukebox Software

105 Your Photos

106 Digital Cameras

108 Photo Software and Services

110 Make Your Slide Shows Sparkle

110 Photo Printers

113 Your Games

114 Gaming Systems

117 Tying It All Together

123 Your Future Home

IROBOT ROOMBA



While we aren't quite at the level of the "car in the briefcase" or the Spacely Sprocket, there are a few products on the market right now that would make George Jetson proud.

DUDE, WHERE'S MY DOG?

If you can't go 3 hours without seeing your beloved puppy, we have the product for you. The **AOS iSeePet** is a combination webcam and pet feeder. Dial in remotely, and the pet feeder emits a sound that calls the pet over for a treat. Currently available only in the U.K., Korea, and Japan, it will be available within the year here in the States for around \$500.

AOS Technologies, www.alphaomega.jp/us/iSeePet/product.html.

ASTRO'S GREAT-GRANDPA

The **Sony AIBO** dog-like robot is getting new colors this fall (it will come in black), and new software will teach this old dog a few new tricks. In addition to being able to recognize objects, the AIBO will be able to remember objects and their locations.

\$1,799 list. Sony Electronics Inc., www.sonymstyle.com.

CABANA-BOT

Lonely housewives around the world are shedding a few tears, as the pool boy has been replaced by a robot. The **Aqua Products Aquabot Turbo T2** will scrub, vacuum, and filter algae from most residential pools in a little under an hour. It can even climb stairs, but it can't put suntan lotion on your back.

\$1,400 street. Aqua Products Inc., www.aquaproducts.com.



SONY AIBO

Building such a network is no easy task. And though there are 1.2 million households equipped with digital media networks, in the grand scheme of things that's no more than a handful, and the number isn't growing all that quickly. When it comes to connecting PCs to CE devices, most Americans wouldn't even know where to start.

"The complexity and a lack of understanding of PC-to-CE connections have as much to do with the low penetration of these solutions as any other variable," says Kurt Scherf, a Parks Associates vice president and principal analyst. "Up until now, the only way to connect the home computer with other pieces of consumer electronics was to purchase a kludgy and not always reliable wireless system, or simply lay down an ordinary S-Video or audio cable."

That said, things are getting easier. Many consumer electronics devices—including digital video recorders, gaming set-top boxes, and digital media hubs—are now equipped with built-

tal camera into your PC and view your pictures right there. You can edit them, post them to an online album for viewing (or display them in slide-show format on your PC), and then print them with a home photo printer or through an online printing service. If you plug in a camcorder, you can view and edit your digital videos. You can even share them online in much the same way you share photos, thanks to services like Mediashare 4.0 (www.neptune.com) and ShareGear 2004 (www.sharegear.com).

You can download songs from online music stores like Apple iTunes and RealNetworks' Rhapsody. You can plug in an MP3 player, load it with songs, and listen on your afternoon jog. You can listen to Internet radio feeds and watch all sorts of Web video, including news, sports highlights, and the latest movie trailers. According to Singingfish, an AOL-owned site that keeps a running catalog of Internet audio and video,

MORE ON THE WEB

Go to <http://go.pcmag.com/digitalhome> for full reviews of most of the products in this story, plus more information on digital rights

management, setting up home networks and multimedia devices, and storing and backing up multimedia content. Also, learn the best ways to build a digital home from the ground up.

in Ethernet jacks, letting you link to existing wired or wireless home networks in an instant.

Blaine Miller, a 19-year-old sophomore at the University of South Florida, used his Microsoft Xbox to build a simple digital media network in his Tampa apartment. His cable Internet connection plugs into an Ethernet router. The router links a pair of PCs to his Xbox, tying all three to the Internet. And his Xbox plugs into his TV, just like any other Xbox. Thanks to software built into the set-top box, he can, much like Clarke, stream all sorts of digital media from his PCs to his television. "Many times, I'll do slide shows of my digital photographs," he says, "or bring up a video feed from the Weather Channel Web site."

For many, even Blaine Miller's network might be a step too far. But you can always enjoy the digital life without a high-end media network. You can simply plug a digi-

there are now more than 45 million different feeds to choose from.

With movies-on-demand services like CinemaNow, Movielink, and Starz! Ticket on Real Movies, you can download full-length films to your PC or laptop. Thanks to sites like Yahoo! Games on Demand, you can instantly download the latest first-person shoot-'em-ups and play them with people from across the world. And, yes, if you like, you can watch and record television right there on your desktop PC.

The possibilities are nearly endless—whether you're booting up a single Internet PC or tapping into an Eric Clarke-like network of PCs, laptops, televisions, and stereos. Sounds tempting, doesn't it? Wouldn't you love coming home to your own digital paradise?

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IT'S A SUPER FRIDGE, SUPER FRIDGE

It's not just a fridge, people—it's an experience. The **Samsung HomePAD** displays a list of the items stored inside and tells you when food is about to go bad. But wait, there's more! You can check your e-mail and watch TV on the HomePAD as well. We also hear it keeps your food cold.

\$4,999 list. Samsung Electronics America Inc., www.samsung.com.

OFF-THE-WALL PC

If you think having the PC in your fridge is a good idea, why not stick one in your wall. The **Nobu N12WTB-PC** is a handy 733-MHz, 12.1-inch tablet PC with a touch screen.

\$3,129.99 direct. Nobu LLC, www.nobu-usa.com.



SAMSUNG HOMEPAD

THIS AIN'T YOUR DADDY'S LA-Z-BOY

The **iJoy Turbo 2**, available from The Sharper Image, is a robotic massage chair. Don't get too excited: It doesn't talk to you or transform, but it does accurately replicate chiropractic massage techniques. Unlike other chairs that make you feel like you are sitting on top of a washing machine, the iJoy replicates the feeling of having an actual masseuse or masseur working on you.

\$799.95 direct. The Sharper Image, www.sharperimage.com.

STUFF THAT GLOWS

Sure, you can turn on the TV or check the Internet to get news, but the Jetson home should have another news source: a glowing orb. The wireless **Ambient Orb** changes color with the changes in the stock market, the weather, and the pollen count. The Orb can also detect when IM buddies are online. You can customize the Orb to show the info you want to know. The company also has a rectangular **Weather Beacon** that changes color with the weather. If it goes purple, Astro will want to come inside, badly.

Ambient Orb, \$149 direct; Ambient Weather Beacon, \$179. Ambient Devices, www.ambientdevices.com.

VACUUMING SUCKS

So why not get a robot to do that for you as well? The **iRobot Roomba** is a self-propelled vacuum that scoots itself around your home, cleaning floors and carpets as it goes. The vacuum maneuvers via an infrared sensor, a bumper, and heuristics. Its creators estimate the Roomba takes about five times longer than you would to vacuum a room yourself, but that's just the point: You *don't* have to do it yourself.

\$249 direct. iRobot, www.irobot.com.

A DIGITAL PERSONAL TRAINER

Yourself!Fitness is an interactive fitness application for the Microsoft Xbox, designed with women in mind. Your personal trainer, Maya, tracks your progress, heart rate, and effort, then changes your workouts accordingly. Maya has over 400 unique exercises at her disposal and even offers nutritional advice and 1,000 recipes.

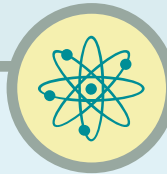
\$35 street. Yourself!Fitness, www.yourselffitness.com.

SO I HAVE TO WEAR PANTS WHEN I ANSWER THE PHONE NOW?

The **Motorola Ojo** personal video phone is a wireless (802.11g) phone that lets you see the person on the other end of the line. It has a high-resolution 16:9 LCD, and unlike previous videophones, has a clear and vibrant picture, provided by new compression algorithms.

\$800 street. Motorola Inc., www.motorola.com.

Jetsonize Your Home



COMPOST IN THE KITCHEN

Now that we've moved in to the sleek and shiny future, is there still a place for the gross and stinky past? Actually there is. Sharp has taken the eco-friendly compost heap and moved it into the 21st century. The **Sharp NP-40CX** and **NP-20CX** look like typical kitchen appliances, but they break down household kitchen waste and reduce the volume by up to 92 percent in 24 hours. Their secret sauce is a proprietary "composting bio mix," a blend of food-digesting microbes and yeast cells.

U.S. price undetermined (currently available only in Japan). Sharp Corp., www.sharp-world.com.

HEAVY PETAL

Speakers have steadily evolved from huge Marshall stacks to teeny-tiny Bose speakers. The next iteration may be a bit more floral in nature. The **Let's Ka-on** attaches to the base of a vase and directs sound out through the petals of any flowers placed within. We're not sure if you can pump your gardenias "up to 11," but a loose translation of a statement on the Japanese company's Web site reads, "This personal stereo system has volume control, so you can honorably enjoy the sound you honorably like whether it is noon or night."

\$46. Let's Corp., www.lets-co.co.jp/english/index.htm.

—Daniel S. Evans ■



MOTOROLA OJO

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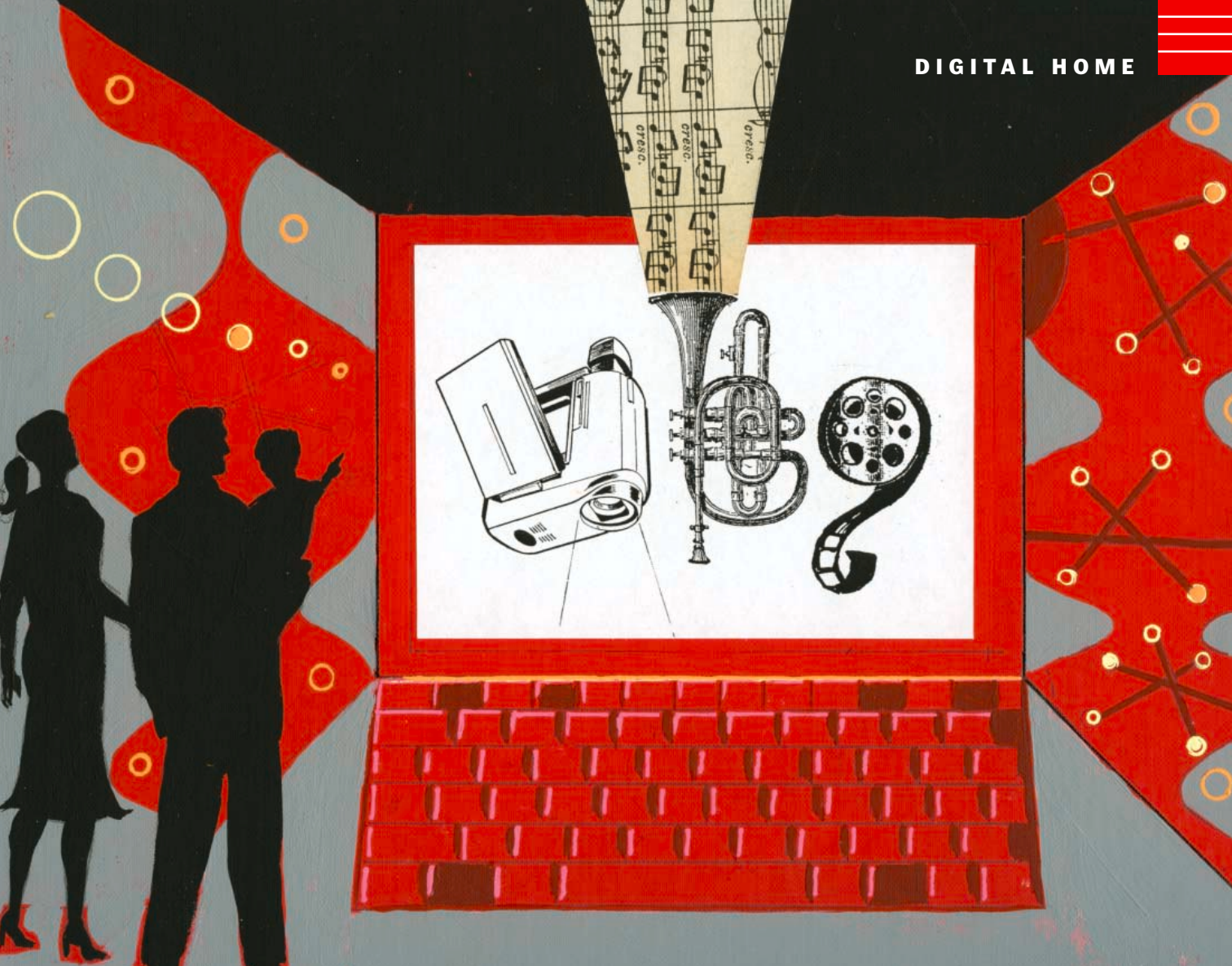
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YOUR PC

The PC you select for your digital home can either bring life to your multimedia or detract from it. Here's how to choose wisely.

BY KONSTANTINOS KARAGIANNIS

Digital homes have captured the imagination of sci-fi writers since the early twentieth century, appearing as settings or even characters in fiction. Consider "There Will Come Soft Rains" by Ray Bradbury for a house that goes on long after its inhabitants are gone. If you too were to imagine your digital home as a living cyber-being, with neural networks connecting all its parts, there's no doubt what would constitute both its brain and heart: the PC. It's the device responsible for intelligently parsing data and pumping

it throughout the home.

Two basic types of PCs can be called into duty for a digital ecosystem: desktops and notebooks. If you want a workhorse that can manipulate, store, and stream data around the home, a desktop is your best bet. Notebooks trail desktops in practically every relevant component, so unless you're tight on space, notebooks should be thought of as complementary devices. That said, a robust PC can do more in the macrocosm of your digital home, but only a notebook can let you take a microcosmic version of it with you.

Our video, music, and gaming sections later in this story recommend systems for those specific tasks, but in this section, we'll cover the basics you need for an all-around multimedia performer.

CHOOSING A DESKTOP

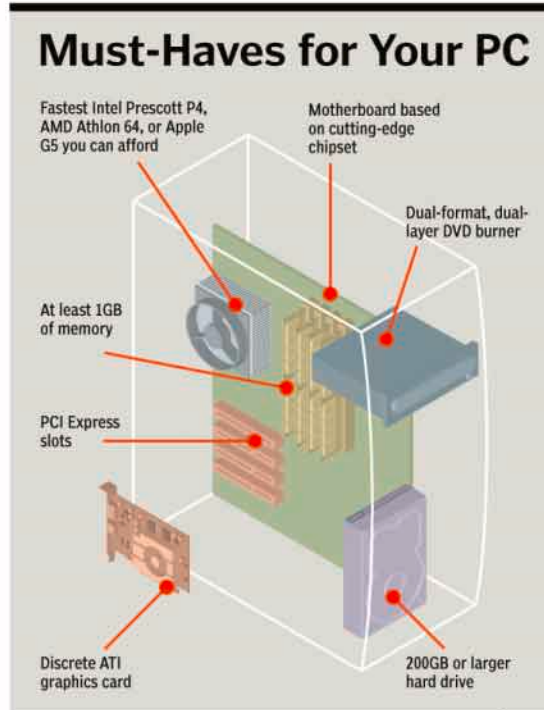
A typical day's work for a digital home PC includes simultaneous downloading, video transcoding, and file streaming. This can bring a typical PC to its virtual knees. You need to buy with performance in mind.

It all begins with getting the most up-to-date **processor and chipset** you can afford.

Everything from transcoding to playing back video and audio requires a lot of behind-the-scenes math, and the processor has to do these operations quickly to ensure a smooth experience. A current chipset gets data from the processor to other parts of the system fast.

If you want an Intel-based system, opt for one built on a 915 or 925 chipset, both of which support DDR2 memory and PCI Express. Pair that platform with the fastest 5-series Pentium 4 processor you can get—that is, look for the highest number in the series, such as 560. Unless money is truly no object or 3D gaming is your primary passion, we don't recommend splurging on a Pentium 4 Extreme Edition chip. You won't feel this chip's benefits as much in multimedia apps as you would in gaming, so it's hard to justify spending several hundred dollars extra on it.

AMD works with multiple chipset vendors, so if you want an Athlon 64-based system, you need to find one with a high-rated Athlon 64 processor, such as a 3700+, and then consider whether the motherboard supports the technologies you are likely to be using. The Athlon 64 gets you the extra future-



proofing of 64-bit support. Like Intel with the P4 Extreme Edition, AMD has an extra-pricey chip—the Athlon 64 FX—which makes sense only for hard-core gamers. And finally, Apple offers impressive power in the dual 64-bit CPU setups for all its

Power Mac G5 machines.

Get at least 1GB of **memory**; digital files, particularly video, are large, and your PC will need the virtual workspace. The ability to access memory quickly helps, which is why we recommend DDR2 support. True, it's not any faster than DDR today, but DDR2 is expected to approach 800 MHz by year's end, and it will be useful to have the upgrade path.

You'll want a capacious and fast **hard drive**: ideally at least 200GB of storage in a Serial ATA (SATA) drive. Most high-end systems have a SATA RAID controller, making it possible to connect two identical drives and stripe data on them with a RAID 0 configuration. This doesn't just give you double the storage; your system will see the two drives as one logical drive, and it can access data on them roughly twice as fast as it would from just one drive.

Despite the proliferation of integrated graphics on both AMD- and Intel-based systems, you'll want a **discrete graphics card**. Not only will it offload tasks from the CPU and improve performance, but a discrete card may also put out a "hotter" output signal that's less prone to

TOP CHOICES | Desktops

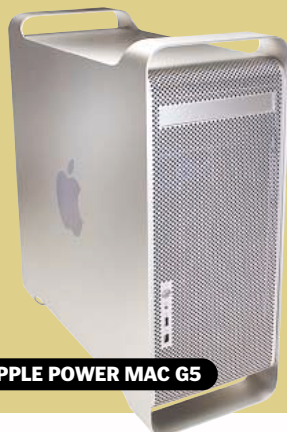
Perhaps the most futuristic-looking PC around, the **Apple Power Mac G5** is also one of the most forward-thinking. This powerhouse contains dual 2.5-GHz PowerPC G5 CPUs, 1GB of DDR 400 SDRAM, a 160GB SATA hard drive, a 256MB ATI Radeon 9800 XT graphics card, and a DVD-R/CD-RW Super-Drive. The 23-inch widescreen LCD is bright, clear, and of course, very attractive.

\$5,448 direct. Apple Computer Inc., www.apple.com. ●●●●○

The **Dell Dimension 8400's** list of industry-leading components reads like a futurist's wish list: a dual-layer DVD burner, dual 160GB (7,200-rpm) SATA hard drives in a RAID 0 array, and a 256MB ATI Radeon X800 XT Ultra

graphics card. Its 3.6-GHz Intel Pentium 4 560 processor gives it plenty of power, and it boasts 1GB of DDR2 SDRAM and a 925 chipset. A 19-inch LCD monitor comes with the package.

\$2,999 direct (including E-Value code 6V411-D84RPW). Dell Inc., www.dell.com. ●●●●○



APPLE POWER MAC G5

VELOCITY MICRO PROMAGIX

With Athlon power from one of the big boys, the **HP Pavilion a550e** offers a nice system at an affordable price. Its Athlon 64 3400+ processor delivers impressive performance, and it comes with 1GB of DDR SDRAM, a 256MB ATI Radeon 9800 graphics card, and a 17-inch LCD monitor. We can't promise you won't need to add another hard drive for deep storage of multimedia data—it comes with dual 80GB (7,200-rpm) SATA hard drives—but the basic feature set, down to a media card reader and DVD burner, is here.

\$2,599 direct. Hewlett-Packard Development Company, www.hp.com. ●●●●○



The **Velocity Micro ProMagix** can handle duty as both the heart of a digital home and as a serious gaming box. Its overclocked 3.6-GHz Pentium 4

560 processor, 1GB of DDR SDRAM, and nVidia GeForce 6800 GT graphics card helped deliver solid performance on our 3D and multimedia benchmark tests, yet it's surprisingly affordable for a machine from a boutique vendor. The dual 200GB (7200-rpm) SATA hard drives offer plenty of storage, and the ProMagix also includes a DVD burner and 19-inch CRT monitor.

\$3,748 direct. Velocity Micro Inc., www.velocitymicro.com. ●●●●○

motherboard noise. If you expect to play a lot of compressed video, consider the best ATI Radeon card you can afford. DivX is optimized for Radeon cards, and they seem to do the best job at smoothing out pixelation in DivX files.

Your graphics card should have digital and analog (VGA) connectors, and you should also shop for a CRT or LCD monitor with digital connectors if possible. This is most important with LCDs: All PC video signals are digital, and LCD panels are digital. If you can avoid having to convert the signal to analog at the graphics card and then back to digital at the LCD, you will get a much better image.

Connectors aside, most CRTs beat most LCDs for watching video, but you can get an LCD with an impressive 16-millisecond pixel response time. On top of that, LCDs add a stylish, futuristic touch to your home. If you'll mostly be burning content for standalone players or streaming to TVs, you can keep the monitor to 17 inches or so to save money.

We mentioned PCI Express earlier. This expansion bus allows you to add cards and peripherals and has moved away from the parallel design of PCI. PCI Express allows multiple serial-data paths to be bundled for better performance. The biggest benefit the new interface currently offers is to graphics, where an interface of 16 data paths, called "by 16" or x16, provides more bandwidth than 8X AGP. In the future, the ability to add high-speed peripherals such as Fibre Channel cards will depend on the presence of PCI Express.

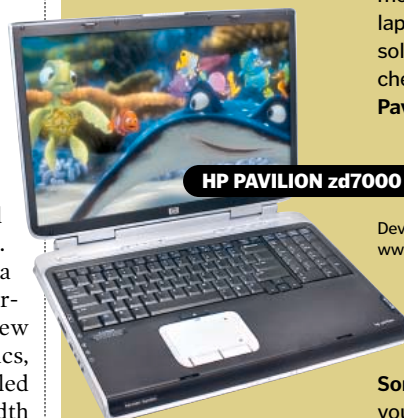
In these pre-Fibre-proliferation days, you'll use either **Ethernet** or **USB 2.0** to access most devices in your digital home. Consider having a Gigabit Ethernet adapter; though your broadband connection will never fully tap it and you don't need it to stream video or audio real time, Gigabit Ethernet will let you set up a high-speed subnet to share files between PCs. To do this you would need to add a Gigabit switch.

As for USB 2.0, all PCs come with that now, making it easy to add numerous peripherals such as printers, scanners, and digital cameras. A **media card reader** isn't a bad idea for reading memory cards from your digital camera or other device, either, but for connecting most DV camcorders, you'll need **FireWire**.

One internal peripheral you can't be without is a **DVD burner**. You can now add or upgrade to a dual-format, dual-layer drive for as little as \$100 more than the cost

TOP CHOICES | Notebooks

At 6.7 pounds, the **Acer Aspire 2020** is a solid choice for those looking for a more portable multimedia notebook than the 9- and 10-pounders out there. This system has a 1.8-GHz Pentium M 745 processor, 512MB of DDR SDRAM, and an 80GB hard drive. It also includes a DVD±RW drive and a 15.4-inch display, along with a 128MB ATI Mobility Radeon 9700 graphics card.



Below the keyboard, you'll find digital display and multimedia-function keys, which launch and control Acer's multimedia software suite.

\$2,300 street. Acer America Corp., www.acer.com. ●●●●○

With a BrightView widescreen 17-inch LCD, the **HP Pavilion zd7000** really makes colors pop, enhancing the overall

viewing experience. The system, at 9.3 pounds, comes with an 80GB hard drive and DVD+RW drive and is powered by a 3.2-GHz Mobile Pentium 4 processor, 1GB of DDR SDRAM, and 128MB nVidia GeForce 4 Go5700 graphics. We love the zd7000's large display, but if you're looking for a more portable multimedia laptop, HP has another solid option: the sleek, and cheaper, 5.4-pound **HP Pavilion dv1000**.

zd7000: \$2,049 direct (with Windows XP Home Edition); dv1000: \$1,424 direct. Hewlett-Packard Development Company, www.hp.com. ●●●●○

Thinner and lighter (8.4 pounds) than the competition, the **Sony VAIO VGN-A190** lets you take recorded shows on the go—even if you have to leave tuner functionality in the docking station. Its high-resolution widescreen 17-inch display and decent weight make it a system worth considering. The system also includes a 1.7-GHz Pentium M 735 processor, 512MB of DDR SDRAM, an 80GB hard drive, a DVD±RW drive, and an ATI Mobility Radeon 9700



graphics card. We just wish Sony would update its GigaPocket software or include Windows Media Center instead of Windows XP Home.

\$2,700 direct. Sony Corp. of America, www.sonymstyle.com. ●●●●○

The new **Toshiba Qosmio E15-AV101** is as close to a mobile multimedia dream machine as we've seen. Thanks to I/O dongles that handle almost every type of connection—including component outputs to an HDTV—the Qosmio takes you on the ultimate AV journey. It has a 1.7-GHz Pentium M 735 processor, 512 MB of DDR SDRAM, an 80GB hard drive, and a DVD±RW drive. Add in the new TruBrite 15-inch screen and its nVidia GeForce FX Go5200 graphics card, and this fairly portable laptop—at 8.2 pounds—is destined for stardom.

\$2,699 direct. Toshiba America Information Systems Inc., www.toshiba.com. ●●●●○

of a standard DVD burner. When dual-layer media get cheaper (discs are still around \$15), copying full retail DVDs without recompression will be practical. (Unlike single-layer DVDs, which hold 4.37GB of data, a dual-layer disc can hold 7.95GB.)

A final consideration is audio. If you'll be listening to music or watching movies on your PC, you'll want to buy decent **5.1 surround-sound speakers** (one left/right pair sits in front of you, another pair is behind

you, a standalone speaker sits on top of or in front of the PC, and a subwoofer rests on the floor). Look for a system that can handle more than 100 watts, and consider that a \$200 set of speakers usually sounds better than a \$100 set. As for powering the speakers, the integrated 5.1 audio found in many new systems is sufficient for most music and video playback applications. Musicians will want discrete audio cards with improved I/O for recording.

CHOOSING NOTEBOOKS

If your digital home is more of a digital apartment, you might be looking for a heavy-duty (and heavy) notebook that crams in much of the desktop tech you just read about. Otherwise, think of a notebook as a complement to your desktop, and apply what you've read with the following considerations.

Again, go for the fastest **processor** you can afford, although judging CPU ratings isn't as easy as it is with desktops. Intel, for instance, offers the battery-efficient Pentium M in speeds up to 2 GHz, but that CPU actually performs on a par with Mobile Pentium 4 processors rated at over 3 GHz. AMD has a Mobile Athlon 64 and an Athlon XP-M. When shopping for a notebook, think Pentium M or Athlon XP-M for lighter computers that will often run on battery power. Save the Mobile Pentium 4 and Mobile Athlon 64 for machines that will mostly move from AC outlet to outlet.

As for **memory**, a notebook pulling media duty should do well with 512MB of DDR SDRAM. **Hard drive** choices are limited, but 60GB is the magic number. At this size, you can likely get a 7,200-rpm drive, which will perform better than 5,400- or 4,200-rpm models. We even recommend taking slightly lower capacity (say, going from 80GB to 60GB) if it means being able to get a higher-speed drive. Regardless of your drive's capacity, you should carry a smaller subset of **applications** on your laptop than you'd install on your desktop. For example, you'll likely use a compact

video-playback app more often than you'll use a pro-level video-editing bundle.

Notebook vendors don't allow a choice of chipset or motherboard, but more of them are letting consumers pick the **graphics processor** and even the amount of **video memory** it contains—though many vendors won't let you choose your **screen resolution**. You will want to max out all these video specs as much as possible within your budget. Luckily for DivX fans, ATI Radeon Mobility cards are appearing in more laptops.

Speaking of video, you'll want a widescreen LCD for maximum movie enjoyment (or just for working on projects side by side). Whatever the aspect ratio, a 14- or 15-inch screen is very portable; 17-inch screens push the limits of your strength and your ability to be comfortable in tight spots like planes. Try to see the LCD before you buy, and be sure you like its crispness, viewing angles, and look. A growing number of vendors are including screens that have some type of brightness-enhancing tech-

HARMONIC MEDIA CONVERGENCE

15 million U.S. households now have a computer network, and roughly 8 percent of those—1.2 million—involve home stereos, digital audio receivers, televisions, or other CE devices.

Source: Parks Associates

flash

nology, so consider this when shopping.

Audio is rarely great on notebooks, and additions such as integrated subwoofers can create hard-to-carry behemoths. Plan on using quality headphones or carrying portable speakers.

If you plan on doing most of your editing of digital content at home, ports won't be much of an issue, although most laptops with the horsepower to handle digital media also have at least USB 2.0. You're likely to find media card readers built in too. Another

type of I/O to look for is a built-in TV tuner, which will let you record and watch shows on the go.

Wireless connectivity and **battery life** determine where you'll be able to stay connected and for how long. Try to buy integrated 802.11g wireless for fast interaction with your home network, and consider a machine with wired Gigabit Ethernet for frequent large data dumps. A laptop intended for true mobile freedom should have one of the aforementioned power-saving CPUs and a battery that's rated or benchmark-tested at over 3 hours. ☰

TOP CHOICES | Personal Printers

It's difficult to imagine having a home PC without a personal printer attached. The following devices can certainly handle basic printing tasks, and some can also handle printing photos or toddler creations for the fridge. But if you're looking specifically for photo printers, see page 88.

With an automatic document feeder, built-in fax modem, and front-panel numeric keypad, the **Brother MFC-3420c** offers a full set of printer, copier, scanner, and fax features. This printer is fast and accurate

for text and graphics, with admittedly budget-quality photo output. It's a good choice if you are primarily interested in printing from business applications.

\$150 street. Brother Industries Ltd., www.brother.com. ●●●○



CANON MULTIPASS

The **Canon MultiPass MP390** prints, scans, faxes, copies, and prints photos directly from cameras and memory cards and lets you fax from programs on your computer. Although a bit slow, this printer has good image quality and a low cost per page, making it a reasonable choice for those who do occasional printing and need fax capability.

\$200 direct. Canon USA Inc., www.canonusa.com. ●●●○



HP DESKJET 5150

For high-quality output without photocentric bells and whistles, the **HP Deskjet 5150** is a solid choice. With the optional duplexer, you can do two-sided printing and print borderless photos on special paper. Test photos we output showed excellent detail and clear colors.

\$90 direct. Hewlett-Packard Development Co., www.hp.com. ●●●●●



WIRED

WIRELESS

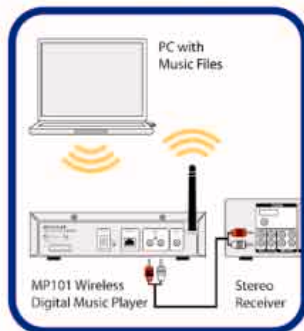
- ROUTERS

- GATEWAYS

- ADAPTERS

→ - MULTIMEDIA

- VOICE OVER IP



The Player's Player

Set your MP3, WMA and Internet radio music free from the confines of your PC with NETGEAR's MP101 Wireless Digital Music Player. NETGEAR and Intel are working together to enhance your home entertainment experience. Built for those serious about playing music, the MP101 lets real players play real music where it belongs – on their stereo. The attractively designed, easy to install MP101 is compatible with 802.11b and 802.11g wireless networks, and comes with a remote control, a crystal clear four-line display and easy to install software that finds all your music files by title, artist, album, genre or play list – automatically. So quit playing around with tinny PC sound, and start booming high fidelity music right from your stereo... wirelessly.

Music files from PC to stereo is one click away. To learn more about the MP101 and how to get a 30-day free trial of Rhapsody™ Digital Music Services, go to www.netgear.com/go/mp101ad

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English (US or UK)	Italian	Russian	Indonesian	Korean	Hebrew	Danish	Welsh	Pashto
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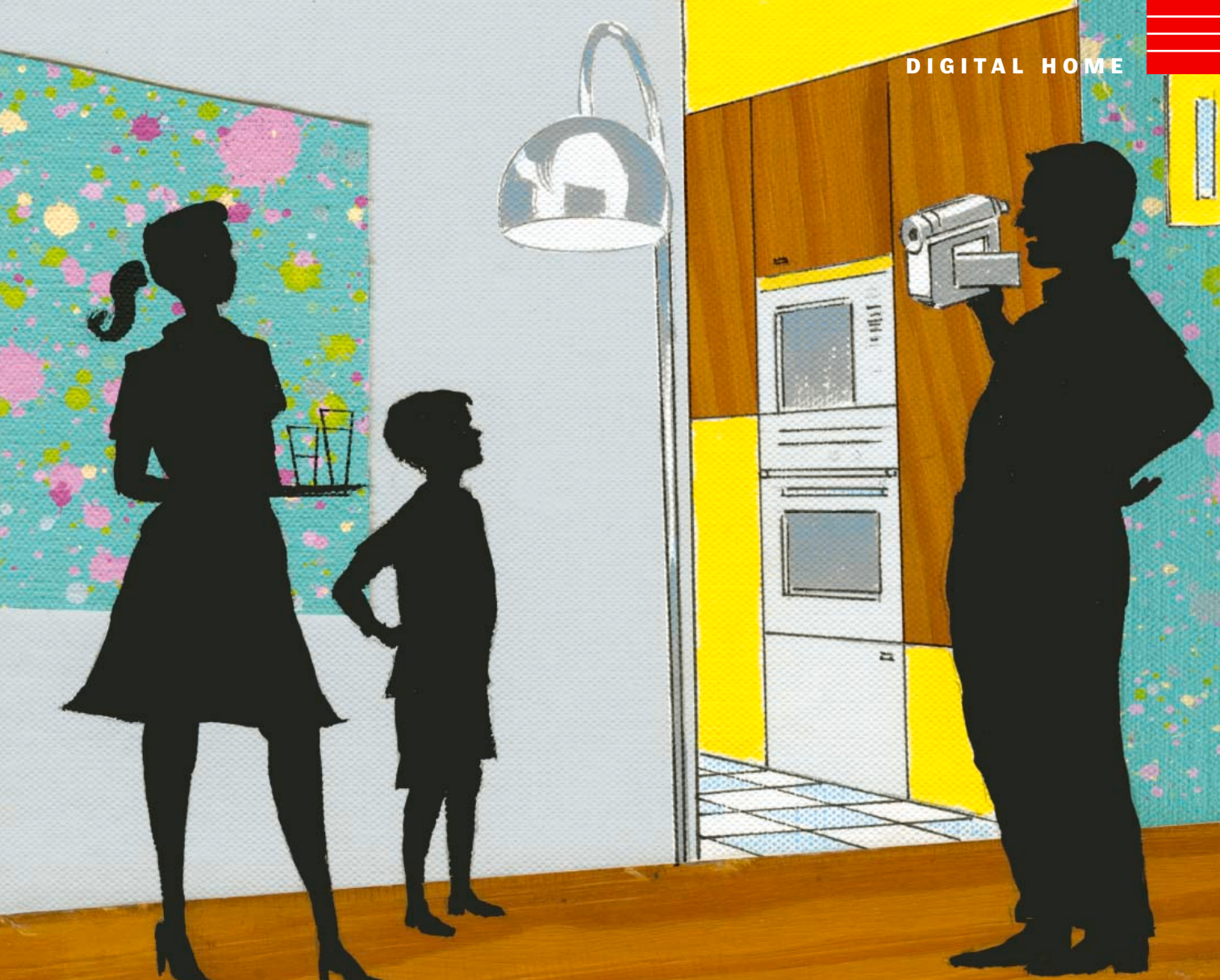
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Your *Video*

The possibilities are endless for creating and watching video in the digital home.

BY BILL HOWARD

Without a doubt, digital video is changing what we watch and the way we watch it. It's changing how we create our own visual memories, and how we share and store them. Thanks to media convergence—the blending of computing and consumer technologies—video buffs are reveling in the many new facets of home entertainment.

The traditional TV is no longer the sole provider of movies and shows. It can talk to PCs and other media devices to deliver

video on demand anywhere in the house. Such video could be a downloaded movie that sits on a PC's hard drive, a recorded show on a DVR (digital video recorder), or possibly even a show beamed directly from the local cable company. Surveillance cameras hooked into your PC (and TV) can show the UPS guy at the front door or the kids playing in the backyard.

For those who create their own video, improved camcorders and software have raised the bar for home video quality. With high-capacity hard drives and

simple editing tools, you can transfer all your videotapes to your PC and edit them with flair. Authoring tools allow you to add titles, music, and transitions to polish what you present at the family reunion, and then burn it all to DVDs. And for those concerned about protecting and preserving all those valuable memories, you can transfer home movies from analog or digital videotape to digital mass storage. Then you can forever halt the aging process that turned Mom's wedding dress a light shade of pink.

Watching Video

BY BILL HOWARD

Someday, all of our video entertainment will be conveniently located in one handy device in the house. For now, though, we get our video content from various places: We channel-surf the TV, we check out DVDs of our favorite movies, and we watch home videos—that is, if we're ambitious enough to hunt down the transformers and cables needed to connect our camcorders.

Thankfully, new convergence technologies have made these tasks easier and allow us to share our video—no matter what the source—throughout the house.

GOOD-BYE, VCR; HELLO, DVR

There are several devices to help you store and share video content, starting with the PC. The gigantic hard drives found on current PCs can hold dozens of hours of video content, such as home movies in (or con-

verted to) MPEG or WMV format, as well as Hollywood movies downloaded from online sources.

But video-friendly PCs offer far more than just large hard drives. Some, such as those with the Windows XP Media Center

connect the two devices via audio and video cables. You can easily navigate the Media Center menus on your TV screen from 10 feet away. And those menus aren't designed for enjoying only video; they also make it easy for you to find and play digital music from your hard drive or view photos.

Some Media Center PCs are shaped like stereo receivers and have ultraquiet cooling fans, making them a better fit for living rooms. The new 2005 edition of the OS allows for various levels of Media Center PCs. High-end PCs have multiple TV tuners, so that you can record one show while watching another.

Do-it-yourselfers can create much of the same experience of a new Media Center PC with their existing systems. (For more on this, see page 66.) Many users will want to add PC TV tuner/remote/software bundles from ATI or nVidia. The SnapStream

VIDEO TO GO You can now take video content with you and play it anytime, anywhere, thanks to new pocket-size devices that run Microsoft's Portable Media Center. For reviews of the latest, go to <http://go.pcmag.com/digitalhome>.

tip

Edition OS, include TV tuner cards, letting you watch cable as well as record shows and link to programming guides. These come with TV-out connectors, so you can watch video on your traditional TV that's stored on your PC; you just con-

TOP CHOICES | DVRs and Media Center PCs

The **ReplayTV 5504** is the perfect device for people who like to jump around within TV shows. It comes equipped with a 40GB hard drive that's good for 40 hours of standard-quality



recording. And you can record your favorite shows with the press of a button. Network capabilities let you control the 5504 from a remote Web browser and stream video from one unit to another. Activation costs a lifetime

service fee of \$299, in addition to the device's price.

\$149.99 direct. ReplayTV, Digital Networks North America Inc., www.replaytv.com. ●●●●○

If your PC already has a TV tuner card, **SnapStream Beyond TV 3** is the way to go. The software's slick

REPLAYTV 5504

interface, ViewScope, has easy-to-read menus that fade in and out, and the stellar channel guide lets you record all episodes of a show with one click. You can avoid commercials with the SmartSkip feature and enjoy easy access to Beyond TV 3 from the road.

\$69.99 direct. SnapStream Media Inc., www.snapstream.com. ●●●●○

The amazing **HP Media Center PC m1050y** includes a 3.6-GHz Pentium 4 560 processor; the optional 23-inch widescreen HDTV-compatible monitor is dazzling. The neatest feature is the HP Personal Media Drive, which accepts hot-swappable 160GB hard drive cartridges, essentially providing unlimited storage potential.

\$999 direct; with 23-inch HD monitor, \$2,899.99. Hewlett-Packard Development Co., www.hp.com. ●●●●○

The **Sony VAIO VGC-RA810G** is a silent beauty, thanks to an innovative

cooling port that reduces the need for noisy fans. The picture quality from the included TV tuner is rock-steady, and the 19-inch SDM-HX93 monitor provides rich, detailed video. With a 3.4-GHz Pentium 4 550 processor and 1GB of RAM, this is a solid Media Center PC.

\$2,199.99 direct. Sony Electronics Inc., www.sonymstyle.com. ●●●●○





10
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TOP CHOICES | DVD Playback Software

Just having a DVD drive on your PC isn't enough; you need the right software before you can watch movies. DVD playback software comes in many flavors (and is often included when you purchase a drive), so you should be able to find the perfect solution for your system and needs.

If you're looking for a higher-quality picture, **CyberLink PowerDVD 5** uses CLEV (CyberLink Eagle Vision) technology to adjust color and contrast automatically for the best image.

Standard, \$49.95 direct; Deluxe, \$62.95. CyberLink Corp., www.gocyberlink.com. ●●●●●

Of the available software DVD players, InterVideo's **WinDVD 6** has the most features, including new ones such as Quick Clip and Reverse Playback.

Gold version, \$49.95 direct; Platinum, \$69.95. InterVideo Inc., www.intervideo.com. ●●●●●



larger hard drive to an old PC, as well as install Windows XP, to give the server the stability it needs.

Another option is to use a network-attached storage (NAS) device, such as the Buffalo LinkStation (250GB drive, \$400 street; 120GB, \$300). But beware: Only a handful of media hubs can talk to a non-Windows device. The others need a host PC to see the network drive.

ROOM WITH A VIEW

Finally, one could argue that the most important device you need for watching video is a high-quality display. If you're considering an HDTV, you need to identify how much space you

have and what you're willing to spend.

Your choices are plasma display panels (PDPs), LCD panels, and rear-projection TVs (RPTVs), many of which use DLP technology. If you're really space-constrained, you might consider a front projector/screen combination. Each technology has its advantages, but none is perfect. RPTVs represent the best price/performance value, with prices for 42-inch units starting around \$2,000. But some good 30-inch LCD panels can be found for as little as \$1,700.

Firefly PC Remote lets you control PC-based media on your computer or with a TV output card on your TV, and its Spotlight feature gives you a single place to find and view premium media content you purchased and downloaded.

TV devotees who don't want the hassle of connecting their PCs to their TVs are turning to dedicated *digital video recorders* (DVRs), also known as *personal video recorders* (PVRs). These consoles record TV shows on internal hard drives. Most use the TV's screen to display menus and show program information; a few have on-system displays as well. You can buy a DVR outright from vendors such as TiVo and ReplayTV, rent one from your cable company as part of a set-top box, or buy a combination DVD player/DVR.

STREAM VIDEO WITH MEDIA HUBS

A new category of recently emerged products, *digital media hubs* (also called *digital media receivers*), lets AV equipment in remote rooms pull content from a PC. Many hubs can stream audio and photo files, and some also stream video files. (For more on these, see "Your Music," page 102.) Some media hubs have integrated DVD players; some are equipped with AV receivers, amplifying audio for your speakers and decoding surround sound on your DVD movies, in addition to streaming content to various devices.

Many new media hubs are adapting to work with audio and video content with digital rights management (DRM), which typically means content protected by Microsoft's Janus DRM protocol. Adopted by many online entertainment services, Janus lets you share downloaded content

with portable media players and stream it to other devices in your house. But it doesn't allow you to stream commercial DVDs that you own from room to room.

VIDEO STORAGE: SERVERS AND NAS

If you're serious about creating a truly digital home, you'll want to dedicate a PC as a media server. It doesn't have to be a fancy, fast, or even new PC. But it must have plenty of storage capacity, about 120GB to 200GB, so you may need to add a

Online Movie Rental Services

Tired of the poor DVD selection and late fees at your local video store? Online movie rental services let you download movies over your broadband connection and watch them for a limited time.

Starz! Ticket on Real Movies offers more than 100 downloadable movies on a rotating basis. You can preview and download movies on up to three computers, then watch them as many times as you want within 30 days. You also get a live stream of the Starz! Channel.

\$12.95 per month. Starz Encore Group LLC, www.real.com/partners/starz/starz.html. ●●●●○

If you don't watch that many movies a month, both **CinemaNow** and **Movielink** offer pay-per-view movie plans. Some movies expire after 24 hours, so you must watch them right away. CinemaNow also offers download-to-own and two subscription plans.

CinemaNow: up to \$3.99 per movie; premium subscription, \$9.95 per month. CinemaNow, www.cinemainow.com. ●●●●○ Movielink: 99¢ to \$4.99 per movie. Movielink LLC, www.movielink.com. ●●●●○

For those of you without broadband, there are several ways to rent DVDs online and have them delivered to your door. These services offer free shipping both ways and no due dates or cancellation fees. **Netflix**, the granddaddy of this type of service, has about 25,000 titles. Subscription prices vary, depending on how many DVDs you want at a time.

\$14.99 to \$21.99 per month. Netflix Inc., www.netflix.com. ●●●●●

Wal-Mart DVD Rentals is a similarly priced plan.

\$15.54 and up per month. Wal-Mart.com USA LLC, www.walmart.com. ●●●●○

TOP CHOICES

TV Displays

The **Dell W1700** LCD monitor/TV has a well-designed and easy-to-use remote control. Even at extreme viewing angles, computer images are excellent, and auto-sync eliminates all pixel jitter. Automatic channel identification finds available broadcast television stations without including weak signals.

\$699 direct. Dell Inc., www.dell4me.com/delltvs.



NEC PLASMASYNC

At 61 inches, the **NEC PlasmaSync 61XM2+/S** is one of the largest displays available—and it's also one of the most expensive. Its built-in scaler and 1,365-by-768 resolution make watching DVD movies into an outstanding experience, and give PC games an immersive feel.

\$14,995 list. NEC Solutions (America) Inc., www.necvisualsystems.com.

The **Sharp 37" Aquos LCD TV (LC-37HV4U)** has a resolution of 1,366-by-768. You can see plenty of detail in both shadows and highlights, and it has less smear on moving images than do rival LCDs.

\$6,499 list. Sharp Electronics Corp., www.sharppusa.com.



SHARP 37" AQUOS

The **ViewSonic N1700w** includes a picture-on-picture feature in which viewers can scroll through images to choose between TV programs. Gray-scale response and color tracking are effective. The speakers, with surround sound, produce good sound quality.

\$600 street. ViewSonic Corp., www.viewsonic.com.

Creating Video

BY JAN OZER

The days of torturing loved ones with grainy, silent Super-8 home movies and carousels full of vacation slides are over.

Creating digital videos is now easy and accessible to people of all skill levels and budgets. But before you become the next Spielberg, you're going to need the right tools.

CHOOSING A CAMCORDER

It sounds axiomatic, but video quality starts with the camcorder. For this reason, if you're shooting to edit, stick with MiniDV cameras that store video in the DV format on matchbox-size tape cartridges. Camcorders that store video on DVDs compress the video into MPEG-2 format, which is fine for immediate viewing but inferior to DV for editing. Ditto for the cool new tiny cameras that store video on SD memory in MPEG-2 or MPEG-4 formats.

Prices for MiniDV cameras range from under \$300 for some inexpensive consumer models to more than \$3,000 for the most expensive prosumer models. Given the near price parity with analog cameras that deliver much lower quality, buying an analog camera makes little sense.

The first thing you should do when comparing digital video cameras is check the size of the *charge-coupled device* (CCD). This chip converts the signal coming in through the lens into digital information. Generally, larger CCDs (such as 1/3- or 1/4-inch) produce higher-quality video than smaller CCDs (1/6-inch, for example), and cameras with three CCDs outperform those with only one.

Other critical features include a *microphone input port*, so you can add a separate microphone to augment the notoriously poor microphones embedded in most camcorders. An intelligent *accessory shoe*, which can power and control both a microphone and video

light, is also a handy option.

A standard feature on all MiniDV cameras is a FireWire port, also known as iLink or IEEE 1394, the technology's official designation. You can use this port to connect the camera to the computer and download your video.

EDITING YOUR VIDEO

Mention video editing to most people, and they probably think of Hollywood special effects à la *Harry Potter* and *The Lord of the Rings*. But the primary role of consumer video-editing programs is more

prosaic; specifically, it's trimming away the visual fat to produce a tight, compelling story: When producing home videos, less is definitely more.

Most video editors offer far more features than home producers will (or should) ever need to use. Zero in on the features you know you'll want, and have an idea of how advanced you want

them to be. For example, all video editors let you adjust video color and brightness manually to correct shots taken with inadequate lighting or improper white balancing. Better editors can automatically analyze and correct your footage.

Since most video editors also include DVD-authoring features, you should factor them into your buying decision too.

DVD AUTHORIZING

DVD authoring is the ability to create menus, add videos and slide shows, and burn your project to a DVD. Usually you edit your video first, and then authorize your DVD.

Most entry-level authoring tools are completely template-driven, with customizable menus but fixed, sequential page navigation. For the most part, templates

WHERE TO SPLURGE, WHERE TO SAVE

Spend more than you can afford on a DV camera, but don't spend more than \$100 on your first video-editing software package.

tip

“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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make DVDs simple to create, but viewers may have to page blindly through multiple menus to find the desired content.

All programs provide libraries of menu backgrounds, buttons, and other design components; take a good look at them before buying, unless you want to design your own. These components will form your viewer's first impression of your production, and if they look cheesy, so will your content.

If your typical DVD exceeds 60 minutes of content, buy an authoring program that can compress audio into Dolby Digital format. This will save disc space without the potential compatibility issues of MPEG-2 audio compression.

DVD BURNING

DVD recorders, which can be internally mounted in your PC or connected externally via USB or FireWire, record your production to a disc you can play in set-top DVD players and computers with DVD drives and the necessary software.

The latest trend in DVD recorders is the dual-layer model, which writes to discs with 7.95GB capacity, compared with the 4.37GB disc capacity of traditional single-layer DVD-R/RW or DVD+R/RW drives. Dual-layer discs are still expensive, and playback compatibility has been spotty in some early tests.

If you're not comfortable tinkering with firmware upgrades and the like, you should probably stick with single-layer

SHARING YOUR CREATIONS

You can share your personal videos simply by plugging your camcorder into your TV. But how do you share them with friends and family who live on the other coast? Consider services that post your videos to a Web site for viewing by your invited guests. Some video editors let you upload your videos from within the application. Pinnacle Studio uses its in-house service, www.studioonline.com,

while both Microsoft Windows Movie Maker 2 and Ulead Video Studio use Neptune's Mediashare (www.neptune.com). Pricing and plan details vary by company. There are also unaffiliated third-party options like www.sharegear.com.

All services compress your files before posting them for viewing, which inevitably degrades quality. This is especially true for your viewers who use dial-up modems to connect to the Internet. Video viewed over broadband, however, can look quite good, and you really can't beat the convenience of having it available on the Web.

tip **BURN ONCE, BURN TWICE** Burn all your rough-draft edits to rewritable discs (DVD-RW or DVD+RW), but once you have your final cut, burn it to burn-once recordable media (DVD-R or DVD+R).

recorders. That said, note that all dual-layer drives can also record on single-layer media, so you can still use the less expensive, more compatible media. Whether buying a single- or dual-layer recorder, purchase a unit that can record to both "plus" and "minus" media.



SONY DCR-HC40

bit warm after shooting 20 minutes of video. But the wow factor is undeniable.

\$279.99 list. Koninklijke Philips Electronics N.V., www.audio.philips.com. ●●●●○

The **Sony DCR-HC40 MiniDV Handycam** produces superior detail and color accuracy, along with impressive audio. Controls on the LCD panel direct recording and enable and disable LCD backlighting to save battery power while shooting. (With the LCD active, the battery lasted 94 minutes on our tests.)

It features an intelligent accessory shoe and a remarkably smudge-resistant and logically organized touch-screen panel.

\$699.99 direct. Sony Electronics Inc., www.sonystyle.com. ●●●●○



PHILIPS KEY019

MPEG-2 video, or 1 hour of 128-Kbps MP3 files. Even with its modest resolution, the SV-AV30 is a stunning device that you'll want to carry everywhere.

\$400 street. Matsushita Electric Corp. of America, www.panasonic.com. ●●●●○

The **Philips KEY019 Key Ring Camcorder** is also an MP3 player and digital camera. Its 128MB of internal memory stores 2-megapixel still shots, digital video, MP3 files, and documents. The camera doesn't have a zoom or a flash, the MP3 player lacks a playlist function, and the device gets a

TOP CHOICES | Camcorders

The **Canon Optura 20** includes a 16X optical zoom and a manual focus ring on the lens. It's very competent in low-light shooting, which is a common Achilles' heel in Canon's consumer line. Zoom controls offer multiple speeds and are easy to manipulate; the intelligent accessory shoe can house a light or a directional microphone.

\$999 list. Canon U.S.A. Inc., www.canondv.com. ●●●●○



CANON OPTURA 20

Boasting a 3-CCD video, 1.2-megapixel still-image capture capability, and a Leica Dicomar 10X optical zoom lens, the **Panasonic PV-GS120** produces sharp, well-exposed digital video with accurately reproduced colors. It fits comfortably in your

right hand and offers easy access to zoom and basic operating controls. The generous 2.5-inch LCD panel flips out 90 degrees and rotates vertically 270 degrees.

\$699.95 list. Matsushita Electric Corp. of America, www.panasonic.com. ●●●●○

The sleek **Panasonic SV-AV30 e-wear**

SD Multi AV Device functions as a still camera, video recorder, music player, and voice

recorder. With a 2-inch (diagonal), 320-by-200 color LCD flip-up screen, 3.55-mm fixed-length lens, flash, and rechargeable lithium ion battery, the SV-AV30 looks like a miniature laptop. An included 64MB SD card gives you 124 photos, 35 minutes of MPEG-4 video, 2 minutes of

TOP CHOICES | DVD-Editing and -Authoring Tools

BASIC EDITING TOOLS

MyDVD Studio 6 is the most intuitive application we've tested for producing high-quality DVDs quickly, though it has limited video-editing features. This new version lets you position video thumbnails manually on a menu; you can



also import MPEG-4 and DivX content, as well as video from non-copy-protected DVDs.

\$69.99 direct. Sonic Solutions, www.sonic.com. ●●●●○

Pinnacle Studio 9, v. 9.1

features a second video timeline for picture-in-picture and chroma key effects, as well as image pan and zoom for slide

shows and outstanding DVD-authoring tools. Pinnacle Studio 9 Plus (\$99.99 direct) adds new features, including image stabilization, automatic color correction, and noise reduction.

\$99.99 direct. Pinnacle Systems Inc., www.pinnacle.com. ●●●●○

As a video editor, **Ulead VideoStudio 8** is mature and full-featured. New features include automatic background audio-track creation and pan and zoom capabilities for slide shows. But DVD-authoring options are very limited.

\$99.95 direct. Ulead Systems Inc., www.ulead.com. ●●●●○

The dazzling templates of Apple's **iDVD** and graceful usability of **iMovie** enable novices to produce impressive results. iMovie's interface is a model of simplicity, and its capture function is one-click simple. Direct trimming gives

users the ability to trim a clip by dragging the edges to a new location. iMovie also offers a good range of special effects, including lightning, fog, and fairy dust—all with excellent configuration options. iDVD has 45 templates that are light-years ahead of the rest. Navigation options are good, with submenus and chapter menus, and you can create slide shows with transitions and match image duration to background audio.

\$49 direct for the iLife '04 suite (includes iDVD, iMovie, iPhoto, iTunes, and GarageBand). Apple Computer Inc., www.apple.com. ●●●●○

EDITING TOOLS FOR PROS

All Adobe's video production tools are functional, but they work best as part of the **Adobe Video Collection 2.5 Professional** suite. For example, Premiere is highly usable but lacks chroma key and motion controls. Enter After-Effects, which buttresses these capabilities and adds much more. Encore's menu design capabilities, though



improved, are competitively weak. But Photoshop offers round-trip menu editing between the two programs.

\$1,499 direct. Adobe Systems Inc., www.adobe.com. ●●●●○

DVD AUTHORING

Sonic DVDIt 5 has a structured workflow, excellent design templates, a slide show creation function, and disc and jewel case printing. Assigning navigational properties to buttons and menus is easy, but DVDIt can't capture video directly, making it less efficient than Ulead DVD Workshop for tape conversions.

\$299 direct. Sonic Solutions, www.sonic.com. ●●●●○

Converting VHS to Digital Video

If your old family videos are collecting dust, digitize them. These hardware products make it easy to convert your videotapes to DVDs; you can then edit and jazz up your movies. Hey, someone might actually want to watch them!

For beginners, the **HP DVD Movie Writer dc 4000** is a good product to start with. It captures analog home movies, converts them to digital, and provides software so you can edit your videos and add titles, music, and more.

HP DVD Movie Writer dc 4000: \$249.99 direct. Hewlett-Packard Development Corp., www.hp.com. ●●●●○

The **ADS Instant DVD 2.0** offers strong performance and good video quality. Three application-specific programs are included: muvee autoProducer DVD SE (converts your home movies to music videos), Ulead DVD MovieFactory 2 (for tape conversion), and, for more advanced video editing, Ulead

VideoStudio 7 DVD SE.

\$199 direct. ADS Tech, www.adstech.com. ●●●●○

Now here's a device that gives you more for your money. The **Adaptec VideOh! DVD Media Center USB 2.0 Edition** easily captures analog video from camcorders, VHS tapes, and digital media and converts it into MPEG-1 or MPEG-2 files. You can also record, pause, replay instantly, fast forward, and rewind television shows. The package includes Sonic MyDVD video creation software as well.

\$179.99 list. Adaptec Inc., www.adaptec.com. ●●●●○



THE ADAPTEC VIDEOH! Media Center is an all-in-one recording and transfer device.

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BUSINESS PACKAGE

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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		
1&1 Chat channels	5	5
1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	18 pages	18 pages
Software bundle worth \$600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3 and PHP4	✓	–
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		
POP3 accounts	500	500
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	3 accounts	3 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**

IMPROVED

DEVELOPER PACKAGE

FROM
\$19⁹⁹
PER MONTH

INCLUDES 5 DOMAINS

PACKAGE FEATURES		
Web space	4,000 MB	4,000 MB
FTP accounts	25	25
Monthly Transfer Volume	100 GB	100 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
1&1 Chat channels	10	10
1&1 WebStatistics	✓	✓
In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	25 pages	25 pages
Software bundle worth \$600	✓	✓
FrontPage extensions	✓	✓
CGI library	✓	✓
Active Server Pages	–	✓
ASP.NET, .NET Framework	–	✓
Perl, PHP3 and PHP4	✓	–
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		
POP3 accounts	1,000	1,000
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	6 accounts	6 accounts
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
SSH Secure Shell Access	✓	–
Dedicated SSL Certificate	✓	✓

PER MONTH

\$19⁹⁹ **\$24⁹⁹**

IMPROVED

HOME PACKAGE

FROM
\$4⁹⁹
PER MONTH

INCLUDES 1 DOMAIN

PACKAGE FEATURES		
Web space	1,000 MB	1,000 MB
FTP accounts	1	1
Monthly Transfer Volume	25 GB	25 GB
1&1 Control Panel	✓	✓
Logfiles	✓	✓
MARKETING TOOLS		
1&1 Chat channels	1	1
1&1 WebStatistics	✓	✓
SITE-BUILDING TOOLS		
WebsiteCreator	12 pages	12 pages
Software bundle 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		
POP3 accounts	200	200
Aliases, auto-responders, forwarding	✓	✓
1&1 WebMail	✓	✓
Symantec Virus Scanners	1 account	1 account
SECURITY FEATURES		
Protected by up-to-date firewall	✓	✓
Daily backups	✓	✓
Password protected directories	✓	✓
Dedicated SSL Certificate	optional	optional

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disk with data rates from 2.5MBits/sec up to 12Mbits/sec. Play the recordings back to your PC screen, or burn them onto DVD.

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Your Music

For years, consumers overlooked the PC as an audio component. But they're finally taking notice.

BY EMILE MENASCHÉ

Just about any desktop computer made in the past decade is capable of playing high-quality audio. Until recently, however, the average music fan had no compelling reason to ditch his or her conventional CD player in favor of a PC. But many factors—from the emergence of legal download services to dedicated network audio receivers to obscenely inexpensive hard drives—have made a computer the next

must-have component for your home entertainment system.

MUSIC ON YOUR PC: THE BASICS

As we mention in “Your PC” (page 85), the ultimate multimedia PC should have plenty of storage space (ideally, 200GB). This allows you to store thousands of CDs as digital audio files—MP3, WMA, and other formats—encoded with typical compression settings (about 160 Kbps, for example).

You'll need a CD burner, which can be used for ripping audio CDs to digital files and, of course, burning CDs. Consider buying a DVD drive as well, so you can take advantage of the new multichannel audio DVDs that offer albums with 5.1 surround sound (provided you have a sound card that supports multichannel standards). You'll also want plenty of USB 2.0 ports for connecting peripherals, such as portable players.

If music is really important to you, don't

TOP CHOICES Media Hubs

If you have a wireless home network, the easiest way to stream your digital music library to your stereo is to use the **Creative Labs Sound Blaster Wireless**

CREATIVE SOUND BLASTER

Music. This small wireless hub plugs into your stereo's analog line-in or optical S/PDIF inputs (or directly into a set of powered speakers). It then streams music from any computer connected to your home network.

\$200 direct. Creative Labs Inc., www.soundblaster.com. ●●●●○

The **Prismiq MediaPlayer** is an excellent all-in-one solution for the serious digital junkie who wants to pipe music and video throughout the home. The hub includes an Ethernet port, RCA audio/video jacks, S-Video connectors, and coaxial optical audio outputs. You can also add a wireless network card. Controlling the MediaPlayer with its handy remote control, you can easily stream digital audio files to your stereo, MPEG video from your hard drive to your TV, and so on.

\$200 direct. Prismiq Inc., www.prismiq.com. ●●●●●

Those who don't mind dealing with wires might consider the **Turtle Beach AudioTron AT-100**. This device, which looks like a traditional stereo component, also streams music

PRISMIQ MEDIAPLAYER

stored on your network. Unlike many of the other options, it supports network-attached storage (NAS) drives, meaning that if you have such a drive, you don't have to turn on your PC to listen to music.

\$200 street. Voyetra Turtle Beach Inc., www.audiotron.net. ●●●●●



settle for just a basic audio card. A good interface will have a low signal-to-noise ratio and offer better output options for connecting to other audio devices. For CD-quality audio, a stereo 16-bit interface should work fine, but a 24-bit device will give better sound quality. If you're playing DVDs or surround mixes, you need an audio device that supports surround sound, such as the Creative Sound Blaster Audigy 2 ZS.

USE RADIO TO BEAM YOUR MUSIC

For a quick-and-dirty way to transmit music wirelessly throughout your home, use a close-range FM transmitter to send a signal from your computer's audio outputs to any FM receiver in your house.

tip

MANAGING YOUR MUSIC LIBRARY

The digital-jukebox software you use is more than just a window into your music library. Programs such as iTunes, Music-match Jukebox, RealPlayer, and Windows Media Player are more like command centers. All are available in free versions, and some offer enhanced versions with superior audio features and faster CD burning.

Even the free players can rip audio CDs, play back audio files in various formats, and be used for managing playlists and large music libraries. They even let you listen to streaming audio, and they also pro-

streaming digital music stored on your PC to your stereo system. The choices include traditional-looking stereo components that read the music on your network, simple wireless hubs, and even boom boxes—at widely varying prices. Be sure the hub you choose supports the format your music is stored in.

GETTING DOWN WITH DOWNLOADS

When the peer-to-peer craze first hit (remember the original Napster?), many record companies wanted to quell the buzz

vide online stores where you can legally buy and download audio files.

TUNING YOUR NETWORK

One reason more people are tapping into their PCs as audio devices is that the prevalence of home networks has made it easy to get music from your PC to your stereo, either via a wired or wireless connection. The digital media hubs we mention in "Your Video" (page 91) work with audio and video,

TOP CHOICES | Portable Players

The **Apple iPod** has been a favorite of ours since its release. The newest iPod supports both USB 2.0 and FireWire 400.

APPLE IPOD

This iPod is a millimeter thinner than the previous iPod and offers an updated touch-wheel interface borrowed from the iPod Mini.

20GB, \$299 direct; 40GB, \$399. Apple Computer Inc., www.apple.com. ●●●●●

If you want a smaller player with a roomy hard drive, check out the 4GB **Apple iPod Mini**. You really can carry it in your shirt pocket.

\$249 direct. Apple Computer Inc., www.apple.com. ●●●●●



The new **Rio Carbon** won't rub off on your hands, but it will rub off on your lifestyle. This tiny 5GB player does everything you wish the iPod Mini did, such as voice recording, bookmarked Audible voice files, and drag-and-drop transfers. Your fingers will love its palm-pleasing shape and the navigation/volume wheel; your ears will love the sound quality.

\$250 street. Rio Audio, www.rioaudio.com. ●●●●●

SAMSUNG YEPP

The excellent **Samsung Yepp YP-T5** is a tiny flash player about the size of a lipstick case. It has 256MB of storage, many features, and an FM receiver, yet weighs only 1.3 ounces.

\$150 direct. Samsung Electronics America Inc., www.samsungusa.com. ●●●●●



around digital audio. Now, though, the same companies want you to download music (legally, of course), and they expect you to put your music onto portable players. Services like the Apple iTunes Music Store and Microsoft's new MSN Music store make it easy to buy and organize music, transfer it to a portable player, and burn it to CD. And you can almost always purchase individual tracks to download, so you can get the songs you want without having to buy the whole album.

On the downside, purchasing music online is more akin to buying a software license than to buying a CD: Your rights to duplicate and transport the music are limited, and depending on the vendor, the format may not work with your portable player. Online music sales are also currently restricted to compressed audio formats such as MP3, AAC, and WMA, so you aren't really getting CD-quality audio, though the difference is unnoticeable to many people.

TAKING IT WITH YOU

One of the main benefits of the MP3 format is the convenience of portable music players. When picking a player, think about how you plan to use it. Flash-based players, which are a good option if you want to take music to the gym, are small and light. They have no moving parts and

Choosing Speakers

To get the best sound quality, let's face it, your speakers matter most. Here are some pointers for picking out a good set of speakers. First, size matters. Larger speakers generally boast greater low-frequency (bass) response, but you can also opt for small speakers and mate them with a subwoofer, which specializes in pumping out the low end.

If you plan to put the speakers near a TV or PC display, look for shielded speakers, which keep the speakers' magnetic field from causing interference or distortion in your display's picture.

If you aren't piping your music through your stereo system, consider a set of powered (or active) speakers that are designed for home-studio use—as opposed to the ones you'll find in your computer superstore. These are easy to set up, can deliver superior sound, and are often surprisingly cost-effective.

Passive speakers are the type you use with a component stereo system and receiver. If you have a big receiver but want small speakers, don't fret: Your receiver's wattage can exceed the speakers' power rating, as long as you don't pump the volume too hard.

For surround sound—or for convenient placement throughout your abode—consider wireless speakers.—EM

offer long battery life, but they have only about 256MB of storage on the average. Hard-drive players, on the other hand, tend to be heavier, and their battery life is shorter. But these devices have anywhere from 20GB to 60GB of storage space, so they can hold hundreds of CDs worth of music. Players with micro hard drives are

a new option; they're closer to the size of flash-based players, but can hold up to 2GB of music.

Finally, be sure the player you choose supports the music file format you use. Sony's players, for example, will work only with Sony's proprietary ATRAC3plus format and the Sony Music Store. ☐

TOP CHOICES | Jukebox Software

Apple's iTunes quickly found its way onto Windows desktops, thanks to its market-leading music store. The newest version, iTunes 4.6, is now available. (For our review of Version 4.5, visit www.pcmag.com.) iTunes is a competent audio player, offering a simple interface and standard features such as playlists and CD burning. But the real appeal is the gigantic online store, which offers more than 1 million tracks to download.

Free download. Apple Computer Inc., www.apple.com. ●●●●○

Musicmatch Jukebox 9.0 is an excellent option for managing and listening to digital audio files. Unlike Windows Media Player, Musicmatch Jukebox is purely a music



player; it doesn't support video. Its premium options are unique and appealing. Notably, the On Demand service (an extra \$8 per month) is like a customizable radio station; you can pick exactly what songs you want to hear and when. The music

is streamed to you, so you don't have to own the CDs. Additionally, Musicmatch offers a decent music-download store integrated with the application.

Jukebox Basic, free download; Jukebox Plus, \$19.99. Musicmatch Inc., www.musicmatch.com. ●●●●○

Windows Media Player 10, available as a free update from Microsoft's Web site, has a vastly improved interface, and the player now includes MP3 encoding for the first time. It supports digital audio (including streaming radio stations), video, and photos; it offers plenty of tools for easily managing large libraries of music files. Media Player 10 also provides a spate of useful audio tools, such as EQ. The really big news, however, is that Microsoft has launched the MSN Music service, which lets you buy music downloads right from within the Windows Media Player interface.

Free download. Microsoft Corp., www.microsoft.com. ●●●●○

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YOUR *Photos*

From capturing a moment to sharing it with friends, we walk you through digital photography.

BY GALEN FOTT

Taking digital photos has become part of our daily lives, and there's no better evidence of that than the massive number of cameras in pockets and purses, even in embedded cell phones. People enjoy the immediacy and accessibility of taking digital shots, as well as what they can do with them afterward on their home computers. Editing, manipulating, organizing, and printing are all easily within reach, giving you total control of the process.

No digital home is complete without a camera and the right suite of photo software. Here's how to equip yourself with the right tools.

CAPTURE YOUR PHOTOS

Choosing the right digital camera is the first step, and it requires some research. Before you start, figure out what kind of camera you want. Many compact cameras can take impressive pictures but lack the sex appeal of ultracompacts. The latter are small enough to fit in your shirt pocket but might not deliver top-notch performance. Superzooms have 10X or greater optical zoom lenses and are just below the enthusiast category, which comprises full-size models that offer more control than compacts. Digital SLRs are the highest-end cameras available, offering true reflex through-the-lens viewfinders, inter-

changeable lenses, and total control over your pictures.

Once you figure out what kind of camera you want, you'll be bombarded with numbers. Don't get too hung up on camera resolution; even midrange 3-megapixel (MP) models give you enough for an attractive 8-by-10 print; raise that to 4MP or 5MP if you want some room for cropping your photo before printing. A more pressing issue is a digital camera's lag time—the time lapse from when you press the shutter button to when the camera actually snaps the picture. Many cameras claim to have a lag time of less than a second, but you should test this in the store before buying.

Also of concern is start-up time—how much time a powered-down camera needs before it's ready to shoot. Again, this is something to try in the store, but anything from 1 to 5 seconds is normal. You should also ask how long you have to wait between shots. Many cameras now offer a *burst mode*, which lets you fire off two or three shots per second and store the pictures in the camera's buffer memory before writing them to your media card.

MANAGE YOUR PHOTOS

No matter which camera you use to snap photos, you'll probably transfer the images to your PC to store, manage, and edit. Don't forget that Windows offers a lot of built-in photo-handling options. Microsoft Windows XP's AutoPlay fea-

DIGITAL CAMERAS ON THE RISE

Digital camera shipments in the U.S. totaled 14.3 million units in 2003 and will rise to over 27 million by 2008.

Source: Gartner, August 2004.

flash

dering prints online from services like Ofoto and Shutterfly.

Over time you may acquire thousands of photos, and trying to find a certain image by rooting around in folders on your hard drive can be an exercise in futility; having a solid software solution for managing your collection is vital.

Image-organizing programs let you assign multiple keywords or tags to each image. These let you search your collection by keywords to find, for instance, all

ture, for example, automatically downloads pictures from a connected camera. You can then open that folder of images in Windows Explorer and perform actions such as rotating image thumbnails, watching simple slide shows, creating layouts for printing multiple pictures on a single page, and ordering

the photos that both your brother Rob and your sister Linda took during their trip to Vancouver—no matter where those pictures are scattered on your hard drive. Of course, as your photo collection swells, your hard drive fills; make sure you choose a program that lets you burn backup CDs or DVDs and keeps track of which images have already been backed up.

EDIT YOUR PHOTOS

Almost everywhere you look there are devices with image-editing capability, from cameras with built-in red-eye removal to photo printers featuring on-board image-enhancing functions. These fixes can be effective, but to make photos really look their best, you should turn to image-editing software.

Several midrange programs offer a slew of easy one-click commands for novices, without skimping on complex tools for more advanced users. For instance, all the major midrange programs have one-click sharpening functions for correcting focus by a predefined amount. But they also offer the powerful (if confusingly named)

TOP CHOICES | Digital Cameras



The **Canon EOS Digital Rebel** is a fast and easy-to-use digital SLR, and the lens is surprisingly good considering its light weight and low price. Image quality is generally excellent, but our flash shots were often underexposed. The Rebel lacks a flash exposure compensation control, which we fixed by using an external flash. But this adds considerable cost and weight.

With lens, \$999 list; without, \$899. 6.3 megapixels. Canon U.S.A. Inc., www.canoneos.com. ●●●●○

The **Canon PowerShot S60** compact camera takes crystal-clear pictures with its 3.6X zoom lens and wide-angle capabilities. ISO selec-

CANON EOS DIGITAL REBEL

tions include nine white balance choices, with one for underwater. Video capabilities are slim: 640 by 480 pixels at just 10 fps for 30 seconds. But the zoom operates smoothly, and you can shoot from as close as 2 inches, though with wide-angle distortion. Boot-up time was 3.8 seconds, recycling in 2.6 seconds. Our daylight still life was clear with honest colors and great exposure.

\$500 street. 5 megapixels. Canon U.S.A. Inc., www.powershot.com. ●●●●○

Although a bit pricey, the **Casio Exilim Pro EX-P600** compact camera is worthwhile. The solid image quality, versatile 4X zoom lens, and impressive design, LCD, and menus outweigh this camera's dark exposures and mediocre recycle times. With 25 scene modes, beginners will appreciate the on-screen help. And pros will like its focus bracketing and advanced modes—all easily accessible. Our daylight image was balanced, though slightly dark. Flash shots were well illuminated, if a bit cool. It

boots in 3.03 seconds and recycles in 4 seconds.

\$599.99 list. 6 megapixels. Casio Inc., www.casio.com. ●●●●○

The **Kodak EasyShare LS743** compact is a nifty little point-and-shoot. It has a 1.8-inch LCD that is sharp but doesn't automatically adjust when the scene is very dark or light. It can accommodate SD or MMC cards, and it comes with 16MB of built-in memory. The camera boots in 4 seconds and recycles in 1.5. Our daylight and flash test shots were crisp, with excellent detail and color, though slightly underexposed.

\$299.95 list. 4 megapixels. Eastman Kodak Co., www.kodak.com. ●●●●○

You'll love the features of the **Leica Digilux 2** enthusiast camera, including an anodized silver body, leather trim, well-placed shutter button, and smooth manual focus. It also



CANON POWERSHOT S60

Unsharp Mask command, which gives you total control over the precise amount and scope of sharpening. Best of all, some programs let you apply image corrections as adjustment layers, giving you flexibility to adjust the amount of correction at a later date or cancel it altogether.

And if you find you frequently shoot sequences of similar photos, look for software offering batch processing. This function can be an invaluable time-saver, applying basic functions like resizing, renaming, and simple color correction to an entire group of images at once.

PRINT YOUR PHOTOS

Dedicated photo printers that crank out prints at a maximum size of 4-by-6 inches are easy to recommend. Print quality can equal that of your local developer, and in some cases the cost is the same as well (29 cents per print). Portability is another big plus; many dedicated photo printers are battery operated and quite

compact, so you wouldn't even think twice about taking one along on your next vacation.

If you need to make larger prints and also crank out the occasional page of text, a desktop photo printer may be what you're looking for. Most photo printers use at least six colors of ink, usually two

printer on the market has sufficient resolution. And print speed can be misleading, since vendors almost never test at the slow Best Quality mode you'll want to use for your prints.

Even if excellent photo output is your primary goal, all-in-one devices that also scan, copy, and fax can really let you have your cake and eat it too. Although photo output from one of these multi-function devices may not be quite at the same quality as a photo printer, some models are able to deliver excellent results.

Like dedicated photo printers, all-in-ones that emphasize photo printing may even include connections for printing directly from your digital camera or its removable media.

SHARE YOUR PHOTOS

Back in the olden days, folks would return from vacation, drag the slide projector and screen out of the closet, and invite

TAKE CONTROL BEFORE YOU SHOOT

Some cameras let you shoot in RAW file format. This cuts out the automatic brightening and sharpening a camera performs on images before storing them, giving you more control over image correction.

tip



LEICA DIGILUX 2

offers fast shooting and an excellent 3X optical zoom lens. The bright, 2.5-inch LCD complements the high-resolution electronic viewfinder by displaying a magnified square. Our flash test shot was excellent, with accurate exposure, even illumination, and outstanding color. The daylight shot exhibited sharp detail and very good exposure. Sure, \$1,850 is a little pricey, but those who want the best will understand.

\$1,850 list. 5 megapixels. Leica Camera AG, www.leica-camera.com. ●●●●●

Get ready for some serious competition with the **Nikon D70** digital SLR. Its body is solid and well designed. The camera offers a host of professional features, including shutter speeds up to 1/8,000 second, sRGB and Adobe RGB color modes, and sharpening and color saturation controls. On our tests, image quality was good yet somewhat underexposed when we shot pictures at the default settings. But when we manually configured white balance and exposure controls or shot in RAW mode, the quality jumped to excellent. The D70 handles and shoots as fast as any film SLR out there and boots in just 0.4 seconds.

With lens, \$1,300 street; without lens, \$1,000. 6.1 megapixels. Nikon U.S.A. Inc., www.nikonusa.com. ●●●●●

The Olympus Camedia C-765 Ultra Zoom is a superzoom

camera that produces sharp images with its 10X zoom lens. Not to mention that the 1.8-inch LCD is extremely bright and crisp. With seven resolutions, the camera also offers support for TIFF files and four levels of JPEG compression. It captures 640-by-480 QuickTime video with audio, but at only 15 fps. Boot and recycle times were slow at 6.8 and 2.5 seconds, respectively. But when we



SONY CYBER-SHOT DSC-T1

took daylight still-life shot, the C765 showed realistic colors and even exposure.

\$450 street. 4 megapixels. Olympus America Inc., www.olympusamerica.com. ●●●●○

The **Sony Cyber-shot DSC-T1** ultracompact camera is stunning. Although it does not have an optical viewfinder, its massive 2.5-inch LCD enables easy viewing. The camera offers 30-fps video, manual focus, eight program modes, and a histogram. In our testing, boot time was lightning fast at 1.6 seconds, but recycle time and burst mode were slow at just 3.6 and 4 seconds, respectively. Our test shots had a yellow cast. The daylight image was underexposed, but the flash image was well exposed. Despite its rated 5.1 megapixels (MP), the DSC-T1's resolution is more in line with a 4-MP model. Neverthe-

less, the DSC-T1 is designed for buyers who want the highest-resolution possible in a subcompact digital camera.

\$500 street. 5.1 megapixels. Sony Electronics Inc., www.sonystyle.com. ●●●●○

Photo Software and Services

Now that you've taken those price-less photos, it's time to make them look their best and show off your photographer's eye to family and friends. Here are some software packages and services that make editing, managing, printing, and sharing your photos a snap.

EDITING SOFTWARE

Adobe Photoshop Elements 2.0 is a powerful yet easy-to-use program that offers impressive graphics technology. It lets you

lay out multiple images to be printed on a single page. And a deal with Shutterfly (www.jasc.shutterfly.com) lets you easily order prints, as well as specialty items like calendars and greeting cards. Look for a review of Jasc Paint Shop Pro 9 in an upcoming issue of *PC Magazine*.

Download, \$99 direct; CD, \$109. Jasc Software Inc., www.jasc.com. ●●●●○

The **Microsoft Digital Image Suite 10** bridges the gap between your digital camera and PC. It scans your hard drive for

Microsoft Digital Image Suite 10 is a competent and easy-to-use package, but it pales in comparison to the offerings from Adobe and Jasc.

\$129 direct. Microsoft Corp., www.microsoft.com.

●●●●○

MANAGING SOFTWARE

ACDSee 6.0 sets the bar for image management programs. The power and flexibility is most obvious in its organizing, sorting, searching, and retrieving of files. Its screen is divided into four panes: Folders, Thumbnails, Preview, and Image Basket. You can customize the screen and unlock panes. A new Acquire wizard simplifies the process of retrieving images from a camera, scanner, or USB storage device. But it offers no help menu to guide you in choosing the right options.

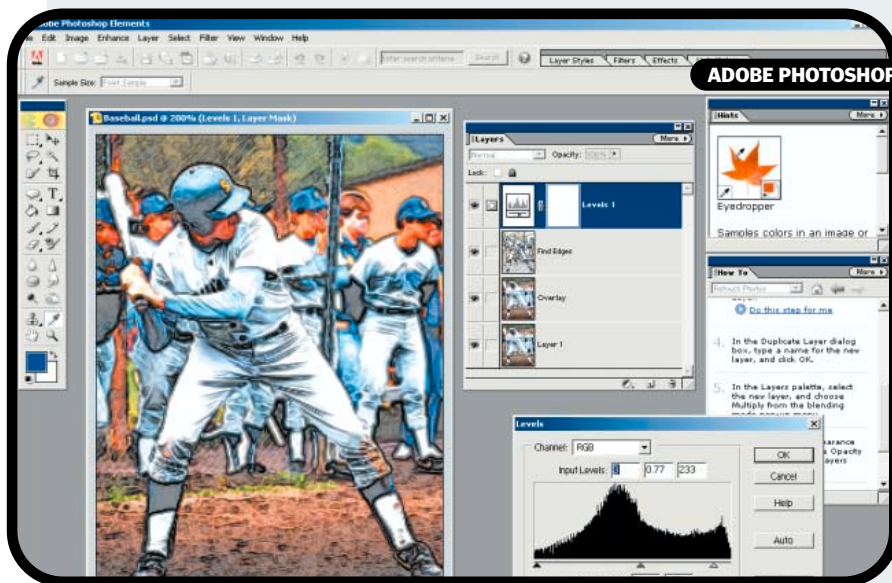
ACDSee now lets you perform the most common image-editing tasks, such as adding effects, adding or removing noise, and cropping. The new Backup utility archives the database information with or without its associated images and can do full or incremental backups.

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

Adobe Photoshop Album 2.0 is even more impressive than Version 1.0. But you probably won't need to upgrade if you already have it.

Version 2.0 retains the timeline across the top, which lets you browse through images according to when they were taken. Tags are organized into categories, and you can create a hierarchical structure for organizing them.

The image-editing tools are first-rate for



ADOBE PHOTOSHOP ELEMENTS 2.0

fix red-eye, eradicate color casts, sharpen blurry images, and more. We like the Fill Flash and Adjust Backlighting features.

While its simplicity appeals to novices, more experienced users appreciate its versatile-layer technology and full complement of special-effects filters, vector shapes, and editable text. And mistakes are no big deal, thanks to a History palette that lets you roll back edits.

\$99 direct. Adobe Systems Inc., www.adobe.com.

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Jasc Paint Shop Pro 8 delivers an amazing amount of power at a low price. It does take a while to learn, but automated tools, such as One Step Photo Fix, auto-sharpen, and red-eye removal, give novices a head start. It also offers many correction mechanisms for power users, including a channel mixer, histogram adjustments, and tone cures.

The template-based approach lets you

images and imports photos from your camera. It also catalogs images on CDs without copying them to your hard drive, and the archiving system lets you burn incremental backup CDs of recently added or edited photos.

You can assign keywords, star ratings, and new user-definable flags to individual images. The Photo Story feature lets you create a video slide show of your images, adding background music, narration, and pans and zooms. But you can't zoom in closer on vertically oriented photos.



JASC PAINT SHOP PRO 8

this caliber of software. You can now run Auto Fix on multiple images at once, avoiding the tedious task of editing one image at a time. A simple wizard resizes and compresses images for you and can generate a PDF-based slide show automatically. \$49.99 direct. Adobe Systems Inc., www.adobe.com. ●●●●●

Previous versions of Jasc Paint Shop Photo Album had a frustrating interface, but **Jasc Paint Shop Photo Album 5** has followed its competitors' lead, moving away from a hierarchical structure.

You still get the hierarchical folders, but that schema is now supplemented by Calendar and Keyword views. These make finding pictures easier. Photo Album doesn't provide the full set of image-editing features you get in the company's Paint Shop Pro editing application, but it



does offer an impressive set of tools that do a very good job of adjusting images.

Download, \$45 direct; CD, \$49. Jasc Software Inc., www.jasc.com. ●●●●●

PHOTO-PRINTING SERVICES

Most of **ez prints**' business comes from partnered Web services that offer photo-sharing and other similar tools. For sheer print quality, ez prints is the best. It does a better job of adjusting colors when necessary. The intentionally dark pictures were kept dark—but enhanced to look better. Otherwise, the service is somewhat lacking. For instance, ez prints is devoid of photo-editing tools. The service does provide a general enhancement feature that consis-

tently improved the look of our images.

SHUTTERFLY

4- by 6-inch prints, 29¢ each; 8- by 10-inch prints, \$2.45. ez prints inc., www.ezprints.com. ●●●●●

Ofoto offers equally handy tools and is quite easy to use. The service also produces very good prints that are close to the original images. Still, Shutterfly, with its impressive image enhancement feature and slightly easier-to-use Web site, edges out Ofoto in our eyes.

4- by 6-inch prints, 29¢ each; 8- by 10-inch prints, \$3.99. Ofoto Inc., www.ofoto.com. ●●●●●

Shutterfly is extremely easy to navigate and offers convenient single-click actions for common tasks. It successfully enhanced and bright-

ened the dark pictures without any posterization. The only minor flaw was that the sky in one of our pictures contained some hints of unnatural purple.

4- by 6-inch prints, 29¢ each; 8- by 10-inch prints, \$3.99. Shutterfly, www.shutterfly.com. ●●●●●

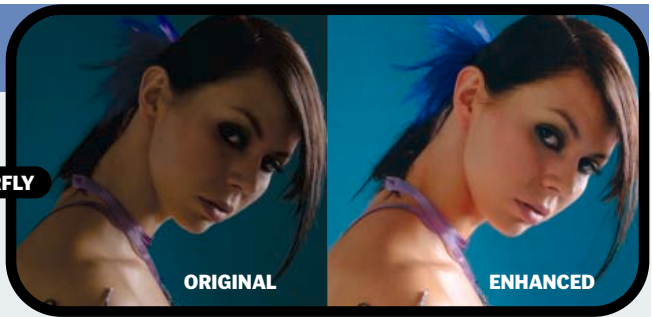
Snapfish offers good-looking prints but can't match the quality of Ofoto and

Shutterfly. The dark pictures we submitted were automatically brightened, and the result is a posterization effect. Also, the tools aren't as streamlined as with some services; for example, tasks we performed with Shutterfly in just one or two clicks required far more on Snapfish.

4- by 6-inch prints, 19¢ each; 8- by 10-inch prints, \$3.79. Snapfish, www.snapfish.com. ●●●●●

SHARING SERVICES

Built on Microsoft .NET, **OurPictures** provides a tabbed interface that gives you easy access to two folders: one that holds the pictures you've taken and one that holds the pictures you've received from other people. You can edit, print, and save pictures, view them as a slide show, or



share them with friends. When you send images to other OurPictures users, the photos stream straight to their desktops, appearing in the app's Received Pictures folder. As the recipient, you can opt to have OurPictures automatically print incoming images. When you send photos to someone who isn't an OurPictures user, that person receives an e-mail message with a link to a temporary Web page. For the next 30 days, he or she can use this page to view, print, or download the photos. The only real hassle is convincing your friends and family to load and use the application. \$19.95 per year. OurPictures Inc., www.ourpictures.com. ●●●●●

Attaching files to e-mail is easy, but **SendPhotos Gold 2.0** makes it even easier while adding power to the process. With this program, you select the images you want to include in your message; choose image size, layout, stationery, and picture order; add optional captions; and send. SendPhotos can work directly with Microsoft Outlook and Outlook Express by adding a toolbar button, or on its own. \$19.95 direct. Novatix Corp., www.novatix.com. ●●●●●

smugmug offers a nice selection of built-in styles for displaying photos and some slick photo-editing abilities. It also shows the upload progress of individual files, as well as the time remaining. smugmug provides a dozen presentation styles, including thumbnails, slide show, and journal. For customizing albums, you can't go beyond setting black or white as a background color. Fortunately, you can brand your pages using HTML, CSS, and JavaScript. The photo-editing tools are solid, with support for cropping and resizing images, adding color effects like sepia tones, and auto-correcting color balance. smugmug doesn't let you individualize your albums significantly without digging into HTML, but it is effective and creates very attractive photo galleries.

Standard plan, \$29.95 per year. modgods inc., www.smugmug.com. ●●●●●

their friends over for a big-screen slide show of their trip. Now you can do this digitally. Just connect the bundled cable from your camera's video-out port to an RCA jack on your TV or VCR, switch to your camera's review mode, and let the slide show begin. And in case your camera isn't cooperating, you can use a media hub to stream photos on your PC to your TV wirelessly (see "Media Hubs," page 102). Or, if you have a Media Center PC connected to your TV or a large display, you can present your photos as a slide show with just a few simple clicks (for more on Media Center PCs, see page 91).

For family and friends who live too far away to invite over for popcorn and a slide show, numerous online photo-sharing services offer unlimited space for housing your images. You can upload photos by simply dragging and dropping them into a downloadable software interface or into the Web page itself. From there you can have the service send e-mail to your friends inviting them to visit the Web site.

Many photo-organizing software programs offer other ways to share your images, making it easy to build your own Web gallery or create sophisticated slide shows on video CDs or DVDs, featuring music, narration, slick transitions, panning, and zooming. ☰

Make Your Slide Shows Sparkle

Slide shows don't have to be as boring as they used to be. Here are six creative ways to spice them up.

1. Since most slide show-editing tools are weak, use a separate image-editing program to make your images pop. And don't forget to remove red-eye, crop your images, and adjust color and brightness.
2. When inserting transitions, match the effect to the tone of the event. For a wedding or graduation, for example, use simple, elegant dissolves, saving the wilder transitions for beach and ski vacations.
3. Audio is essential, and most programs let you narrate the slide show or insert background music. Narration is more work but helps memorialize the event.

If you don't narrate, choose music that matches the nature of the pictures.

4. Pan and zoom effects make your slide shows easier to watch but can get repetitive if used identically with each image. Avoid this by customizing these effects for each image.

5. Slide duration is a critical creative decision. Beyond 5 seconds is a stretch for one image. And if your background music is fast-paced, you'll want to flip through images much more quickly.

6. Customize your slide show for your distribution medium. Burning to DVD gives you the most flexibility, but when compressing for the Web or e-mail distribution, wild transitions and pan and zoom can look awful. When producing for digital-picture frames like the Pacific Digital Memory Frame, check the required input parameters before starting.—Jan Ozer



MOST SLIDE SHOW programs offer easy tools for finessing images.

TOP CHOICES | Photo Printers

For large, high-quality photos, the **Canon i9900 Photo Printer** delivers. This standard printer has two front-panel buttons and supports the PictBridge standard but not memory cards. It uses eight ink cartridges, adding red and green to the usual six colors. This pays off in true photo quality. Text quality is also excellent; more than half of the fonts we tested were easily readable at 4 points with default settings. Graphics in default mode showed only minor flaws. If you need a printer



EPSON PICTUREMATE

that does it all and produces superb photos fast, the i9900 is tough to beat.

\$500 street. Canon U.S.A. Inc., www.canonusa.com. ●●●●●

Possibly the easiest way to print photos is with the **Epson PictureMate** dedicated photo printer. Based on standard ink jet technology, it competes with thermal-dye photo printers.

It tops out at 4- by 6-inch photos but prints at true photo quality. You can print from multiple memory cards, PictBridge, CD, ZIP drives, USB memory

keys, and Bluetooth. Unfortunately, it has no color LCD to preview the images; for this you have to print an index sheet, with 20 images per sheet. Image quality is a match for conventional film-based photos. It's also water-proof and smear-proof.

\$200 street. Epson America Inc., www.mypicturemate.com. ●●●●●

The **HP Photosmart 7960** lets you print true photo-quality images without using your PC and can serve as your single, all-purpose printer. Front-panel buttons let you set options and choose which pictures to print.



HP PHOTOSMART 7960

It doesn't support PictBridge but has slots for most memory cards.

Output quality was excellent with saturated colors, smooth gradients, and crisp lines and edges for graphics; text was easily readable in default mode at 5 points or smaller. You'll love the tilting 2.5-inch LCD on the front rather than the top of the box. If you want a standard photo printer with direct printing from memory cards, the 7960 should be your printer of choice.

\$229.99 direct. Hewlett-Packard Development Co., www.hp.com. ●●●●●



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**mobility,
mobility,
mobility.**

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- One-touch operation

*after rebate



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- One-touch operation
- Attractive and inviting design



Your Games

Host a LAN party or compete with players around the world from your living room.

BY CADE METZ

Everything was so simple 20 years ago. If you wanted an in-home arcade, you bought an Atari system and played Asteroids on your living-room television. If you were lucky, a friend would show up and the two of you would spend the afternoon passing a joystick back and forth, each playing while the other watched.

Today, it's a little different. You can play on a Microsoft Xbox, a Nintendo GameCube, a Sony PlayStation 2, or a souped-up PC. You can choose from literally thou-

sands of titles, including 3D sports games like Madden NFL 2004, strategy games like Command & Conquer, and first-person shoot-'em-ups like DOOM III and Quake. And thanks to the wonders of modern networking, you can connect your console or PC to the Internet and compete with friends across town or strangers halfway around the world.

TAKE IT ONLINE

Almost all the leading PC titles, including Battlefield 1942, DOOM III, Medal of

Honor, and Quake, now let you compete online. You can easily set up a private game with friends or log on to a public server and play with strangers.

You can do much the same on the newest gaming consoles, including the GameCube, PlayStation 2, and Xbox, but the real action is on the PC side. In addition to playing traditional first-person shooters online, millions are enjoying massively multiplayer online games (MMOGs) with titles such as Dark Age of Camelot and Star Wars Galaxies. An

MMOG is played only online, bringing together hundreds of thousands of gamers into one massive virtual world.

YOUR NEXT PARTY

Couple your broadband connection with a home network, and the possibilities multiply. You can throw a LAN party, where all your gamer friends show up with their PCs, plug into your router and compete face-to-face. This has been going on among serious gamers for years, but it's becoming more popular now that more people are gaming and have home networks.

You can tie together multiple gaming consoles in much the same way. You can even tie your gaming console to the rest of your digital home, using it to stream pictures, videos, and MP3s from your PC to your television. (For more on multiplayer gaming and LAN parties, see our cover story, "The Broadband Lifestyle," in our issue of September 21.)

RENT, DON'T BUY

A broadband connection also gives you

access to games on demand. Atari, Comcast, Yahoo!, and others now rent popular retail titles directly from the Web. You pay a small subscription fee—typically \$15 per month—and they give you unlimited access to dozens of titles, many of which are still on sale down at the local mall. Nowadays, you'll find games such as *Age of Wonders II*, *Border Zone*, *Civilization III*, and *Dead Man's Hand*.

This fall, a company called Infinium Labs will offer even newer games through a set-top box. Priced at about \$30 a month, its Phantom Gaming Service promises to include almost every game you find on retail shelves—although you may have to pay an extra fee for the hottest titles.

WHAT YOU NEED

What do you need to join the fun? If you prefer the PC platform, you need a system with some serious juice. We recommend an AMD Athlon 64 FX-53 or a Pentium 4 Extreme Edition processor, a 7,200-rpm hard drive with at least 160GB

of storage space, and a high-end graphics card along the lines of an ATI Radeon 9800XT or an nVidia GeForce FX 5950 Ultra. And don't forget an extra-wide display, a 19- to 21-inch CRT, and an eight-piece Creative Gigaworks S750 speaker set. All together, a dream gaming system will cost you anywhere from \$2,500 to \$5,000.

If you don't want to spend that much, consider a system with an AMD Athlon 64 chip or a 2.8-GHz Pentium 4, a midrange 3D graphics card along the lines of an ATI Radeon 9800 Pro, a 17-inch monitor, and some run-of-the-mill speakers. This shouldn't cost you much more than \$1,700. But make sure you stick to a 7,200-rpm hard drive and at least 512MB of memory.

Depending on which games you're into, you might want to look into a gaming console as well—especially if you're interested in home networking. Each costs between \$100 to \$200. And whichever hardware you choose, you can't do without a broadband Internet connection. This isn't like the old days: The real action is on the Web. ☰

TOP CHOICES | Gaming Systems

The Cyberpower Gamer Ultra 9900 Pro is a gaming bargain, with a flashy green X-Blade case, Athlon 64 FX-53 CPU, a 20.1-inch ViewSonic LCD, and nVidia GeForce 6800 Ultra graphics. The Athlon chip, helped along by 1GB of DDR SDRAM and two 74GB, 10,000-rpm SATA drives in RAID 0 array, delivers solid performance. The case fans, each with a blue LED, help keep the case cool.

\$2,899 direct. Cyberpower Inc., www.cyberpower.com. ●●●●○

The Falcon Northwest Mach V is a slick-looking system with blistering performance. It's far from cheap, but this system doesn't cut any corners. It features a 3.6-GHz Pentium 4 560 processor (overclocked to 3.8 GHz), 1GB of 533-MHz DDR2 SDRAM, and an nVidia GeForce 6800 Ultra graphics card. To keep the processor cool, the Mach V uses a hermetically enclosed water system. You also get an 8X DVD±RW dual-layer drive, Klipsch 5.1 Ultra speakers, and a 21-inch NEC CRT monitor.

\$6,140 direct. Falcon Northwest, www.falcon-nw.com. ●●●●○

The Velocity Micro Gamer's Edge FX certainly lives up to its name. It's hard not to love a performance core made up of an AMD Athlon 64 FX-53 slightly overclocked to 2.46 GHz, 1GB of Corsair PC3200 DDR SDRAM, and a 256MB ATI Radeon X800 XT graphics card. For TV buffs, this system includes a Leadtek Winfast TV2000 XP TV/FM



MICROSOFT XBOX

tuner, and the 12X DVD±RW drive comes in handy for burning recorded shows. Video and games look great on the included 21-inch NEC FE2111 CRT monitor.

\$4,459 direct. Velocity Micro, www.velocitymicro.com. ●●●●○

CONSOLES

For those interested in console gaming, there are three choices—Microsoft, Nintendo, and Sony. Performance differences among these aren't significant, so your buying decision will probably be based on which game titles are available. So do a little research to make sure you buy one that supports the games you want to play.

The **Microsoft Xbox** boasts a 733-MHz Intel CPU, a custom nVidia graphics chipset, and

64MB of memory. It supports online gaming (with a paid subscription to Xbox Live), while an optional kit adds support for playing DVDs.

\$149.99 list. Microsoft Corp., www.xbox.com. ●●●●○

The **Nintendo GameCube** has a 485-MHz PowerPC CPU, a custom ATI graphics chipset, and 40MB of memory. A network adapter can be added for online gaming. But unlike the others, the GameCube doesn't support DVD playback.

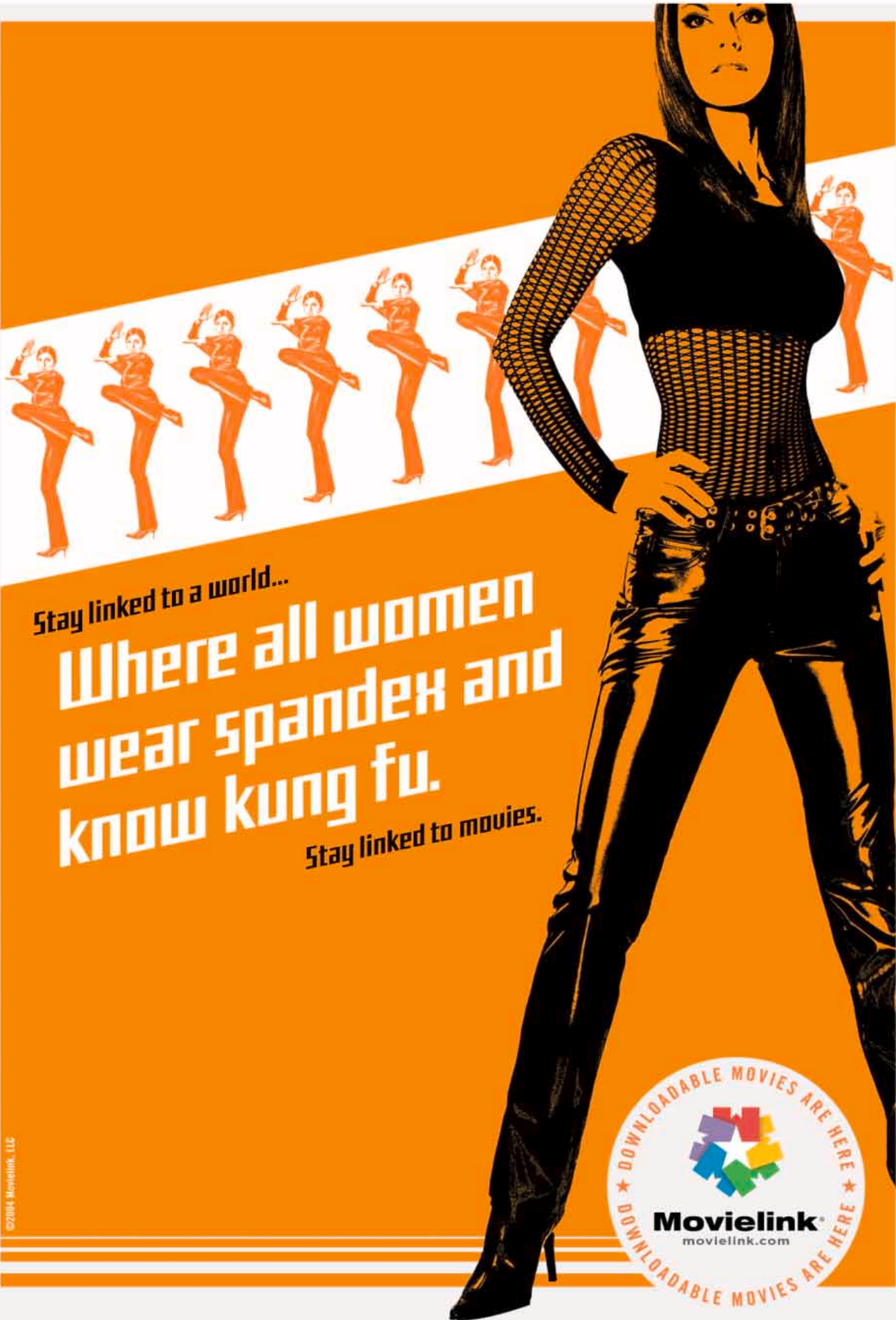
\$149.99 list. Nintendo, www.nintendo.com. ●●●●○

The 4-year-old **Sony PlayStation 2** is built on a 128-bit 300-MHz processor, a custom Sony graphics chipset, and 32MB of RDRAM. It can play DVDs and supports online gaming with an optional network adapter. And you'll be happy with its plentiful selection of games.

\$149.99 list. Sony Computer Entertainment America Inc., www.us.playstation.com. ●●●●○



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Tying it all Together

Now the hard part: Making sure all your new devices work together. If adding multimedia to your home network seems daunting, read on. **BY DAVIS D. JANOWSKI**

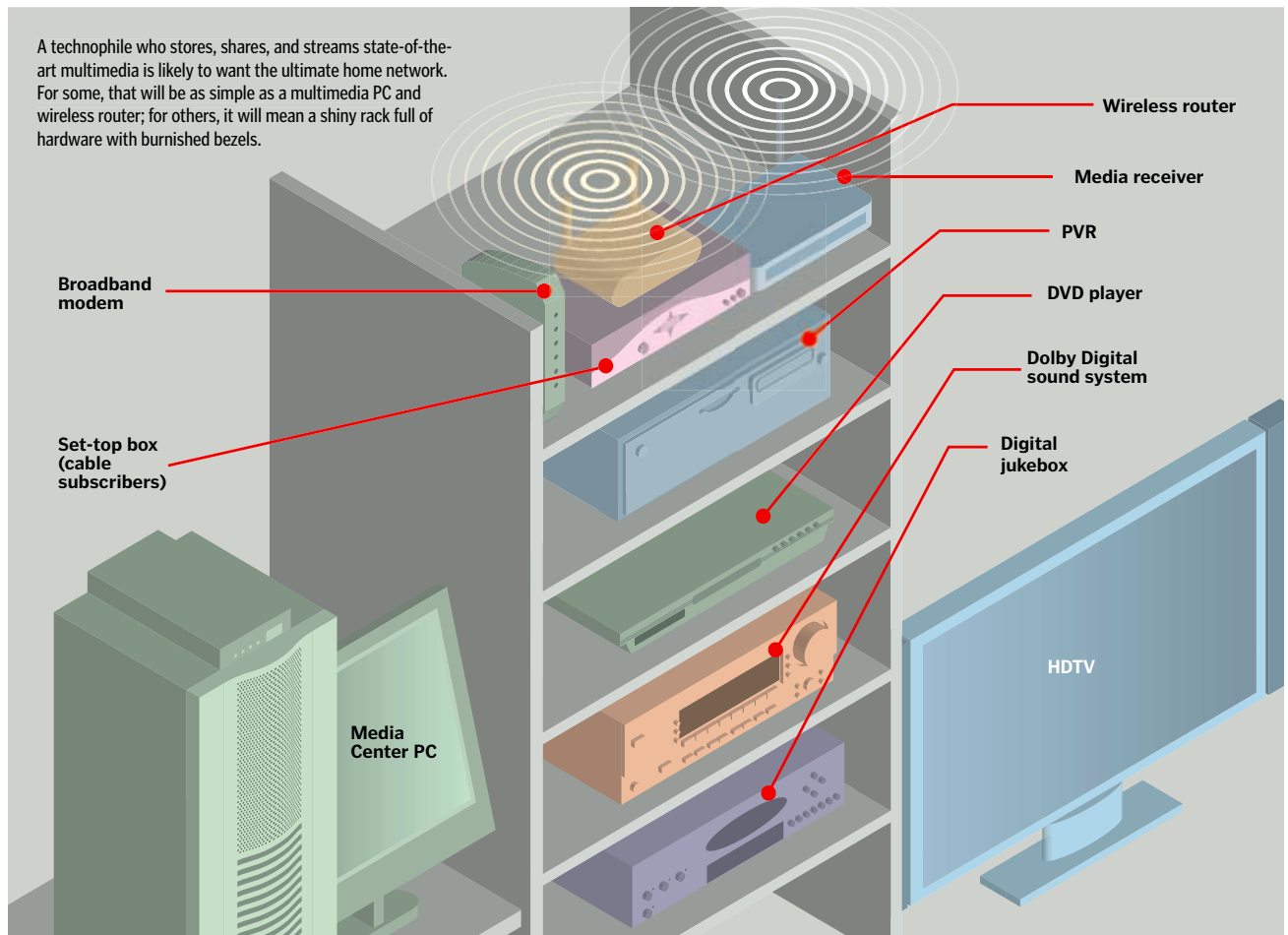
Once you've purchased the various devices and software you'll need for your digital home, you may be flummoxed by the task of hooking everything up, so that all the parts play together nicely on the same network. After all, the keys to these devices are their connections, allowing music to stream from your living room PC to your bedroom speakers, your photos to stream from your home office PC to your living room TV, and so on.

Many of you already have a rudimentary network for sharing your Internet connection. The question is, will it support your additional multimedia needs?

In terms of wired networking, in which you run Ethernet cable through your walls or along the baseboard, the answer is yes. More and more people, though, are forgoing the wires and setting up wireless networks. And these, too, are capable of handling just about any multimedia content short of HDTV.

But these are just home networking

A technophile who stores, shares, and streams state-of-the-art multimedia is likely to want the ultimate home network. For some, that will be as simple as a multimedia PC and wireless router; for others, it will mean a shiny rack full of hardware with burnished bezels.



basics. Now, on to specifics. Following are answers to the most frequently asked questions we've encountered regarding the setup and use of digital entertainment and home networking devices.

Q If I choose a wired connection for transferring video in my house, is Gigabit Ethernet necessary?

No. As long as you don't plan on streaming HDTV content, a 100-Mbps Fast Ethernet network will work just fine. But if you're planning for the future and expect to stream HDTV or transfer large files between workstations or servers within your home, Gig E (and the cable to support it—preferably Category 6) is the right call.

Q What's the best wireless standard for streaming various media?

If you want to carry a mix of traffic, accommodate multiple streams, and support multiple users wirelessly in your home, the optimal solution is a dual-mode router or access point with 802.11a and 802.11g built in. These devices cost from \$100 to \$250, and you'll need either dual-mode client cards or a mix of 802.11a and 802.11g cards for your devices. The "a" radio could, for instance, be configured to handle video streams, while the "g" radio could handle everything else.

A second choice, particularly if you'll be streaming more data and audio than video, would be to just go with 802.11g-only products, which are the most popular in the wireless market. These are cheaper—priced from \$65 to \$100—and, like 802.11a products, they offer a data rate of 54 Mbps. But "g" also has a longer range than "a," particularly when the signal needs to penetrate walls and floors, and is compatible with the older, slower 802.11b standard.

A forthcoming standard, 802.11n, promises to double the throughput available with "g"—ideal for streaming video. Look for precertification "n" products at the end of this year or early next.

Moving Content Around the Home

This illustration lists the relative throughput of major home networking technologies, as well as that required by typical applications.

HOME NETWORKING TECHNOLOGIES (DATA RATE/AVERAGE USABLE THROUGHPUT)	
Gigabit Ethernet	1,000 Mbps / 600 Mbps
Fast Ethernet	100 Mbps / 60 Mbps
pre-802.11n	108 Mbps / 50 Mbps
802.11a & 802.11g	54 Mbps / 25 Mbps
Power-line (HomePlug)	14 Mbps / 5 Mbps
Phone-line (HPNA 2.0) and 802.11b	10 Mbps / 5 Mbps
Cable or DSL Internet connection	512 Kbps-6 Mbps / 150 Kbps-2 Mbps

Q If I want to blanket my house with wireless connectivity for all of my devices, how many access points will I need?

This depends on the size, design, and construction of your house. Dense materials such as concrete and brick can decrease the range of your wireless router or access point dramatically. A device performing at 15 Mbps out to 120 feet in an open space might get only 5 Mbps at 60 feet under challenging conditions.

If your wireless signal won't reach upstairs, try purchasing a directional antenna or a wireless bridge, repeater, or signal booster to amplify your access point's signal. Or you can use power-line networking to help bridge the gap. With this method, the wireless signal is transmitted through your home's electrical wiring at a maximum data rate of 14 Mbps, though on our tests, actual throughput maxed out at 4.8 Mbps. Once you've extended your Ethernet

connection upstairs, you can then plug a wireless access point into your power-line adapter in a wall outlet to distribute the signal wirelessly on the second floor.

Q I bought a digital media hub so I can stream MP3s, photos, and video from my home office PC to my living-room stereo or TV. How do I go about connecting the two?

Install the digital media hub next to your TV and music system. Connect the hub's audio and video cables—either color-coded analog or digital—to your audio-video receiver's Aux-In or CD jacks. Or you can connect the hub's cables to a pair of powered speakers—creating a digital boom box—or directly to the TV's video-in jack. Composite cables are best; if they are not available, then use S-Video. Keep in mind, too, that with the advent of HDTV, two additional types of cable are becoming popular, DVI, which carries just a digital video signal, and HDMI, which carries both digital audio and video signals. With almost all media hubs, you must install the included media client application or applet on each PC where your content is stored and have it search for your music, photo, and video files.

If you purchase a wireless media hub, once you set it up and turn it on, it

WIRELESS OR WIRED—WHICH WORKS BEST?

For transferring multimedia files, wireless is cool but can be unreliable. Wired is faster and more reliable but can be expensive. You should run wired Ethernet at least from your router to your main PC, and from your media hub to the PC that stores your media files.

tip

APPLICATIONS
(AVERAGE REQUIRED THROUGHPUT)**VIDEO****Uncompressed full-motion video stream**
1,000-2,000 Mbps**Compressed HDTV**
18 Mbps**Compressed standard / extended definition TV stream**
7-15 Mbps**AUDIO****Radio-quality MP3 or WMA stream**
64 Kbps**CD-quality MP3 or WMA stream**
128 Kbps**Dolby AC-3 stream**
640 Kbps**OTHER****VoIP traffic**
64 Kbps**Typical broadband surfing traffic**
1-256 Kbps**E-mail traffic**
30-100 Kbps

should find your home access point automatically. If you have a hidden network identifier (SSID) and WEP encryption enabled, you'll have to type your SSID and WEP key into the hub using the remote control. Once you do this, the media hub will request the audio, video, or photo files from your PC; stream them over your wireless network; uncompress them from MP3 or WMA format in the hub; and pass them off to the component you select, whether a dedicated digital audio receiver, stereo system, or TV.

The PC serving up the content has to be on at all times if you want 24/7 access to your music. And a single PC can easily send a half-dozen music, photo, or video streams throughout the house simultaneously.

If your PC is in the same room as your AV system (or just one room away) and you're interested only in streaming audio, the simplest solution is to run an audio cable (from your PC's audio-out jack to your receiver's CD or Aux-In jack) along the baseboard or perhaps through a wall. An example of a high-quality wired solution is the Xitel HiFi-Link (\$49.95 direct, www.xitel.com), a USB-to-audio converter with a 30-foot cable. With such a solution, you'll need to control the music from your PC, which will not be a problem if you're running hour-long playlists or albums.

Q How do I connect my digital video recorder (DVR, also known as a personal video recorder or PVR) to my home network?

With TiVo or ReplayTV, you can connect to your network either via a USB-to-Ethernet adapter or via a USB wireless adapter (while 802.11b will be fine for downloading schedule updates, to stream the content you'll need 802.11g or 802.11a).

TiVo Series II receivers with the Home Media Option (\$50 licensing fee) let you stream audio and photo files to or from your home PCs over Ethernet once you load a small client program on the PCs to be used.

Q I have a vast collection of photos and music stored on my network. How do I protect it?

The best protection is a multitiered defense. Many people don't realize that a virus or worm can potentially wipe out their entire collection of photos or music. First, make sure that you have adequate protection on your Internet connection. You should deploy a firewall with stateful packet inspection at your gateway to the Internet. This means buying a router or dedicated firewall that sits right behind your cable modem or DSL modem.

We also recommend that you run a software-based firewall on all your PCs and that you run a virus scanner with updated virus signatures to catch any harmful viruses or worms that might have slipped through. None of these by itself is sufficient, though companies such as Symantec and Zone Labs offer integrated software solutions that work as firewalls as well as virus scanners.

Just as important as security is backup. Even if you don't use any kind of backup software, try to copy your photo and music files to CDs or DVDs. Ideally, you should keep a set of copies at a different location,

such as your office. This will give you access to your files even if a disaster such as a fire strikes.

If you find that you have too much content or not enough time to back up on CDs or DVDs, consider purchasing an external USB hard drive and copying all of your data to it. Just make sure its capacity is larger than that of your internal hard drive.

Q If I enable file sharing on my network, how do I make sure that others have access only to specific folders, such as music folders, and not the entire hard drive?

When setting up file sharing in Windows, you can assign users and permissions to every folder you want to share. To do this in Windows 2000 and XP, find the desired folder in Windows Explorer, right-click on the folder, and select *Sharing and Security*. Choose *Share this folder*, and type in the name you'd like the folder to be called on the network. Then select the *Security* tab, and add users from the local Windows database.

If you don't have any names in the database, you can add them manually by going to *Control Panel | Administrative Tools | Computer Management*. Choose *Users* from the *Local Users and Groups* subdirectory. From the *Action* menu, select *New User* and follow the wizard to add the users' information. Once you add a valid user, you can deny or allow *Full Control*, *Change*, or *Read* privileges for the chosen folder. All of this is somewhat tedious.

It's easier just to grant *Full Control to Everyone*, but don't do it; granting everyone full control means that people on your network can browse all your files, as well as delete them. So be specific and stingy when sharing access to folders on your hard drive. If you really don't want to set up security on an individual basis, at least create a group log-on name for all the members of your family.

MEDIA SERVER MANIA

Worldwide unit shipments of media server products will almost double in 2004—to a whopping 6 million units. High-end digital cable or satellite set-top boxes and networked DVD players will provide the majority of media

server product unit shipments through 2008.

Source: In-Stat/MDR, 2004

flash

Q Is file sharing the best way for three family members to share separate music collections on separate PCs, so that they can be accessed from any PC or media hub?

It's the cheapest method. Anybody allowed access can map a drive on their local PC to one of the remote PCs and play music files. This does, however, require that all PCs are turned on at all times.

If you have large amounts of music and photos, a better approach is to create a centralized network server for sharing these files. This could be as simple as a dedicated PC with a large hard drive or an external USB hard drive, or you can get a bit more sophisticated and employ an actual server or home NAS (network-attached storage) device.

This makes backing up your memories and music easier, too. Just keep in mind that if you'll be using a media hub to stream your music to your stereo, not all hubs talk directly to NAS devices. You may need to map the NAS device to a drive on one of your PCs and run the media hub's client software on that PC.

Q I want to play games with people on the Internet. What settings do I need to adjust on my router and PC to let me do that?

Online games require the opening of specific ports on your broadband router. So you have three choices: You can manually open ports in your firewall using port forwarding, rely on Universal Plug and Play (UPnP), or establish a DMZ (demilitarized zone)—a subnetwork that sits between your internal network and the Internet. We recommend that you use port forwarding to open ports selectively, as specified in the game's documentation. This will ensure that your computer is protected against attack, but you'll still be able to use Internet applications.

UPnP is the easiest method for setting up gaming, because port configuration is managed automatically by the game, OS, and router. But by using it, you're opening up a huge security hole in your

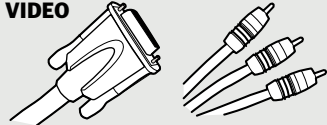
MORE ON THE WEB

Visit <http://go.pcmag.com/digitalhome> for the answers to more questions like these, as well as other home networking information.

Cable Encounters

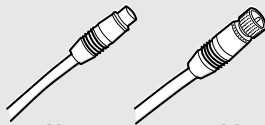
Take special care when selecting components for your living room temple to multimedia, as you'll be confronted with numerous cable choices. Many of the following are recognizable, but some, like DVI or HDMI, may be new and unfamiliar.

VIDEO



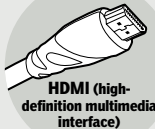
DVI (digital visual interface)

Component video



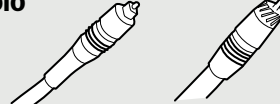
S-Video

Coaxial



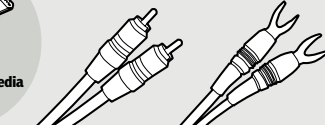
HDMI (high-definition multimedia interface)

AUDIO



Fiber-optic

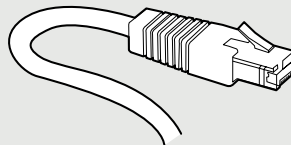
Coaxial



Analog audio

High-quality speaker wire

NETWORK CONNECTIONS



Wired Ethernet cable (RJ-45). This type of cabling can link many of your networked devices, as well as connect some AV systems to your switch or directly to your broadband modem.

network. If you go the UPnP route, make sure that you've applied Microsoft's December 2001 patch (Microsoft Security Bulletin MS01-059), and scan regularly for spyware that could potentially exploit UPnP services. Another easy set-up option is to establish a DMZ for your PC when gaming. But this may compromise security, too, because it opens every port on your router (not just the ones needed by the game), leaving you vulnerable to attack.

Q I went to an online music store, paid, and legally downloaded music. The downloaded songs play on my PC but not on my digital media hub or MP3 player. What gives?

Welcome to the morass of Digital Rights Management (DRM). There are no easy answers, and things keep getting more confusing. For example, RealNetworks has come out with a technology called Harmony, which allows songs from Real's service to play on almost any device—including Apple iPods. That has angered Apple, which uses its own DRM technology to control where songs can be played. Meanwhile, Microsoft has come out with its own music service and is moving forward with its own DRM strategy, dubbed Janus.

At this juncture, Real's Harmony lets

you get tunes you can play on a very broad array of devices. But all of this is a moving target, and there remain many incompatibilities even between devices that are supposed to support certain formats. No doubt, as the DRM battles continue, some music listeners will remain irritated over proprietary rights strategies. (For even more detail visit <http://go.pcmag.com/digitalhome>.)

Q What's the easiest way for me to share a printer across my network?

The simplest and least expensive option is to dedicate a single Windows PC on your network as a print server. The catch here is that the PC must always be running for others on your network to print. A second option is to buy and install a wired or wireless print server, which usually costs from \$100 to \$150. You simply plug one into any printer via a USB or parallel port. The server then communicates with your router and in turn with any PCs on your network. (For more on print servers, see "Unleash Your Printer," in our issue of August 17).

The final option is to buy a network printer, though these are designed for businesses and are priced that way. —Answers by Bill Howard, Oliver Kaven, and Matthew D. Sarrel. ■

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I pass
company secrets
via the web

I surf porn websites
from behind
my cubicle walls

I shop online
after closing
my office door

YOUR Future Home

By the end of this decade, the digital home will be stocked with a multitude of speedy, automated ways to assist and entertain you. **BY SEBASTIAN RUPLEY**

ILLUSTRATION BY QUICKHONEY/NANA RAUSCH

With the arrival of home networking and broadband, one thing has become crystal clear: The future digital home will have even better connections and devices and will serve its owners in new and fascinating ways—especially in the field of entertainment. Experts agree that wireless technology is the key enabler that you'll find in homes a few years from now. Several upcoming technologies—including 802.11n, ultra wideband (UWB), and wireless USB (WUSB)—promise to increase data rates dramatically and make wireless video streaming a reality. For more information on these standards, go to <http://go.pcmag.com/futurehome>.

While the wireless wars rage on, some groups are approaching the digital home of the future conceptually. At Microsoft's concept home in Redmond, Washington, you can say the name of a recipe, and the recipe will be displayed on the counter in front of you. In the living room, intelligent LED lights of various colors are embedded in the walls. When you sit down for a gaming session on the large flat-panel display, the LED lights will respond to events in the game to enhance the experience.

Although Microsoft strategists would like the digital home of the future to have a PC as the central mediating device, others imagine many mediators. "You'll find a sophisticated audio server, a PVR, and a PC or other kind of hub," says Charlie Gonsalves, business development manager in Texas Instruments' streaming media group.

In home security, futurists see devices such as smart Web-connected cameras and robots playing a role. White Box Robotics, for example, has produced a prototype robot that looks like R2-D2 and can perform facial recognition on anyone who walks through the front door. JVC, Linksys, Sony, and others are at work developing next-generation IP cameras that can help homeowners keep an eye on their houses from wherever they are.

And what's a home of the future without smart appliances? Robotic vacuums, digital washing machines that can control water

flow for different kinds of loads, and refrigerators with built-in LCDs already exist, though they haven't found their niche quite yet.

On these three pages, you'll find an annotated version of what we see as the digital home of the near future. Its central artery is exponentially faster wireless technology that will automate and speed up many tasks. You'll also find it loaded with innovative devices and technologies. It's a smart place to live. >>



>> **CAR**

- 1** Flat-panel LCDs on seat-backs for passenger entertainment.
- 2** A satellite radio/mapping/entertainment system that can

- read e-mails aloud.
- 3** A Wi-Fi jukebox in the trunk syncs wirelessly with the entertainment center in the living room to download playlists. It can also download

- movie and educational TV content for passengers.
- 4** A sensor on the front of the car alerts you if other objects are too close or if you're approaching at too great a speed.

- >> **ROOF**
- 5** An HDTV/satellite/premium services dish.
- >> **FRONT HALL**
- 6** A software-customizable robot recognizes faces at the

- door and sends wireless alerts if an intruder enters.
- 7** A closet houses wirelessly connected storage system arrays for entertainment content, digital photography

archives, and backup data.

>> KITCHEN

8 A speech-recognizing, cabinet-mounted **PC** displays recipes, directions, and other information right on the counter.

9 A **wireless broadband videophone**, **portable gaming device**, and **movie player** with an 8-megapixel **digital camera**, and a speech-recognizing **802.11n Wi-Fi tablet PC**.

10 A **wireless USB photo printer**.

11 An **RFID reader** on the counter scans RFID-tagged groceries and other retail purchases, tracking your home's inventory and displaying recipe possibilities.

12 An **LCD** on the refrigerator shows TV, the Web, and calendars, and also sends driving directions to the photo printer on the counter via wireless USB.

>> LIVING ROOM

13 A wall-mounted **touch- and speech-enabled LCD** controls music, blinds, temperature, lighting, sprinklers, and entertainment.

14 A wireless, remotely movable **IP video camera** with a motion sensor and Web server streams video to a browser or cell phone.

15 A **central media hub**, a **DVR** (digital video recorder), and other devices stream entertainment content throughout the house—all connected wirelessly.

16 An **LCD-based universal remote control**.

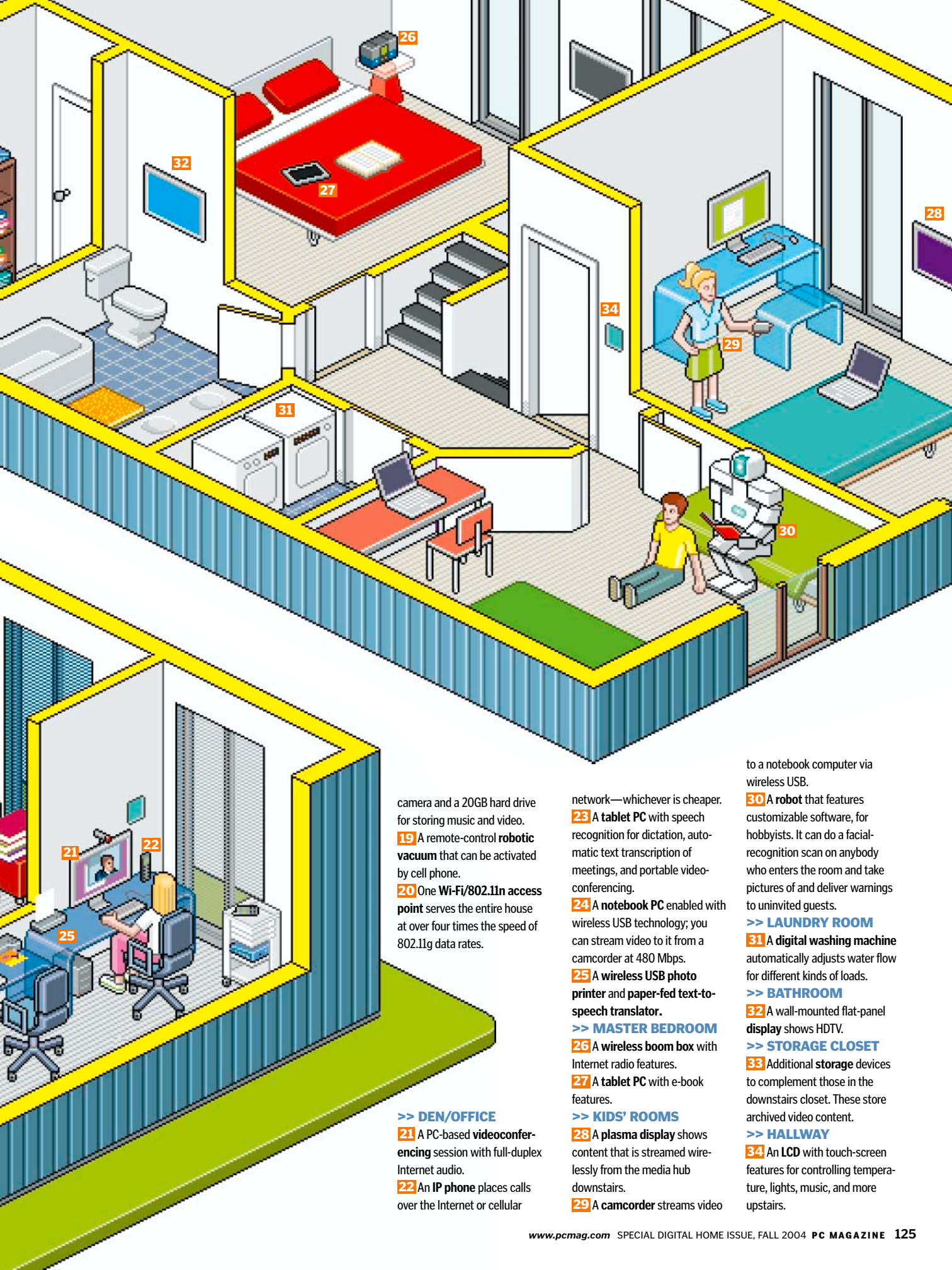
17 A 50-inch, **flat-panel TV/display** is surrounded by LED lights that enhance gaming. Multiple HDTV streams travel wirelessly throughout the house.

18 A **3G-enabled mobile phone** does two-way videoconferencing and has an 8-megapixel digital



MORE ON THE WEB

Read the full version of "Your Future Home," including more information about upcoming wireless technologies, at <http://go.pcmag.com/futurehome>.



camera and a 20GB hard drive for storing music and video.

19 A remote-control **robotic vacuum** that can be activated by cell phone.

20 One **Wi-Fi/802.11n access point** serves the entire house at over four times the speed of 802.11g data rates.

>> DEN/OFFICE

21 A PC-based **videoconferencing** session with full-duplex Internet audio.

22 An **IP phone** places calls over the Internet or cellular

network—whichever is cheaper.

23 A **tablet PC** with speech recognition for dictation, automatic text transcription of meetings, and portable videoconferencing.

24 A **notebook PC** enabled with wireless USB technology; you can stream video to it from a camcorder at 480 Mbps.

25 A **wireless USB photo printer** and **paper-fed text-to-speech translator**.

>> MASTER BEDROOM

26 A **wireless boom box** with Internet radio features.

27 A **tablet PC** with e-book features.

>> KIDS' ROOMS

28 A **plasma display** shows content that is streamed wirelessly from the media hub downstairs.

29 A **camcorder** streams video

to a notebook computer via wireless USB.

30 A **robot** that features customizable software, for hobbyists. It can do a facial-recognition scan on anybody who enters the room and take pictures of and deliver warnings to uninvited guests.

>> LAUNDRY ROOM

31 A **digital washing machine** automatically adjusts water flow for different kinds of loads.

>> BATHROOM

32 A wall-mounted flat-panel **display** shows HDTV.

>> STORAGE CLOSET

33 Additional **storage devices** to complement those in the downstairs closet. These store archived video content.

>> HALLWAY

34 An **LCD** with touch-screen features for controlling temperature, lights, music, and more upstairs.



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AFTER HOURS

TECHNOLOGY ON YOUR TIME

Your Automated Home

BY TROY DREIER

Home automation technology has been around for years, but it's primarily been the domain of hobbyists—too expensive, complicated, or just plain unnecessary for most mainstream consumers. Far from languishing, though, home automation tools have been steadily improving and dropping in price. The four starter kits we review here are simple enough for anyone to install, and they're fairly affordable. • If our title makes you think of robot maids and self-vacuuming floors, though, you're ahead of the game by at least decades. The reality isn't so gee-whiz, but it is plenty useful. Automation systems let you turn lights on and off by a preset schedule, so it looks as if someone is home; they also let you control everything from

sprinklers to appliances remotely.

These starter kits vary widely in price and features. If your main concern is controlling lights, look to the Sylvania or Z-Wave systems. The X10 package is our Editors' Choice, thanks to its combination of cost and usefulness. The Shell HomeGenie is a powerful system, but its high price is hard to justify. All the systems here can be expanded as your interest grows, to cover more of your house and do more things. That means you won't feel locked in but will be able to improve your home system as the technology improves.

Shell HomeGenie Home Management System

The Shell HomeGenie Home Management System works with a powerful online system to give you not only strong control over the devices in your home but also an easy way to monitor them remotely. The package includes a Motorola Gateway communication hub, contact sensor, wireless camera, and power switch module. That isn't much, though, considering the \$599 price tag—especially when you need a \$19.95 monthly online account



Shell HomeGenie

through www.shellhomegenie.com to use the system.

Start by connecting the Gateway with your broadband setup, then log on to link your wireless modules. The flexible power switch works with any lamp or appliance and is easier to fit into a tight space than the others we review here. The contact sensor notifies you if the door or window on which it is placed is opened or closed.

The camera is the same unit included with the Motorola Home Monitoring and Control System kit reviewed in "Do-It-Yourself Home Security" (After Hours, October 19). It's a lightweight cam that

provides grainy images and doesn't work well in dim light. You can add up to four cameras (\$119.99 each), eight contact sensors (\$34.99 each), and 32 power switches (\$39.99 each).

If online access is crucial to you, the HomeGenie is your best bet. You can monitor all of your modules and sensors easily through an online account, and it's the only system here that lets you receive e-mail notifications when the camera detects motion or the window sensor goes off. Furthermore, the Shell

HomeGenie system will work even when the computer attached to it is turned off, the only product in our roundup with that ability. But if you can do without online access, the X10 system gives more bang for your buck.

Requirements include Microsoft Windows 98, Me, 2000, or XP or Mac OS X 10.2 or better; a Pentium II or better or Mac G3 or better; 128MB or RAM; and a broadband Internet connection.

\$599.99 list. Shell Oil Co., www.shellhomegenie.com; available at www.smarthome.com.



Sylvania Remote Control Home Deluxe Starter Kit

The Sylvania starter kit might seem out of place in this story, since it doesn't work with a computer and offers none of the advanced features—like Web access or event timing—of the other systems. But it uses Z-Wave controllers and provides an inexpensive entry into home automation. And you can build on it later with other peripherals, such as those offered by HomeSeer.

The kit comes with a remote control (the same Sylvania remote included in the Z-Wave USB Starter Kit) and two lamp modules; you can control only lamp modules and light switches. In the Z-Wave kit, the remote is used solely to transfer module information to the USB device, but

WHAT THE RATINGS MEAN

- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

with this product it does all the work.

Start by plugging the lamp modules into outlets, then plugging your lamps into the modules. With a few clicks, you can set the remote to recognize the modules and begin using them. The remote lets you group modules together (in up to 64 groups with up to 64 modules in each) or else use up to 64 modules ungrouped.

The Sylvania system does have security features, although they're not as advanced as those of the other systems here. You can turn on a burglary deterrent system that will randomly turn your lights on and off within a specified time. A child-safety setting lets you stop the power to specific modules. The company sells additional lamp modules and wall switches for \$35 to \$40.

The Sylvania starter kit may be basic, but it's powerful enough to make a great first step for those interested in home automation.

\$139.99 list. Osram Sylvania Inc., www.unical-usa.com/sylvania. ●●●○○

X10 ActiveHome Professional



Anyone who's been put off by X10's salacious online ads might be surprised to hear this, but the company's starter kit for home automation is one of the best around. Selling for a low \$99, ActiveHome Professional excels with its extensibility and friendly software and is a strong choice for those who don't need Web access.

The ActiveHome Professional comes with a lamp module, an appliance module, a PC interface device, a universal remote, a keychain remote, and software (this new product was being finalized when we tested it, so the contents may vary slightly). Using a screwdriver, you set dials on the modules so that each

Sylvania
Remote
Control
Home
Deluxe



has its own alphanumeric code. The PC interface connects to your computer via a USB cable and sends stop and start instructions to your modules through your home's wiring. The PC interface also has an antenna so that it can catch radio frequency commands from the universal and keychain remotes.

X10's software is colorful, easy to understand, and well designed. You create different "rooms" to represent the rooms in your house and then establish links to the modules in each. Once the system is set up, you can turn all the lights in a room on or off at once, design macros, and schedule repeated events. Macros bring a lot of power and versatility to the program, letting you build routines like slowly dimming all the lights and running the sprinkler in the evening.

The only thing X10's software does not offer is an online connection, but at least you'll have the universal and keychain remotes to control modules while you're home. The universal remote can work not only your X10 devices but also your home entertainment center, and the keychain can turn two lights on or off within 100 feet.

The X10 ActiveHome kit offers far more extensibility than the other kits reviewed here, with a wide variety of additional modules available, such as motion-sensitive outside lights and screw-in lamp modules.

Extra modules sell for between \$13 and \$50. Requirements are Windows 98, Me, 2000, or XP.

\$99.99 list. X10, www.x10.com. ●●●●●

X10 ActiveHome
Professional



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Z-Wave USB Starter Kit with HomeSeer

Both affordable and versatile, the Z-Wave USB Starter Kit with HomeSeer finishes only slightly behind the X10 system.

The HomeSeer software is a snap to set up and customize. It works with the included Z-Wave adapters, communicating with them by radio frequency, but can also communicate with X10 adapters in the same system.

The starter kit comes with two lamp modules, which plug into standard outlets, a remote control, a Z-Wave USB interface device, and the HomeSeer software. You use the remote to add devices to your system. When you hold the remote near a lamp module, for example, it registers information about the module; when you hold it near the USB device it sends that information to your computer.



Z-Wave USB
Starter Kit

Once you've registered all your devices, the on-screen wizard walks you through adding timed events to each one. The wizard will also help you make your HomeSeer controls accessible through a browser or add X10 devices to your system.

HomeSeer sells a few Z-Wave peripherals through its Web site, but only a few. You can buy lamp modules for \$35 to \$40 and wall switches for \$42.95. The devices will also work with voice commands (which we didn't test); the company sells a microphone separately for \$239.95. We were pleased by the ease and performance of this Z-Wave kit and think it would make a solid choice for anyone beginning to build a home automation system.

Requirements are Windows 98, Me, NT4, 2000, or XP (XP or 2000 is recommended).

\$336.95 list. HomeSeer Technologies LLC., www.homeseer.com. ●●●●●

GEAR + GAMES



Home Arcade Play

Old-school gamers who swooned for Jakks Pacific's first line of plug-and-play arcade games will love the **Jakks Ms. Pac-Man** and **Classic Arcade Pinball**. Lady Pac recreates the eighties arcade experience—right down to the low-tech sound effects—and comes with four other games, including Galaga and Pole Position. The Pinball game is actually a step up from arcade versions, with three different games, secret bonus levels, and a righteous tilt feature. Powered by four double-A batteries, these devices won't replace your PS2 or Xbox, but they're an easy and inexpensive way to take a trip down memory lane.—*Dan Avery*

\$19.99 list each. Jakks Pacific Inc., www.jakksstvgames.com.



USB Everywhere

Virtually all newer peripherals connect to your computer via USB, which makes the **CODi USB 2.0 Retractable 5 in 1 Cable** a handy device indeed. You can use the 6-foot cable as a simple USB extension cable. Or, with the four supplied interchangeable tips, you can convert your USB connection to a type A or B male tip or a 4- or 5-pin mini tip. For universal USB connectivity, \$25 is a steal.—*Craig Ellison*

\$25 list. CODi Inc., www.codidirect.com. ●●●○○



Protect Your iPod

The **Otterbox oPod Case** provides watertight, crush-proof protection for your iPod, with a rugged plastic shell that easily snaps together. The bottom supplies a protective rubber padding inside as well as an insulating rubber seal; the top has a clear rubber window that gives access to the iPod's front panel. The kit includes three inserts:

one for the iPod earbuds, one for the remote, and one for "universal" headphones (though we had trouble using the Etymotic ER-6 earphones).—*Dave Foster*

\$49.95 direct. Otter Products LLC, www.otterbox.com. ●●●●○



A Neater Office

The **Cable Caddy**, a small plastic cable-management system, can straighten out your tangled mess of wires. It's available in five colors and has five slots that should accommodate most of your desktop cables. At 4.8 ounces, the Cable Caddy is heavy enough not to tip over. Still, the base model comes with adhesive tape, and a model with a clamp is also available.—*CE*

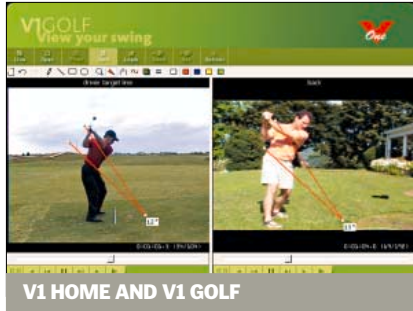
Base model, \$7.99 direct; clamp model, \$9.99. Cable Caddy, www.cablecaddy.net.



Get Your Golf Game On

BY JAN OZER

Most golfers spare no expense in pursuit of shaving a stroke or two. Though we can't promise your handicap will drop, these products can help you identify and correct weaknesses in your game and are great values for you or your favorite golfer.



Interactive Frontiers V1 Home, V1 Golf

Anyone who's watched Tiger, Ernie, or Annika play knows what an expert golf swing looks like, but the critical issue is what *your* swing looks like. In the past, video swing analysis required an expensive lesson, usually dumped to VHS tape, which is useless for later frame-by-frame analysis.

With V1 Home, you can videotape your swing, capture it to your computer, and compare it with a male or female golf professional's swing. Simple drawing tools help analyze swing plane and body sway, and a zoom tool reveals grip and clubhead positioning throughout the swing. For a little more cash, V1 Golf includes camera setup tutorials and a wizard-based module that identifies swing faults and recommends corrective drills. Both versions let you upload your swing to the Web for review by a professional coach; prices start at about \$30 per analysis.

V1 Home: \$39.95 list; V1 Golf: \$89.95. Interactive Frontiers Inc., www.frontiers.com. ●●●●○

Golfwits PC, Pocket Golfwits, eScoringRecord

Golf is a statistics-driven game, but recording the data can be time-consuming. An affordable trio of products from Siscosoft makes this easier than ever before.

Golfwits PC uses customized golf course maps to help you record all your shots. Siscosoft has over 7,000 courses on file and will build new maps for \$20 each. As you play, you record each shot—including club and flight pattern and distance—in a yardage book that shows layout and yardage markers, one page per hole. After the game, take 5 minutes to enter this data into the program. If you have a Palm or Windows CE device, you can enter data

while playing using Pocket Golfwits.

The wide range of statistics include driving distance, greens hit in regulation, and distance per club. Using the Statwits tool included with the PC version, you can produce stats for multiple rounds, though information is text only.

eScoringRecord is an online tool that lets you upload multiple rounds to compute an unofficial handicap. This service displays stats graphically and presents color-coded analysis highlighting weak spots in your game. You can also print out "storybooks" for each round that show the club hit and distance for each shot.

Golfwits PC: \$49.95 list. ●●●●○ Pocket Golfwits: \$49.95 list. ●●●●○ eScoringRecord: \$29.95 direct per year. ●●●●○ Siscosoft Inc., www.golfwits.com.



LinksPoint StarCaddy

StarCaddy uses golf course layouts built from satellite maps and an optional handheld GPS device to provide useful and precise distance information. Both versions (software only and software plus the CompactFlash GPS receiver) come with one course map; additional maps are \$19.95 each. As you would expect, the software provides yardage from your current location to the front edge of the green, with a cool feature that automatically zooms in as you get closer to the green. You can also compute layout distances by touching various spots in front of the green and use a measure function to determine any point-to-point distance. Though the program can keep score for a foursome, including automatic handicapping calculations, it does not record stroke-specific information.

Software only, \$49.95 list; software plus GPS device, \$189.90 list. LinksPoint Inc., www.starcaddy.com. ●●●●○

QUICK CLIPS

Chessmaster 10th Edition

This Chessmaster update won't let you see several moves ahead, but the new teaching tools by international chess masters Josh Waitzkin and Larry Christiansen can help improve your game.

The easy-to-use navigation system features coaching options from basic moves to advanced strategy, and the skill-appropriate AI offers a challenge for players of all levels. But the novelty of animated pieces, along with 3D glasses for a virtual chess board, wears off quickly. The online module includes a ranking system, tournaments, chats, and advanced teaching tools.—*Peter Suci*

\$39.99 list. Ubisoft Entertainment, www.ubisoft.com. ●●●●○



Nancy Drew: The Secret of Shadow Ranch

This modernized version of the classic teenage sleuth Nancy Drew uses a fancy Web-enabled cell phone (call the Hardy Boys for help!), yet she retains an Eisenhower-era politeness. In this game, based on the best-selling book of the series, you be-

come a ranch hand and solve a mystery through a diverse series of puzzles, from sorting vegetables to tracking down a phantom horse.—*Dan Ackerman*

\$19.99 list. Her Interactive Inc., www.herinteractive.com. ●●●●○

Manhunt

You star in a new underground production from Valiant Video, whose director has spared you from death by bribing corrupt prison guards. He also has lots of nasty people hunting you down in an abandoned part of town while he films the gory action. To win, you must use the shadows and mind your noise level. You'll find yourself tilting in your chair to peek around corners.—*John Blazevic*

\$39.99 list. Rockstar Games, www.rockstargames.com/manhunt. ●●●●○



BACKSPACE

WHERE CORDLESS MICE ALWAYS HAVE CORDS

Edited by Don Willmott



» Of all the unromantic things to say!
(LovingYou.com)

Today's Love Quote of the Day
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Submit your love quote [here!](#)

« Backspace on the Road: Eket, Nigeria.

Quick Poll

If you were stranded on a desert island and could have one thing with you, what would it be?

- Wireless Phone
- Another Person
- Food/Water
- Matches/Lighter

« Now let's think really hard about this one for a minute (www.wow-com.com)

» The kids just love it, Part I (Amazon.com).

» The kids just love it, Part II (CNet.com).

Kids & Parents Rave

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GRRRRREEAAATTTT Batteries, December 29, 2003

Reviewer: A toy enthusiast from Kansas

These batteries are the absolute best batteries, they can last forever. I got them for my nephew, and he loves playing with for hours. He can stack them, he can lick them, he can do anything!

	1	2	3	4	5	"My son said it is good"
Features	●	●	●	●	●	I nothing to say, just take out my money
Ease of Use	●	●	●	●	●	
Stability	●	●	●	●	●	

Half-ton man drops 321 pounds, and still counting

Admitted to hospital weighing more than 1,000 pounds

Wednesday, August 11, 2004 Posted: 10:50 AM EDT (1460 GMT)

SIoux FALLS, South Dakota (AP) — A man who once weighed more than half a ton has lost 321 pounds under the care of a team of doctors and hopes to lose 450 pounds more.

Patrick Deuel, 42, of Valentine, Nebraska, weighed 1,072 pounds when he was admitted to Sioux Falls' Avera McKennan Hospital eight weeks ago. Deuel, who is just under 6 feet tall, is on a 1,200-calorie-a-day diet.

"If we hadn't gotten him here, he'd be dead now," said Fred Harris, Deuel's

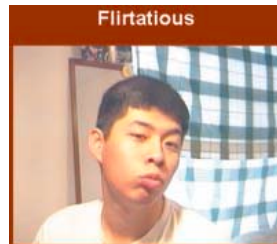


Patrick Deuel at Avera McKennan Hospital, in Sioux Falls, South Dakota.



« For a second there we thought this was a "before and after" shot. (CNN.com)

» Online comedians come and go, but Eric Wu has been emoting into his Web cam regularly since 1998. What emotion would you like to see him portray? Send your suggestions to www.emotioner.com. We can't wait to see "zestfully clean."



If your entry is used, we'll send you a PC Magazine T-shirt. Submit your entries via e-mail to backspace@ziffdavis.com (attachments are welcome) or to Backspace, PC Magazine, 28 E. 28th St., New York, NY 10016-7930.

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Winners this issue: Bruce Fox, Randy Gardina, Jason George, Vijay Jagdale, John Kennedy, and Brian Wright.

PC Magazine, ISSN 0888-8507, is published semi-monthly except 3 issues in November (11/2/04 is the Fall 2004 issue) and monthly in January and July at \$39.97 for one year. Ziff Davis Media Inc, 28 E. 28th St., New York, NY 10016-7940. Periodicals postage paid at New York, NY 10016-7940 and at additional mailing offices. POSTMASTER: Address changes to PC Magazine, P.O. Box 54070, Boulder, CO 80328-4070. The Canadian GST registration number is 865286033. Publications Mail Agreement No. 40009221. Return Undeliverable Canadian Addresses to P.O. Box 503, R.P.O. West Beaver Creek, Richmond Hill, ON L4B 4R6, Canada. Printed in the U.S.A.



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