

# PC

# MAGAZINE

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NOVEMBER 16, 2004

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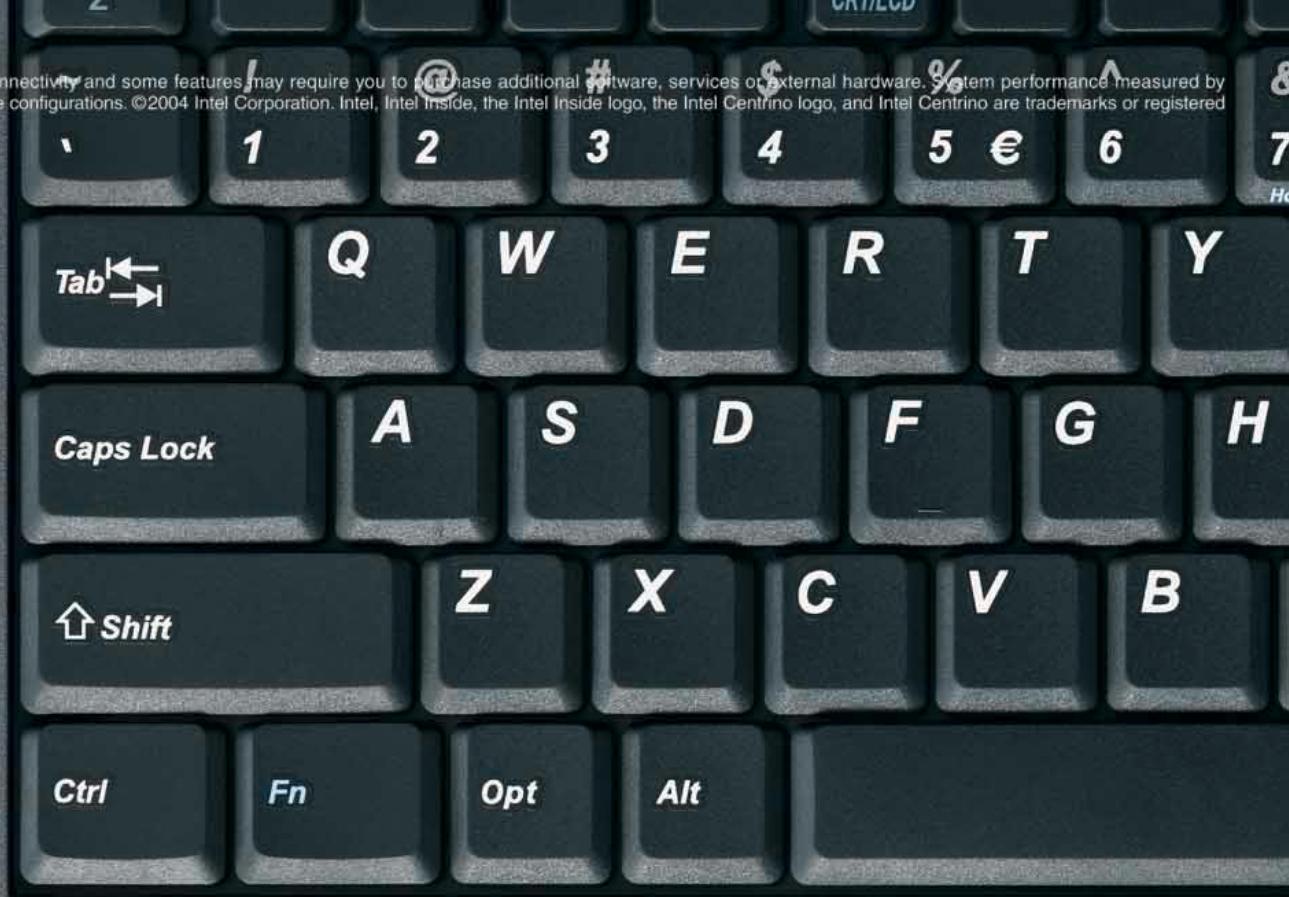
*–Laura DiDio, The Yankee Group, April 2004  
Linux, Unix, and Windows TCO Comparison*

The Yankee Group, a global research and consulting firm, concluded that a significant switch to Linux from Windows or Unix could cost three to four times as much without delivering tangibly better performance or business value. These findings are based on a non-sponsored worldwide survey of 1,000 IT administrators and C-level executives in midsized and large enterprises.

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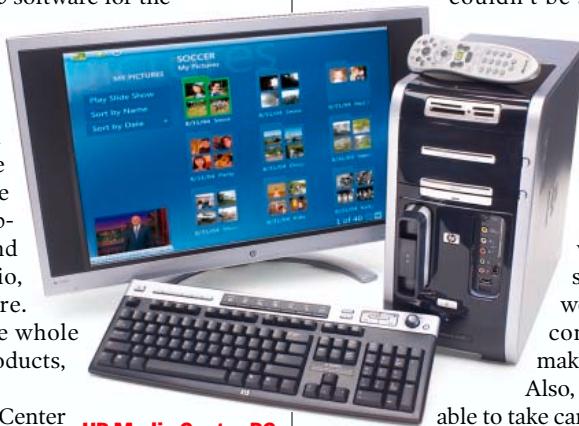


# Forward Thinking

## Microsoft's Growing Family

I've been playing with the latest versions of Microsoft's Media Center 2005 software for the past few weeks. Overall, I'm quite pleased. More important than the software itself, though, is its role in Microsoft's grand scheme for connecting all the gadgets you use for capturing, managing, and playing digital audio, video, photos, and more. When you consider the whole set of Media Center products, the plan is a bold one.

- Windows XP Media Center Edition is operating-system software for desktops and notebooks. It's designed to be the center of your digital home, controlling your audio, TV, photos, and traditional PC functions.
- Windows Media Player, which works on all versions of Windows XP, is designed to manage and play audio and video.
- Media Center Extenders are devices that connect your TV to your Media Center PC via wired or wireless networking and send TV, video, audio, and photos throughout your home. Media Center Extenders for Xbox are kits that include a sensor, a remote, and software, to turn your Xbox into a similar device.
- Windows Media Connect is embedded software for other devices (not Media Center Extenders) that connects them to a Windows PC and lets them share data with it.
- Portable Media Centers are handheld devices that display video and audio from your Windows computer. These are not to be confused with portable PCs running Media Center Edition.
- Windows Mobile is software for all sorts of portable devices, including Portable Media Centers, Pocket PCs, and smart phones.



HP Media Center PC

Confused yet? I sure am. Yet Microsoft's strategy couldn't be simpler: The company wants its software to control all the TV you watch, all the music you listen to—in fact, all the ways you get digital entertainment.

The plan has its advantages. Microsoft software in all these devices should make everything work better together, and a common interface should make hardware easier to use. Also, a single vendor might be able to take care of basic issues, such as security, setup, and digital rights, more easily than several different vendors.

But there's a downside, too. One vendor means less competition, and in the long run, that may mean less innovation. For instance, I think digital products could get easier to use, and I'd be interested to see what kind of 10-foot interface Apple could come up with.

And what about digital rights and privacy? The privacy concern is mostly theoretical; although a lot of information will be passing through one company, Microsoft has had a pretty good track record for protecting data privacy. But as for digital rights, the difference is clear: Microsoft takes a much stronger view of protecting digital rights than most other consumer electronics vendors, possibly because the company's size would make it a prime target for lawsuits.

This means that taking content recorded on a Media Center and passing it around to your friends is much more difficult than with competing products. That's okay, but you're much more restricted in using your content wherever you want. Balancing the rights of content owners and consumers will continue to be a big issue over the next few years.

Altogether, though, at the moment, Microsoft has the most advanced, comprehensive plan for connecting all your digital-content products in the home.

**Microsoft wants its software to control all the TV you watch, all the music you listen to—in fact, all the ways you get digital entertainment.**



Creative Zen Portable Media Center



HP Media Center Extender

# Forward Thinking

MICHAEL J. MILLER

## Living with Media Center 2005

Windows Media Center is the core of Microsoft's strategy, and the 2005 edition is a big step forward. From a features standpoint, the most impressive advance is the improved picture quality on big displays. On the new machines I've been using in our labs, the picture quality is much better than on my older Media Center PC at home. Also, the TV functions are improved. The system now supports up to three tuners, so you can watch one show while recording another. It has HDTV support (though it's confined to a single tuner for now), the ability to burn recorded TV directly onto a writable DVD (Sonic PrimeTime offers a similar feature for older versions of Media Center), and better features for sorting and selecting movies to record.

The product I'm most looking forward to is the new Media Center Extender. I've tried a couple of the wireless media receivers on the market, but haven't been impressed with their usability. And as far as I'm

concerned, distributing recorded TV on a home network is the killer application. (Distributing DVD playback would be cool too, but rights management prevents it.) The Extender should be easier to set up, though it requires an 802.11 a/g network to distribute TV wirelessly, and it works only with Media Center Edition 2005. I'm eager to try this in my home—we'll see if it passes the real-world test.

I've found that downloading content to a Portable Media Center works quite well, and

I've been reasonably happy with the video content (though it's heavily compressed) and the audio. You have to sync from Windows Media Player, however, not from the 10-foot Media Center interface. I've also just started trying out a Windows Mobile device with Windows Media Player 10 Mobile. This works well if you don't want to carry a separate MP3 player. But I'm still not convinced I would watch a lot of TV on a phone.



## Talking Digital Rights

Gary Shapiro, President and CEO of the Consumer Electronics Association, recently stopped by PC Magazine Labs and spent some time talking with us. The CEA is an interesting organization. Although known by many mostly for hosting the annual International Consumer Electronics Show, the CEA is actually a trade organization representing the companies that make and sell most CE gadgets.



We had a fascinating discussion about digital rights in the era of the connected home. Shapiro said his group supports the freedom of manufacturers to build products without restrictions, and he mentioned the major battles that have raged in the past and that continue to be fought over home recording. Shapiro believes consumers should be able to move content from one product to another—from home to the car, for instance. But he noted that his view was not shared by Hollywood, which has supported restrictions on such rights.

In particular, he discussed his organization's opposition to the INDUCE Act (officially, the Inducing Infringement of Copyrights Act of 2004), according to which individuals or corporations could be held liable for rights-infringing acts that "they intend to

induce." This legislation, sponsored by Senate Judiciary Committee Chairman Orrin Hatch (R-UT) and Senator Patrick Leahy (D-VT), is aimed at cutting music piracy on peer-to-peer (P2P) networks. But many people, as well as the CEA, have argued that the legislation could hurt normal consumers and CE manufacturers.

Shapiro was quick to point out that he frowns on commercial piracy: "When you take something that isn't yours and sell it, that's wrong." He told us he personally believes that concerns about losses from piracy are greatly overstated, though, and said that much of the downloaded material would never have been purchased anyway.

That pretty much mirrors what I've been saying all along. I'm not in favor of people downloading music they didn't pay for without the permission of the people who created it, but I'm also very concerned about digital rights restrictions that hurt those of us who do buy the content. I like ripping the CDs I pay for and putting them on my desktop, laptop, music player, or mix CDs—and I sure don't want those devices to stop me from doing that.

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27 Editors' Choices

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

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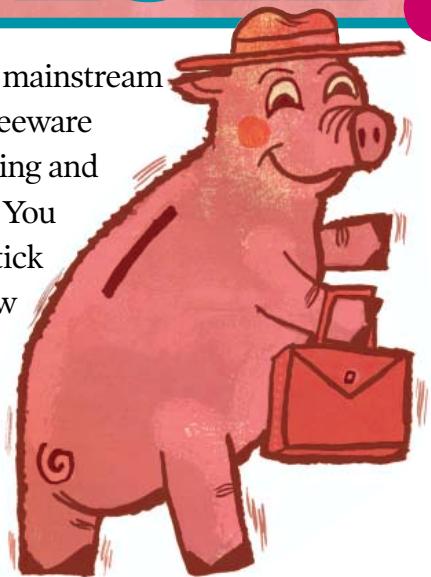


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101 FREEWARE GOES TO WORK

While licensing costs of mainstream apps continue to soar, freeware competitors are flourishing and improving. So why buy? You can be productive and stick it to The Man. We review 21 apps to replace Microsoft Office, Word, Excel, PowerPoint, and Access; and various graphics tools.



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112 More Than Just a Pretty Picture

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## CAMCORDERS

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There's a lot of hype out there when it comes to digital video. We tell you what really matters—and what doesn't—when it comes to buying a camcorder. We also present reviews of 17 MiniDV and DVD camcorders for \$1,000 or less.



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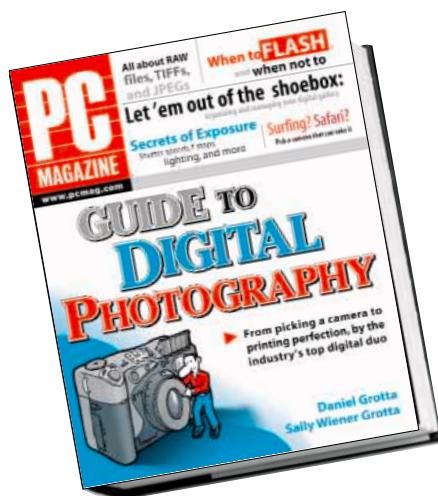
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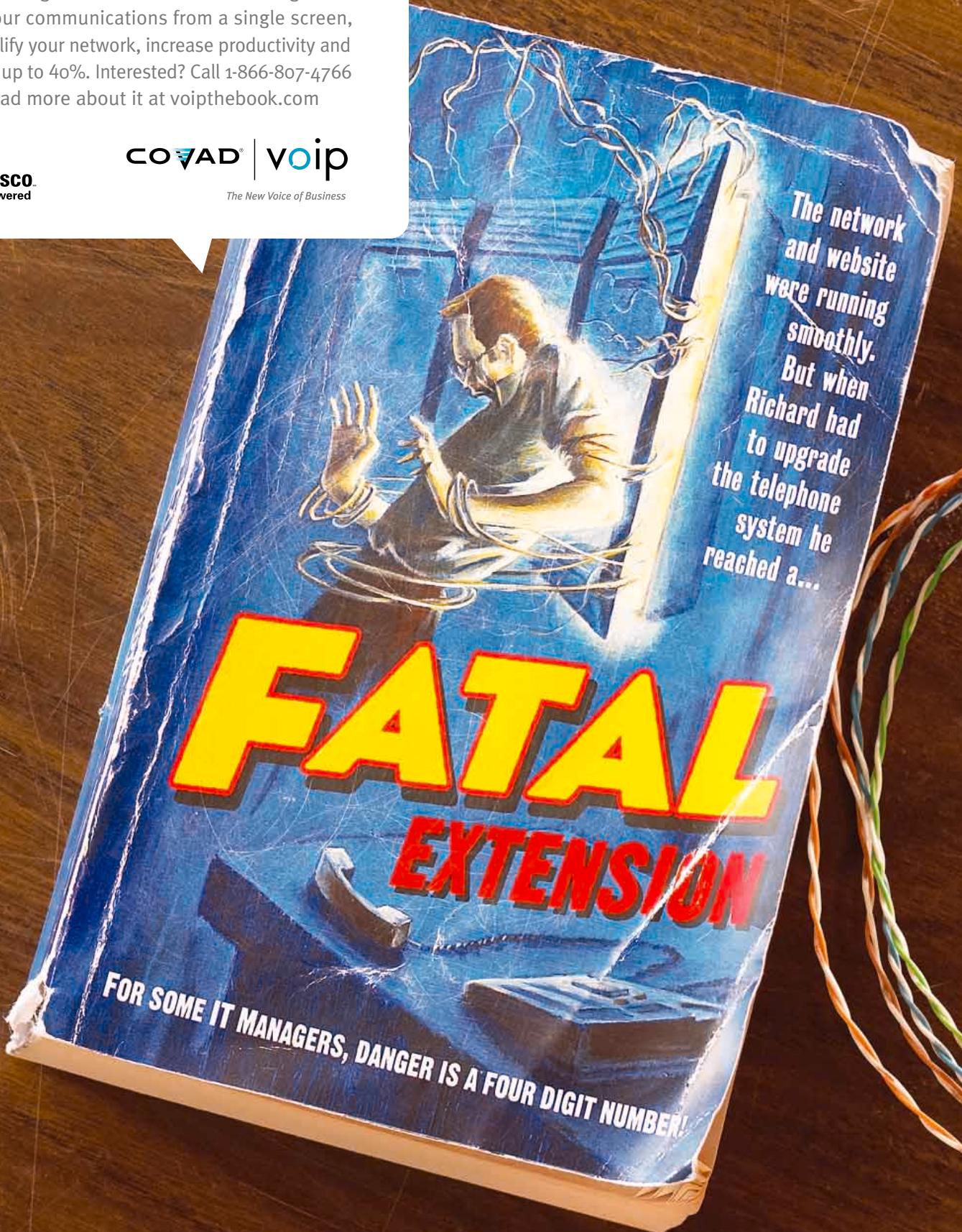
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# PIPELINE

## TECHNOLOGY TRENDS & NEWS ANALYSIS

### Will Ultra Wideband Survive?

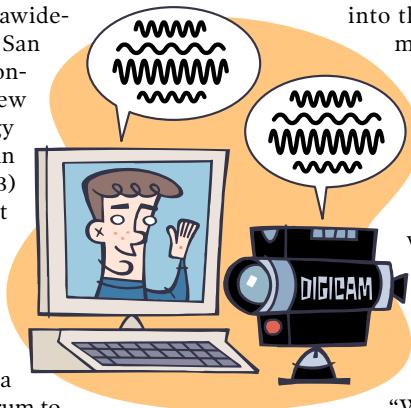
It's controversial, but it could be a big wireless story next year.

LATE SEPTEMBER'S Ultrawideband World conference in San Jose, California brought concrete evidence that a new breed of wireless technology will result in real products in 2005. Ultra wideband (UWB) has powerful backers, but it faces substantial challenges from new strains of Wi-Fi technology, especially 802.11n.

While 802.11-based wireless technologies carve out a particular portion of spectrum to operate in, UWB sends out tiny bursts of radio over many frequencies. Data goes out in millions of pulses per second and is reassembled by a receiving UWB device.

San Diego-based Pulse-LINK's demonstration in San Jose included a single chipset simultaneously achieving gigabit UWB data rates, data rates of up to 125 Mbps over standard home or office power lines, and data rates of up to hundreds of megabits over cable television networks.

Pulse-LINK's president, Bruce Watkins, says there are many applications for UWB. "You might bring a new DVD player home, plug it



into the wall, and have it automatically networked," he says. "Or imagine wirelessly streaming video from a camcorder to the hard drive on a PC."

Wi-Fi's momentum looms large, though. "The window of market entry for new wireless technologies is closing rapidly," says Dr. Predrag Filipovic, consulting analyst with The Diffusion Group.

"While UWB may offer greater throughput than today's 802.11 solutions, new consumer multimedia systems will require longer ranges than UWB promises. Moreover, 802.11n has plenty of ammunition—100 Mbps or more—to address bandwidth-intensive applications across distances."

Pulse-LINK's chipset will be available commercially in the third quarter of 2005. The company's demonstration came two weeks after Intel, NEC, Texas Instruments, and Wisair showed prototype UWB products interoperating at the Intel Developer Forum conference. Intel plans to ship UWB products in 2005. Stay tuned.—Sebastian Rupley



### PS2 Redo

Sony has sizable moves afoot for its market-leading PlayStation gaming consoles. A redesigned, svelte version of the PlayStation 2 console is slated to go on sale in November. The new PS2 is about the size of a hardcover book, and much more portable than the current console (see the photo). It weighs less than half as much as the current version and is much thinner.

Meanwhile, the PS2's successor, due out next year and likely to arrive at May's E3 show, will work with Blu-Ray discs, which offer 54GB of storage—several times the capacity of DVDs. Sony is betting that the huge installed base of PS2 users—27 million in the United States, according to Jack Tretton, a Sony executive vice president—will upgrade and popularize the Blu-Ray media format.—SR

**MORE THAN MEETS THE EYE** Linux has been gaining a foothold on PCs sold in cost-conscious overseas markets. But researchers at Gartner report that widespread piracy and availability means that 80 percent of the machines will end up running Windows.

### No Cheap Sunglasses



MP3 PLAYERS are now in sunglasses. Oakley's Thump line of shades is the first-ever example of MP3 eyewear. They're available in seven combinations of lenses and colors.

The shades have earphones and lenses that flip up and down. But they're not cheap by either MP3 player or sunglass standards. A 128MB model stores 2 hours of music and costs \$395; a 256MB model stores 4 hours and costs \$495. They'll be in Circuit City and Oakley O retail outlets in late November.

Meanwhile, the market for compressed audio players of all kinds—portable and not—is exploding. (See the chart.)—SR

### I Want My MP3

Attributing much of the growth to falling flash-memory costs and more consumer choice in both players and online music services, researchers at IDC see the market for compressed-audio devices, such as MP3 players, skyrocketing.

Global Sales of Compressed Audio Players (in billions)



Source: IDC, September 2004 \*Projected



## Photos in The Raw

For many photographers, digital cameras often “overcook” images when processing them for saving. Adobe is jumping on that issue, gaining backers for a standardized format for raw digital images.

When digital images are saved as JPEG or TIFF files, they are altered from the original raw image file, and image artifacts can crop up. Adobe’s new Digital Negative (DNG) specification and free converter tool ([www.adobe.com/dng](http://www.adobe.com/dng)), let users save images—from more than 65 camera types—before any processing goes on inside the camera.

Raw files give photographers, especially professionals and enthusiasts, “unprecedented control over the processing of their images,” says Aaron Weiss, a director in Hewlett-Packard’s consumer imaging and printing division. “But the lack of an interoperable standard for raw file formats restricts the use of these files between devices and across workflows.”

Initial support has been strong, and many well-known professional photographers are endorsing DNG. “Within five years, it will be implemented in the majority of high-end cameras,” predicts Paul Worthington, senior analyst at Future Image.—SR

## Easy Wait at Gate 58

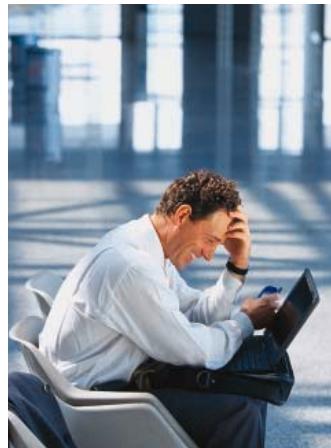
YOU GET TO the airport 90 minutes before the flight and breeze through security. At the gate, you find out your connecting flight is late, so you’ve got a couple hours to kill. If the airport has Wi-Fi, why not watch TV on your laptop?

OnAir Entertainment, a Silicon Valley startup, builds media servers that record broadcast, cable, or satellite TV, so airport Wi-Fi providers can offer it along with wireless Internet access. Already, users at the 26 gates at Austin’s Bergstrom airport who log on to the Wayport Wi-Fi network will see a new option: “Watch Live TV.” Users can watch any of eight TV channels live or any show aired in the last day.

The Austin deployment is the test run for Wi-Fi TV, says OnAir President Rand Bleimeister. “Until now, if you wanted to watch TV in the airport, you watched what the bartender picked,” he says.

How much will it cost? That’s up to Wi-Fi hot spot operators, Bleimeister says. It could be rolled into the airport Wi-Fi access fee.

Other Wi-Fi users don’t have to worry about losing bandwidth to Montel Williams fans. “The access points have more capacity than the T1 lines feeding them,” Bleimeister says. And if bandwidth ever becomes a problem, the operators could limit the TV connections to make sure data comes first.—Bill Howard



## A LATE BURST

In one fell swoop, IBM appears to have wrested the record for world’s fastest supercomputer from a Japanese system called the Earth Simulator. Although the only results at this point are from internal tests, IBM reports that its BlueGene/L system has achieved a benchmarked speed of 36.01 teraflops, beating the NEC-built Japanese system’s previous record of 35.86 teraflops. When the Japanese system set its record in 2002, National Science Foundation officials sounded dire warnings about the United States losing its competitive edge in high-end computing.

## Modeling Internet Epidemics



CLEARLY, ATTEMPTS TO prevent viruses and worms from infecting the Net aren’t working. So a couple of recent National Science Foundation Cyber Trust research grant recipients are taking a naturalistic approach: If you can’t beat

them, contain them.

The Carnegie Mellon University-based Security Through Interaction Modeling research center, with \$6.4 million in NSF funding, will examine the ecology of computer networks. One project will be to model healthy network interaction to see how it differs from network activity under an attack.

Another site taking a similar approach is the Center for Internet Epidemiology and Defenses, which received a \$6.2 million NSF grant. It’s led by Stefan Savage of the University of California at San Diego and Vern Paxson, chief scientist at the International

Computer Science Institute in Berkeley, California.

“In terms of detection, the state of the art is very poor,” says Paxson. “You don’t even know an attack has happened until your inbox is full.”

So one of the center’s goals will be to focus on how a global early-warning system could issue timely attack alerts. Part of that work, says Paxson, will be creating a vast collection of traps or “honey pots” fed by a network of sensors scattered around the Internet. The difficult part will be determining what tactics could quickly contain an outbreak, such as blocking certain traffic.—John R. Quain

**TALKING HEAD** For the third time, Richard Wallace’s online chatbot, Alice, was awarded the Loebner prize for most human cyber-conversationalist. If you’re lonely, you can chat with Alice at [www.alicebot.org](http://www.alicebot.org). She is aware that she won the prize, by the way.

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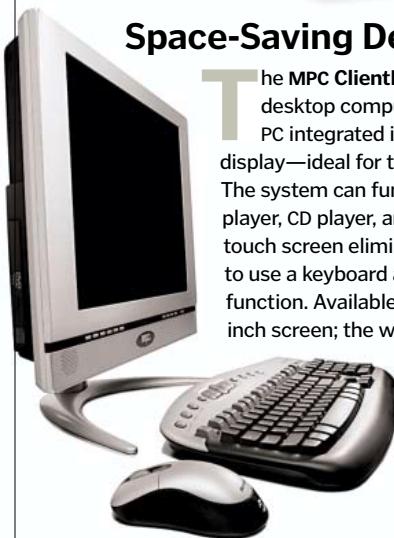
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\$1,849 direct (17-inch display). MPC Computers LLC, [www.mpccorp.com](http://www.mpccorp.com).



## Fast Tungsten Handheld

**T**he **palmOne Tungsten T5** PDA has a 416-MHz Intel XScale processor—the fastest currently available in a Palm OS device—plus 215MB of available memory and a 320-by-480 screen. Plug the T5 into any USB port and the unit pops up in Windows' My Computer directory, looking and acting just like a USB flash drive. The unit comes bundled with Documents To Go 7 for viewing files and both Mac and Windows desktop software, and it has Bluetooth wireless connectivity. The “nonvolatile” file system keeps information safe even when the unit is not charged.—MKM

\$399 direct. palmOne Inc., [www.palmone.com/us](http://www.palmone.com/us).



## Stylish Gaming Case

Looking to build your dream system? Hardcore gamers will love the high-gloss paint (available in four colors) and LCD temperature readout of the **MGE Viper** chassis. The case features front-mount fan ports, seven expansion bays, top-mounted I/O ports, and a 500-watt ATX power supply.—MKM

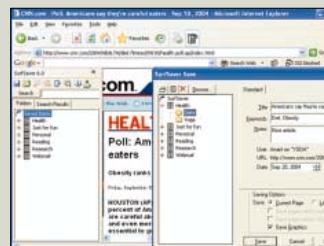
\$99.99 direct. MGE Company, [www.xgbox.com](http://www.xgbox.com).



## Save Your Surfing

Save, search, and organize the information you gather on the Internet using **SurfSaver 6**. Integrating seamlessly with Internet Explorer (version 5.5 or later), the utility lets you save pages from your browser and access them even when off-line. SurfSaver 6 also includes a QuickSearch function and allows users to save PDF files.—MKM

\$29.95 direct. askSam Systems, [www.surfsaver.com](http://www.surfsaver.com).



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# EDITORS' CHOICES

NOVEMBER 2–NOVEMBER 15, 2004



In the market to buy? Here are our latest Editors' Choices in the leading technology categories—the products we've picked as the best from the hundreds that PC Magazine Labs has been testing. For links to the complete reviews, including dates of publication, visit [www.pcmag.com/editorschoice](http://www.pcmag.com/editorschoice).

## DESKTOP PCs & SERVERS

### GAMING DESKTOPS

- Falcon Northwest FragBox Pro
- Falcon Northwest Mach V
- Velocity Micro Vision FX

### MULTIMEDIA DESKTOP

- Dell Dimension 8400

### MEDIA CENTER PC

- NEW** HP Media Center Photosmart PC m1050y Series

### ALL-IN-ONE

- Apple iMac G5

### VALUE PC

- eMachines T3092

### SMALL-BUSINESS PC

- IBM ThinkCentre A50p

### CORPORATE PC

- IBM ThinkCentre S50

### ENTRY-LEVEL SERVER

- IBM eServer xSeries 306

### ENTERPRISE SERVER

- Dell PowerEdge 2850

## PORTABLE PCs

### BUSINESS NOTEBOOKS

- Acer Travelmate 8000
- HP Compaq nc6000

### ULTRAPORTABLE NOTEBOOK

- IBM ThinkPad X40

### MULTIMEDIA NOTEBOOKS

- HP Pavilion dv1000
- Toshiba Qosmio E15

### GAMING NOTEBOOK

- Dell Inspiron XPS

### VALUE NOTEBOOKS

- Apple iBook
- Averatec AV3225HS
- HP Compaq Presario R3000Z

### TABLET PCs

- Motion Computing M1400
- Toshiba Portégé M205-S809

## MOBILE DEVICES

### PDA's

- HP iPaq hx4700
- palmOne Zire 72

### PHONE/E-MAIL DEVICE

- BlackBerry 7100t

### PHONE

- Nokia 6620

## GPS DEVICE

- TomTom Bluetooth GPS Receiver

## HOME ENTERTAINMENT

### MEDIA HUBS

- Creative Sound Blaster Wireless (music)



HP Media Center Photosmart m1180

- Prismiq MediaPlayer
- Turtle Beach AudioTron AT-100 (music)

### DIGITAL VIDEO RECORDER

- SnapStream Beyond TV 3 HDTVs
- NEC PlasmaSync 61XM2+/S
- Sharp Aquos 37-inch LCD TV

## CAMERAS

### ULTRACOMPACT

- Sony Cyber-shot DSC-T1

### COMPACT

- Canon PowerShot S60
- Casio Exilim Pro EX-P600
- Kodak EasyShare LS743

### SUPERZOOM

- Olympus Camedia C-765 Ultra Zoom

### ENTHUSIAST

- Konica Minolta DiMage A2
- Leica Digilux 2
- Olympus C-5060 Wide Zoom
- Olympus C-8080 Wide Zoom

### DIGITAL SLR

- NEW** Canon EOS 20D

### CAMCORDERS

- NEW** Canon Optura 400
- NEW** JVC GR-D33US
- Sony DCR-DVD201 DVD Handycam

- Sony DCR-HC40 MiniDV Handycam

## DIGITAL IMAGING

### FLATBED SCANNER

- Microtek ScanMaker 6100 Pro

### IMAGE EDITORS

- Adobe Photoshop CS (pro)
- Adobe Photoshop Elements 2.0 (consumer)

### PHOTO ALBUM SOFTWARE

- Adobe Photoshop Album 2.0

### PHOTO SHARING

- OurPictures

- smugmug

### PHOTO-PRINTING SERVICE

- Shutterfly

## DIGITAL AUDIO & VIDEO

### VIDEO EDITORS

- Adobe Video Collection 2.5
- Pinnacle Studio Plus 9

### CD/DVD-BURNING SUITE

- Roxio Easy Media Creator 7

### DVD AUTHORIZING

- Sonic MyDVD Studio 6

- Ulead DVD Workshop 2

### SLIDE SHOW CREATOR

- Arcsoft DVD SlideShow

### PORTABLE AUDIO

- Altec Lansing inMotion
- Apple iPod
- Apple iPod Mini
- Belkin Digital Camera Link
- Delphi XM Roady2
- iRiver H140
- Samsung Yepp YP-T5V

### SOUND CARD

- Creative Sound Blaster Audigy 2 ZS

### SPEAKERS

- Creative Gigaworks S750
- Klipsch ProMedia GMX D-5.1

### PC MEDIA PLAYER

- Microsoft Windows Media Player 10

### MUSIC STORE

- Napster 2.0



Sony DCR-HC40 MiniDV Handycam

## WEBCAM

- Logitech QuickCam Pro

## MOUSE

- Logitech MX1000 Laser

## PRINTERS

### PERSONAL PRINTERS

- NEW** Samsung ML-2250 (laser)
- HP Deskjet 5150 (ink jet)
- Lexmark C510n (color laser)

### PERSONAL AIO's

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

### PHOTO PRINTERS

- Canon i9900 Photo Printer
- Canon Pixma iP4000
- NEW** Epson PictureMate
- Epson Stylus Pro 4000
- NETWORK PRINTERS**
- HP Color LaserJet 4650n
- HP LaserJet 9000dn
- Xerox Phaser 4500DT
- Xerox Phaser 7750DN

## DISPLAYS & STORAGE

### BUSINESS DISPLAYS

- Envision EN7220
- IBM ThinkVision C220p
- NEC MultiSync LCD1960NXi

### BUSINESS 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



Epson PictureMate

## EDITORS' CHOICES

NOVEMBER 2-NOVEMBER 15, 2004

**EXTERNAL DRIVES**

- Transcend 1.8" Portable Hard Drive
- Western Digital Media Center
- WiebeTECH Fire800

**REMOVABLE STORAGE**

- Iomega Rev 35

**NETWORKABLE STORAGE**

- Buffalo LinkStation Network Storage Center

**PORTABLE PHOTO STORAGE**

- Micro Solutions RoadStor

**PRODUCTIVITY SOFTWARE****OFFICE SUITE**

- Microsoft Office 2003

**OCR**

- ScanSoft OmniPage Pro 14 Office

**PDF CREATION**

- Adobe Acrobat 6.0
- FinePrint pdfFactory PRO 1.57
- Jaws PDF Creator 3.0

**DOCUMENT MANAGEMENT**

- ScanSoft PaperPort Pro 9 Office

**DESKTOP PUBLISHING**

- Adobe InDesign CS

**FINANCE & ACCOUNTING**

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

**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**

- Norton AntiVirus 2005

**FIREWALLS**

- NEW** Norton Personal Firewall 2005
- 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



Madden NFL 2005

**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**

- LapLink Everywhere 3.0

**FILE MANAGER**

- Novatix ExplorerPlus 6.1

**MIGRATION**

- Alohabob 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**

- 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**

- 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**

- NEW** Madden NFL 2005

**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
- NEW** Sonicfire Pro 3.2
- Visual Thesaurus

# We'd like to think that not all perfect matches are made in heaven.

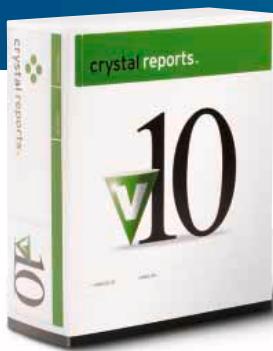
## Crystal Reports 10

Which edition of Crystal Reports® is right for you?

	Report Author/IT Editions		Bundled Developer Editions		Full Developer Editions	
	Standard	Professional	.NET Edition <sup>2</sup>	Java Edition <sup>3</sup>	Developer	Advanced
<b>Report Creation</b>						
Visual report designer for rapid data access and formatting	●	●	● <sup>2</sup>	● <sup>1</sup>	●	●
Customizable templates for faster, more consistent formatting	●	●			●	●
Repository for reuse of common report objects across multiple reports <sup>4</sup>		●			●	●
<b>Data Access</b>						
PC-based and Microsoft® ODBC/OLE DB for MS Access and SQL Server	●	●	●	●	●	●
Enterprise database servers (ODBC, native)		●	● <sup>1</sup>	● <sup>1</sup>	●	●
Custom, user-defined data through JavaBeans™				●	●	●
Custom, user-defined data through ADO and .NET			●		●	●
<b>Report Integration</b>						
Report viewing APIs (.NET and COM SDKs)			●		●	●
Report viewing APIs (Java SDK)				●	●	●
Extensive report viewer options (DHTML, ActiveX, Java Plug-in, and more)					●	●
APIs for run-time report creation and modification						●
Report Parts for embedding report objects in wireless and portal apps	●	●			●	●
<b>Report Deployment</b>						
Crystal Reports components for report viewing, printing, and exporting:						
a) Java reporting component				●	●	●
b) .NET reporting component			●		●	●
c) COM reporting component					●	●
Full featured report exporting		●			●	●
Report server (Crystal Enterprise Embedded deployment license)						●

1 Limited functionality. 2 Bundled with Microsoft® Visual Studio® .NET and Boland® C#Builder™. 3 Bundled with BEA WebLogic Workshop™ and Boland® JBuilder®. 4 This feature is available on the Crystal Enterprise CD, included in the Crystal Reports 10 package.

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# FIRST

HANDS-ON TESTING OF NEW PRODUCTS • [www.pcmag.com/firstlooks](http://www.pcmag.com/firstlooks)

- 36 Belkin Wireless Pre-N Router
- 43 McAfee Personal Firewall Plus 6.0
- 43 Norton Personal Firewall 2005
- 44 ACT! 2005 Premium for Workgroups
- 44 QuickBooks SimpleStart



- 46 Paint Shop Pro 9
- 46 PassAlong.com
- 50 Canon EOS 20D
- 52 SecureZIP 8.0 for Windows
- 52 WinRAR 3.4



## The Home PC, Perfected

THE MAGAZINE  
WORLD'S LARGEST  
COMPUTER-TESTING  
FACILITY

BY BILL HOWARD



Three times is a charm, and never is this truer than with Microsoft products. With its brand new Windows XP Media Center Edition 2005 operating system, Microsoft may have unleashed the perfect OS for a home PC. • Fulfilling the promise of the previous two iterations, MCE 2005 is a markedly better OS, supported by markedly better graphics hardware—particularly the TV tuners, which now deliver picture quality comparable to what you get from a good TV.

For virtually anyone buying a new PC for home use, we can't think of a reason not to go with an MCE 2005 box. Even price is no longer an issue, as you should be able to find entry-level models for \$500 (without monitor), versus the \$1,000 or so that was the cost of entry with the previous offerings. That's because MCE 2005 is built atop Windows XP Home (rather than the costlier XP Pro), and Microsoft no longer requires that PC makers include a TV tuner and remote control. So going with MCE 2005 as the OS should cost you only about \$50 more than a comparably equipped PC running Windows XP Home.

In a typical \$1,000 Media Center box, you get a capable TV tuner (MCE 2005 supports three), an FM radio tuner, digital video recorder (DVR) software with a free program guide, DVD and CD player, MP3 and WMA ripper, video player, photo player, and Web browser. Output can be sent to a PC dis-

play or a TV.

Perhaps the biggest improvement in MCE 2005 is support for companion Media Center Extender appliances (MCX for short). An MCX lets you wirelessly stream most (but not all) of your Media Center-resident digital content to another TV in the house—even if the host PC is occupied with other MCE 2005 chores (see the sidebar, "A Near-Perfect Add-on for the Perfect Home OS"). In addition, Media Center PCs can now sport up to three TV tuners. That means you can record several shows simultaneously, a trick TiVo still can't accomplish.

While the view-from-the-couch interface of MCE 2005 looks much the same, its usefulness is evolving. Icons for each of the apps (My Pictures, My Music, My TV, Radio, and so on) expand when you make the pointer hover over them, revealing the latest three events (programs, slide shows, albums) you

accessed. The MCE 2005 UI now includes support for DVD and CD burning. All told, if you dedicate a Media Center PC to playing audio and video, showing photos, and watching TV, it's possible that you'll never even see the standard Windows UI lurking beneath.

### Alienware DHS-511

Look at the Alienware DHS-511 and you'll see the future of Media Center PCs. Unlike most models that have come to market, the DHS-511 has a chassis that makes it look the part of a home-theater component, not a PC. It's also one of the first Media Center machines we've tested that use an AMD Athlon 64 CPU (the 3500+) rather than the Intel Pentium 4.

Instead of using a vertical PC tower, Alienware houses the DHS-511 in a black horizontal case. When the front access panel is closed, all you see is a clean front panel. The flip-down panel covers a media card reader as well as USB and FireWire ports (additional USB and FireWire ports on the back of the system).

The slot-load optical drive keeps the clean look of the front panel. We also love the two-line backlit LCD readout on the



**OUR EDITORS' CHOICE** among this first crop of MCE 2005 machines, the HP Media Center Photo-smart PC m1050y Series delivers some unique features and extras.

PHOTOGRAPHY BY THOM O'CONNOR

# LOOKS

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

- 54 Ask Jeeves
- 54 A9.com
- 55 OQO model 01
- 56 Samsung ML-2250
- 56 Xerox DocuMate 252



- 56 Samsung SCX-4100 Digital Productivity Center
- 56 Primera Signature Z1 CD/DVD Printer
- 56 Ricoh Aficio CL3000e
- RED denotes Editors' Choice.



front, which shows pertinent information. Watch TV and it displays the name of the show you're watching; play music and it displays the track time, track name, and artist info.

The inside of the DHS-511 case is roomy, with space for a couple of additional hard drives to augment the 160GB main drive already installed. The DHS-511 is pretty quiet; under the hood are only the Zalman CPU cooler and a single low-speed case fan blowing cool air over the ATI Sapphire Radeon 9600 XT graphics card. Performance is fine for multimedia applications and gaming, though this is no high-end gaming box.

Sitting in your easy chair, you'll appreciate the wireless keyboard and Gyration mouse, which you can hold in midair to control cursor movement, no mousing surface required. We also like the TV-like remote, which is better looking than the Microsoft-mandated remotes that shipped with earlier Media Center PCs.

For the money, we'd prefer to see a larger hard drive and dual TV tuners. But we can't argue with the DHS-511's sleek, AV-friendly design.—*Jol Santo Domingo*

#### Alienware DHS-511

With 2.2-GHz AMD Athlon 64 3500+, 1GB 400-MHz DDR SDRAM, 160GB SATA hard drive, ATI Sapphire Radeon 9600 XT graphics, DVD±RW/RAM drive, Creative Labs Sound Blaster Audigy 2 sound card, Klipsch Promedia 5.1 speakers, Microsoft Windows XP Media Center Edition 2005, \$2,380 direct. Alienware Corp., www.alienware.com. OVERALL ●●●●○ Music: 90 (out of 100); Photos: 92; Video: 93; Gaming: 83



**THERE'S A PC** lurking within the Alienware DHS-511's sleek AV chassis.

#### Gateway 820GM

What can you say about the system that finished last on virtually every performance test? How about "Buy this machine!"? The Gateway 820GM meets one of Microsoft's goals with MCE 2005: to provide a solid multimedia experience for around \$1,000.

To get there, Gateway turned not just to Microsoft but to Intel and its BTX (basic technology extended) motherboard, and the chassis Intel created to house it. The BTX is the motherboard Intel expects will replace the venerable ATX motherboard, and the new chassis optimizes airflow across the components and motherboard using just two big, slow-turning, whisper-quiet fans. Gateway rates the system at 40 decibels maximum, quiet enough for the living room. The front provides for two optical drive bays, which Gateway fills with a DVD-ROM drive and a double-layer, dual-format (DVD±RW) unit. Besides a front-mount flash card reader,

you'll see USB, FireWire, and audio jacks in front, but no front video inputs.

The reason for Gateway's lower performance (at least in this field of speed demons) is the choice of money-saving components: a 3-GHz Pentium 4 530 and ATI x300 graphics (which does use the BTX motherboard's PCI-Express bus instead of AGP). Truth be told, though, these components are just fine for the multimedia chores a Media Center PC will be asked to do. The only area in which it may disappoint is high-res, high-action gaming.

Also on the affordability front, Gateway used Intel's 7.1-channel integrated audio (not the Creative Labs Audigy) and a modest pair of speakers. Photo buffs are fairly well served with Microsoft PictureIt Photo Premium 9. For burning video, photo, or audio discs (and backups of all your files), there's Nero Express 6.

Our test unit came with the FPD1950, a 19-inch Gateway LCD panel (1,280-by-1,024 pixels); at \$600, it's a reasonable value. In fact, that was the overall impression the 820GM left: Nothing flashy, but everything capable. It's ready to roll for TV, video, music, and

photos. For those looking to try a Media Center PC without breaking the bank, Gateway hits the sweet spot. The price is right and the performance is reasonable.—*BH*

#### Gateway 820GM

With Intel Pentium 4 530 (3.0 GHz), 1GB DDR SDRAM, 250GB SATA drive, ATI Radeon X300 graphics (128MB), double layer DVD±RW drive, DVD-ROM drive, Microsoft Windows XP Media Center Edition 2005, \$1,250 direct (19-inch FPD1950 LCD panel, \$600 direct). Gateway Inc., www.gateway.com. OVERALL ●●●●○ Music 82 (out of 100); Photos: 92; Video: 98; Gaming: 74

#### HP Media Center Photosmart PC m1050y Series

The new HP Media Center Photosmart PC m1050y Series is currently your best bet in a multimedia PC. It's a feature-rich product that melds the PC and entertainment worlds quite impressively.

The m1050y uses the same chassis that helped the previous model win our Editors'



**FOR A NEW MEDIA CENTER PC** on a budget, consider the Gateway 820GM entry.

Choice a few months ago (First Looks, August 17), now back with even more power: a Hyper-Threaded Pentium 4 560 (3.6 GHz), a 400GB SATA drive, and ATI Radeon x600 graphics. The bundle also includes an extended-range wireless keyboard and wireless mouse. About the only components that are merely good, not outstanding, on our test system are the Altec Lansing VS2121 speakers and subwoofer.

If you're looking for add-ons, one dazzling piece of hardware is the HP f2304 23-inch (1,920-by-1,200), widescreen LCD panel. It's a killer desktop display, as well as a reasonable den or apartment TV. Of course, at \$2,200, it doubles the price of the package.

Since HP now resells Apple iPods, the m1050y comes with iTunes as well as Real Player, Sonic RecordNow, and Windows Media Player 10 (which forms the underpinnings of the Media Center music engine). Problem is, no one program can handle every kind of music you may have. In particular, WMP10 and the Media Center My Music player can't handle iMusic-protected AAC downloads, while iTunes must convert open WMA and can't deal with protected WMA files.

You'll appreciate the nice touches that make the m1050y chassis a delight in daily use. There's a zillion-in-one flash card reader. There's one of every kind of video, audio, and data interconnect

on the front, and it's all labeled as words, not icons, in legible white text on HP's gray background. A flap on the front flips back to reveal the slide-in Personal Media Drive bay, the hot-swap hard drive cartridge (\$220 for 160GB) that makes backing up or augmenting the unit's main hard drive a snap.

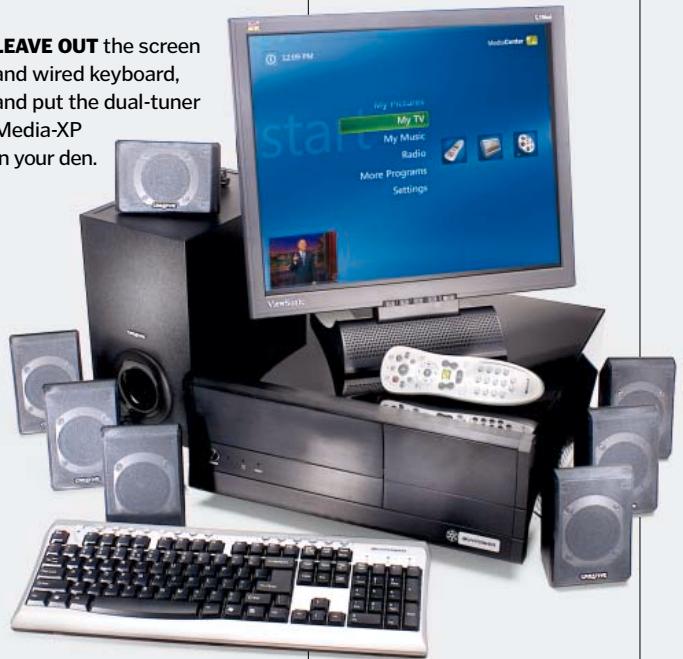
A sliding door on top reveals a cutout for any of HP's Photosmart camera docks (\$80), and the spot can accommodate docks from other makers as well. The keyboard has a big, easy-to-turn volume knob. And there's enough included software to help the m1050y garner nearly perfect scores across the board on our multimedia ratings.

Though this case doesn't look the part of a dedicated AV component, the cooling fans are quiet enough to be at home anywhere in your house. And adding an HP Media Center Extender (\$299; see the sidebar) lets you put the 802.11g-equipped m1050y anywhere in the house and still have access to your media in the family room.—BH

### HP Media Center Photosmart PC m1050y Series

With Intel Pentium 4 560 (3.6 GHz), 1GB DDR 400 SDRAM, 400GB SATA hard drive, ATI Radeon X600 Pro graphics (256MB), DVD±RW drive, DVD-ROM drive, Creative Labs Sound Blaster Audigy 2 ZS sound card, Altec Lansing VS2121 2.1 speakers, 802.11g wireless, Microsoft Windows XP Media Center Edition 2005, \$2,390 direct (23-inch HD LCD monitor, \$2,200). Hewlett-Packard Development Co., [www.hp.com](http://www.hp.com).  
OVERALL ●●●●● Music: 98 (out of 100); Photos: 100; Video: 100; Gaming: 97

**LEAVE OUT** the screen and wired keyboard, and put the dual-tuner Media-XP in your den.



### iBuyPower Media-XP

Innovation, style, and a hefty price tag usually abound in the world of boutique PC vendors. Fortunately for those on a budget, iBuyPower often manages to get away with a decent amount of the first two and rarely anything approaching the third. With the iBuyPower Media-XP, the company proves it can create a Media Center case in a low-lying, black metal box in a low-lying, black metal case reminiscent of an AV component, yet do so at an approachable price.

With its brushed-metal front, the attractive Media-XP case was designed to live in an entertainment center. And if you do plan to hook the Media-XP to your TV and stereo, you can leave out the 19-inch ViewSonic LCD and Creative Labs P7800 7.1 speakers that came

with our bundle and pay just \$1,797 for the PC proper. Of course, then you'll want to ditch the lackluster wired keyboard and mouse and go with wireless versions you can use from the couch. For most media-centric tasks, the included remote control and IR dongle work perfectly.

The innards of the case make good sense. The Intel 915-based motherboard with a 3.4-GHz P4 550 and 1GB of DDR2 533 SDRAM form a decent performance core for multimedia applications. Considering the machine's purpose, we can't complain about its 21.6 score on Business Winstone and 31.6 on Multimedia Content Creation. The Media-XP's 3D performance was hindered a bit by the midlevel nVidia GeForce 6600 graphics card, but the unit should prove fine for casual gaming. Most important, the card looked fine handling 2D video.

nVidia is also the vendor behind the system's NVTV dual tuner, which let us record from two channels simultaneously while playing back a video file. Of course, if you will often be recording two shows a once, the included 250GB hard drive will fill up

### BENCHMARK TESTS

High scores are best.  
Bold type denotes first place.

	Processor	Graphics chipset	Business Winstone 2004	Business Winstone 2004 Multitasking (overall score)	Multimedia Content Creation Winstone 2004	3DMark03
<b>Alienware DHS-511</b>	Athlon 64 3500+	ATI Sapphire Radeon 9600 XT	24.9	2.5	32.1	3,950
<b>Gateway 820GM</b>	P4 3.0 530	ATI Radeon X300	20.1	2.8	30.9	1,897
<b>HP Media Center m1050y</b>	P4 3.6 560	ATI Radeon X600 Pro	22.0	2.8	32.3	3,567
<b>iBuyPower Media-XP</b>	P4 3.4 550	nVidia GeForce 6600	21.6	2.9	31.6	5,225
<b>VoodooPC Vibe Media Center</b>	Athlon 64 FX-53	nVidia FX GeForce 6800 GT	24.9	3.0	34.4	<b>11,139</b>
<b>ZT Media Center PC A5346</b>	Athlon 64 FX-55	nVidia FX GeForce 6800 GT	<b>29.4</b>	<b>3.2</b>	<b>38.3</b>	7,597

RED denotes Editors' Choice. We tested these systems at 1,024-by-768 resolution, and with anti-aliasing and anisotropic filtering turned off.

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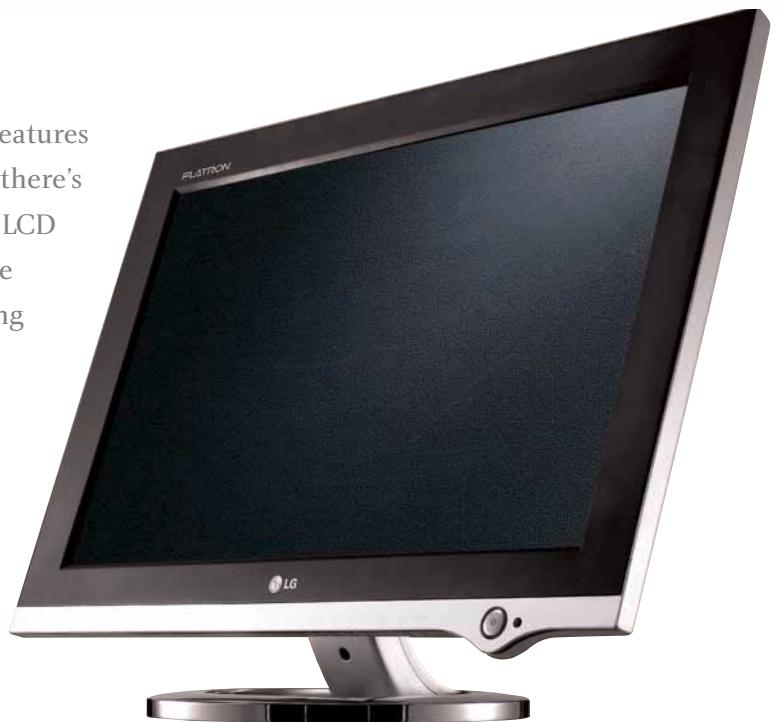
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pretty quick. Think about augmenting that, or plan on off-loading keepers often to the double-layer DVD burner.

Two front panels pop open to reveal audio I/O, two USB 2.0, and FireWire ports on the left, along with the DVD burner and media card reader on the right. Six more USB 2.0

ports are on the back, along with every video and audio I/O option you could ask for (except HDTV connections).

The iBuyPower Media-XP can provide a very likable Media Center experience when married to a living-room TV and sound system. And we like getting a boutique AV-component

look at a mass-market price. —Konstantinos Karagiannis

**iBuyPower Media-XP**

With Intel Pentium 4 550 (3.4 GHz), 1GB 533-MHz DDR2 SDRAM, 250GB SATA hard drive, nVidia GeForce 6600 graphics, 19-inch LCD (1,280-by-1,024), 16X dual-layer DVD±RW drive, Microsoft Windows Media Center 2005, \$2,247 direct. iBuyPower; www.ibuypower.com. OVERALL ●●●●○ Music: 70 (out of 100); Photos: 75; Video: 95; Gaming: 90

**VoodooPC Vibe Media Center**

VoodooPC is known for building gaming machines to die for. Realizing that the fast CPUs and disk arrays in these systems can add up to a killer Media Center PC, the company has come up with a way to make both gamers and mediaphiles happy: the VoodooPC Vibe Media

# A Near-Perfect Add-on

Now that you've invested in a powerful computer running Windows XP Media Center Edition 2005, wouldn't it be great if you could enjoy its multimedia features in other rooms of your house? A Windows Media Center Extender (MCX) lets you do just that.

The concept is simple: Use your Media Center PC as the central conduit (and repository) for all your media, then add an MCX as an access device wherever else in your home you want to enjoy that content. That means the main PC can reside in the den or home office, but you can watch your recorded TV shows in the bedroom. Point the included remote at the MCX and the familiar MCE 2005 interface appears. Choose the function you want (live TV, recorded TV, music,

photos, and so on), and the content is streamed wirelessly (or via an Ethernet cable) to the MCX. Is someone using the central Media Center PC? No problem. With an MCX, you'll still have access to the media files on that PC, too.

If you already own a Microsoft Xbox gaming console (or were planning to buy one), Microsoft has good news for you, too. Xbox was designed to serve as a media hub, so all you'll need is the Media Center Extender for Xbox software (\$79.99 direct, available by year end). The software turns the game console into a wired MCX, able both to play games and play back content stored on the host PC.

To put the MCX concept to the test, we hooked up a pair of **HP Media Center Extenders** (\$299 direct each), one via Ethernet and the second using 802.11a wireless. (Depending on the power of your Media Center PC, it can host up to five MCX devices.) Initial setup of the slim, stylish unit was quite straightforward. The MCX supports connections to your video equipment via composite video (good quality), S-Video (better quality), or component video (best quality).

The HP MCX communicates with your Media Center PC either over 100-Mbps Ethernet or via the built-in 802.11a/g wireless adapter. When accessing the PC via an MCX, top-level menu choices include My Videos, My Pictures, My TV, My Music, and Radio. Noticeably missing from the menu are the Play CD and Play DVD choices. The MCX does respect and enforce digital rights management (DRM) and then some, so DVDs and CDs can be played only on the host PC. Also, some premium content providers such as HBO have marked their content with a CGMS-A (Copy Generation Management System—Analog) flag. Microsoft respects those flags and limits the playing of



**THE HP MEDIA CENTER EXTENDER** is an ideal add-on for an MCE 2005 PC.

premium content, as well as Video on Demand (VoD), to the host Media Center PC (see the chart). Also, the MCX does not handle the host PC's Windows desktop UI, just the MCE 2005 media interface. Hence, you cannot browse the Internet via the MCX, nor can you run programs other than those that appear in the top-level interface.

Still, what you can do with an MCX far outweighs what you can't do. On our tests, with a dual-tuner Media Center PC as the host and two HP MCX units, we recorded two different live TV shows simultaneously while playing music on the host PC. Similarly, we watched a different live TV channel on each of the connected MCXs while simultaneously playing back a recorded TV show on the host PC. To stress the system even further, we also recorded the live TV streams while watching a recorded show on the host. Neither the video nor the audio was degraded in any of these torture tests. In wireless testing, video and audio streams held up, even when the MCX was 160 feet from the router.

All told, the HP Media Center Extender makes for a much better experience than any of the multimedia hubs we've yet tested. It's effortless to set up and the interface (thanks to MCE 2005) is the best we've seen. The only sticking point, of course, is that its benefits are available only to MCE 2005 users.—Craig Ellison

**HP Media Center Extender**

\$299 direct. Hewlett Packard Development Co., www.hp.com. ●●●●○

## What MCX Can—and Can't—Play

Media Center Extender is a huge boon for multimedia-crazed home PC users, but not everything that can play on a host MCE 2005 PC can be accessed via an extender. Here's a rundown of the leading media types.

Content on host PC	Streamable to MCX
Live television feed	✓
Recorded TV content	✓
Content recorded from premium cable (HBO and so on)	
HDTV content	
Copyright-protected DVDs	
Unprotected DVDs (home movies and so on)	✓
Music CDs (in CD/DVD drive)	
AVI	
DVX	
MP3	✓
MPEG-2	✓
MPEG-4	
WMA	✓
WMV9	✓



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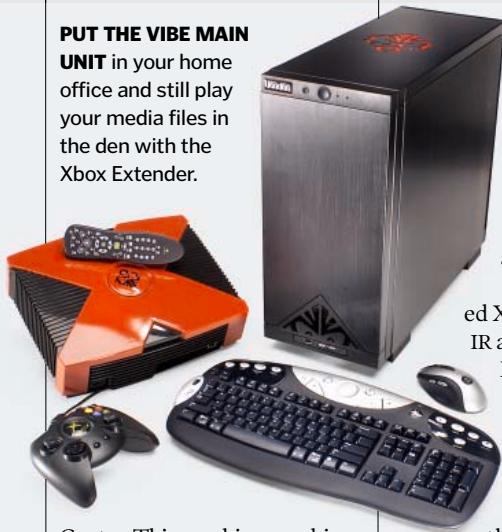
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**PUT THE VIBE MAIN UNIT** in your home office and still play your media files in the den with the Xbox Extender.



Center. This machine combines a gorgeous MCE 2005 PC with a equally striking, custom-painted Microsoft Xbox that functions as a Media Center Extender. Leave the hot system in the room where you normally do your gaming or other computing and connect the Xbox to a remote TV to watch and listen to your stored multimedia content.

The Vibe is based on an AMD Athlon 64 FX-53, with 1GB of Crucial Ballistix DDR 400 SDRAM. There are two 250GB SATA drives in a RAID Level 0 configuration. In other words, it can churn a lot of data quickly, and read and write to disk quickly. This translated to excellent performance on our benchmark tests, including the best 3DMark score by far among this first batch of Media Center entries, thanks to the 256MB eVGA GeForce 6800 GT graphics card.

While the core makes for a peppy hardware base for the new Microsoft OS, VoodooPC doesn't exactly max out the new operating system's capabilities. There's only one TV tuner (surprising given the price), so you can't record two shows (or watch live TV and record a different show) simultaneously. At least after you've recorded content, you can archive it in style with the 16X

dual-layer DVD burner. Included in our bundle's price is a gorgeous 20-inch NEC LCD monitor to watch it all on; delete that nicety and save about a grand.

The custom-painted Xbox, complete with IR adapter, remote, and Media Center Extender disc, counts for only \$99 of the system price we quote—but is not available without the purchase of a

Vibe. Microsoft will be making the software and IR kit available for Xbox owners in the near future (\$79.99 list), but for now VoodooPC is the only vendor we've seen implementing the console in this way.

The Vibe does a nice job being two kinds of PC in one. For gamers and power users who want horsepower and flash, it delivers. With its MCE 2005 abilities and Xbox Media Center Extender, it lets you store and serve multimedia around the house, as well. Of course, buyers not used to the boutique world of computing might suffer sticker shock.—*KK*

### VoodooPC Vibe Media Center

With AMD Athlon 64 FX-53 (2.4 GHz), 1GB 400-MHz DDR SDRAM, two 250GB SATA hard drives (RAID Level 0), 256MB eVGA GeForce



**ARE GAMING AND MULTIMEDIA ENTERTAINMENT** your pleasure? The ZT Media Center PC A5346 delivers both, in spades.

6800 GT graphics, 20.1-inch LCD (1,600 by 1,200), 16X dual-layer DVD±RW drive, Microsoft Windows Media Center 2005, Xbox Media Center Extender, \$6,094 direct. VoodooPC, www.voodoooc.com. OVERALL ●●●●○ Music: 80 (out of 100); Photo: 75; Video: 100; Gaming: 100

### ZT Media Center PC A5346

Gamers and performance enthusiasts interested in the gentler world of mainstream multimedia may find just what they're looking for in the ZT Group Media Center PC A5346. This is a flashy, fast-as-they-come PC that now runs, fairly successfully, Windows XP Media Center Edition 2005. Odds are this 20-inch-tall system unit will remain under your desk, not in the living room next to the audio-video rack.

For \$2,600 street, you get no software (other than the OS) and a lot of hardware, starting with a black Cooler Master Cavalier case with gray accents, hinged front cover, a see-through side panel, and neon lighting. The case has five external 5.25-inch drive bays, one external 3.5-inch bay, four internal 3.5-inch bays, and an analog decibel meter in front. There are front-mounted memory card slots, along with jacks for USB and FireWire. The case maker proclaims it will be "the focal point of your living space," but that, of course, depends on your taste

in decorating. Despite claims of being ultra quiet, we noticed more fan noise than with the new Gateway and HP systems we tested.

But the target market may forgive a little noise, given that the combination of the AMD Athlon 64 FX-55, the MSI K8N-Neo2 Socket 939 motherboard, 1GB of RAM, a pair of 7,200-rpm 120GB SATA drives, and an nVidia FX 6800 GT graphics adapter made this the fastest of the initial wave of MCE 2005 systems on all benchmark tests except 3DMark03. Conversely, the bundle's scores on most of our multimedia ratings are comparatively low, because ZT lets the user choose his or her own software.

Our system included dual TV tuners, high-end Logitech peripherals (a wireless keyboard, a wireless high-res optical mouse, a Z-640 5.1 speaker system), and a good NEC Mitsubishi 71V 17-inch LCD panel (which accounts for \$400 of the system's price). There's also an infrared remote to control Media Center PC functions. The dual tuners make it possible to watch one show while recording another, or allow a Media Center Extender device remote access to one of the tuners.

With the power of its components, there's no combination of multimedia tasks that will bring the ZT Media Center PC to its knees. If you want a system that combines first-class gaming abilities with music ripping, TV viewing and recording, and photo/video editing, this is a solid choice. Just remember to keep some money aside to add your own application software.—*BH*

### ZT Media Center PC A5346

With AMD Athlon 64 FX-55, 1GB DDR 400-MHz SDRAM, two 120GB SATA hard drives, nVidia FX 6800 GT graphics with dual TV tuners, DVD±RW drive, DVD-ROM drive, Logitech Z-640 six-way speakers, Microsoft Windows XP Media Center Edition 2005, \$2,600 direct (17-inch NEC 71V LCD, \$400 direct). ZT Group, www.ztgroup.com. OVERALL ●●●●○ Music: 60 (out of 100); Photos: 60; Video: 89; Gaming: 69

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MOBILE  
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# Getting a Leg Up on 802.11n

BY CRAIG ELLISON

**R**ight when you thought you'd mastered the alphabet soup of wireless networking, along comes 802.11n. Or, more precisely, *pre*-802.11n. Even though there is no agreed-upon industry standard yet, that isn't stopping some companies from rolling out their visions of what an 802.11n product should be.

We tested the **Belkin Wireless Pre-N Router**, and were impressed with the speed and range benefits 802.11n technology promises. The downside: Such pre-standard products are not guaranteed to work with later 802.11n devices—though the unit is compatible with existing 802.11b/g equipment.

In testing we found the Belkin's performance to be simply unparalleled. On our wireless testing obstacle course simulating a real-world office environment, we measured throughput of 40.7 Mbps at 60 feet from the router (where 802.11g products typically deliver 15 Mbps). And at the 160-foot mark, where other products struggle to deliver 1 Mbps, the Belkin unit was still going strong at 8.9 Mbps.

That's the upshot. Now, the back story. The IEEE (Institute of Electrical and Electronics Engineers) 802.11 working group formed Task Group n (TGn) in September 2003 with the mission of developing a standard with a claimed data rate in excess of 200 Mbps, to deliver real-world usable throughput of at least 100 Mbps. By comparison, the theoretical maximum throughput for standards-based 802.11a and 802.11g products is 54 Mbps, and the highest usable throughput we typically see in our wireless testing lab is around 25 Mbps. That's quite an ambitious leap, and it wasn't until September 2004 that the first batch of proposals was formally introduced.

Not surprisingly, several groups of industry giants have emerged with separate, distinct proposals that are more advantageous to their planned products—each hoping that their proposal will be the one to be adopted. Some components from each camp will likely end up in the final 802.11n standard when it is ratified; ratification is unlikely to happen before late 2005, at the earliest. Unfortunately, with the number of proposals fielded (over 60), ratification could easily stretch into early 2006.

Agere, Atheros, Intel, Nokia, Philips, and Sony form the core of the TGn Sync group (<http://tgnsync.org>), which supports the use of 40-MHz channels—double the spectrum used by standards-based 802.11a/b/g products. Some countries, such as Japan, don't allow the use of 40-MHz channels, so, hypothetically speaking, any TGn Sync-based products would have to be built to fall back to 20-MHz channels.

The other industry group emerging goes by the name WWiSE (World-Wide Spectrum Efficiency, [www.wwise.org](http://www.wwise.org)). Led by Airgo, a pioneer in MIMO (Multiple-Input Multiple-Output) technology, it includes other wireless industry chipset

manufacturers such as Broadcom, Conexant (which owns the former Intersil's WLAN assets), STMicroelectronics, and Texas Instruments. WWiSE has come up with a proposal that sticks with a 20-MHz channel and uti-



**IN A WORD,**  
this stuff  
is fast.

lizes 2X2 MIMO (two transmitters and two receivers in each device) and OFDM—the same underlying technology used in the 802.11a and 802.11g standards. Optional components call for either three or four transmit antennas and 40-MHz channels that could drive data rates up to 540 Mbps.

There are a number of parallels, as well as differences, between the emerging 802.11n standard and the last standard that delivered improved performance, 802.11g. First, as with 802.11g, there will be a significant number of pre-standard

(in this case, “pre-n”) products introduced to the market. The Belkin equipment we tested is based on Airgo's MIMO-OFDM technology. With the 802.11g standard, just eight months elapsed between the first shipment of pre-standard products and the standard ratification; pre-n products, however, will be on the market for 12 to 15 months prior to ratification of 802.11n.

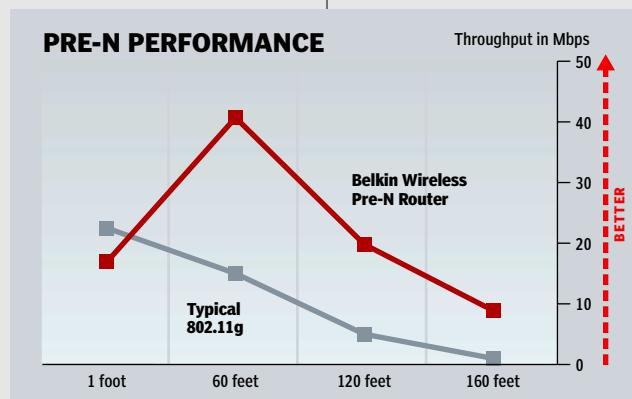
Secondly, as with 802.11g products, pre-n products will achieve better performance as compared to their legacy counterparts, but will also cost more. In part, this is because the MIMO technology of all pre-n products utilizes multiple transmitters and receivers in both the client cards and the access points.

A big difference in the launching of the two standards is that while pre-g manufacturers could promise that the products would be upgradable to the 802.11g standard, it's too early in the standards-setting process for any manufacturer to guarantee upgradability of pre-n products to be compliant with the final 802.11n standard.

While early adopters may want to try out the technologies in the pre-n products, they should understand that the products they purchase most likely won't be upgradable and may or may not be interoperable with other manufacturers' products. Enterprise buyers should wait until the 802.11n standard is ratified before making any purchases. And at the very least you can master a few related acronyms like MIMO, TGn, TGn Sync, and WWiSE, and you're sure to be a hit at your next social gathering.

**Belkin Wireless Pre-N Router.**

\$149.99 list (plus \$99.99 for Belkin Wireless Pre-N Network Notebook Card adapter). Belkin Corp., [www.belkin.com](http://www.belkin.com).



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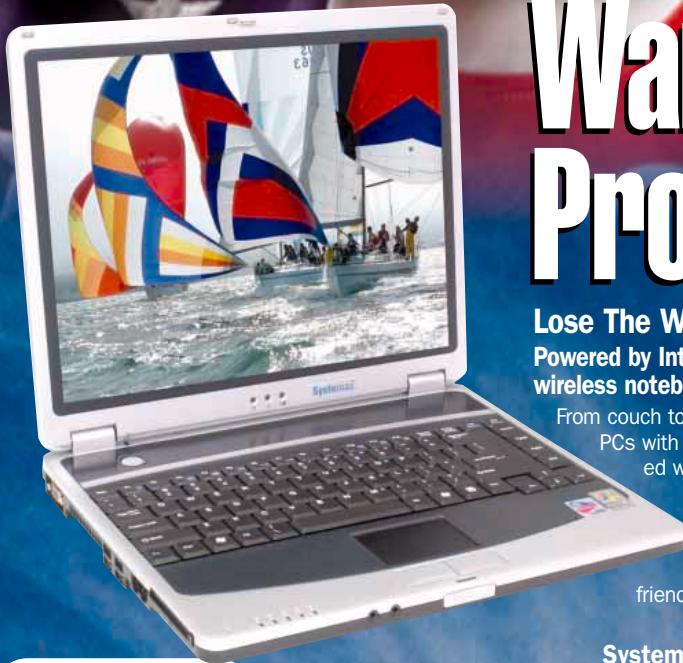
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ALL PRICES ARE SUBJECT TO CHANGE. NOT RESPONSIBLE FOR PHOTOGRAPHIC AND TYPOGRAPHICAL ERRORS.

# A Personal Firewall—Don't Surf Without It

BY NEIL J. RUBENKING

A personal firewall should protect your computer against external attacks by hackers or worms and against internal betrayal by spyware or Trojan horse programs. It shouldn't inundate you with alerts or otherwise interfere with normal computer use.

We tested new versions of two well-known firewalls in three distinct ways. On a direct, unprotected connection to the Internet, we ran a dozen Web-based tests to ensure that all ports were *stealthed*—that is, completely hidden from the outside. We ran ten *leak test* programs—single-purpose utilities that attempt to circumvent the firewall in the same way a worm or Trojan might. Finally, we took the gloves off and attacked the firewall process using techniques available to a malicious program.

## McAfee Personal Firewall Plus 6.0

McAfee Personal Firewall Plus 6.0 adds new features that make it more thorough and less obtrusive. Direct integration with HackerWatch.org (a McAfee site) provides detailed information about specific attacks and outbreak warnings, as well as a world map of hacker activity. Advanced Worm Protection blocks the spread of worms, and Smart Recommendations reduce interruptions by automatically configuring over 700 known programs.

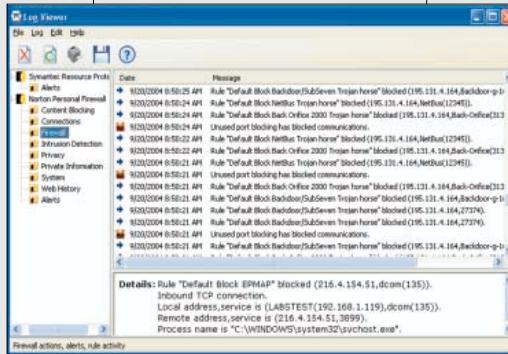
The Startup Assistant initially configures settings such as network type and the desired alert reporting level. MPFP can display three levels of alerts. Red ones (always displayed) require a response. Blue alerts are informational, usually warning of a blocked connection attempt. Green ones report programs granted access. From the alert or the Event

Log, you can map and trace an event's origin and view the sender's WHOIS data (when available). The Traffic Monitor lists bandwidth-intensive processes: An unfamiliar program here could be cause for alarm.

MPFP successfully thwarted virtually every Internet-based attack we threw at it. The one very minor exception was the IDENT port, which most firewalls leave closed but not stealthed, to avoid significant problems. However, among our ten leak tests, it caught only Gibson Research's two-year-old LeakTest. McAfee verified that while its corporate firewall protects against such attacks, the personal edition does not. Still, MPFP defended itself well against direct attack. Stopping the firewall service triggered a dire warning and an offer to restart the firewall. When we killed the same process using Task Manager, the firewall restarted immediately.

McAfee Personal Firewall Plus is easy to set up, and the red alert pop-ups diminish as it learns what programs are allowed access to the Internet. It tested well against external intrusion, and our direct attacks on the firewall failed. The ability to trace and map attacks is impressive, though not likely to result in capturing a hacker. However, if a brand-new worm or Trojan using the well-known leak test techniques gets loose on your system, MPFP won't protect you.

**McAfee Personal Firewall Plus 6.0**  
\$39.99 direct. McAfee Inc.,  
www.mcafee.com. ●●●○○



**THE LOG VIEWER** in Norton Personal Firewall 2005 shows a detailed list of events and attacks.

## Norton Personal Firewall 2005

Symantec's Norton Personal Firewall 2005 protects the system's ports and controls program access to the Internet, as always. This version automatically recognizes and allows almost 1,700 programs. It also analyzes incoming traffic to identify and block attacks that a basic firewall might miss. A Privacy Control feature impedes phishing scams, and it can block ActiveX controls, Java applets, and ads.

On installation, NPF automatically recognizes your net-

work and lets you identify it as one of four separately configured locations. It displays an unobtrusive alert box when Automatic Program Control recognizes a new program. You can optionally scan for Internet-aware programs and

manually approve or block them. The intrusion event dialog offers more information and the option to suppress similar alerts—but no chance to trace the attack.

By default, an attacking IP address is totally blocked for half an hour, a feature we disabled for Internet attack testing. Like MPFP, NPF successfully stealthed every tested port except the IDENT port. It failed all but one of our leak tests until we enabled "Program component monitoring" and "Program launch monitoring." With these options it blocked all but one leak test, but we also had to endure a new flurry of alerts during normal Internet usage. And we found that choosing "Permit once" when warned about "unrecognized modules" added all modules involved to the safe list. We were completely unable to shut down NPF's essential services or to terminate them using Task Manager. A Registry attack disabled parts of the user interface but not the underlying protection.

Privacy control is a nice bonus. For example, if you enter your eBay password or bank account number in the wrong Web site, you'll get an alert. On a family computer, you can set it to block personal information

completely and lock the settings with a password.

So with its excellent protection and bonus features, this package is hard to beat.

**Norton Personal Firewall 2005**  
\$49.95 direct. Symantec Corp.,  
www.symantec.com. ●●●●○



**YOU CAN SEE WHAT MPFP** has been up to by checking the handy Inbound Events log.

completely and lock the settings with a password. So with its excellent protection and bonus features, this package is hard to beat.

# ACT!: All Your Sales Force May Need

BY RICHARD V. DRAGAN

For years, ACT! has been a solid contact-management solution. The latest version, **ACT! 2005 Premium for Workgroups**, adds improved database scalability and better sales and CRM (customer-relationship management) capabilities that extend the application into new territory.

The setup utility got us up and running smoothly, with only a couple of added steps for setting up the included Microsoft SQL Server 2000 Standard Edition. Fortunately, you needn't know much about SQL Server administration; you can perform backups and other administration tasks right from the ACT! 2005 console.

As a pure contact manager, the program still excels. It has an intuitive interface for searching, editing, and adding contacts. Importing existing address books from Microsoft

Outlook, Outlook Express, and a variety of text formats is a cinch. ACT! 2005 beefs up its support for groups and adds the ability to track companies and groups separately. Meanwhile, a handful of function tabs let you relate contact histories and to-do tasks along with contact information, which is the real strength of the product.

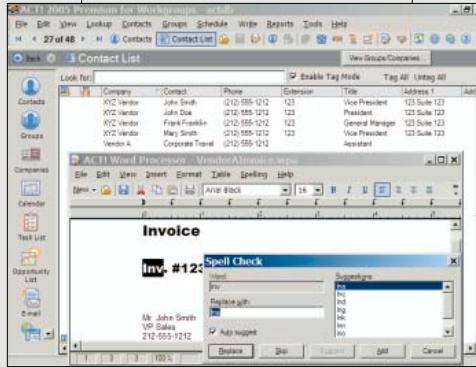
The included e-mail client works with Exchange 2000 and 2003 servers. And in a big plus, ACT! 2005 supports synchronization with Outlook 2000 and later. The program also includes client software for mobile users, which lets them take a snapshot of contact and scheduling data and load it on Pocket PC or Palm OS PDAs. The only drawback: The file is static, so updates made to the

database won't be reflected until the next time a user syncs up, and changes made on the PDA won't be reflected back.

fillment, and you can view opportunities graphically to estimate sales figures.

Unlike [salesforce.com](http://salesforce.com), a direct competitor in the CRM space, ACT! has excellent customization options. Not only can you modify your workflow for closing deals, you can also customize any and all layouts and reports with the integrated designer tools.

As a solid database for tracking contacts, ACT! 2005 Premium continues the application's winning ways. And with a new emphasis on CRM, it is ready to impress a whole new audience.



ACT! 2005's integrated word processor includes a convenient built-in spell-checker.

A new emphasis in the Workgroup edition provides handy tools for tracking sales and managing customer relationships. A predefined ACT! sales cycle includes six steps from initial contact to sales ful-

fillment, and you can view opportunities graphically to estimate sales figures.

ACT! 2005 Premium for Workgroups  
\$399.99 direct. Best Software SB Inc., [www.act.com](http://www.act.com), [www.bestsoftware.com](http://www.bestsoftware.com). ●●●●○

# Electronic Accounting Made More Approachable

BY KATHY YAKAL

Word processors and spreadsheet applications have grown incredibly complex, but they're still easy to use because much of the bloat is hidden. With your typical accounting software, however, all the bloat and complexity is in plain sight. Intuit's new **QuickBooks SimpleStart** addresses this problem and makes accounting much more approachable for small businesses.

Setup takes about 3 minutes. The program's wizard simply asks you a few questions about your business preferences.

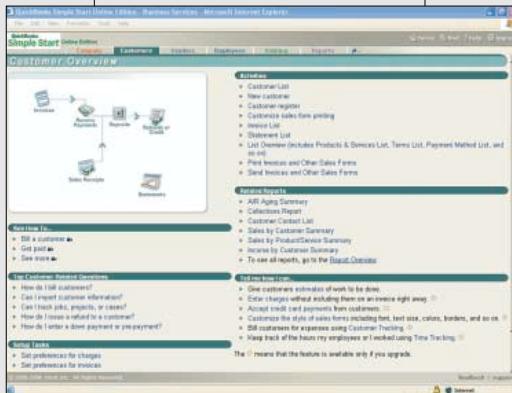
The home page displays an interactive flowchart with icons representing the program's core functions. The program distills accounting tasks down to only those most necessary, and it presents them in straightforward language. Rather than

lumbering phrases like "accounts receivable" and "aging reports," SimpleStart refers to "Money In" and "Invoices That Haven't Been Paid."

Click on a tool and you can add and edit records (customers, vendors, and items), forms (invoices and estimates, sales receipts, deposits, and customer payments), and bank account registers. You can write and print checks, and enter expenses and refunds. There are practically no ways to customize individual form and record templates, but the included options should suffice if your business is really small. Likewise, only

a handful of report types are available, but all the standards (such as Profit & Loss) are here.

An online version of SimpleStart is also available (\$9.95 per month for one or two users), and it is actually more powerful than the desktop software. It's just as easy to use but adds handy tools and navigational features. Its forms are more customizable than those in the desktop version, and its reports are more plentiful. You can do very simple employee tracking and display all account activity history. Our biggest problem with the online version is that the screens are liberally peppered with ads for more expensive products and services.



SIMPLESTART's online version surpasses the desktop edition, offering clearer navigation.

QuickBooks SimpleStart  
\$99.95 direct (desktop); \$9.95 per month for one or two users (online). Intuit Inc., [www.quickbooks.com](http://www.quickbooks.com). ●●●●○

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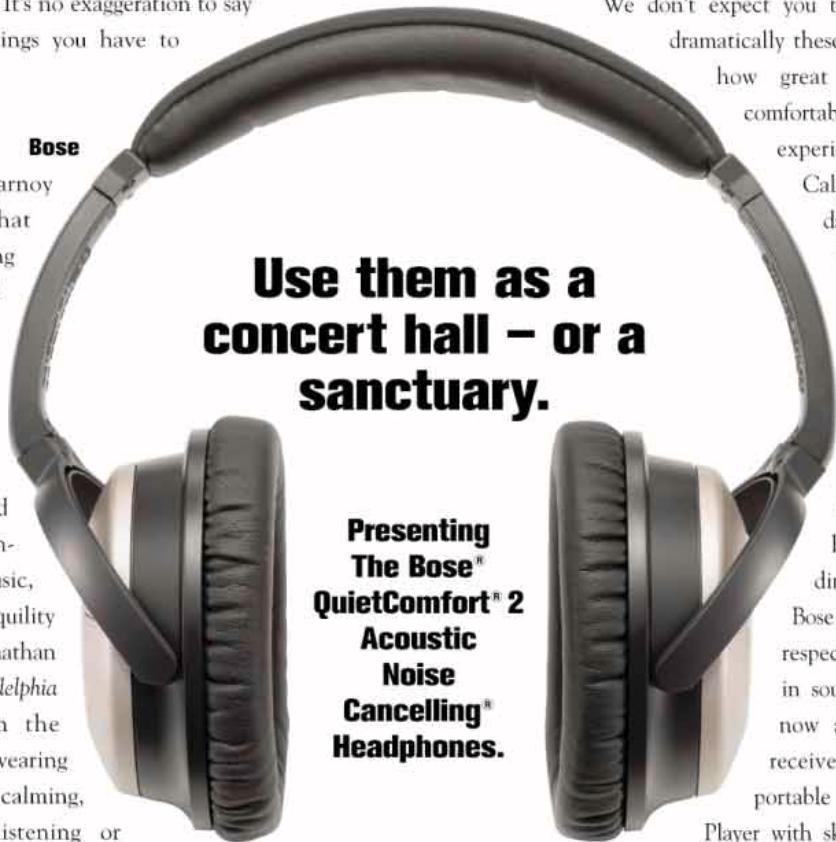
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# Better Painting in Paint Shop Pro 9

BY GALEN FOTT

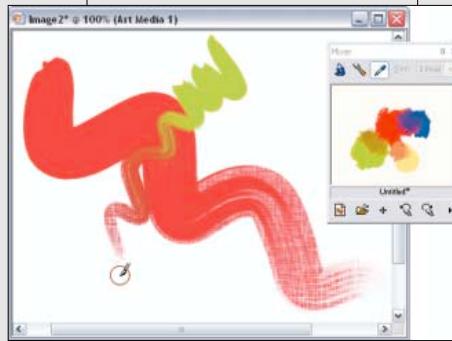
Compared with the dramatic redesign Jasc Software introduced in Paint Shop Pro 8, the updates and enhancements in **Paint Shop Pro 9** seem at first glance much subtler. But Jasc has packed a number of impressive new tools and capabilities into this professional-level image editor. In a couple of cases, Jasc is playing catch up with Adobe Photoshop CS. But Paint Shop Pro 9 reaches beyond mere image editing with “painting” features that resemble Corel Painter’s.

The most noticeable change to the interface is the addition of a Photoshop-style History palette, which records a list of the commands you’ve performed on an open image. You can click on command names in the palette to undo and redo actions, watching the image update as you go. But Jasc in-

troduces a novel twist: Unlike Photoshop, Paint Shop Pro lets you undo a command without undoing subsequent commands. The inherent downside is that Paint Shop Pro’s History palette can be much slower than Photoshop’s, especially when you have to wait for complex filters to reapply themselves.

The new Art Media tools effectively replicate the experience of painting and drawing on canvas or paper. New documents can be created with inherent background textures such as “coarse paper” and “fine canvas.” Like a real-world artist’s palette, the Mixer palette lets you swirl and combine colors until you find the perfect shade. You can then apply your color to the tex-

tured canvas using tools such as Chalk, Crayon, and Oil Brush. These tools don’t quite achieve the real media verisimilitude of Painter, which is



**BOTH THE IMAGE** canvas and the Mixer palette in Paint Shop Pro 9 let you smear and blend thick oil-paint strokes.

dedicated to simulating real-world painting on the desktop. But Paint Shop Pro’s artistic toolkit is nonetheless a very impressive addition.

Paint Shop Pro 9 has also

added some new tools for correcting photos, including the ability to open Camera RAW-formatted images. And the new feature that smooths digital photo noise does a very good job. But two other features, Fill Flash and Backlighting, fail to provide the same degree of control and quality that Photoshop’s counterpart, the Shadow/Highlight tool, offers.

While Photoshop CS remains the champ for prepress work, Paint Shop Pro 9 continues to provide a more than satisfactory—and much cheaper—alternative for editing digital photos. And the new painting tools could attract an entirely new, cameraless audience to the program.

**Paint Shop Pro 9**

\$119 direct. Jasc Software Inc.,  
www.jasc.com. ●●●●●

# Pass “Pass the Dutchie,” Make a Penny

BY TROY DREIER

Do you enjoy discovering new music and recommending it to your friends? Then **PassAlong.com** could be for you. This new online music store lets you turn your recommendations into purchase credits. It’s an interesting idea, one that turns the listener into a salesperson. But the young service trails the established players in polish and depth.

In a novel twist, the entire PassAlong catalog of songs and albums is available through eBay, giving a giant kick start to eBay’s new Digital Downloads section. And buying through eBay gives shoppers

the option to pay with PayPal.

PassAlong launched with a scant 500,000 tracks. That’s on the light side, considering that iTunes Music Store has over one million tracks and MSN Music soon will, too. PassAlong’s tracks are 128-Kbps WMA DRM-protected files, and

they mostly cost 99 cents per song or \$9.99 per album.

What sets the service apart is that with PassAlong you can earn store credit by recommending songs to your friends. You earn 10 percent of the purchase price if you recommend music and it’s purchased, so if

you recommend an album for \$9.99, you’ll get 99 credits—enough for one song—if your recipient buys it. If your friend then recommends the album and that leads to another purchase, you’ll earn another 1 percent. The store also lets you create “showcases,” so that you can display all your finds to your friends in one spot. This lets budding entrepreneurs and

trendsetters set up their own virtual music stores with songs they’ve discovered.

Apart from the recommendation angle, the store doesn’t have much going on. There’s no biographical info about the artists, and none of the amenities (allowances, gift certificates, videos, charts) offered by iTunes Music Store or Napster. Browsing the store quickly becomes boring, and the different music genres aren’t laid out well (for example, there are no sub-genre pages under Rock). That said, it’s easy to see how the company’s recommendation-tracking technology could work well in a bigger, more established online store.

**PassAlong.com**

99 cents for most tracks, \$9.99 for most albums. PassAlong Networks,  
www.passalong.com. ●●●●●



**PASSALONG.COM'S UI** is inviting enough, but the store lacks the deeper features of its competitors.



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# Canon Shoots Back with New SLR

BY DANIEL GROTTA  
AND SALLY WIENER GROTTA



Canon and Nikon have long been head-to-head competitors in the SLR (single-lens reflex) camera market, and that fierce rivalry has carried over into the digital SLR market as well. The \$1,499 Canon EOS 20D body is Canon's latest counter to Nikon's best-selling \$999 Nikon D70 body, which was an Editors' Choice winner in the digital SLR category (and Nikon's answer to Canon's \$900 Digital Rebel). In addition to offering a higher resolution and better construction than the D70, the EOS 20D is a stellar performer capable of capturing spectacular images.

While the Nikon D70's body—like that of the Digital Rebel—is made of high-impact plastic, the EOS 20D is built on a magnesium alloy chassis. It is ergonomically sculpted, with a finger indent to the side of the shutter button, a thumb indent on the back of the camera, and lots of nonslip surfaces on the hand grip and the back. The camera has a rock-solid, sturdy feeling, with well-marked and conveniently clustered controls.

The EOS 20D has a subdial behind the shutter button, a select dial on the left side, and Canon's

and settings within the viewfinder window are quite visible and easy to read. One nice touch: Instead of having to depress and hold the analog buttons while using them in conjunction with the subdial, joystick, or quick-control dial, users need only depress and release a button and then move another control within 6 seconds.

The EOS 20D comes with an impressive array of features and settings that help photographers fine-tune images at the capture point. It offers auto-exposure, aperture priority, shutter priority, manual, and six program modes, as well as the ability to adjust exposure, white balance, and flash bracketing and to set contrast, sharpness, saturation, and color-tone parameters. It also provides some options not available on the Nikon competitor, such as the ability to shoot monochrome images (including black-and-white film filter-like effects) and set a precise white-

balance color temperature. For safety's sake, the EOS 20D automatically shuts off whenever the memory card (it takes CompactFlash) door is inadvertently opened; the D70 doesn't. The EOS 20D also has nine autofocus points to the D70's seven, an ISO equivalency range of 100

to 3,200 (compared with 200 to 1,600 on the D70), and the ability to save RAW and JPEG images simultaneously at various resolutions and two compression levels (the D70 has a single RAW+JPEG setting and three JPEG compression levels).



**TOP-NOTCH**  
images hail from  
the Canon EOS 20D.

The D70's 6-megapixel CCD produces a maximum resolution of 3,008 by 2,000 pixels; the EOS 20D's 8.2MP CMOS sensor yields a maximum resolution of 3,504 by 2,336 pixels. Both cameras have top shutter speeds of 1/8,000 of a second, although the D70 syncs with its built-in flash at 1/500 of a second. The EOS 20D manages just half that.

Nikon's \$1,299 D70 camera kit comes with a solid, well-built DX digital series f/3.5 18- to 70-mm lens, which our tests show produces an impressive average resolution of 1,700 lines, and a very good average pixel-transition ratio of 2.09 percent. Canon's \$1,599 EOS 20D camera kit comes with a somewhat flimsy, plastic-mount EF-S digital series f/3.5-f/5.6, 18- to 55-mm lens (the same one that comes with the Canon EOS Digital Rebel).

We don't love the feel of this lens, but we can't deny that it scored well on tests. With it, the camera's average resolution is a tremendous 1,800 lines, and its average pixel-transition ratio is a fine 2.01 percent.

The camera can accept any Canon EF or EF-S mount lenses, and Canon's beautifully crafted, fast-focusing EF 16- to 35-mm f/2.8L USM lens (\$1,499) is much better matched to the EOS 20D's abilities.

When we shot with this lens, we got an average resolution of 1,825 lines and an amazing average pixel-transition ratio of 1.86 percent. But this lens costs as much as the 20D body.

The EOS 20D is fast, booting in 0.2 seconds and clicking off 5.4 fps for up to 23 frames. Shutter lag is practically nil. The image quality with the EOS 20D's default JPEG settings is very good to excellent. Our simulated-daylight shot was well exposed and exhibited exceptional detail, though it was slightly clipped in the highlights. Our flash shot was almost picture-perfect, with razor-sharp details, even illumination, accurate exposure, and great color. Like other digital SLRs, the EOS 20D shoots best in RAW mode or by using its extensive repertoire of exposure and color controls, which would easily eliminate the highlight clipping in our simulated-daylight shot.

Excellent construction and design, fast performance, and great image quality make the Canon EOS 20D the current top gun among digital SLRs under \$3,000. We only wish that the bundle included a better lens.

#### Canon EOS 20D

Body only, \$1,499 list; kit with f/3.5-f/5.6 18- to 55-mm lens, \$1,599. Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com). ●●●●●



**MENUS ON THE EOS 20D'S** easily readable LCD are intuitive and well-organized, giving quick access to the camera's myriad features (such as in-camera red-eye reduction, shown here).

signature circular quick-control dial on the back. It also sports a tiny nine-way joystick, for quickly moving the autofocus point or the white-balance shift, as well as for playback panning. Menus are bright, intuitive, well-organized, and legible, and the large, illuminated control panel

balance color temperature.

For safety's sake, the EOS 20D automatically shuts off whenever the memory card (it takes CompactFlash) door is inadvertently opened; the D70 doesn't. The EOS 20D also has nine autofocus points to the D70's seven, an ISO equivalency range of 100



"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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# File Compression Beyond ZIP

BY CADE METZ

Ever try to e-mail 15 to 20 digital photos at once? Or a hefty PowerPoint presentation? It's not always easy. Some e-mail systems put a limit on the number of files attached to each outgoing message, and others restrict the number of megabytes. And if you manage to get all those megabytes out on the wire, there's a chance they'll be rejected by the recipient's e-mail server.

Thankfully, you can avoid all this hassle. All you need is file-compression software. This can not only reduce the size of single large file but also squeeze several large files into a svelte archive that behaves like a single file. Yes, Microsoft Windows Me and XP come with such software built in, but they support only the ZIP compression format (just one of many, though the most popular), and they don't offer many of the advanced compression tools available from third-party standalone apps.

Two of the market's bigger names have released new versions of their compression apps. PKWare, creators of the ZIP format, introduced SecureZIP 8.0 for Windows, a business-oriented app that not only compresses your files but also uses high-end encryption techniques to guard data against tresspassers. Meanwhile, win.rar, creator of the RAR compression format, introduced Version 3.4 of its consumer product, WinRAR.

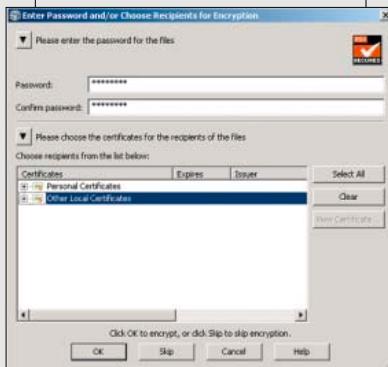
## SecureZIP 8.0 for Windows

Need to keep your business documents confidential? With SecureZIP, you can protect your compressed archives with 256-bit AES encryption, complex passwords, and even digital certificates. This program will secure your data whether it's

zipping across the Internet or just sitting on your hard drive.

The app uses the same basic interface as PKZip for Windows, PKWare's tried-and-true compression product for consumers. Like many compression apps, it runs either as a wizard or as a standard application window. Both interfaces are quite easy to use: You simply choose the files you'd like to compress and encrypt, enter a password, and—if need be—select a digital certificate from your hard drive. If you want to leave the archive unencrypted, simply uncheck the encryption option in a dialog box.

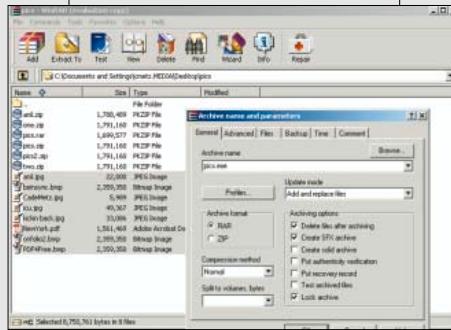
The app defaults to 256-bit AES encryption, but you can



**KEEP PRYING EYES** from seeing sensitive documents with SecureZIP's encryption.

switch to 192-bit AES, 128-bit AES, or 168-bit 3DES. And PKWare has made sure you can send encrypted archives to others even if they don't own the full application: A free reader that decompresses and decrypts archives is available on the company's Web site.

The main app can also integrate with Microsoft Outlook and IBM Lotus Notes, so you can compress and encrypt files without leaving your e-mail client. If you want to deploy the app across your entire or-



**THE SELF-EXPLANATORY UI** makes moving to WinRAR from your current utility painless.

ganization, PKWare offers separate versions of the program designed specifically for large corporate environments. With these versions, you can control the app from a central console, ensuring that employees use it only as you'd like them to, or you can integrate the app with directory servers holding vast numbers of digital certificates.

The standalone version of SecureZIP can be purchased for \$99. Versions with Administrative and Directory Integration Modules can be purchased in volume.

## SecureZIP 8.0 for Windows

\$99.95 direct. PKWare Inc., [www.pkware.com](http://www.pkware.com). ●●●●●

## WinRAR 3.4

Not everyone will need to protect their files with AES encryption. If security is a minor concern, WinRAR

gives you just about everything you could possibly want from a desktop compression tool. Whether you use it as a wizard or as a standard application window, you have a wonderful amount of control over how your archives are created. And WinRAR is smart enough to tweak existing archives: It can convert archives from one compression format to another and even repair damaged archives.

When creating an archive, WinRAR defaults—naturally—

to the RAR format, but you can easily tell it to use ZIP instead. The company claims that its format results in files up to 30 percent smaller than ZIP files. Indeed, RAR archives generally take up less space than ZIP files, but the amount of space you save varies depending on how many megabytes you're compressing. The rub, of course, is that few people

who might receive your archive will have a utility to decompress RAR archives.

Whichever format you use, the app gives you all sorts of tools for customizing the way it creates archives (though not all apply to ZIP archives). You can make the program automatically delete your original files once it has created an archive. You can create a self-extracting archive, so someone without compression software can open it. You can also adjust the compression speed and even embed text comments in your archive.

Though it doesn't go nearly as far as SecureZIP, WinRAR does offer some security tools. You can protect an archive with a password, for example, and encrypt the names of the files buried within. There are a lot of tools to keep track of, but luckily, WinRAR offers a convenient Profiles feature that lets you save configurations so you can easily use them in the future.

WinRAR is also a fine tool to have when compressed files start rolling into your e-mail in box. It doesn't just convert RAR files to ZIP and vice versa. It can also convert from ARJ, GZ, TAR, and several other file formats. It can even convert a standard archive into a self-extracting archive. In short, WinRAR is well worth its price.

## WinRAR 3.4

\$38.24 direct. win.rar GmbH, [www.win-rar.com](http://www.win-rar.com). ●●●●●

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\* For more information on how to enter and complete terms and conditions see [www.3com.com/smallbusiness](http://www.3com.com/smallbusiness)

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# MyJeeves Helps Make Sense of Your Searches

BY JANET RUBENKING

Google is still king when it comes to comprehensive Web searches. But the avalanche of seemingly unstructured results a given search will return has opened a market opportunity for more specialized search utilities. The latest entry is actually a newly revamped Web veteran: Ask Jeeves or, more specifically, the service's MyJeeves utility. MyJeeves lets you save, organize, and annotate search results.

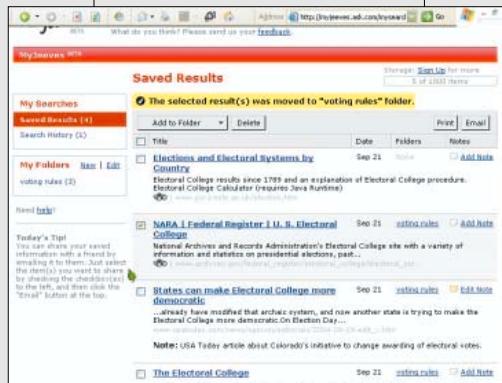
MyJeeves lets you save up to 1,000 Web search results, create folders for the saved results, enter notes on individual sites, send links with messages via e-mail, and print lists of search results. From MyJeeves, you can search the Web, your search history, or your saved searches. You can sort results alphabetically, by date, or by folder name.

Clicking on the MyJeeves link the first time brings you to

a sign-up form (signing up gives you additional free storage and the ability to access your history on any computer). The only information required is your e-mail address and a password. Unlike A9, Ask Jeeves promises to keep your information private.

After this initial setup, your saved searches appear as folder icons whenever you return to Ask Jeeves. The real time-saver comes from being able to drill down into these folders. Instead of culling information from a vast number of sites, you can search on only a subset of trusted sites you've specified in MyJeeves.

Ask Jeeves's other enhancements are relatively minor but still useful. You can now carry



**MYJEEVES LETS** you save search results for later perusal or categorization.

out map, movie, white-page, definition, and famous-people searches. There's also a new page-preview feature. Mousing over a binoculars icon that appears next to some search results pops up a thumbnail image of the page, which saves you from actually having to click away from the search results page. The previews aren't

necessarily up to date and are too small to save you from having to go to the page you need, but they show the general look of a page and should help you avoid clicking through to irrelevant pages.

The Toolbar now offers a multicolor highlighter, a pop-up blocker, and other useful tools. You can also configure the

Toolbar to access news, weather, stock, and dictionary searches as well as other features.

Ask Jeeves and its MyJeeves utility raise the bar in the expanding field of specialized search utilities. This old favorite has a new life.

**Ask Jeeves**  
Free. Ask Jeeves Inc., www.ask.com.  
●●●●●

# Amazon's A9 Search Evens Out

BY JANET RUBENKING

The full version of Amazon.com's search utility, A9, offers an attractive mix of features, and Amazon has fixed some of the flaws we found in testing the public beta version. Powered by Google and tied to your Amazon.com account, the updated A9 service includes related search results from Google Images, the Internet Movie Database, GuruNet.com, and books at Amazon.

A9 keeps a history of your queries on its servers, thus allowing you to retrieve it from any computer. When searching and retrieving results, you have the option to activate panes for books, images,

movies, reference, history, bookmarks, and the diary. The help files are extensive and include A9's privacy statement.



**THE A9 SEARCH SERVICE** includes relevant results culled from Google Images.

Be sure to read that privacy statement before signing on, because A9 will be storing and using your personal informa-

tion—both to customize your search results and for commercial purposes.

You may also want to install the A9 toolbar, which has a diary, a highlighter, customizing features, and information about the site you're visiting. You can create lists and block pop-ups. Editing your history is easy, and you can delete links individually or all at once. You can also easily edit your bookmarks and diary, create folders for links, move folders up or down, and move links

from one folder to another. It's important to note, however, that the A9 toolbar will record *everything* you do in

your browser, not just your A9 searches, while you're logged on. You can sign out to keep A9 from tracking your history. If privacy is a concern, you can opt to use the generic service at <http://generic.a9.com>. You get access to the same page layout and customizable panes with links to related images, books, movies, and reference, but you won't get the toolbar, search history, and diary—arguably the most useful parts of the site.

A9 is an attractive and easy-to-use special-search utility that might be useful to Amazon customers. Like Ujiko, another special-search utility, it provides tools to customize your history and preferences and help organize your favorite sites. Unlike Ujiko, A9 requires that you give up a measure of your privacy to use the service fully.

**A9**  
Free. A9.com Inc., www.a9.com.  
●●●●●

# A Computer in Your Pocket

BY CISCO CHENG

**T**he **OQO model 01** may make some users wonder if a traditional laptop is really what they need. It's a real Windows XP PC that you can carry with you everywhere. If you don't do heavy-duty typing on the go or intensive computing, the pocketable OQO may be a match. But at \$1,999 and with the inherent drawbacks of its diminutive size, it may be destined to become a niche PC.

The OQO measures 4.9 by 3.4 by 0.9 inches and weighs just under a pound—slightly larger than a typical PDA. The 5.1-inch widescreen LCD (800-by-480 resolution) is remarkably viewable outdoors, except in direct sunlight, but it's small enough to grow tough on the eyes if used for long periods.



**THAT'S NO PDA**, but rather a full Windows XP PC, only smaller.

Once you slide the screen up, a QWERTY thumb keyboard is revealed. There's a big black TrackStik for navigation (slightly fatter than a typical pointing

stick), with left and right mouse buttons stacked on the left-hand side. Even with Windows XP Pro (not Tablet PC Edition) installed, the model 01 incorporates some tablet-like functions with the use of a digital pen, most notably as a means of maneuvering through windows. Unfortunately, the stylus is rather imprecise, which makes tapping on small icons (such as the Open and Close boxes in the corners of documents) a chore.

The unit is built around a 1-GHz Transmeta Crusoe TM5800 processor and a Silicon Motion Lynx3DM graphics chip. In hands-on use, running Microsoft Office apps and surfing the Internet seemed fine, but we don't recommend having several applications running at the same time. On

our wireless tests, the OQO mastered throughput of 3.9 Mbps at close range.

The OQO has a lot of the same ports found on your PC, with sacrifices made. There's one USB port, but it's USB 1.1, not the much faster 2.0. There's also a FireWire port, built-in 802.11b wireless, and Bluetooth. The cable that attaches to the included dock has FireWire, power, USB, audio-out, and monitor ports (supporting up to 1,280-by-1,024 resolution).

Clearly, the OQO model 01 isn't right for everyone, but it could prove very useful for the salesperson who needs a scaled-down PC on the road.

#### OQO model 01

With Transmeta Crusoe TM5800 (1 GHz), 256MB RAM, 20GB hard drive, Silicon Motion Lynx3DM graphics, 5.1-inch transreflective LCD (800-by-480), 802.11b wireless, Microsoft Windows XP Professional, \$1,999 direct. OQO, [www.oqo.com](http://www.oqo.com). OVERALL: ●●●○○. Music: 22 (out of 100); Photos: 22; Video: 12; Gaming: 12.

## Special Advertising Supplement

# R-TOOLS: SAVING USERS FROM THEMSELVES

It seems like the amount of data you have to manage doubles every year. Bigger hard disks on every desktop, notebook and server seem to multiply as you deal with an ever-growing volume of e-mail, multimedia, and application data.

What you need is a toolbox for dealing with all that disk storage – wherever it resides – to help manage growth and solve problems, and it's available from **R-Tools Technology Inc.** ([www.r-tt.com](http://www.r-tt.com)).

So, when you get the call from the boss saying: "Hey, I was working on a huge customer presentation, and somehow I deleted it", you can turn to **R-Studio**, the comprehensive data recovery utility that can bring that file back, whether it was on a local disk, RAID or networked disk, even if encrypted or compressed. If the O/S can see the drive, R-Studio can read the data on it.

Often users have the opposite problem – a disk full of unnecessary files left behind by web-surfing, cookies, history, and all the other disk-clogging megabytes left behind by everyday use. **R-Wipe&Clean** frees up all that space to increase performance and create more room for useful information.

**For more information on these and R-Tools other utilities, please go to: [www.r-tt.com](http://www.r-tt.com).**



**R-Tools offers a comprehensive array of utilities that makes managing information easier, including:**

**R-Guard** data security software to keep information safe from theft or damage

**R-Drive Image** which can create exact disk copies used for disaster recovery or for installing multiple copies of the same drive image

**R-Mail** which can recover deleted emails or repair damaged .dbx files

**R-Word** which recovers, repairs and reconstructs lost or damaged Microsoft Word files.



# Personal Printing, Without the Wait

BY M. DAVID STONE

**PC** Personal monochrome lasers aren't what they used to be, and that's good. The 22-ppm engine in the **Samsung ML-2250** will churn out pages faster than some network printers and deliver respectable output quality as well. Even better, you can boost the 300-sheet standard paper capacity to a maximum of 550 sheets, which is plenty for personal use.

The ML-2250 is not the fastest personal laser we've tested, but it's not far off the mark. It showed a total time on our business applications suite of 8 minutes 9 seconds (using QualityLogic's testing software, [www.qualitylogic.com](http://www.qualitylogic.com)), compared with 7:42 for our previous Editors' Choice in this category, the Brother HL-5140.

Text output is excellent. All but two of the fonts we test



**QUICK AND AFFORDABLE,** the ML-2250 is a fine choice.

with were easily readable at 4 points. The remaining two are highly stylized and often don't print well, yet they were easily readable at 6 points for one and 8 points for the other. Graphics quality is just short of good, which is typical for monochrome laser printers. The one important flaw in the output is visible dithering that

creates a banding effect in some images.

Photo output rates as fair, which is at the low end for monochrome lasers but still within the expected range. As with some graphic output, the photos suffer from a banding effect. You won't want to print photos for framing, but the quality is good enough for newsletters and similar output, which is really all you should expect from a monochrome laser printer.

Most important, the ML-2250 output quality overall is better than for most monochrome laser printers. And the package as a whole offers a highly attractive mix of performance, output quality, paper handling, and price.

**Samsung ML-2250**  
 \$230 street. Samsung Electronics America Inc., [www.samsung.com](http://www.samsung.com).  
 OVERALL ●●●●○ Text ●●●●○  
 Graphics ●●●●○ Photos ●●●●○

## Samsung SCX-4100 Digital Productivity Center

**Pros:** Combines a laser printer, color scanner, and monochrome copier for a lower price than many personal lasers.  
**Cons:** No fax features. Relatively slow, with a 15-ppm engine.  
**Bottom line:** Although the Samsung SCX-4100 lacks an ADF and fax features, it's a lot of AIO at a low price. As a personal printer, scanner, and copier, it's all that many people will need.



\$200 street. Samsung Electronics America Inc., [www.samsung.com](http://www.samsung.com).  
 OVERALL ●●●●○ Text ●●●●○  
 Graphics ●●●●○ Photos ●●●●○

## Primera Signature Z1 CD/DVD Printer

**Pros:** Gives discs made in-house a more professional look. Ink costs only 10 to 40 cents per disc.  
**Cons:** Prints in only one color (black, red, green, or blue).  
**Bottom line:** The Primera Signature Z1 CD/DVD Printer makes it easy to label discs for a more professional look. The only question is whether you need to print on enough discs to justify the cost of the printer.



\$130 street. Primera Technology Inc., [www.primera.com](http://www.primera.com). ●●●●○

## Ricoh Aficio CL3000e

**Pros:** Excellent performance.  
**Cons:** Quality of output is a little low for a color laser printer.  
**Bottom line:** The Ricoh Aficio CL3000e is the fastest color laser we've seen at anything like this price. But both text and graphics quality are at the low end for color lasers, so you're paying for the speed, in part, by sacrificing some output quality.



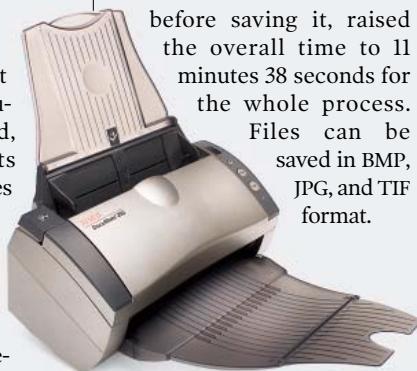
\$1,250 street. Ricoh Corp., [www.ricoh-usa.com](http://www.ricoh-usa.com). OVERALL ●●●●○  
 Text ●●●●○ Graphics ●●●●○  
 Photos ●●●●○

# Fast Scans for Long Documents

BY M. DAVID STONE

**T**he Xerox DocuMate 252 isn't the fastest document scanner around, but at a rated 25 sheets per minute, or 50 images per minute (ipm) in duplex mode, it's the fastest we've seen that's targeted for personal use.

Actual scan speed depends on the settings for pixels per inch (ppi) and the scan mode. A black-and-white scan, for example, will be faster than a color scan. The claimed 50 ipm assumes a 200-pixel-per-inch (ppi) scan in black-and-white mode. We got an even faster time with those settings going to PDF format, at 68 ipm. Going to searchable PDF format, which applies OCR to the file



before saving it, raised the overall time to 11 minutes 38 seconds for the whole process.

Files can be saved in BMP, JPG, and TIF format.

**IF YOU NEED** to scan stacks of paper, the unit has the speed.

The DocuMate comes with ScanSoft's PaperPort (one of the best scan control and document management programs available) and OmniPage Pro (one of the best OCR programs), as well as Twain, WIA, and ISIS drivers. You can use it

with essentially any program that can initiate a scan.

In addition to the programs installed by default, you can install three more: ArcSoft PhotoImpression 4, a photo editor, and two scan programs, Kofax VRS and QuickScan. Our only serious quibble is that the documentation offers no hint of why you might want them. We won't complain too strenuously about issues with extra programs, but the effect of not explaining their purpose is to make the package feel like less than a fully integrated whole. But aside from that nit, the Xerox DocuMate 252 is a fine package.

**Xerox DocuMate 252**  
 \$999.99 direct. Xerox Corp., [www.xeroxscanners.com](http://www.xeroxscanners.com). OVERALL ●●●●○  
 Photos ●●●●○ Slides (N/A)  
 Business cards (N/A)  
 Documents ●●●●○ OCR ●●●●○

For an in-depth look at these products go to [www.pcmag.com/printers](http://www.pcmag.com/printers).

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**Andreas Gauger**  
Chairman of  
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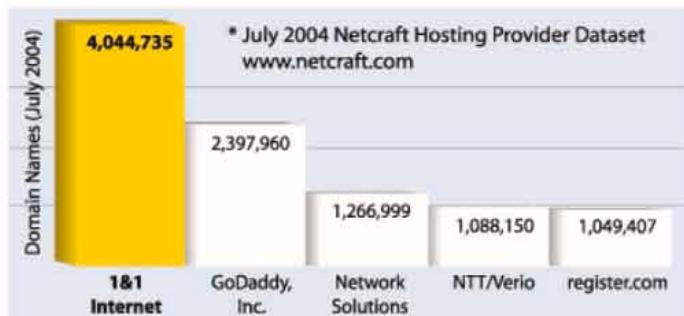
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**Michael Krupit**

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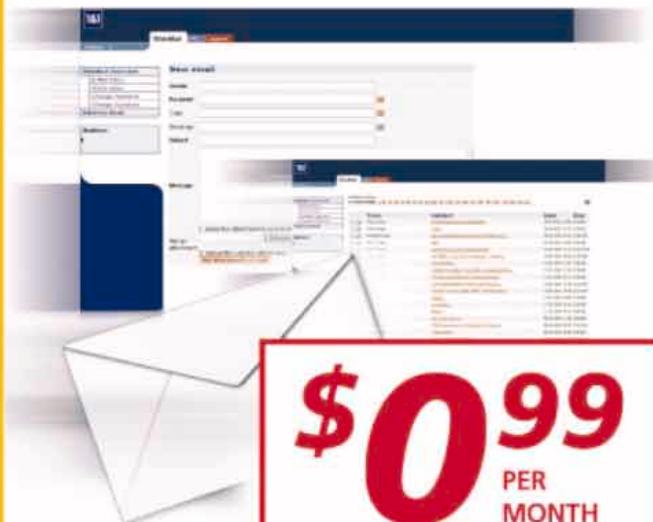
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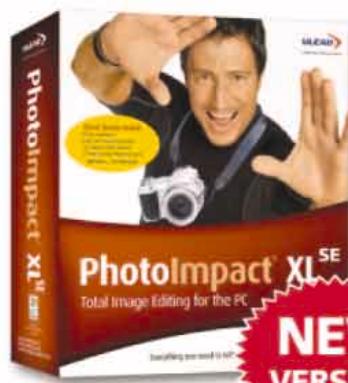
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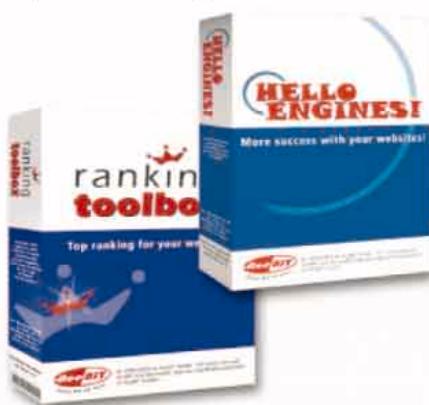
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Reliably submit your website to all the important search engines and directories.

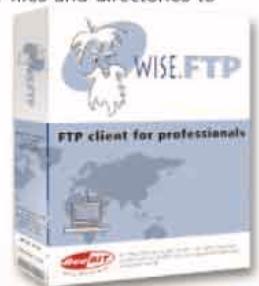


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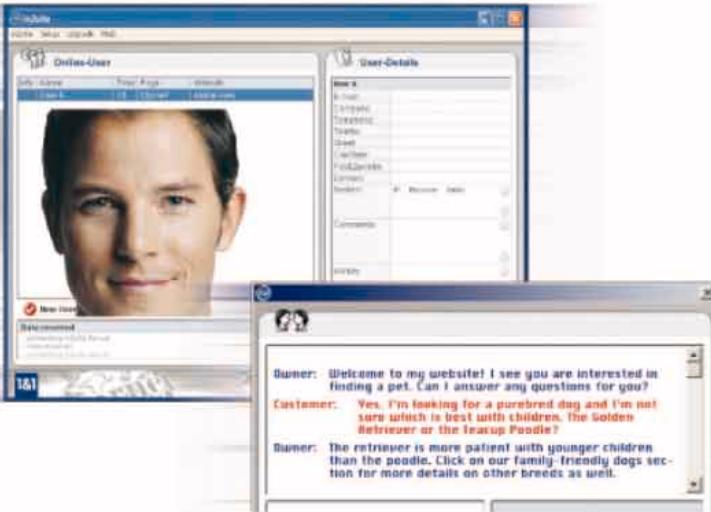
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Helen McSweeney	817 Providence Hwy, Boston, MA 02116	helenmcsweeney@hotmail.com



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\*Home packages do not include WebElements, In2site Live Dialogue, WebDatabase or Newsletter Tool.

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[www.HighImpactNetworking.com](http://www.HighImpactNetworking.com)

"When I signed up for 1&1's 3 year hosting promotion, I was skeptical, but to my delight, 1&1's services were so exceptional that I purchased a Microsoft Hosting account. 1&1's services are so reliable and affordable that I plan on purchasing additional services as my business expands."

George Alto



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In2site Live Dialogue	✓	✓
1&1 Newsletter Tool	✓	✓
1&1 WebElements	✓	✓

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SSI (Server side includes)	✓	✓

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Included Domains	3	3
Subdomains	50	50
Run multiple independent sites	✓	✓
Full DNS management	✓	✓

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1&1 WebMail	✓	✓
Symantec Virus Scanners	3 accounts	3 accounts

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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 independent 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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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

#### DOMAIN NAMES

Included Domains	5	5
Subdomains	200	200
Run multiple independent 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	✓	✓

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- Unlimited number and depth of sub-categories
- Unlimited shipping methods
- Multi-currency support
- Newsletter editor
- Import/export customer data
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# FEEDBACK

“Since my first boot of Knoppix Linux, I have been obsessed with this OS and its software suite.”

## WHAT PRICE BPL?

Michael Miller (Forward Thinking, September 21) talks about the wonders of BPL (broadband over power lines), but what is their cost?

Those unfamiliar with the technical side of BPL need to know that those “signals” are being passed via power lines (antennas), and they occupy the frequency range of about 2.0 to over 60.0 MHz. That means *radiation* of buzzy signals over the *entire* shortwave band, including CB, ham radio (I am a ham radio operator, call sign WA6AZN), and many other services. Tests have shown that the noise produced makes it nearly impossible to hear signals on a receiver unless the signals are very loud. Shortwave listening will be a thing of the past, as will emergency ham communications (remember 9/11, hurricanes, etc.?) Before jumping at the prospect of high-speed data to your computer, consider what this means to the radio world.

RON BAKER

## KNOPPIX LINUX ROCKS!

I have always been an avid fan of Microsoft and its OS. However, John C. Dvorak's mention of Knoppix Linux (Inside Track, August 17) has changed my entire outlook. Since my first boot of Knoppix from the ISO image, I have been obsessed with this OS and its software suite. The fact that it cost me nothing, “except for the 10-cent CD-R,” has turned me into a Linux fiend.

I sing the praises of Knoppix to all who will listen. I have given everyone I know a copy of the ISO image, including my wife. (No, honey, I am not a computer geek: I bench press!) I am building a new PC, and you can bet that Knoppix 3.6 will be the OS. Thank you for bringing such an outstanding product to the forefront.

KENNETH DARBY

## NIGHTS AT THE OPERA

Two years ago I was having lots of problems using Internet Explorer. It was shutting down, crashing, and sending me all kinds of error messages. One of the most annoying was “Microsoft Internet Explorer has encountered a problem and needs to close.” This was most frustrating when I was in the middle of writing e-mails or trading online. So I switched to Opera. Since then all my problems have gone away, and Opera loads pages so much faster! Since I don't



use Outlook Express either, I am not too worried about downloading critical updates (I run Windows 98 SE). That's a relief, because the last time I did a critical update, it messed up my system so badly that nothing worked, and I had to roll back to the previous version. Of course, I use an antivirus and firewall. Any reader having problems with IE should switch to Mozilla or Opera, because they are so much better. I am so glad that I discovered Opera, which has really changed my surfing experience.

LYDIA CHEN

## “HOT SWAP”: ARE READERS SERVED?

You do your readers a disservice when comparing servers (“Servers: More Power 2U,” October 5) by not explaining that the term “hot swap” has no set definition and is interpreted differently by different vendors. Administrators would like to see “hot swap” mean that the component can be replaced on the fly, with zero downtime to the users of that server. We would like the end users to be unaware that there was a problem.

On my HP/Compaq servers, a disk failure is remedied by removing the dead drive, plugging in a replacement, and letting the system rebuild the RAID array in the background. There is no need to even go to the console. Many other vendors' servers can do this.

On my Dell servers, you need to start their Array Manager software, and then pause I/O on the controller, before removing the drive. This effectively knocks all users off the server. Failure to do so results in trashed RAID volumes. After replacing the dead drive with a new one, the server needs to be rebooted, and the OS will not come up until the RAID volume has rebuilt. For Dell, “hot swap” simply means that power did not have to be removed. This is of little value when the server is unavailable for four hours.

TERRY R. RYNDA

## DVD AUTHORIZING WORKAROUND

DVD authoring (Bill Machrone, October 19) indeed requires excessive work to make up for programs's failings. Pinnacle Studio does a decent job of creating DVD menus, including customized chapter links and thumbnails, but the DVD directory it produces contains DVD-incompatible file entries (e.g., “Author”), and the program has also never been able to burn a disc on my system. As a workaround, I create the initial set of files in Studio, delete the superfluous entries, and then use a separate program to burn the files to disk.

MICHAEL WEINER

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We regret that we cannot answer letters individually.

## Corrections and Amplifications

■ In the story on “Smart Phones” (October 19, page 93), our photographer's name was misspelled; it is Thom O'Connor.



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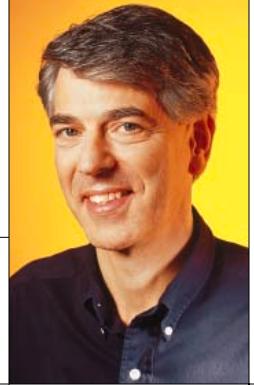
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# Bill Machrone



## Electron Leak? Raging Torrent!

Since I wrote “The Electron Leak” (October 5), which addressed the issue of standby power and how much electricity our computers consume, I think I’ve heard from most of the electrical engineers on *PC Magazine*’s subscriber list. Most complained that I’d probably done the measurements wrong by using improper instruments for AC voltage and current, or I’d ignored the difference between volt-amps and watts.

I did, in fact, use a calibrated rms (root-mean-square) voltmeter appropriate for AC measurement and an accurate AC ammeter with resolution in the milliamp range. But I measured volt-amps, not watts.

One of the challenging things about measuring AC power consumption is that current consumption is not constant, since the voltage varies continually. An ammeter is likely to read the peak value, while the average current consumed is much lower. The power factor—the phase relationship between AC voltage and current—is another wrinkle. As reader Gary Handova (and numerous others) explained:

*Current is not necessarily in phase with the voltage. An example would be equipment that is powered by a transformer. When no power is being consumed, the transformer will still have a significant “excitation current.” This current is 90 degrees out of phase with the voltage and will not register on a power meter. There is also some loss that does consume true power, but this is typically much less than the excitation current.*

Your power company sells you watts, not volt-amps, and it takes true current consumption to spin the electric meter. But the power factor can be affected by capacitive and inductive loading on the line as well as by the devices that are using the juice. And while it’s generally close enough to base your billing on, it’s never perfect.

I remember all of that theory from my high-school electronics classes. I also remember the bench testing we did with instruments, motors, and transformers under varying loads. We quickly discovered that transformers wandered pretty far from the theoretical ideal and that most consumed real power all the time, whether they were loaded or not.

You can verify this in a very unscientific way just by touching some wall warts—your basic, cheap, transformer-based power supply. You’ll find that some are warm, even though they’re not charging anything or the equipment is off. The cheesy, lossy transformers are a problem, as are poorly designed

power-filtering circuits. If there’s thermal rise, there’s power consumption. For much of the equipment I was measuring, the power factor isn’t that far off, and VA is pretty close to watts. The damage is cumulative: 50 megawatts here, 100 MW there, and you’ve got gigawatts of wasted power across the country.

I also verified my findings with published numbers on various government and industrial Web sites, and again, I was pretty close. When I shared that with some of the folks who wrote to me, they told me to be suspicious of the numbers, that the government and industry had a vested interest in not building more power plants and in putting the onus of conservation on the consumer.

Whether that’s true or not is hardly the point; the real issues are keeping millions of tons of pollutants out of the air, lowering the consumption of fossil fuels, decreasing our dependence on imported fuels, and freeing headroom in our electrical supply system that may amount to 5 or 10 percent of the total. And for all that, the onus is on us, and on the industry.

Microsoft and Intel influence many aspects of PC design, far beyond the operating system and the chips. Intel is currently pushing for more efficiency in the power supply in future PCs, which will mean cooler operation and less power consumption.

Chris Calwell, research director of Ecos Consulting, has done research for the EPA and worked with Intel on efficiency. He points out that laptops are, on average, five times more energy-efficient than desktops, and can be even more so. A shocking 95 percent of users don’t bother to enable any power management features when the system is on AC power—when the savings, both in power conserved and longevity of the system, can be dramatic. Many desktops have power-conserving modes, which often go unused.

Meanwhile, desktop power supplies need an efficiency overhaul to counteract another trend: Graphics card power consumption is rising much faster than any other component in the system, potentially doubling between this year and next—making it by far the hungriest component in the system. Check out <http://www.80plus.org> for an understanding of the improvements that can be made.

**The real issues are keeping millions of tons of pollutants out of the air, lowering the consumption of fossil fuels, and decreasing our dependence on imported fuels.**

**MORE ON THE WEB:** You can contact Bill Machrone at [Bill\\_Machrone@ziffdavis.com](mailto:Bill_Machrone@ziffdavis.com). For more of his columns, go to [www.pcmag.com/machrone](http://www.pcmag.com/machrone).

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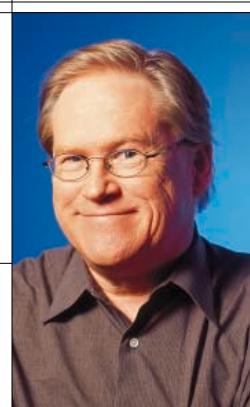
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# John C. Dvorak



## A Google-Microsoft War

**T**here's been a lot of gossip about the upcoming Google browser and its possible impact on Microsoft. It's hard to predict what will happen, but it won't surprise me if an all-out war between Google and Microsoft ensues. We are about to witness a repeat of the Netscape browser war—this time with a different strategy.

It's unlikely that Google will ever sell its browser. The company has developed a strategy to make money on advertising. The strategy works, and it gives Google a clear edge over Microsoft; Google can give away everything.

Besides its premier search engine, Google recently started Gmail, which competes head-on with Hotmail and has even forced Hotmail to add more free storage for its users. Google News competes with MSN in a subtle but important way too, by providing a useful home page of news. The browser will draw a new battle line. I suspect that Google may well be on its way toward exercising the strategy that Netscape threatened years ago, when its executives asserted that they could take over the desktop. Google could be trying to make the browser its nexus in a desktop strategy to eliminate the need for Microsoft Windows.

I don't really think that Windows and Microsoft can be marginalized by a browser-centric environment that relies more and more on the Internet, remote-application servers, and no real operating environment. I think there is a place for such a system, but I'm not expecting to see anyone running Microsoft PowerPoint slides from the Internet rather than from local storage anytime soon. Furthermore, the current glut of inexpensive hard drives with capacities between 100GB and 250GB makes the current architectural model for the PC too practical to go away anytime in the near future. Still, not everybody needs a high-performance Windows machine with a 250GB hard drive. Microsoft could easily lose part of the market to any number of configurations. You can be sure that the company will see the Google browser as its biggest threat and find ways to thwart Google.

According to some valley gossip, Google is already raiding Microsoft for browser developers right out of the Microsoft Internet Explorer staff.

It's possible that the entire Google browser initiative is nothing more than a retribution maneuver, because Microsoft has recently made a lot of noise about the super search engine that it intends to roll

out—a Google killer. When fully realized, this engine is supposed to be able to do natural-language queries, which have always been laughable. All you have to do is look at the results of any translation software to realize that anything but the most simplistic structures cannot be parsed by any known methodology with any consistent accuracy. If the idea is just to have fun with words, then go for it. If the idea is to help people search the Internet better, you might as well use Ask Jeeves.

While it's nice to imagine a search engine that could respond meaningfully to questions like "What is the best restaurant in Boston?" the likelihood of actually getting the right answer is nil. Part of this is because some of these natural-language queries have philosophical underpinnings as well as linguistic issues. The last time Microsoft tried to explore anything deeper than the "C" prompt was with Microsoft Bob, its ill-fated, smart OS shell that was human engineered. From that came Clippy, the idiotic helpmate for Office users for which even the simplest problem is impossible. A simple query quickly becomes a dialogue that deteriorates into a series of yes-or-no questions as if you are being diagnosed.

Microsoft rolled out a simple version of its new search engine as a beta last year, and I've had it on my personal portal ([www.dvorak.org/home.htm](http://www.dvorak.org/home.htm)) as an alternative engine. I am not impressed by it and seldom use it. It does not seem to have nearly the number of update crawlers as Google must use. The pages are always dated and old. Also, the new Microsoft engine does not employ a cache, one of Google's most useful features. With a cache, you can load pages that have been taken offline, recently changed, or served from a sluggish server; this is a must-have element in any competitive search engine if it intends to surpass Google.

The only light at the end of the search engine tunnel for Microsoft is that Google's once-vaunted page-rank methodology, which thrust it into leadership, has been rendered useless by the ever-changing nature of the Web. But Google still seems to have the most crawlers, the biggest server farms, and the most depth. If Microsoft can't get close to that, then these other features, even if they work, won't make much difference.

**You can be sure that Microsoft will see the Google browser as its biggest threat and find ways to thwart Google.**

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

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# Inside Track

**A**nyone who uses digital cameras soon discovers that the best file format to save images in is RAW. While RAW produces large files, those files contain all the data that comes off the CCD or CMOS image sensor. The information is pure, “raw” data that’s not turned into a JPEG or TIFF. The cool thing about all this data is that it allows for more **complex image manipulation** than you get with other formats. And there are no weird artifacts.

**The problems with RAW are threefold.** The first is the file size. A RAW file is often ten times larger than the same image saved in JPEG, depending on your compression setting. With larger and larger CompactFlash and SD memory, this is less of a problem than it used to be. I usually carry around 4 gigs of memory when shooting RAW.

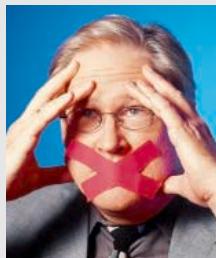
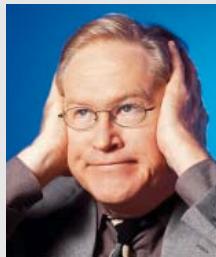
The second problem is that RAW files **do not** become thumbnails in Windows, so you can’t find pictures easily. And the final problem is related: Camera makers do not all use the same RAW format—as a matter of fact, **no two RAW formats** from different manufacturers are alike. If all RAW formats were the same, the thumbnail issue would probably get resolved.

Now Adobe wants to change all this and is promoting the idea of a **digital negative specification format**, called a DNG file—in effect a universal RAW format. The idea is that once a specification has been settled on each camera maker will develop its future cameras to produce a **standardized RAW format**. In the meantime, Adobe is going to develop plug-ins or utilities so that today’s various formats can be turned into DNG.

I’m not sure how far this will go, since the data that comes off various camera CCD/CMOS systems is **radically different** from camera to camera. One way to create a DNG file would be to take the real RAW data and process it into a DNG file, but that would seem to defeat the purpose of the concept. And you’d still have purists who would gripe about the “horrible” changes that occur.

Of course, the idea behind Adobe’s initiative is for users to get more out of working with RAW files in Photoshop.

**Sun Microsystems Update.** I recently had a chat with Sun Microsystems chairman Scott McNealy. The company wanted to set me straight about its relationship with Microsoft, emphasizing that it’s about **interoperability** more than anything else. I saw it as a scheme to attack Linux and OpenOffice. OK, whatever. The conversation resulted in some interesting comments whose real meaning I had to get by **reading between the lines**. The most telling thing I



**Baseball games are mildly dangerous, since you can get hit by a foul ball and seriously hurt. Does encouraging people to use laptops in the stands sound like a good idea?**

gathered was that Sun is heavily involved with AMD and apparently loves working with the company. McNealy hinted that Intel, by comparison, is very difficult to work with. Sun is rolling out some interesting high-performance eight-way Opteron-based servers. We’ll see where that goes.

What also interested me during the conversation was the **open-source Solaris** strategy. There’s been a lot of talk about Solaris going open-source. McNealy says that Sun is spending a lot of time trying to deduce the perfect licensing model. I suspect this whole thing will never get traction.

And, finally, the most interesting bit is that Ivan Sutherland is still there, working on the **asynchronous or clockless processor**. Once something like that is perfected (if it ever is), the game will change.

Meanwhile, I did chat a little about the failed Itanium initiative that Sun signed on to early in the product’s predevelopment. Sun was one of the first companies to **bail out**. Now I see that HP **just announced that it will jump ship** and stop selling Itanium workstations—specifically the Itanium 2-based ZX2000 and ZX6000—because apparently nobody is buying them. This is a particular blow to Intel since HP helped develop the chip, and if HP doesn’t want it, then who will? It’s toast. **A fiasco** on a par with the iAPX 432 chip from the early 1980s. And, man, was it the talk of the town when it was announced. Hah.

Then it was divulged that Intel CEO Craig Barrett **will be retiring** as of May. His tenure pretty much coincided with the Itanium mess, and I’m sure that he’s none too pleased with the outcome.

**Tidbit:** For over a year the San Francisco Giants have provided full wireless 802.11b access to fans at their stadium, SBC Park. Now they intend to use the wireless access to give laptop users **instant replays** and other useful information during a game. I suspect that an audio feed will eventually be incorporated too. As far as I’m concerned, baseball games are mildly **dangerous**, since you can be hit by a foul ball and seriously hurt. Does encouraging people to use laptops in the stands sound like a good idea to you? “Hey, look, I got an instant message from Mary!” BAM!

**This story in EE Times** got my attention: “WASHINGTON—A consortium of 28 aerospace and IT companies unveiled an initiative on Tuesday (Sept. 28) aimed at developing a common networking architecture that would link military and homeland security users and a range of sensor systems to an interoperable, global network.” Isn’t this how the robots and computers **took over the world** in *Terminator 3*? Just a thought.

# TURBO DRIVE



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# Bill Howard



## The Persistence of Scanners

**A**round the heyday of the Model T 80 years ago, this column might have started out, “Buggy whips have never been more versatile or useful than they are now.” And the parallel today might be, “Document and business-card scanners remain a valuable and increasingly affordable tool for business and personal productivity.”

So let's say it: Scanning lives and even thrives, despite the proliferation of e-mail for communication. Hardware prices are coming down and scanning software has gotten smarter. Odds are that that blue-ink-on-yellow-paper invoice you never could scan properly two years ago now scans perfectly on the first pass. And it's likely stored in an open format that will be with us a century from now: the PDF.

The biggest change for the better has been the availability of Kofax VRS (VirtualReScan) software in affordable—now sub-\$500—document and personal scanners, despite the software's costing \$500-plus were you to buy it alone. VRS figures out the best way to knock out colored and gray-shaded backgrounds while increasing the legibility of text and writing even when it's not black ink on the original. Think of VRS as an add-on to other scanning software, not a replacement.

The most impressive scanner I've worked with lately is the Xerox DocuMate 252, about \$980 street. It uses Scansoft PaperPort for scanning and file management, plus Scansoft TextBridge for optical character recognition, and Kofax VRS for tough-situations scanning. As with nearly all document scanners costing more than \$500 these days, it has two CCD scan heads so it can read both sides of a document at once (and discard blank back sides if desired). It scans 25 sheets or 50 sides a minute. By year's end you may see auto-duplex scanners for well under \$500.

Visioneer recently released a VRS-enabled version of its Visioneer Strobe XP 200, a sheet-fed (one sheet at a time by hand) scanner for \$400 street, \$100 more than the non-VRS version. Current Strobe XP 200 owners can upgrade to the VRS software for the \$100 price difference—a reasonable price for all the time you'll save.

Scanning hardware and software remain cantankerous. PaperPort software, even in its ninth version, still has quirks. So does VRS. For instance, on the DocuMate 252 I could create a front-panel preset to scan in 300 dpi with a filter to remove a red back-

ground, but it resisted my best efforts to implement the blue- and green-background filters at 300 dpi monochrome. The auto-crop button—useful when you're scanning a receipt—remained grayed out; it turns out that it hasn't actually been implemented yet.

For scanners with automatic document feeders (ADF), you need to pull out staples and paper clips (obviously), riffle the stack so you don't get two sheets fed as one, then babysit the ADF output tray (so the papers don't skew and eventually spill onto the floor). So even if you can load 50 sheets in the ADF, you can't just walk away and come back a couple minutes later. If there's a gray background, VRS does a great job making the type legible. But the shading creates a huge document, often 600Kb for a sheet scanned at 300 dpi, which you can knock back to less than half of that by manually using the Remove Stray Dots button.

Business card scanners are coming down in price too. Corex, the best-known of the brands (Iris, Visioneer, and Targus also sell them), now has a USB-powered scanner, the Corex 700C, which correctly scans most business cards that don't have an oddball (or italic) font. Its free online AccuCard service e-mails the card image back to the card owner for corrections. AccuCard is a great concept that could sink as users worry if the AccuCard e-mail is another online scam. (It's not.) The 700C's typical street price is around \$250; it makes more sense when it's on sale in the \$150 to \$200 range.

While you can find a slew of flatbed scanners for less than \$100 that do a great job with photos, there's no affordable negative or slide scanner. (Even if there were, scanning your old negatives can be a huge time sink.) Nor are there many affordable 11-by-17 or tabloid-size scanners for graphic artists (the tabloid Microtek ScanMaker 9800XL runs \$1,400), although stitching software is adequate for the occasional big document. For photos, your best bet is to get a flatbed scanner with an ADF (HP, Visioneer, others), run your prints through at 100 dpi, and use those as a proof sheet quality guide to your pictures (or for passable display on screen or on a TV screen), then have your best images scanned professionally (if you can't find a friend with a film scanner, preferably one with automatic scratch reduction).

**MORE ON THE WEB:** You can contact Bill Howard directly at [bill\\_howard@ziffdavis.com](mailto:bill_howard@ziffdavis.com). For more of his columns, go to [www.pcmag.com/howard](http://www.pcmag.com/howard).

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# SOLUTIONS

MAKING TECHNOLOGY WORK FOR YOU

## Understanding Queries and Reports

Here's how to display or output the information in your Access database in usable form. **BY HELEN BRADLEY**

Storing data in a database is only useful if you are able to extract it when needed. Sometimes (when making a catalog or printed list, for example), all you need is a list of the data. Usually, though, you need to find a single set of data that answers a question, such as “Which customers live in Idaho?” If you use Access, tools like the Queries and Reports are useful in getting information out of your database and onto the screen or paper. (For the basics on creating a relational database in Access, see “Spreadsheet Does Not = Database” at <http://go.pcmag.com/relationaldb>.)

We'll look at how these tools work and how you can find data, print reports, and even make calculations using your data as you retrieve it. While our examples use Access 2003, they will work fine in older versions of Access. If you use another database program, check its Help file, as it should offer similar tools for extracting data.

For our examples, we'll use a simple data table called *Employees*, with this structure:

EmployeeNumber	AutoNumber
FirstName	text
LastName	text
Office	text
Salary	Currency
ParkPermit	Yes/No
StartDate	Date/Time

Although our queries use a single table, the techniques are equally applicable to relational data using multiple tables.

### BUILDING A SIMPLE QUERY

A simple test query is to list all employees in the Baltimore office. In the *Objects* list, click on *Queries* and double-click on *Create query in Design view*. The *Show Table* dialog appears, listing all the tables in your data file. Click on the *Employees* table, then on *Add*; this lets you access the table's fields to build your query. Click on *Close*.

You create a query in the *Select Query* dialog. The details of your table appear at the top. Below them is a grid in which you will list the fields you want to see in your results and the question you're asking.

To get each field to appear in the results table (called a “recordset”), drag it from the table list in the top half of the dialog and drop it onto a column in the grid. You can also double-click on a field and it will jump to the next available column. Even if you don't want to see the office listed—after all, you only want to see Baltimore entries—you must include the *Office* field, as it contains the data to match. Dragging the asterisk will make all fields appear in the results but you'll still have to include the *Office* field so you can build your criteria. Type “Baltimore” in the *Criteria* line under the *Office* field, and click on the *Run* button on the toolbar (its icon is an exclamation point); you'll now see a list of everyone who works in that office. Click on the *Design view* button to return to the query. To hide the *Office* column, disable the check box in the *Show* column for that field.

When you close the query, you'll be asked if you want to save it. If you do, it will appear in the *Queries* list.

### REUSING A QUERY

While this simple query would be useful if you often needed a list of Baltimore office employees, it is unnecessary to create separate queries for each office. It's simpler to create a query that will return a list of employees from the office of your choosing.

For this, you create what's called a *parameter query*, which, whenever you run it, prompts you to enter the office descriptor. Return to the Query design view and replace “Baltimore” in the *Criteria* area under the *Office* field with this entry:

[Type the Office for a list of employees]

Now, whenever you run the query, you'll be prompted with a dialog into which you can type the *Office*. When you do, a list of that office's employees appears.

### MULTIPLE CRITERIA

Some queries will involve more than one match. For a list of everyone in the Baltimore office who earns more than \$45,000 a year, you can write a query with two crite-

The screenshot displays the Microsoft Access interface. At the top, a window titled "10% salary increase Query1 - Select Query" shows a data grid with columns: LastName, Salary, and SalaryIncrease. The data rows are: Johnson (\$45,000.00, \$4,500.00), Mountain (\$50,000.00, \$5,000.00), Deegan (\$65,000.00, \$6,500.00), Smith (\$45,500.00, \$4,550.00), and Ingram (\$47,000.00, \$4,700.00). Below this, a "10% salary increase" report is shown with the same data. In the background, the "Query1: Select Query" design view is visible, showing the "Employees" table selected and fields being added to the design grid. The design grid shows: Field: LastName, Office, Salary, SalaryIncrease: [salary]\*0.1; Table: Employees, Employees, Employees, Employees; Sort: ; Show: [checked]; Criteria: ; or: .

**USING CALCULATED** fields, you can make calculations from data in the database. We have also included examples of a returned query and a report generated from these calculations.

**86** INTERNET:  
Google  
everywhere.

**88** SECURITY  
WATCH:  
Limited  
userhood.

**90** INTERNET  
PROFESSIONAL:  
Webmaster  
tools.

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

ria, framing it as an AND search, as both criteria—"works in the Baltimore office" and "earns more than \$45K"—must be met.

In the *Query design view*, ensure that the *Salary* and *Office* fields are included; under *Office* in the *Criteria* row, type "Baltimore" and under *Salary*, type ">45000" (or ">=45000" to include people who earn exactly \$45K). Run the query to test it.

A similar query is to find everyone who works in the New York office or who has a parking permit. In this situation, you want anyone who matches either or both of these criteria. To write this, place one of the *Criteria* (it doesn't matter which) in the criteria line of the query design screen and the other in the OR line. To phrase the query for the *ParkPermit's* Yes/No field type, type *Yes* as the text to match.

You may encounter a problem when you want to write an AND search involving a single field. Consider the situation where you want to return everyone who started employment between 1/1/2000 and 3/2/2002. For this you want everyone who started on or after 1/1/2000 and who started on or before 3/2/2002; a record must meet both criteria to be a match. However, there's only one criteria box for the *StartDate* field, and you need to fit two criteria into it. The solution is to use *Between*, so the search criteria are phrased as:

**Between #1/1/2000# and #3/2/2002#**

When you use *Between*, it's like writing criteria using *greater than or equal to* the smaller value and *less than or equal to* the larger value.

To make this a parameter query so that you're prompted to enter the start and end dates, you'd write it as:

Between [Type the earlier of the two dates in the format mm/dd/yyyy] and [Type the later date (mm/dd/yyyy)].

You can also write an AND query based on a single field, like *StartDate*, by dragging the field into the *Field* area twice and writing one half of the AND query in the *Criteria* for the first instance of the field and the other half in the second instance of the field. It's not as tidy an approach, but it still works.

## MAKING CALCULATIONS

Another kind of query involves making a calculation with the data. To determine

how much it would cost to give everyone in the Baltimore office a 10 percent raise, you first create a regular query to return everyone who works in the Baltimore office. To manage the calculation, you'll add a temporary calculated field to the query—one that only exists in the query recordset. In the *Field* area of the next blank column, type:

Increase: [Salary]\*#0.1

Now run the query and notice that the last column, which we've called *Increase*, contains a figure that is 10 percent of the corresponding *Salary* field for each person. The figures appear as bare numbers, such as 4,500, and aren't formatted neatly, so you must format the new field yourself. Right-click on the field and choose *Properties*, then choose *Currency* from the drop-down list to the right of the *Format* entry.

Another type of calculation query is used for questions like "What is the total amount of salaries paid to employees in the Baltimore office?" Here you should display only two fields: *Salary* and *Office*. You also need a *Totals* row in the query design. To display it, choose *View* and *Totals*.

Under the *Salary* field, click in the *Totals* row and choose *Sum* from the list. Add the word "Baltimore" to the criteria under the *Office* field and run the query. There are other calculators you can use in the *Totals* row, including *Avg*, *Max*, *Min*, and *StDev*. This type of totals query can only work where you group records based on a field that contains repeated values—such as *Office*, where you have many employees in one office. If you try to run this same query with, say, *Office*, *LastName*, and *Salary* fields visible, it won't work right.

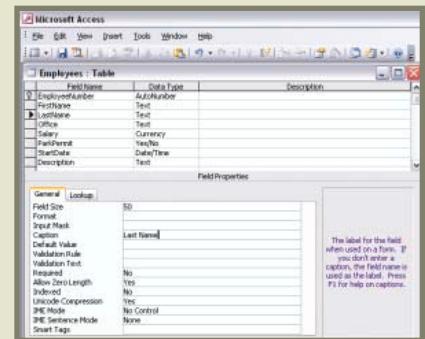
## CREATING REPORTS

So far, the results of our queries have been displayed on the screen. To get a printed list, you will use a *Report*. They are often easiest to create using the report wizard; you can fine-tune their design later.

You can create a report based on either a table or a query. If you base it on a query, only those records that match the query will appear in the report. If you base a report on a parameter query, the prompt dialog for the criteria will appear when you open the report. Type the entry to look for, and the query will be run behind the scenes and the report created from that data only.

## CAPTIONS

Single-word field names are easier to work with (particularly when you're making calculations), but they look pretty awful in reports and forms. You can get around this limitation by including a *Caption* for each field in the table design. The text in the *Caption* area is used when the wizard creates a form or a report, and you still get the benefit of single-word field names when working in other areas of Access.



To create a report using the wizard, choose *Reports* from the *Objects* list and double-click on the *Create report by using wizard* option. From the *Tables/Queries* drop-down list, choose the table or query to use and then select the fields to include in the report. Click on *Next*; when prompted with "Do you want to add any grouping levels?", select a field (if desired) to group by. In our example, you could group all employees by *Office*. Click on *Next*, and choose one or more fields to sort the data by. If you choose to group the records, this sort order will apply within each group.

To create totals and to summarize the data, click on the *Summary Options* button and enable checkboxes for the calculations you want performed on the numerical fields in the report. Click on *OK* and then *Next*. Choose a layout and a style, and give your report a name. When you're done, choose *Preview the report* and click on *Finish*. You can adjust the report's layout by switching to *Design View* and making changes there.

*Helen Bradley is a contributing editor of PC Magazine. You can contact her at Helen\_Bradley@ziffdavis.com.*

## INTERNET

# Google Everywhere

There are a number of ways to get your favorite search results—with or without a PC. **BY TARA CALISHAIN**

Most of us use Google many times a day for many different things: Phone-book lookups, word definitions, news searches, and, of course, ordinary Web searches. Most of the time, we do this sitting at our computers looking at our browsers. That's fine, but you're not in front of your PC all the time, and even when you are, you have other things to do than keep up with searches. Happily, both Google and third parties offer alternatives for getting Google information without using your browser. Some of them don't even require a computer!

There are several ways to get Google search results sent to your mailbox.

Google Alerts ([www.google.com/alerts](http://www.google.com/alerts)) are still in beta, but they're already useful. Simply enter a Web or news search query, how often you want to receive updates (either once a day or as it happens), and an e-mail address. Google will then send you notes with the titles, URLs, and brief snippets from matching stories. If you get a Google account (they're free) you can sign in and manage the alerts, choosing how often you want them and whether you want them in text or HTML e-mail.

Google Alert ([www.googlealert.com](http://www.googlealert.com)), which is not affiliated with Google, is another option for tracking Web searches. You need to register (it's free), but then you can track several different queries.

If you just want to run one search at a time, however, use Cape Clear's Google by E-mail. Send a note to [google@capeclear.com](mailto:google@capeclear.com) with your query in the subject line, and you'll get the first ten results back by e-mail. Unfortunately, since Cape Clear's application uses the Google API, you can only use this service for Web searches. (The Google API doesn't offer access to Google's "special searches," including phone numbers, news, and images.) That's a

pity, because it would be much cheaper than dialing 411 from a mobile phone.

Of course, e-mail is passé to some people; all the cool kids these days use Google via RSS feeds. Some of the feeds are within Google's terms of service; some, alas, are not. The aforementioned Google Alert makes its search updates available as RSS feeds. (See Figure 2.) Also, try Peter Drayton's Google2RSS ([www.razorsoft.net/weblog/stories/2002/04/13/google2rss.html](http://www.razorsoft.net/weblog/stories/2002/04/13/google2rss.html)). If you'd rather not install the Google API, you can use Ben Hammersley's Google-to-RSS solution, which is available at [www.benhammersley.com/tools/google\\_to\\_rss.html](http://www.benhammersley.com/tools/google_to_rss.html).

If you really want to get away from your browser, try instant messaging to get answers from Google. YIMGoogle provides search results in Yahoo Instant Messenger. You'll find instructions for using YIMGoogle at [www.tropo.com/techno/java/yimgoogle](http://www.tropo.com/techno/java/yimgoogle). For Mac OS X users, there's a Perl script called Googlematic that lets you search Google via AIM or MSN ([www.macupdate.com/info.php/id/7633](http://www.macupdate.com/info.php/id/7633)).

What about staying in touch with Google even when you're away from your computer? Google offers two forms of search by cell phone. One is for shoppers: Froogle Wireless (<http://labs.google.com/frooglewml.html>) allows any WML-capable cell phone to search Froogle's catalog of online products. Unfortunately, the

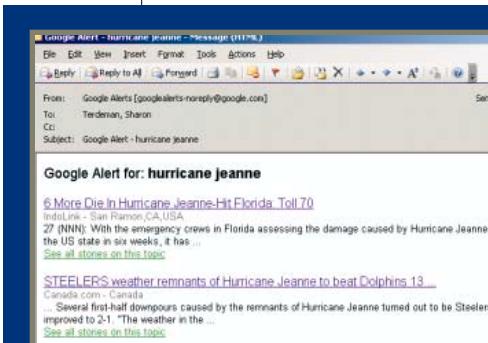


**FIGURE 3:** You don't need a computer to use Google—get search results on your PDA.

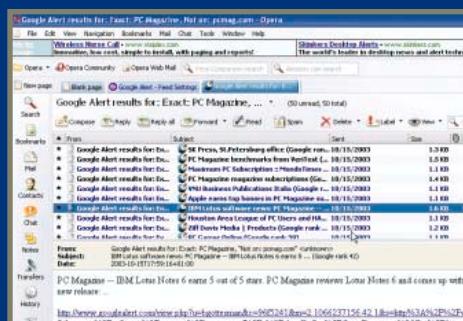
search results list only prices. Froogle is meant to be a price comparison engine, not a catalog offering details about the items. To do regular Google Web searches by phone or wireless PDA, visit Google's Wireless User Guide ([www.google.com/options/wireless.htm](http://www.google.com/options/wireless.htm)). Here you'll find out how to access Google via a Palm PDA or an Internet-enabled cell phone.

Finally, the Google Voice Search is also worth noting, though at this writing the service is not available. But the page at <http://labs1.google.com/gvs.html> instructs visitors to "check back in a little while." We look forward to trying this out when it becomes available.

*Tara Calishain is the author of Web Search Garage (Prentice Hall).*



**FIGURE 1:** Get news or other search updates delivered to your inbox with the Google Alert service.



**FIGURE 2:** You can also get Google search results delivered when you want via RSS.

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## SECURITY WATCH

## Limited User Accounts

Logging into Windows XP as a limited user provides security benefits, but there are downsides. **BY LARRY SELTZER**

One of the things that make Microsoft Windows so vulnerable to attacks is that most users run it as administrators—users with full rights. This often means that any attack code that finds the system also has full rights.

Some people running Windows XP have tried using their systems primarily as a less-privileged “limited user.” You still need an administrator account available for system maintenance (and Windows won’t let you remove all your admin accounts anyway), but you do your day-to-

a long, but hardly comprehensive, list of such programs (<http://support.microsoft.com/default.aspx?scid=kb;en-us;307091>).

A limited user can’t save files to the root directory or to the Windows directory itself. So if a program you are using needs to save a file to the Windows directory and you’re a limited user, it will fail.

Registry keys also have permissions attached to them, with the same potential for error—even in Microsoft programs! The spelling and grammar checkers in Microsoft Word 97 will not run on Windows XP

when you’re a limited user because certain required registry keys have permissions not met by this category. Microsoft Knowledge Base article 257643 (<http://support.microsoft.com/default.aspx?scid=kb;en-us;257643>) describes how to fix the problem, but again it’s typical of the sort of issues limited users must be on the lookout for.

An issue of greater concern is that we also ran into problems running Symantec’s Norton Antivirus and Norton Internet Security as limited users. The LiveUpdate program, which updates both the

programs themselves and the definitions for viruses and other protections, requires greater privileges, as does the full system scan. (This problem doesn’t appear to be limited to Symantec’s tools.)

So when the inevitable happens and you have to perform some task that requires administrator access, what do you do? First, you can log off and log back on as the system administrator. This has the distinct disadvantage of taking you out of whatever you were working on, but it does work.

In some cases you can use the *Run As* command. This lets you run a single program in the context of a different user. If you can right-click on the program icon in Windows Explorer, you will see a “Run As...” menu option that will prompt you for



**MANY PROGRAMS** will fail to run properly in Windows when the user is logged in as a limited user.

day computing logged in as a limited user. You’ll no longer have unfettered access to all of the system in this mode and neither, in all likelihood, will any exploit code you inadvertently run. Limited-user accounts won’t make you exploit-proof, but they will generally make you safer.

You configure a user’s account type through the User Accounts control panel. Select an account, choose *Change my account type* and select *Limited*. (The procedure is different on a domain.)

Unfortunately, running as a limited user can have some significant downsides. You typically can’t install a program unless you have administrator rights, and a number of programs don’t function properly when the user has limited rights. Microsoft provides

## THE LOOKOUT

## PHISHERS SPOOF FDIC SITE

A phishing scam that appeared in late September claiming to help protect consumers against debit-card fraud and identity theft has experts worried about the increasing skill and creativity of online scammers. The scam, which takes the form of an e-mail message, falsely claims that the FDIC (Federal Deposit Insurance Corp.) has created a new program to track suspicious activity on accounts linked to consumers’ ATM, debit, and check cards. The message contains an authentic-looking FDIC logo and directs recipients to a spoofed Web site that anti-phishing experts say is located in China. Representatives from the U.S.-based Anti-Phishing Working Group have been working with officials from China’s CERT (Computer Emergency Response Team) to take down the fraudulent site.

Read more about this new con at [www.eweek.com/print\\_article/0,1761,a=135852,00.asp](http://www.eweek.com/print_article/0,1761,a=135852,00.asp).—Dennis Fisher

the username and password, or you can use the command line “runas” command. The *Run As* command is quite complex; type “runas /?” for the syntax to see for yourself.

There’s another option that makes things easier, at least for power users. Using Windows XP’s Fast User Switching option, you can have both an administrator and a limited user logged in. You try to accomplish as much as possible as the limited user. When something comes up that requires attention by the administrator, you can “switch users” to the administrator, perform the task, and switch back.

Sometimes this will require the limited user to log out and log back in, and some tasks can require a reboot, but this approach is still more convenient than the alternatives and leaves you no worse off than if you ran Windows as a single user.

The bottom line is that the limited-user option, while attractive from a security perspective, creates difficulties for users. The impediments to running Windows smoothly from it are significant unless the machine configuration rarely changes. Until Microsoft and application developers address the problem, users are left to choose between security and smooth function, and that’s not a choice anyone should have to make.

Larry Seltzer is the editor of Ziff-Davis’s Security Center (<http://security.eweek.com/>).



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## INTERNET PROFESSIONAL

# Extending Your Browser With Webmaster Tools

Here are some free and easy ways to add developer-oriented features to your browser. **BY JOHN CLYMAN**

**W**eb browsers are designed primarily for people who merely visit Web sites. But with just a few handy tricks, you can turn your browser into a tool that can help when you're creating a site. Here are some of our favorite browser-extension techniques.

## BUILD BOOKMARKLETS

When you create a bookmark or Favorites entry, its target doesn't have to be a plain old http URL: It can instead include actual code. Let's build just such a "bookmarklet" or "favelet" that resizes your browser window, letting you readily preview how a page will look to users with a lower-resolution monitor. (Although the following step-by-step instructions use Microsoft Internet Explorer terminology, the same techniques will generally work in Netscape and Mozilla.)

First, create a new Favorites entry out of any old page; the bookmarked URL is just a placeholder we'll overwrite in a moment. Then go to the Favorites menu, select the link you just created, right-click on it, and choose *Properties*. In the URL field, enter `javascript:self.resizeTo(640,480);`

Press OK, and click on Yes if IE warns you, "The protocol 'javascript' does not have a registered program...."

Select this Favorites link and you'll see the browser resize to 640 by 480 pixels. You can drag the link to your Links bar so it's always just a single click away.

Bookmarklets can be much more ambitious. For instance, you could write one that advances your browser to the next sequentially numbered page on your site in the following way: If you're currently on "www.mysite.com/page2.html," selecting the link would load "www.mysite.com/page3.html," giving you a quick way to click through subsequent pages. This code does just that, by extracting the number between "page" and ".html" in the current URL and incrementing it, then sending the browser to the resulting location:

```
javascript:
L = self.location.href;
CL = L.indexOf("page");
CR = L.indexOf(".html");
N = Number(L.substring(CL+4,CR))+1;
U=L.substring(0,CL+4) + N +
L.substring(CR);
self.location=U
```

(We've inserted line breaks between semicolons to make this code more readable, but you'd need to remove them before entering this into the *Properties* dialog.)

A variety of Web sites contain prefab



**SSPOWERTOOLS** adds a number of handy developer-oriented tools to Internet Explorer.

bookmarklets you can use right away. For links to some of them, see "Bookmarklets Boost Web Surfing" at <http://go.pcmag.com/bookmarklets>.

## CREATE CONTEXT MENU ITEMS

If you want to personalize your browser further, you can add items to the context menu that appears when you right-click within Internet Explorer.

Let's create a context-menu item that automatically submits your site to the

W3C's free HTML validation service at <http://validator.w3.org/>. Start by creating an HTML page containing some JavaScript to run the W3C validator on the current page, and save it:

```
<script language="javascript">
open('http://validator.w3.org/
check?uri=' + external.menuArguments
.document.URL);
</script>
```

Now we have to instruct IE to make this page available as a context-menu item. Run *Regedit* and find the key `HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer\MenuExt`. Right-click and select *New | Key*; call it "Validate this page." Edit the contents of the (Default) key so that it contains the name of the file you just created. Finally, right-click and choose *New | DWORD Value*; call it *Contexts* and enter the number 1. Close and restart IE. Now when you right-click, you'll see a new context-menu item that will start the HTML validator on the currently loaded page.

## ADD FREE TOOLS

Third-party utilities can be handy, bundling multiple tools into a package you can simply install and use.

Matt Kruse's IE Context Menu toolset (free, <http://mattkruse.com/contextmenu>) adds numerous context-menu items that, among other features, toggle table borders on and off, show the borders of DIV and SPAN sections within HTML code, and expose hidden form fields. Microsoft's Web Developer Accessories (free, [www.microsoft.com/windows/ie/previous/webaccess/webdevaccess.msp](http://www.microsoft.com/windows/ie/previous/webaccess/webdevaccess.msp)) let you view the source for just the highlighted portion of a page or show an entire DOM (Document Object Model) tree for a Web page.

SSPowerTools for IE (free, <http://slingfive.com/pages/code/ssPowerTools>) adds tools for a variety of tasks, from resizing the browser (and changing color depth) to validating HTML pages to highlighting sections bounded by any tags you choose.

With just a few tweaks, you can go a long way toward customizing your browser so it better meets your needs as a webmaster.

*John Clyman is a contributing editor to PC Magazine.*

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# USER TO USER

PC MAGAZINE'S COMMUNITY OF EXPERTS AND READERS

## 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

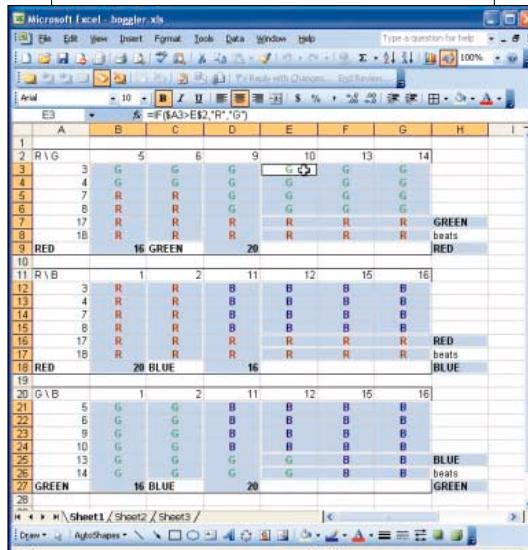
Given the number of slides and negatives you have, I'd argue that a good slide scanner, also known as a film scanner, is worth getting. One reason is resolution. At the risk of oversimplifying, for best image quality you need an image resolution of at least 300 pixels per inch (ppi) at the size you're 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. On the other hand, 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 the 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*

## Copy Only Values in Excel

I have a spreadsheet that has formulas. I need to merge data from another spreadsheet into it, without changing the formulas. How do I do this? I tried to cut and



**TO COPY** only values, delete all the formulas first.

paste, but this erased all of the formulas. Is there any way to transfer the data without having to reenter everything manually?

DELMA CORRAL

We'll assume that the two spreadsheets are laid out in precisely the same fashion, with the data values in the same places. We'll further assume that the data is not conveniently located in a simple rectangular block, because otherwise you could just copy and paste that block. Here's what you can do.

First, make a copy of the entire worksheet from which you want to transfer the new data. In the copy, select *Go To...* from the *Edit* menu, click on the *Special* button, check the *Formulas* option, and click on *OK*. Now all formulas in the copy are highlighted. Press the *Del* key to delete all the formulas. If there are any other cells that you do not want transferred to the worksheet holding the formulas, delete those, too. You should wind up with a worksheet that contains nothing at all except the data you want to transfer. Press *Ctrl+A* and then *Ctrl+C* to copy this sheet's contents to the clipboard.

Now switch to the worksheet that contains the formulas and needs new data. Click in cell *A1*, select *Paste Special* from the *Edit*

menu, check the *Skip blanks* box, and click on *OK*. Only the data will be pasted into this worksheet, leaving the formulas unchanged. Again, this can work only if the layout of the two sheets is identical.—*Neil J. Rubenking*

## Maintaining Display Settings

I'm having a minor but annoying problem with my new notebook computer. I have a KVM (keyboard-video-mouse) switch that I plug my notebook into, primarily so I can use it with my 19-inch CRT monitor. With my old notebook, I set the external video to a 75 Hz refresh rate once, and the notebook then remembered the setting. My new notebook reverts to a flickering 60 Hz every time I reconnect it. Changing the refresh rate through the *Display Properties* dialog box is easy enough, but it's a pain to have to do it every time. Is there anything I can do to automate this process?

BILL WARREN

Your best bet is to look for a graphics utility on your notebook. My Sony VAIO TR3A, for example, has an Intel graphics controller and a utility called Intel Extreme Graphics. One of the options is *Save As Scheme*, which saves the current display settings under whatever name you like—CRT, for example. You can then return to those settings by clicking on the icon in the system tray, moving the mouse cursor over the *Display Modes* choice to open the list of schemes, and then clicking on the CRT choice. This isn't fully automatic, but if your new notebook does include a utility like this, you'll probably be able to change the settings with far fewer steps than you're using now.—*MDS*

## The Reappearing Prefetch Folder

I'm using Microsoft Windows XP Professional and I keep noticing a suspicious subdirectory named Prefetch under *C:\Windows*. It seems to take all the .exe files and attach a .pf extension. Is this a virus or a bona fide Windows creation? I

I keep noticing a suspicious subdirectory named Prefetch under C:\Windows.

# Tweak UI is a terrific program for customizing Windows XP.

keep renaming this directory because I'm not sure what's creating it, but it keeps coming back.

CYNTHIA REED

You might well wonder about files that appear seemingly without reason, especially when they're directly related to executable programs on your disk. Such files could be part of some scheme to run malicious code instead of those trusted programs, but don't worry, they're not. The Prefetch folder is used by Windows XP to speed the boot process. Windows XP records information about each program that launches at boot and uses that information to boot faster the next time. Because multiple files might have the same name, it appends a "hash" of the file's location. That's the odd string of numbers and letters between the filename and the .pf extension.

This folder may accumulate useless junk, especially if you change your configuration a lot. There's no harm in emptying it. Simply delete all the files in that folder; Windows will rebuild it as needed.—NJR

**TweakUI for Win XP Install Fails**  
I tried to install the Power Toys Tweak UI utility for Windows XP, but I kept getting the message "The procedure entry point GetDllDirectoryW could not be located in the dynamic link library Kernel32.dll." How can I solve this?

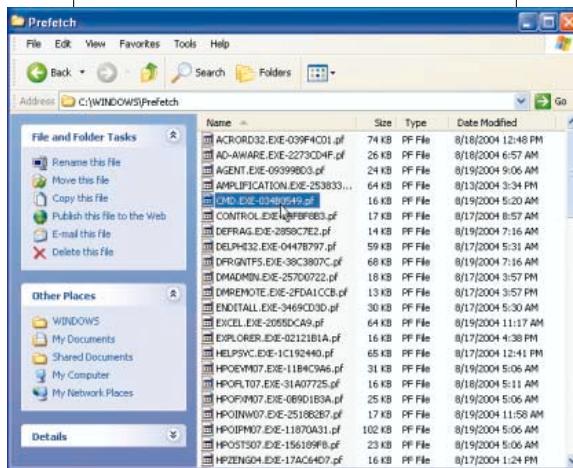
JULIO LEONE

Tweak UI is a terrific program for customizing Windows. That threatening and incomprehensible message you received when trying to install it simply means that your Windows XP version was never updated to Service Pack 1. By the time you read this, Service Pack 2 will be available, and it's always wise to keep Windows XP updated to the latest Service Pack. If you have Win XP set to up-

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**THE PREFETCH FOLDER** may seem ominous because it keeps reappearing, but Windows XP uses it to speed the boot process.

date automatically, you may have SP2 installed already. If not, we suggest that you visit [www.windowsupdate.com](http://www.windowsupdate.com) and install SP2. After doing so, you will be able to install TweakUI for Windows XP.—NJR

**Restore Suppressed Dialogs in OE**  
While creating a new message in Outlook Express 6, I accidentally checked the *Don't show me this again* box in the warning about changing to plain text. How can I undo this action?

FAROOK

Microsoft Outlook Express has a number of warnings that include an option to block future occurrences of the same warning. To restore any of these that have been suppressed, you must make a small tweak to the Registry. Launch Regedit and navigate to the key `HKEY_CURRENT_USER\Identities\`. Below this key you'll find one or more subkeys with awful names composed of letters and numbers in curly braces, like so `ABCDEF00-1234-5678-9012-1234ABCD3456`. If there's just one, open it. If more than one such key is present, select each in turn and check the user name value in the right-hand pane to pick the one corresponding to your OE identity. Below that key, open `\Software\Microsoft\OutlookExpress\5.0\DontShowDialogs`.

In the right-hand pane you'll see a value named for each *DontShow* selection you've made. Simply delete the one that you

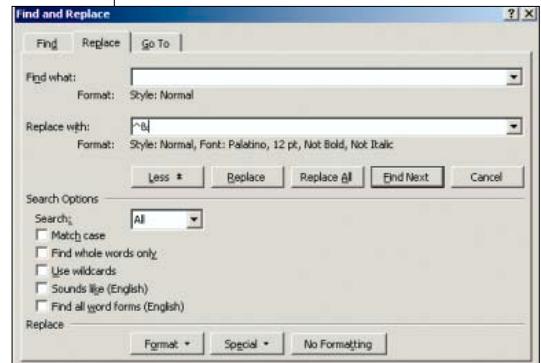
checked by mistake, or double-click on it and change the data from 1 to 0. Now that warning dialog will appear again.—NJR

## Clean Up Formatting in Word

When I cut and paste text from other documents, I often encounter a variety of fonts, styles, and sizes. I can use Ctrl+A to select all of the text and change it to one font, but this changes everything, including the headings. Is there a way to change the font and size of all text except the headings?

ANGELO GIOVAS

Yes there is, but it's a little tricky. Press Ctrl+H to bring up the *Find and Replace* dialog and click on the *More* button. Click in the *Find what* box, click on the *Format* button, and select *Style*. In the Style list, select *Normal* and click on *OK*. Now click in the *Replace with* box, click on the *Special* button, and select *Find What Text*. This inserts the code `^&`, which represents all found text. Click on the *Format* button, click



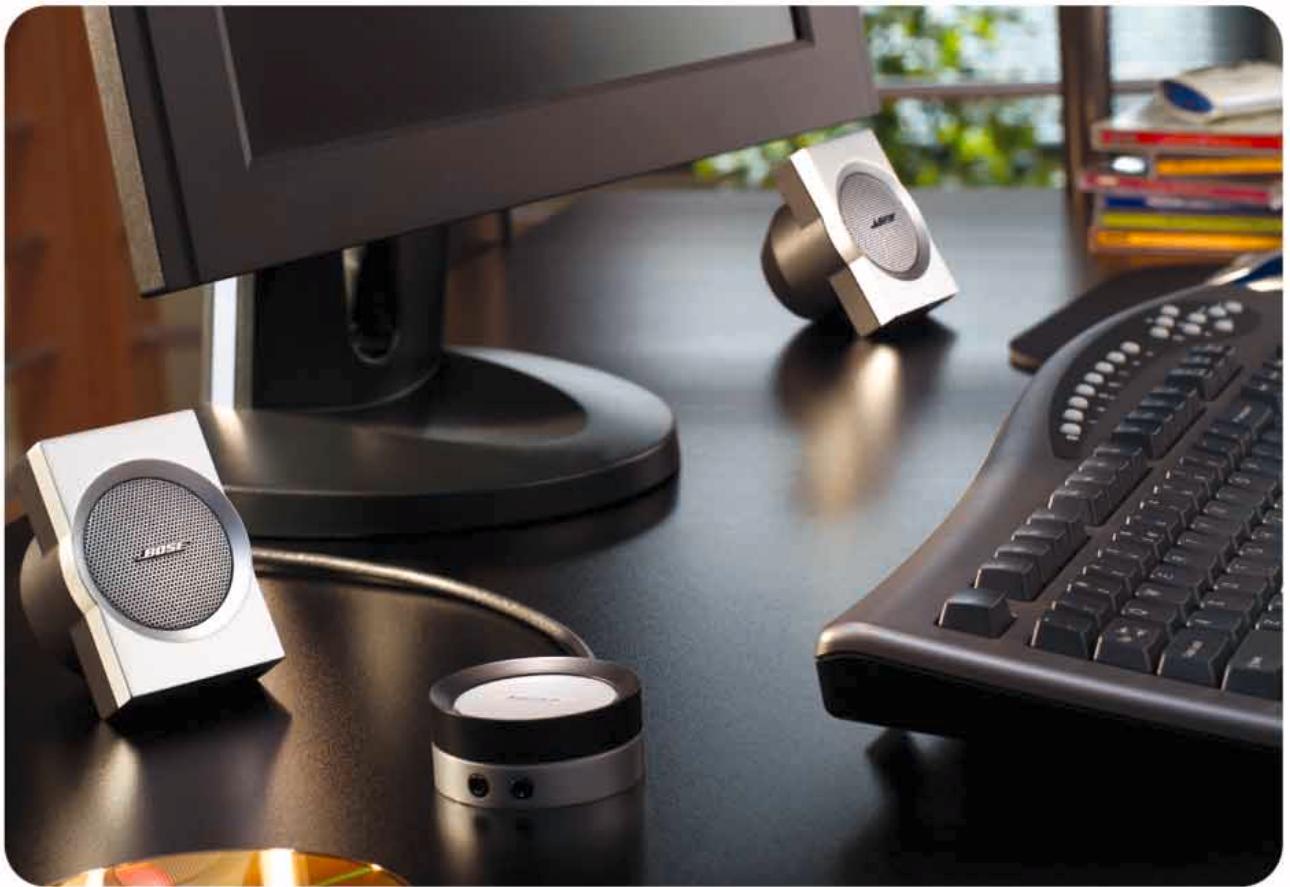
**YOU CAN CHANGE** the text in a document without affecting the headings by using Word's *Find and Replace* dialog.

on *Style*, select the *Normal* style, and click on *OK*. Then click on *Format* again, click on *Font*, and specify the desired font and size. If you also want to remove unwanted bold and italic formatting, select *Regular* under Font Style. Click on *OK*.

When you click on *Replace All*, all Normal-style text will be replaced with the same text in the font and size you specified. Be sure to save the document first, as a typo could wipe out text instead of reformatting it.—NJR

See more tips online at [www.pcmag.com/usertouser](http://www.pcmag.com/usertouser).

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- 14.1" XGA TFT display (1024x768)
- 256MB DDR SDRAM<sup>(5)</sup>
- 30GB hard drive<sup>(6)</sup>
- Ultrabay™ Enhanced CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength<sup>(7)</sup>
- 1-yr system/battery limited warranty<sup>(8)</sup>

NavCode 288380U-M419

THINK EXPRESS MODEL PRICED AT: **\$1,299\***

ServicePac® Service Upgrade:<sup>(9)</sup>  
3-yr Depot Repair #30L9192 **\$132**

### IBM ThinkPad X40

Our thinnest and lightest

#### Distinctive IBM Innovations:

- IBM Embedded Security Subsystem 2.0 – Strongest security as a standard feature
- IBM Rescue and Recovery™ – One-button recovery and restore solution

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor ULV 1GHz
  - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- 256MB DDR SDRAM
- 20GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM full-size keyboard<sup>(10)</sup>
- Only .94" thin<sup>(11)</sup>
- 2.7-lb travel weight<sup>(12)</sup>
- 1-yr system/battery limited warranty<sup>(8)</sup>

NavCode 23861CU-M419

THINK EXPRESS MODEL PRICED AT: **\$1,499**

business, professional or trade purposes, rather than personal, family or household purposes. Service period begins with the equipment date of purchase. Service levels are response-time objectives and are not guarantees. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. Calls must be received by 5pm local time in order to qualify for Next Business Day service. **(10) Full-size keyboard:** As defined by ISO/IEC 15412. **(11) Thinness:** may vary at certain points on the system. **(12) Travel weight:** includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. **(13) Public network access limited:** Subscription may be required and fees may apply. **Trademarks:** The following are trademarks or registered trademarks of IBM Corporation: IBM, the IBM logo, Rapid Restore, Rescue and Recovery, ThinkPad, Ultrabay, UltraConnect and UltraNav. Microsoft and Windows are registered trademarks of Microsoft Corporation. Intel, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Intel SpeedStep and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other company, product and service names may be trademarks or service marks of other companies. ©2004 IBM Corporation. All rights reserved. Visit [www.ibm.com/pc/safecomputing](http://www.ibm.com/pc/safecomputing) periodically for the latest information on safe and effective computing.

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### Why IBM ThinkPad Notebooks?

To make IBM ThinkPad® notebooks even more valuable, each one featured here can give you the efficiency, productivity and edge you need and comes with all the following ThinkVantage™ Technologies:

#### IBM Active Protection System:

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

#### NEW! Rescue and Recovery with Rapid Restore:

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

#### Access Connections:

Switch between wired and wireless connections.

#### Embedded Security Subsystem 2.0.1

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

#### Access IBM:

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

### IBM ThinkPad R51

#### System Features:

- Intel® Centrino™ Mobile Technology
  - Intel Pentium® M Processor 715 (1.50GHz)<sup>2</sup>
  - Intel PRO/Wireless Network Connection 802.11b/g<sup>3</sup>
- Microsoft Windows XP Professional<sup>4</sup>
- 15" SXGA+ TFT display (1400x1050)
- 256MB DDR SDRAM<sup>5</sup>
- 40GB hard drive<sup>6</sup>
- Integrated Ethernet and modem
- IBM Ultrabay™ Enhanced CD-RW/DVD-ROM combo
- IBM UltraConnect™ Antenna for increased signal strength<sup>8</sup>
- 1-yr system/battery limited<sup>9</sup> warranty<sup>9</sup>

NavCode 1836HBU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$1,499\***

With Microsoft Office Small Business Edition 2003: \$1,739

### IBM ThinkPad T42

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 1.50GHz
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 14.1" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 30GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim DVD-ROM
- IBM UltraConnect Antenna for increased signal strength
- Only 1" thin,<sup>10</sup> 4.5-lb travel weight<sup>11</sup>
- 1-yr system/battery limited warranty<sup>9</sup>

NavCode 2378DTU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$1,499**

With Microsoft Office Small Business Edition 2003: \$1,739

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

### IBM ThinkPad T42

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 735 (1.70GHz)
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 14.1" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 1-yr system/battery limited warranty<sup>9</sup>

NavCode 2378FTU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$1,749**

With Microsoft Office Small Business Edition 2003: \$1,989

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

### IBM ThinkPad T42

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 1.50GHz
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" XGA TFT display (1024x768)
- 32MB ATI Mobility RADEON 7500 graphics
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Ultrabay Slim CD-RW/DVD-ROM Combo
- Only 1" thin, 5-lb travel weight
- 1-yr system/battery limited warranty<sup>9</sup>

NavCode 2378DWU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$1,649**

With Microsoft Office Small Business Edition 2003: \$1,889

ServicePac Service Upgrade:<sup>12</sup>  
2-yr Onsite Repair/9x5/Next Business Day Response #30L9189 **\$197**

### IBM ThinkPad T42

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor 735 (1.70GHz)
  - Intel PRO/Wireless Network Connection 802.11b/g
- Microsoft Windows XP Professional
- 15" SXGA+ Flexview TFT display (1400x1050)
- 64MB ATI Mobility RADEON 9600 graphics
- 512MB DDR SDRAM
- 60GB hard drive (7200 RPM)
- Integrated Gigabit Ethernet and modem
- IBM Ultrabay Slim CD-RW/DVD-ROM combo
- IBM UltraConnect Antenna for increased signal strength
- 3-yr system/1-yr battery limited warranty<sup>9</sup>

NavCode 2379DXU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$2,399**

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

### IBM ThinkPad X40

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor LV 1.20GHz
  - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- Intel Extreme Graphics 2
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- Legendary IBM fullsize keyboard<sup>14</sup>
- 7.5hr Li-Ion battery<sup>15</sup>
- 1-yr system/battery limited warranty<sup>9</sup>

NavCode 23866GU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$1,699**

With Microsoft Office Small Business Edition 2003: \$1,939

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

### IBM ThinkPad X40 Solution Pack

#### IBM ThinkVantage Technologies:

- Longest standard battery life of any leading-brand notebook

#### System Features:

- Intel Centrino Mobile Technology
  - Intel Pentium M Processor LV 1.20GHz
  - Intel PRO/Wireless Network Connection 802.11b
- Microsoft Windows XP Professional
- 12.1" XGA TFT display (1024x768)
- 256MB DDR SDRAM
- 40GB hard drive
- Integrated Gigabit Ethernet and modem
- 7.5-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty<sup>9</sup>

#### Accessories Included:

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

NavCode 23826UU-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$2,199**

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

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# IBM recommends Microsoft® Windows® XP Professional.



(Monitor not included)



(Monitor not included)



(Monitor not included)

## Why IBM ThinkCentre PCs?

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

## Rescue and Recovery with Rapid Restore:

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

## Access IBM:

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

## ImageUltra™ Builder:

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

## IBM ThinkCentre A50

### System Features:

- Intel® Pentium® 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Tower form factor
- 256MB DDR PC3200\*
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Norton AntiVirus™ with 90 days of virus definition updates
- Lotus® SmartSuite® Millennium license
- 1-yr parts limited warranty with 1-yr limited onsite service†

NavCode 814821U-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$699**

## IBM ThinkCentre A50

### System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Small form factor — 62% smaller than a standard desktop†
- 256MB DDR PC2700
- 40GB hard drive • CD-ROM
- Integrated 10/100 Ethernet
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- 3-yr parts limited warranty with 1-yr limited onsite service†

NavCode 841943U-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$799**

### ServicePac Service Upgrade:

4-yr Onsite Repair/9x5/Next Business Day Response #69P9158 **\$198**

## IBM ThinkCentre A50

### System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Tower form factor
- 256MB DDR PC3200
- 40GB hard drive • CR-RW
- Integrated 10/100 Ethernet
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- 1-yr parts limited warranty with 1-yr limited onsite service†

NavCode 814822U-M419

THINK EXPRESS MODEL  
PRICED AT:

**\$749**

## IBM ThinkCentre A50 Ultra small form factor

### System Features:

- Intel Pentium 4 Processor with HT Technology 3.0GHz
- Microsoft Windows XP Professional
- Ultra small form factor — 74% smaller than a standard desktop†
- 256MB DDR PC3200
- 40GB hard drive • DVD/CD-RW combo
- Norton AntiVirus with 90 days of virus definition updates
- Lotus SmartSuite Millennium license
- Integrated 10/100 Ethernet
- 1-yr parts limited warranty with 1-yr limited onsite service†

NavCode 809022U-M419

**\$849**

With Microsoft Office Small Business Edition 2003: \$1,089

### ServicePac Service Upgrade:

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

## IBM ThinkCentre A51p

(model not shown)

### System Features:

- Intel Pentium 4 Processor 530 with HT Technology
  - Processor speed 3.0GHz
  - 800MHz FSB
- Microsoft Windows XP Professional
- Tower form factor
- 512MB DDR2 PC3200
- 80GB hard drive • DVD/CD-RW combo
- Gigabit Ethernet-integrated
- 64MB ATI RADEON x300 Pro
- 1-yr parts limited warranty with 1-yr limited onsite service†

NavCode 842722U-M419

**\$1,049**

With Microsoft Office Small Business Edition 2003: \$1,289

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



## IBM Think Express Program:

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

## IBM ThinkPad Accessories

Belkin Components Universal Notebook Travel Surge Protector #22P7127 **\$20**

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

IBM ThinkPad Carrying Case® — Expander #73P3597 **\$59**

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

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

## IBM ThinkCentre Accessories

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

Lexmark X2250 All-in-One Printer #22P8810 **\$100**

IBM ThinkVision™ L150 15" Flat Panel Monitor with system purchase #W95PAB1 **\$379**



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# FREEMWARE GOES TO WORK

**M**icrosoft Office 2003 Professional costs \$499. Corel WordPerfect costs \$299. Need to distribute documents in PDF format? Adobe Acrobat Professional will run you \$449. The venerable Adobe Photoshop image editor is a whopping \$649. Not every business or individual can shrug off the cost of such expensive productivity software as just another line item.

Less-expensive alternatives exist to all of these programs, but why spend any money to create important files when there are free products that can do the job? In this story we review three viable office suites that don't cost a cent, as well as free word processing, spreadsheet, presentation, and database applications. We also review dedicated PDF writers and graphics tools that let you perform optical character recognition and image, photo, and movie editing, all free of charge. We ignored the applications you normally wouldn't pay for anyway, like e-mail clients, browsers, instant-messaging clients, and file managers, all of which either come with Windows or are available as free downloads.

What type of business model is free? It varies by product and company. Two of the best programs we looked at,

OpenOffice and MySQL, come from the open-source community, with its fierce dedication to good programming and the idea that you shouldn't have to pay to get your work done. A few products are free for personal use only. And in some cases, the free apps serve as marketing tools for paid versions that have fuller feature sets. Similarly, one company we looked at, Serif, makes old versions of its products available free. These businesses hope you'll like their products, but that you'll eventually want that little bit more—enough to pull out your credit card.

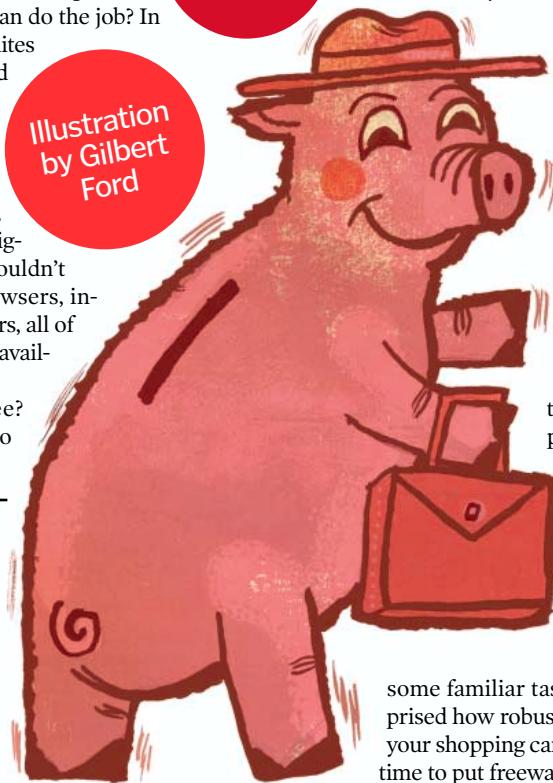
When you pay nothing, do you get what you pay for? Sometimes, yes, although we carefully chose products that can provide real value. Of course, whenever you stray from industry-standard products, you have to worry about the cost of incompatibilities. If you have to exchange documents with other people, beware the minor compatibility issues that can crop up between freeware apps and their major-market counterparts. Make sure your app can read documents you get from others, and vice versa.

Free products tend not to come with tech support. And you may find some cost to using them, in the form of training time or improvisation in accomplishing some familiar tasks. But we think you'll be surprised how robust free software can be. So fill up your shopping cart, but skip the checkout line. It's time to put freeware to work.

**21**  
free apps to  
get the job  
done

By Sarah  
Pike

Illustration  
by Gilbert  
Ford



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# OFFICE SUITES

By Edward Mendelson

## EasyOffice 7.0

E-Press Corp, [www.e-press.com](http://www.e-press.com).



EasyOffice 7.0 packs more applications and utilities into one freeware package than you'll find in any high-priced suite. A 96MB installer expands into a word processor, spreadsheet, calculator, picture editor, PDF editor, presentation program, and e-mail client. EasyOffice also contains several applications that no other office suite provides, including a ZIP file manager and a backup program.

Unfortunately, quantity isn't quality. EasyOffice is clearly a work in progress. Its applications perform many basic and mid-level tasks just as well as the high-priced competition, but are underpowered compared with free alternatives such as 602PCSuite and OpenOffice.org. The suite's many explanatory menus are too wordy to be helpful. And at times the freeware version seems overwhelmed with advertisements for the \$44 EasyOffice Premium 7.0 suite, which adds dozens of other programs ranging from a VoIP (Voice over Internet Protocol) client to a Web page editor and an encryption utility. Whenever you start one of the applications in the freeware suite, you must click on a *Continue* button to get past the advertisement for the paid suite.

The EasyWord word processor had no trouble with the complex formatting of our sample Microsoft Word files, but it removed all footnotes and endnotes without warning. EasyWord runs in either of two modes: Easy or Advanced. The Easy mode has a limited feature set and icons that you can expand; they're clearly labeled, but they're also screen hogs.

The word processor's Advanced mode, like much of the rest of the suite, displays the most overpacked set of menus we've seen in any software. Most word processors have a File menu; EasyWord has two,

labeled File1 and File2. Each of those menus contains more than 20 items, including PDF and HTML export and items that store and search backup, grandfather, and great-grandfather versions of your files—features you won't find in better-known suites. Some menu items have shortcut keys that let you access them by typing an underlined letter; others are ac-



**EVEN IN EASYWORD'S** crowded icon set, the smiley face stands out. Clicking it inserts the poem "Desiderata" by Max Ehrmann.

cessible only if you zero in on them with the arrow keys or the mouse. Different menu items lead to the EasyContactManager and "Old version of EasyContactManager." But clicking on the grammar-checking item causes an "unsupported feature" message to pop up.

Despite the capacious menus, the program's feature set may not be strong enough even for high-school use. For example, the word processor can't create footnotes, and although it creates endnotes, it doesn't automatically number or renumber them, so you have to number them by hand when you create them. If you add or remove a note, you have to find the remaining notes by hand and laboriously renumber them, in both the text and the note. Worse, you can't apply ital-

ic or bold to the text you type in the *Insert Endnote* window, so if you want to italicize a book title in a note, you have to insert the note with no italics, then edit the text in the main editing window and italicize it.

EasySpreadsheet handled our complex sample worksheets reasonably well, although it did not even try to open the charts. Our 4MB Microsoft Excel spreadsheet opened slowly but accurately. EasySpreadsheet makes life simple for beginners by displaying a vertical Totals column on the right edge, showing the sums of all rows, and a horizontal Totals column at the foot, with the sums of all columns. It supports about 125 functions, but none as advanced as pivot tables, array formulas, conditional formatting, filtering, and macros. You cannot customize

the built-in number formats. You won't find Excel's data validation and other automated features either, but you can certainly maintain a budget and calculate your mortgage payments. A separate program, EasyBookkeeper, provides preset templates for accounts receivable, accounts payable, and other standard record-keeping functions.

The EasyPresentation software lives up to its name by providing wizards for creating slides, recording your voice to use in a sound clip, applying animated transitions, and inserting cheerful clip-art cartoon images. The packed menus include an option to save the presentation complete with Microsoft's free PowerPoint viewer, so users with no presentation software can view it. PDF and HTML export aren't available from the EasyPresentation program.

EasyOffice goes out of its way to make everything easy for beginners, even providing a separate EasyHelper program that opens with a list of frequently asked questions and lets you run a tutorial. You're warned in advance of potential problems, as in a dialog that tells you to ignore error messages issued by the installer for the PDF converter.

Whether the EasyOffice package as a whole is as easy as it tries to be will depend on the individual users. Some may

**OUR CONTRIBUTORS:** Edward Mendelson and Richard V. Dragan are contributing editors of *PC Magazine*, and Cade Metz is senior writer. Galen Fott is a freelance writer. Associate editor Sarah Pike and PC Magazine Labs lead analyst Neil J. Rubenking were in charge of this story.



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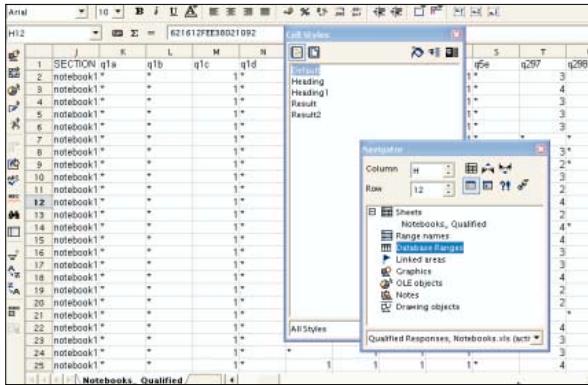
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**THE NAVIGATOR IN OPENOFFICE.ORG'S CALC** application makes it easy to move around within your spreadsheet.

be grateful to find every function spelled out on the menus, along with an over-stuffed default icon set. Others may prefer a program that has fewer features, but is actually easier to use.

**OpenOffice.org 1.1.2**

www.openoffice.org.



OpenOffice.org 1.1.2 is the open-source app on which Sun's StarOffice, another outstanding alternative to Microsoft Office, is based. StarOffice costs \$79.95 for a single-user license; OpenOffice is a 64MB download that installs a freeware powerhouse that can easily take the place of Microsoft Office on most desktops. Its full-featured word processor, spreadsheet, and image and presentation editors match all the widely used features in Office; they open and save Office documents almost as smoothly as Office itself and add PDF generation from all applications. OpenOffice is also the only suite that is completely, unequivocally free, whether you use it for business or pleasure.

Don't be fooled by the low version number. This open-source suite has been evolving for a decade, partly through the work of volunteers and partly with support from Sun Microsystems. Versions of OpenOffice run on every major platform, so it's an ideal choice if you need seamless file transfers among Windows, Linux, Solaris, and Macintosh systems. Some of the elements require Java. A more powerful Version 2.0 is in late public beta, due for final release in 2005.

The suite's interface has a sparse, gray, gloomy style—at least it's not distracting—but beneath the surface is a well-oiled machine. The word processor, Writer, handled our

The word processor and spreadsheet let ordinary users record macros, and the entire suite supports a powerful programming language similar to Office's Visual Basic for Applications.

Writer duplicates most of the functions of Word and adds a built-in bibliographical database designed for scientists and academics. Only two views are available: Page and Online (akin to Word's Normal view). The Find menu supports regular expressions (including nontext items like paragraph and line breaks, formatting items like bold and underline, and fonts) for elaborate wild-card searches, and the help file explains this advanced feature clearly enough for beginners to use it. A well-organized Format | Page dialog gives quick access to features like headers and footers, which are scattered among multiple menus in Word. But if you want to change margins in the middle of the page, you'll have to look in a different menu for the Section dialog. Strangely, the Undo feature won't reverse a page-margin change; you have to remember the earlier setting and restore it by hand.

You can create Web pages in Writer, but if you want to be able to modify the raw HTML code rather than work in a strictly WYSIWYG view, you have to start up the word processor in a special Web-editing mode. You can build HTML forms with the help of wizards, but you need to use a separate Form Navigator to modify them after creation. Writer's tables don't support tables within cells.

The Calc spreadsheet supports over 200 functions and has most of the raw power of Excel, with slightly

intricate Microsoft Word documents as smoothly as if it had created them. The Calc spreadsheet was unfazed by our complex Microsoft Excel spreadsheets, although it did not display the data in the imported charts—it showed only the axes and background. Impress, the presentation editor, opened Microsoft Office presentations, complete with fancy slide transitions.

**Word Processors**

**N**eed a free word processor without the baggage of a whole office suite? Try AbiWord or Jarte.

Open-source **AbiWord 2.0** looks and acts remarkably similar to Microsoft Word. Its help system is a work in progress, but if you know Word, you'll find AbiWord easy to use. Among its many advanced features are mail merge, columns, revision marking, footnotes/endnotes, and automatic misspelled-word flagging; Jarte has none of these. AbiWord can also insert data fields, though not the wide variety found in Word.

On the other hand, AbiWord lacks print preview, highlighting, clipboard history, and the ability to insert objects, all features Jarte includes. Neither program includes autocorrect, find/replace of



formatting or nontext items, or support for Unicode fonts. (Dom Lachowicz, www.abisource.com. ●●●●○)

**Jarte** (pronounced jar-TAY) has many of the same features as Microsoft Word, but its appearance could hardly be more different. A colorful set of buttons and tool panels surrounds the tabbed multidocument editing area, controlling all features.

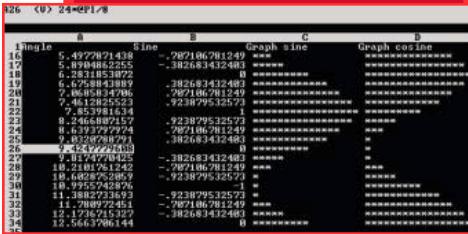
Jarte lacks some important advanced features, most notably tables; the program suggests embedding a spreadsheet instead. The built-in reference panel connects to an online dictionary, thesaurus, or encyclopedia, as well as user-defined sites. Unfortunately, the program becomes unresponsive while waiting for results. Jarte offers a "format brush," like Word's Format Painter, keeps a clipboard history, and even has a built-in option to capture an area of the screen. And unlike AbiWord, Jarte includes a full help system. (Carolina Road Software LLC, www.jarte.com. ●●●●○)—Neil J. Rubenking

**More on the Web**

For links to the freeware applications in this story—and more—head to **go.pcmag.com/freeware.**

# VISICALC

In 1979 Software Arts released VisiCalc, the “visible calculator” for the Apple II that convinced many people that there might be some use for a personal computer. Many years and many spreadsheets later, VisiCalc is still available, at [www.bricklin.com](http://www.bricklin.com). It’s now free, rescued from oblivion by its coauthor Dan Bricklin—and it



still works. The 27KB download is smaller than some banner ads, and the entire help system fits in five downloadable scanned images.

Considering its age, VisiCalc is surprisingly capable. If you’ve ever used it, the slash-based menu system and “@” functions will come back quickly. Cells can contain labels or numbers (no dates), and you enter cell references in the A1 style still used by modern spreadsheets such as Microsoft Excel. The limit of 63 columns and 254 rows seems less onerous when the entire sheet displays in an 80- by 25-character window. VisiCalc’s set of numeric-only functions includes simple items like SUM, MAX, and AVERAGE, as well as LOOKUP and common trigonometric and logarithmic functions. You can format numbers as integer, decimal, scientific, or “graph.” We used this last format, which displays a row of asterisks as long as the number, to create a graphical sine table. VisiCalc is surprisingly smart about replicating formulas. For each cell reference in the formula, it asks whether to keep the reference unchanged or adjust it relative to the cell position.

VisiCalc won’t replace Excel; its limitations are just too great. Still, you may be amazed at how much calculating power is packed into this 27KB historical gem. Give it a try for a quick trip back to the early 1980s.—Neil J. Rubenking

fewer conveniences. Calc matches most of Excel’s advanced features such as conditional formatting, filtering, and pivot tables (Calc calls this feature DataPilot), and it officially supports array functions, although some array functions in the current version produce errors or obviously mistaken results. Calc doesn’t offer the same range of preset cell formats (such as number formatting) as Excel, although you can hand-build any format you like, just as you can in Excel. Spreadsheets are limited to 32,000 rows, about half the maximum in Excel, but that’s large enough for most purposes; Version 2.0 will match Excel’s maximum.

A “floating-frame” menu item makes it effortless to display cells from another spreadsheet inside the current one. Calc’s charts don’t match the graphic razzle-dazzle of Excel but are more than adequate for financial and scientific purposes. The convenient Style palette displays all the formatting styles in the current sheet for one-click application to a selected cell or range.

The presentation application, Impress, bears little resemblance to its Microsoft counterpart, PowerPoint, and file exchange between the two isn’t quite perfect. Most transitions and animations created in PowerPoint displayed smoothly in an Impress slide show, but some of the animations that played couldn’t be accessed and modified from within Impress. And when we ran an

Impress presentation in PowerPoint, it simply ignored some animations applied in Impress.

OpenOffice.org uses XML as its native file format, although it’s a different flavor of XML from Office’s, and OpenOffice can’t open Office-format XML files. OpenOffice can be set to save files by default in Microsoft Office DOC and XLS formats. Corporate users who need a version that comes with technical support can license Sun Microsystems’ StarOffice 7.0, which includes everything that’s in OpenOffice and adds an integrated database, commercial-quality import/export filters, additional fonts, and an integrated desktop feature that most Windows users won’t want.

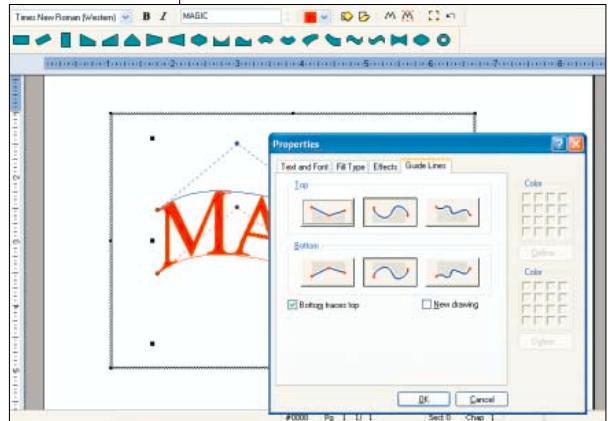
## 602PC Suite 4.1

Software602 Inc., [www.602software.com](http://www.602software.com).



602PC Suite began with some programmers in the Czech Republic trying to duplicate some Microsoft Office applications. It’s grown into an ambitious Office replacement comprising a word processor, spreadsheet, photo editor (with features reminiscent of older versions of midrange graphics packages like Jasc’s Paint Shop Pro), and photo album organizer, all in one 28MB download. You can choose between a free version (tested for this story) and a licensed version for \$39.95.

The freeware version, for personal use only, has most of the features that Microsoft Word and Excel users actually use. They are available from menus that closely mimic Office’s, but with more focus than Word on creating HTML, and without approaching Excel’s advanced charting tools. The paid version—as the free one will keep reminding you—adds such features as PDF export, automatic hyphenation, thesaurus,



**602TEXT'S FLEXIBLE**, easy to use Magic Text contorts editable text into various shapes and forms.

mail merge, spreadsheet autofor-mating and optimization, and many photo-editing conveniences. All these features are listed on the menus of the freeware version. Some of the unavailable items are grayed out and unclickable, but others, such as red-eye removal, look as though they lead to the feature—but only pop up an annoying ad for the paid version.

The 602Text word processor matches Word’s options to view documents in draft (like Word’s Normal view), page, outline, and HTML view (but not Word 2003’s Reading layout), and supports headers, footers, and footnotes, but not endnotes. A click on one toolbar icon splits the window into an editing pane and an uneditable full-page view with a rectangle indicating the



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position on the page of the editing pane; when you drag the rectangle, the editing pane changes contents to match the location of the rectangle. 602Text puts headers and footers on its Format | Chapter menu; this makes more sense than Word's View | Header and Footer menu but may leave Word users at sea until they find it. An awkwardly designed feature lets you build templates for documents with fill-in fields, but you can't write or record macros to perform other repetitive tasks.

602Text's Format Brush, which provides menus that let you choose when to "soak" and "clear" the brush, is easier to use than its Word counterpart, Format Painter. The Find and Replace dialog, on the other hand, doesn't give you a way to search for nontext items like paragraphs, tabs, fonts, or any other formatting.

602Text had no trouble importing our simple text documents but got confused by an elaborately formatted booklet created in Word. It printed pages in landscape instead of portrait mode, and with one page to a sheet instead of two. We tried to create a new document with the same formatting in 602Text and found that the program couldn't manage that either. 602Text was also confused by some of our Word tables and superimposed the table header over the first rows of data. With some of our complex Word documents, 602Text did nothing at all when we tried to open the Page Setup dialog from the File menu, and crashed when we tried to print them. These problems never occurred with everyday documents and ones that we created in 602Text.

The 602Tab spreadsheet app can handle large files and all common financial and data-managing tasks, but it choked on some more complex functions. It supports filtering but not other important spreadsheet features, such as conditional formatting and pivot tables. With a smaller but more complex multipage Excel spreadsheet with charts and pivot tables, 602Tab had no trouble opening the sheet's formulas and text formatting, but, like OpenOffice.org's Calc, it displayed only the axes of the charts, not the data.

602PC Suite's enhanced File | Open and File | Save dialogs include a customizable column of quick-access icons on the left, with a Folder icon that lets you add your own list of document folders to a drop-down menu. The suite's good-looking, unflashy design seems at home in Microsoft Windows XP, and it performs well in a wide range of tasks. But if you can't stand the pop-ups and don't want to pay for the upgrade, check out OpenOffice.org instead.

## Presentation

**P**owerbullet Presenter 1.35 lets you create impressive, multipage, multimedia, animated Flash presentations. The program even includes several effects you don't get in Microsoft PowerPoint.

Powerbullet comes with many preset animation effects. You can assign them to any object or text, setting delays for fade-ins, fade-outs, and more. You can insert sounds and voice recordings in a presentation and work with numerous graphics file formats. You can also synchronize sounds with pages, so that a page won't automatically advance until the sound has been played. Animating text and graphic objects is actually fun. A menu in the program's Element Animation and Effects Settings dialog gives you options with names like "sneak in right," and "spin drop from left."

Creations in Powerbullet can also be saved as HTML or exported to an EXE file for a presentation that functions in an auto-advance mode. If you save to the Web, you can also view and edit the source code.

Powerbullet Presenter's interface has some notable niceties, such as a wizard that pops up to help you create animated bulleted lists. Its interface and tool set aren't quite as rich as some of those in fee-based presentation products (like Liquid Media, which until recently was free for personal use), but it's a simple, flexible, and free way to assemble presentations. (DDD Pty Ltd., [www.powerbullet.com](http://www.powerbullet.com). ●●●○○) —*Sebastian Rupley*



## Databases

**M**ysQL 4.0 is the granddaddy of free databases. It is an industrial-strength, extremely scalable database with strong Linux and Windows support, a proven track record with large organizations, and good SQL support.

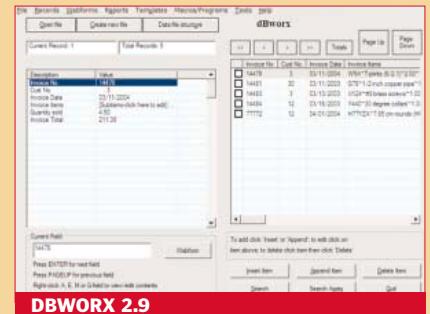
Administering MySQL will require some in-house database expertise. Although there is a simple GUI administration console for viewing and tweaking database options, MySQL uses a command-line interface, `mysql`, to run queries. Luckily, via ODBC, you can easily use another query tool, such as Microsoft Excel. Version 5.0 is currently in development. For a full review of MySQL and other database apps, see [go.pcmag.com/database](http://go.pcmag.com/database). (MySQL AB, [www.mysql.com](http://www.mysql.com). ●●●○○)

**dbWorx 2.9** is an easy-to-use solution with some innovative tools for creating, editing, and exporting records. You can use a GUI to create forms to manage records easily. Queries are a snap, too, as are exporting and importing data. We especially like the ability to export a dbWorx database to HTML quickly, which makes up for the app's most significant limitation: dbWorx databases cannot be accessed by more than one user at a time—even as read-only files. We also like the program's ability to connect to different databases via ODBC. (PLWorx Software Development, [www.plworx-software.com](http://www.plworx-software.com). ●●●○○)

The extremely lightweight **XDb1**—it fits on a single floppy disk—was designed for both Windows and Pocket PCs. It's a more experimental approach to standalone databases. Defining data records requires mastering an intuitive though somewhat quirky set of terms; we bet most users will be fine. XDb1 has the unique ability to let you search by attributes across every *field*, which is much more difficult in a traditional database. Multiple users can't edit data simultaneously, but they can view records remotely from an XDb1 server. XDb1's GUI offers natural-language queries instead of using SQL.

Unfortunately, the current version won't cut it for everyday users who need standard forms and reports, which are missing here. Still, XDb1 offers an innovative approach to standalone databases; it's built for efficiency and a more intuitive way of thinking about data. This is definitely a technology to watch.

At press time a new version, XDb2, was in alpha. (Custom Microsystems, [www.xdb1.com](http://www.xdb1.com). ●●●○○)—*Richard V. Dragan*



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# GRAPHICS TOOLS

By Galen Fott

## The GIMP 2.0

The GIMP Team, [www.gimp.org](http://www.gimp.org).

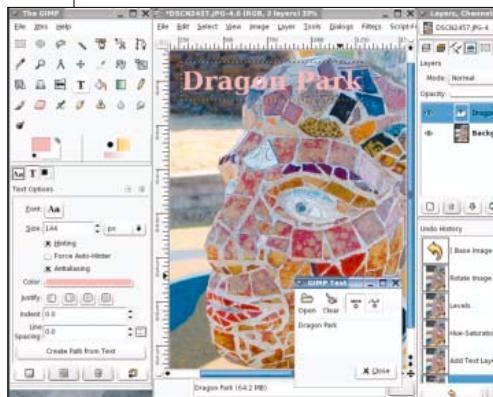
●●●●○

The GIMP (GNU Image Manipulation Program) was first released by two University of California at Berkeley students in 1996. Since then, this open-source program has matured into a powerful image editor with a fairly large user base and has been ported to multiple platforms, including Microsoft Windows. The latest release, The GIMP 2.0, has a completely revamped interface that makes it a real player in the world of mainstream image editors.

The GIMP is best known to Linux and Unix users, so we tested the new release on SUSE Linux 9.1 Personal. The last generation of The GIMP supplied many of the features you get in applications like Adobe Photoshop, including layers, channels, paths, and a spate of painting tools. Unfortunately, its

interface was awkward and sometimes confusing. The new UI takes giant strides forward, making The GIMP simpler and more flexible.

We especially like what The GIMP has done with palettes. First, the new tabbed palettes are nestable and dockable, a more efficient use of screen space. A Histogram



**THE GIMP'S NEW INTERFACE** brings a new level of usability to this advanced graphics editor.

palette displays a constantly updated graph of the brightness levels in the current image, and a handy Navigation palette helps you steer your way through an image when you've zoomed in to work on details. The new Fonts palette lets you choose a typeface for use with the application's new editable-text tool.

We also tested the Windows version and are impressed that The GIMP installs painlessly on Windows XP and runs just as well as it does on Linux. But there is more competition on the Windows platform, and in terms of feature breadth and ease of use, The GIMP just can't compete with products like Adobe Photoshop Elements and Jasc's Paint Shop Pro. Still, The GIMP 2.0 is a powerful program, and its price is unbeatable.

## Microsoft Windows Movie Maker 2.1

Microsoft Corp., [www.microsoft.com](http://www.microsoft.com).

●●●●○

If you need a free, lightweight but capable video editor, look no farther than your Windows XP PC. Win XP shipped with Windows Movie Maker, the latest version of which, 2.1, is available as part of the Service Pack 2 update. Movie Maker is an extremely intuitive program for capturing and editing video from your DV camcorder. A task pane holds your hand throughout the process, making it easy to add still pictures, audio, video effects, transitions, and titles.

This latest version supports real-time

## Serif's Freebies

Software company Serif continues to make and sell graphics programs, but it actually gives away old versions, at [www.freeserifsoftware.com](http://www.freeserifsoftware.com). For example, rather than pay \$135 for the new PagePlus 9 desktop publishing app, you can download 1997's **PagePlus 5** for the cost of nothing more than placement on Serif's mailing lists (and you can opt out of even this).

PagePlus 5 lets you combine text and graphics to create documents for print and the Web. Skip the program's cheesy page wizards and head straight for the layout tools, where you'll find an impressive amount of flexibility and power. Style sheets, tables, indexes, tables of contents, and mail merging are among the well-implemented features. But PagePlus 5's age definitely shows in its lack of PDF export—a serious drawback these days. (There are, of course, free print-to-PDF utilities; see the sidebar on the following page.) (●●●●○)

As with PagePlus, it's easy to be distracted by **DrawPlus 4's** wizards and miss the application's true power. In addition to standard Bezier tools, this capable vector-drawing program provides handy,

customizable QuickShapes for creating common objects like arrows, stars, and spirals. DrawPlus handles color dynamically, letting you create linked parent/child relationships between color swatches of varying brightness values. Change the hue of the parent and the child colors update automatically. Strong control over transparency is another plus. Although there's no direct export to the Flash SWF file format, DrawPlus has an entire animation mode dedicated to creating

animated GIFs, with sophisticated features such as background layers and onion-skinning. The current version, DrawPlus 7, costs \$100. (●●●●○)

**PhotoPlus 5.5** (the current version, 9.0, costs \$100) is an intuitive and robust image editor that offers advanced features like layers, layer masks, editable text layers, a clone tool, red-eye removal, digitizing tablet input support, and even a high-end, Photoshop-style custom filter. The program places an especially strong emphasis on Web graphics; you

can slice images, create image maps and animated GIFs, and use the Export Optimizer to preview GIF and JPEG compression settings side by side. PhotoPlus could use a few more color-correction commands, but its power, flexibility, and clean interface (reminiscent of Photoshop's) make it an excellent alternative. (●●●●○)—GF



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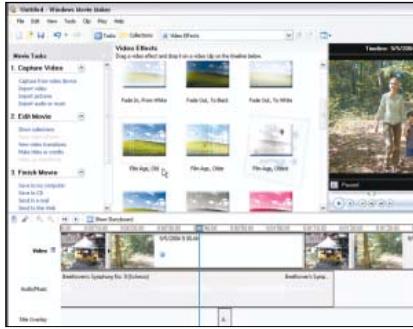
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**WINDOWS MOVIE MAKER** is an easy way to get started on editing your own movies, and it's already on your Win XP system.

“pass-through” of analog video, letting you, for example, pass video from a VCR through your DV camcorder to your computer without first recording the video to DV. (Not all camcorders support this feature.) As you become experienced with the program, the lack of features such as adjustable-length transitions and keyframeable audio levels becomes extremely limiting. But Windows Movie Maker 2.1 provides an easy introduction to video editing for Windows XP users.

**Pixia 3.1**

Isao Maruoka, <http://park18.wakwak.com/~pixia>.  
●●●○○

Previous image-editing experience could actually be a liability when trying to learn Pixia; this program's interface and approach are like no other. If you just want to fix up your digital photos, it's easy enough to find and apply the Image menu's color correction commands. But when you start to work with layers and masks, the program can sometimes become overwhelmingly complex. Luckily, Pixia's help system (a separate download) does a decent job of clearing things up. The more time you put in with Pixia, the more you'll be rewarded by the creative power coiled inside the program's technical approach to digital imaging.

**SimpleOCR 3.1**

SimpleOCR, [www.simpleocr.com](http://www.simpleocr.com).  
●●●○○

Most scanners come with a program that will “read” your scanned text and turn it into editable text. But for those who need to acquire an OCR app on its own,

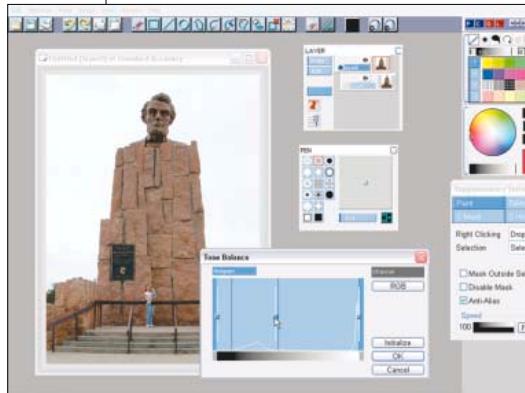
SimpleOCR 3.1's free basic version can do an acceptable job. Several factors can cause the program's analysis to go haywire, though; words in all capital letters frequently come out garbled, and the program often reads multicolumn documents in straight horizontal fashion—across the page—yielding unusable results. It does offer an easy-to-use system for correcting errors with suggestions from its dictionary.

The bottom line as far as basic OCR is: If your document is straightforward, using SimpleOCR is quicker than typing. Built into the app for a 14-day trial is the \$60 SoftWriting mode, which attempts to convert scanned handwriting into editable text. Results were poor with anything but painstakingly rendered, hand-cramp-inducing block letters.

**VCW VicMan's Photo Editor 7.84**

VicMan Software, [www.vicman.net](http://www.vicman.net).  
●●●○○

Like The GIMP, VCW VicMan's Photo Editor 7.84 is built on the Photoshop model. The program's toolbox has painting and selection tools, as well as foreground and background color swatches. Movable palettes let you adjust tools, choose colors, and navigate through your zoomed-in image. We like the Magic Wand tool's live-



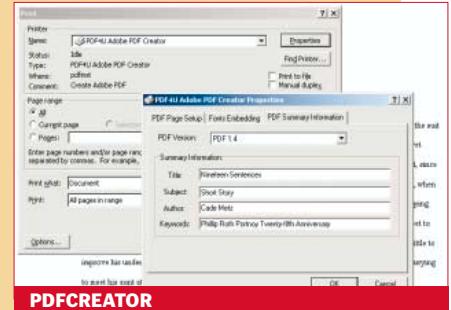
**PIXIA'S UNUSUAL INTERFACE** overlies a powerful, complex approach to digital imaging. Advanced features can be tough to figure out, but the effort is amply rewarded.

tolerance slider, with which you can expand or shrink an active color selection on the fly. But the limited free version of VicMan's Photo Editor feels like a commercial for the \$30 Pro version, which unlocks important features such as cloning tools, GIF export, the ability to have more than two images open simultaneously, and capacity for images larger than 3,000 by 3,000 pixels. And even the Pro version lacks the ability to create layers. ≡

**PDF Writers**

Many machines come loaded with Adobe Reader for reading PDF files. If yours didn't, you probably downloaded the free app the first time you stumbled on a PDF while surfing the Web. But you can also create PDFs free of charge.

**Go2PDF**, like most third-party PDF creators, is a printer driver. You open,



say, a Microsoft Word document, select *Print*, and choose Go2PDF as the printer. “Printing” converts the document to a PDF file. You can embed metadata within the file, including a title, subject, author name, and keywords for searching, and encrypt it with password protection. The catch: A tag on each page of your new PDF advertises the product and links back to the company Web site, where you can purchase a no-tag version. (Wondersoft Inc., [www.go2pdf.com](http://www.go2pdf.com). ●●●○○)

Don't want your PDFs marked with unsightly ads? Try the open-source **PDFCreator**. It's a printer driver too, but with a beefed-up interface: You can also create PDFs by dragging a document onto a freestanding PDFCreator window. PDFCreator lacks encryption and password protection, and it wasn't completely stable during testing. It also has one significant bug: If you create a PDF and give it the same name as an existing file, it will overwrite the existing file without even asking. (Sector 7-g, [http://sector7g.wurzel6.de/pdfcreator/index\\_en.htm](http://sector7g.wurzel6.de/pdfcreator/index_en.htm). ●●○○○)

A barebones printer driver, **Pdf995** won't add metadata, passwords, or encryption—but it doesn't slap ad tags on your documents, either. It does, however, launch a partner pop-up ad each time you create a PDF, unless you buy a sister version for, you guessed it, \$9.95. (Software995, [www.pdf995.com](http://www.pdf995.com). ●●●○○)—Cade Metz

MPC recommends Microsoft® Windows® XP Professional.



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# MORE THAN JUST A PRETTY PICTURE



i9900

PIXMA  
i9400R

# Today's all-purpose and photo printers offer impressive quality and speed, whether you're printing photos, homework, or just about anything.

BY M. DAVID STONE • PHOTOGRAPHY BY THOM O'CONNOR

THE LINE BETWEEN all-purpose and photo ink jet printers is fading rapidly. Although the differences between them were clear in our ink jet roundup last year, today the distinctions are more fiction than reality. Manufacturers may call a given model an all-purpose printer or a photo printer, but in most cases, you really can't tell the difference.

In this story, we evaluate 15 printers (plus 6 dedicated, smaller-format photo printers on page 124). The manufacturers tell us that 5 of the 15 are all-purpose ink jets and 10 are photo printers. But if you handed them to us, covered up the names, and asked us to identify which printers were in which group, the only ones we could reliably identify would be the photo printers with extra ink colors or LCD screens for previewing photos.

Three of the all-purpose printers are strictly four-color printers, but so are three of the photo printers. One of the photo ink jets can print with either four or six colors by switching cartridges. So can two of the all-purpose printers. None of the all-purpose printers allow direct printing from memory cards or cameras, but neither do three of the photo printers.

Both types of printers produce high-quality photo output. The typical photo rating for both groups was just short of excellent, and the lowest rating in each group was very good. Even

performance scores were neck and neck. The three fastest printers for business applications, with less than a 4 percent spread in total time between first and third place, were two photo printers and an all-purpose printer. And for the first time ever, the two fastest in the group were photo printers.

Even as the all-purpose and photo printer categories seem poised to fuse into one, this year's models also hint at the emergence of what may become a new category: kiosk-style printers. These printers, including the Epson Stylus Photo R320 and HP Photosmart 8150 and 8450, take printing photos without a computer to the next level.

Kiosk-style printers don't just let you preview your photos on an LCD. They provide editing tools that you would otherwise find in a graphics-editing program or at a commercial photo kiosk. Typical features let you crop the image, remove red-eye, and adjust brightness, contrast, and saturation. They also let you set the photo and page size and choose how many photos to print per page. Whether this approach represents the future of photo printers, evolves into its own category, or is just a set of features on a few printers remains to be seen.

Whatever you plan to print, you should consider looking at both categories of printers. You may be surprised by what you find.

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## ALL-PURPOSE INK JETS

### Epson Stylus C66, C86

**C66:** \$70 street. OVERALL RATING ●●●●○ QUALITY RATINGS: Text: 5; Graphics: 3.5; Photos: 4.5. **C86:** \$100. OVERALL RATING ●●●●○ Text: 5; Graphics: 3.5; Photos: 4.5. Epson America Inc., www.epson.com.

If you care about output quality more than anything else and you're on a tight budget for purchase price, the Epson Stylus C66 and C86 are good choices. Their quality is among the best of any ink jet, period.

Both are four-color printers with a separate cartridge for each color, using Epson's DuraBrite inks. Epson touts these inks as water-, smudge-, and light-resistant. We found that immediately after printing, the water and smudge resistance was better than with some inks, but not sufficient to prevent serious smudging. After letting the ink dry for four days, however, when we wet the paper and rubbed it, we saw no smudging on photo paper and very little on plain paper.

Epson also claims that many users print their photos on plain paper, and that the DuraBrite inks provide sufficient

image quality to make those photos acceptable. While output on plain paper is reasonably good, it is certainly no match for output on Epson's own photo paper, and it's no better than plain-paper output for any number of other ink jets.

Overall output quality, however, is among the best for any ink jet printer. Both the C66 and C86 earned excellent ratings for text, with most of our test fonts readable at 4 points, and none, including highly stylized fonts, requiring more than 8 points. Photos fell just short of excellent, with the C66's black-and-white photos showing a visible tint. Graphics were just short of very good, mostly because of visible banding in default mode for both printers. We also found that paper with a lot of ink curled completely into a scroll after a couple of days if left with nothing holding it flat.

The key difference between the two printers is performance. The C66 turned in a barely acceptable time on our business



EPSON STYLUS C66

applications suite—54 minutes 24 seconds. Photos took a disappointingly long total time of 13:51 for 4-by-6 photos and 31:30 for 8-by-10s. Cost per page is on the high side at 7.3 cents per monochrome page and 13.4 cents per color page on our tests.

The C86's performance is better than the C66's, but not anywhere near the top. Its total time on our business applications suite

was 23 minutes 10 seconds. That's a lot faster than the C66's 54:24, but not even close to the 15:48 for the \$100 Canon Pixma iP3000. Photos took a similarly acceptable but lackluster total of 8:36 for 4-by-6s and 19:14 for 8-by-10s.

Unlike the C66, the C86 can use high-capacity cartridges for more pages per cartridge and a lower cost per page. On our tests, the C86 proved to be one of the less expensive ink jets to run, at 4.2 cents per monochrome page and 11 cents per color page.

The combination of great-looking output, a relatively low cost per page, and acceptable speeds makes the C86 an attractive choice.

### HP Deskjet 5740, 6540

**5740:** \$100 street. OVERALL ●●●●○ Text: 3.5; Graphics: 4.5; Photos: 4.5. **6540:** \$150. OVERALL ●●●●○ Text: 3.5; Graphics: 4; Photos: 4.5. Hewlett-Packard Development Co., [www.hp.com](http://www.hp.com).

The HP Deskjet 5740 and 6540 Color Inkjet Printers double as photo printers, letting you swap the black cartridge for a photo cartridge to print pictures with six colors. They provide photo output good enough to match that of many photo printers, and they hold their own with graphics and text, too.

Output quality is the strong point of both printers. Text rates as just short of very good for both, with more than half our test fonts easily readable at 4 points for the 5740 and several readable at 4 points for the 6540. Graphics quality for the 5740 is just short of excellent; minor flaws include some slight banding in default mode. The 6540's graphics quality is very good, with some minor banding and dithering in the form of mild graininess.

Photo output for both is also just short of excellent, putting them in the same league as most photo printers. The 5740's output is marred only by slight posterization in one image, and both printers show colors that are a little too punchy. The differences in quality between photos printed with standard ink and those with photo ink are minor, but significant enough to make the small performance sacrifice for a 4-by-6 (roughly 30 seconds for the 5740 and 15 seconds for the 6540) well worth it.

Performance isn't a strength for the 5740, but it's not a weakness either. The total time for our business applications suite was 22:06, which compares favorably with most



**HP DESKJET 6540  
COLOR INKJET PRINTER**

other ink jets, although it's no match for the Canon Pixma iP3000's 15:48. The 5740 is also slower than the iP3000 for photos, totaling 8:42 for 4-by-6s compared with the iP3000's 3:22, and 21:27 for 8-by-10s compared with 7:41. But the iP3000 has somewhat lower quality scores. Running costs for the 5740 are higher than most, at 6.7 cents per text page and 12.3 cents per color page on our tests. But if quality is your top criterion, the HP Deskjet 5740 is a winning printer for the price.

The 6540 delivers what every ink jet should, but few actually do. It's a speed demon with quality that ranges from just short of very good to just short of excellent. And running costs, particularly for color pages, are low compared with other ink jets, at 6.2 cents per monochrome page and 11 cents for color—a little lower than the 5740.

Few ink jets turn in a total time on our business applications suite under 20 minutes. The 6540 came in at 16:20. That's only about 30 seconds slower than the leaders, the Canon Pixma iP3000 and iP4000. But the 6540 beat or essentially tied both Canon printers on 8 of 13 tests and wasn't

far behind on any of the other five. The 6540 was also reasonably fast for photos, totaling 5:09 for printing 4-by-6s and 12:13 for 8-by-10s. That makes it the fastest among the all-purpose printers and faster than all but three of the ten photo printers—an impressive feat.

The 6540's output quality is slightly better than what you'll get from the Canon iP series photo printers. And the combination of speed and quality makes the HP Deskjet 6540 a serious contender.

### Lexmark Z816

\$100 street. OVERALL ●●●●○ Text: 3; Graphics: 3; Photos: 4. Lexmark International Inc., [www.lexmark.com](http://www.lexmark.com).

The Lexmark Z816 Color Jetprinter's most distinctive feature is that with its photo ink cartridge you get six-color photo output worthy of a photo printer. Stay with the black ink cartridge and you'll get four-color printing with reasonably good photos—along with more than acceptable text and graphics—at appropriate speeds for the price.

Aside from its standard setup and automatic printhead alignment, it also has automatic paper sensing, which lets you switch back and forth between plain paper and expensive photo paper without having to change the setting manually.

Printing with the black and tricolor cartridges gave us good output across the board, with some flaws. Text was easily readable at 5 points or smaller in most of our test fonts. But two of the more stylized fonts required 12 points for easy readability. Graphics had smoother than usual gradients and smooth, solid fills, but they showed a slight misregistration and obvious banding. Photos lacked the subtle shading that gives rounded objects a sense of three-dimensionality. Switching to the photo cartridge added those subtle steps and boosted the photo quality rating from good to very good.

The Z816's performance is less impressive than its output quality. Its overall output time for business applications was second to last, at 36 minutes 30 seconds, beating only the Epson Stylus C66's 54:24.

For the same price, you can do better with the Epson Stylus C86, the HP 5740 Color Inkjet Printer, or even the Canon Pixma iP3000 photo printer, all of which offer better quality and faster speed.



**LEXMARK Z816  
COLOR JETPRINTER**

**OUR CONTRIBUTORS:** Associate editor Sarah E. Anderson and PC Magazine Labs lead analyst M. David Stone were in charge of this story.

## All-Purpose Printer: Canon Pixma iP4000 Photo Printer: Canon i9900 Photo Printer Dedicated Photo Printer: Epson PictureMate



Our initial thought that the differences between all-purpose and photo ink jet printers are fading proved true in testing and in choosing our Editors' Choices. The Canon Pixma iP4000 earns the Editors' Choice for the all-purpose printer category, even though Canon positions it as a photo printer. Its balance of performance and quality in both business apps and photos makes the inexpensive iP4000 an irresistible choice.

The HP Deskjet 6540, which also costs \$150, earns an honorable mention for the all-purpose category. It was a close second on our business applications suite for speed, and its graphics quality was better than that of the iP4000. But if we were faced with this buying decision, we'd still pick the iP4000 for its combination of speed and quality.

For printing photos, the Canon i9900 has been tough to beat since it first showed up on the market, and it offers the best photo quality and the highest speed by far. It came in first on every single photo test, with other photo printers trailing by anywhere from 35 seconds to nearly 5 minutes for a single printout.

The Epson PictureMate has been wowing consumers for almost a year now. And its smudge-proof and waterproof photos, 29 cent prints (the same as many photo labs), and ease of use keep it in the winner's circle. It is also highly portable and supports nearly every storage device. Most important, though, its superior quality and low running costs mean you can use it to print your most precious photos at home, eliminating a trip to the photo lab altogether.

## PHOTO INK JETS

### Canon i9900 Photo Printer, Pixma iP1500, iP2000, iP3000, iP4000 Photo Printers

**i9900:** \$500 street. OVERALL ●●●●● Text: 5; Graphics: 4; Photos: 5. **iP1500:** \$50. OVERALL ●●●●● Text: 3; Graphics: 3.5; Photos: 4.5. **iP2000:** \$80. OVERALL ●●●●● Text: 3.5; Graphics: 3.5; Photos: 4.5. **iP3000:** \$100. OVERALL ●●●●● Text: 3; Graphics: 2.5; Photos: 4.5. **iP4000:** \$150. OVERALL ●●●●● Text: 3.5; Graphics: 3.5; Photos: 4.5. Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com).

Canon is leading the printer industry in more ways than one. The company was among the first to include direct printing via PictBridge, and now it's introducing a new line of printers bound to catch your eye in looks, features, and performance.

For fast, high-quality photos up to 13 by 19 inches and general-purpose capabilities, the Canon i9900 Photo Printer is the way to go. The i9900 has just two front-panel buttons and the PictBridge port—no memory card slots. It uses eight ink colors, with a separate cartridge for each, adding red and green to the six colors photo printers typically have.

These extra inks pay off in a wide color gamut and true photo quality. Text also rates as excellent, with more than half of our test fonts easily readable at 4 points using default settings. Graphics in default

mode showed only minor flaws. Photo speed was even more impressive, at 30 seconds for each 4-by-6 photo and 1 minute 5 seconds for each 8-by-10.

On the business applications tests, the i9900 was less impressive. Its total for the suite was 25:19—far closer to the slowest photo printer in the group, at 29:53, than the fastest, at 15:48.

The four printers in Canon's new Pixma line are just as impressive as the i9900 but in a very different way. The first of these is the Canon Pixma iP1500. Its combination of speed and quality is astounding for the very low price of \$50.

Of course, you can expect some trade-offs for this price, too. The iP1500 has no memory card slots or PictBridge port. It's a basic four-color printer that offers only a USB 1.1 port on the back. The black and tri-color cartridges are smaller than most, which means you'll have to replace them relatively often. We had to replace them twice just to finish our testing. On our cost-per-page tests, the iP1500 was 6.3 cents per monochrome page and 11.8 cents per color page.

On our performance tests, the iP1500 totaled 7:29 for printing 4-by-6 photos, and 17:43 for 8-by-10s—among the slowest in

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the group. But surprisingly, it managed a total time on our business applications suite of 29:53, faster than two of the all-purpose ink jets.

Output quality is strong. The rating for photos is just short of excellent, with most photos rating as true photo quality, but with a minor tint on our monochrome test photo. Text rates as good, with more than half the test fonts easily readable at 4 points, but some stylized fonts needing 12 points. Graphics were marred by slight banding in default mode, but still rank just short of very good.

The small ink cartridges limit the iP1500's usefulness, but the combination of speed, quality, and price makes it a good choice as either a light-duty all-purpose printer or a secondary printer for printing occasional photos.

Priced at \$80, the iP2000 offers a little more than the \$50 iP1500, but nowhere near as much as the \$100 iP3000. Like the iP1500, the iP2000 is a basic four-color printer and uses the same low-capacity cartridges. It offers a USB 1.1 port on the back, and unlike the iP1500, a PictBridge port on the front.

On our business applications suite the iP2000 took a total of 26:48. It took 23:48 to

curl. Photos fell a little short of excellent, primarily because of a barely perceptible tint in monochrome output. These scores give the iP2000 a slight edge over the iP3000 for graphics. But these are based on default-mode output. We saw little to no difference in high-quality mode.

If the iP3000 didn't exist, we'd recommend the iP2000 for its combination of speed, output quality, and price. But given how much more printer you can get by adding in the price of a pizza, you ought to be looking at the iP3000 instead.

What's most intriguing about the \$100 iP3000 is that along with high speed and high quality for photos, it delivers extraordinarily fast speed for standard business applications.

The iP3000 and the iP4000 have a lot in common. Both offer a USB 1.1 connector in back and a PictBridge port in front; the iP4000 also has a parallel port. Both have unusually sophisticated paper handling, including duplex printing and two 150-sheet input trays. They differ in ink cartridges, though, with the iP3000 using four colors and the iP4000 using five.

To say that these two printers are impressively fast is an understatement. On our photo suite, the iP3000 totaled 3:22 for 4-by-6s and 7:41 for 8-by-10s, while the iP4000 totaled 3:16 for 4-by-6s and 7:47 for 8-by-10s. Only the \$500 Canon i9900 is faster, at 1:31 for 4-by-6s and 3:14 for 8-by-10s. The iP3000 and iP4000 also printed our business applications suite at a high speed, each with a 15:48 total, beating out all of the all-purpose printers.

Output quality for the iP3000 is somewhat mixed. The rating for photos falls short of excellent only because of a slight tint in our monochrome test photo; the rating for text is good, with more than half our test fonts easily readable at 4 points, but some stylized fonts needing 12 points for easy readability. And graphics rate only slightly better than fair because of flaws in default mode, including banding and black



**CANON I9900 PHOTO PRINTER**



**CANON PIXMA IP3000 PHOTO PRINTER**

print all the photos in the photo suite. The iP3000 and iP4000, by contrast, took only 15:48 for the business apps suite and 11:03 for the photo suite, leaving the iP2000—and every other printer—in the dust.

For output quality, the iP2000 earned a good rating for text, with more than half the fonts easily readable at 4 points. Graphics were just shy of very good, with some minor visible banding and a tendency for sheets with full-page graphics to

fills that are less saturated than they should be.

Quality is where the iP4000's five inks kick in. They include both a pigment-based and dye-based black, with the dye-based version aimed primarily at improving photo output.

Output quality is better overall than for most ink jets. The photo rating is nearly excellent, held back only by a slight tint in our monochrome test photo and in one color photo. Text and graphics are both a bit better than good. While one stylized font was easily readable only at 12 points or larger, over half of the test fonts required no more than 4 points. Graphics showed just a hint of posterization and moderate banding in default mode.

This level of output combined with extraordinary speed could easily make the iP4000 your photo printer of choice.

**Epson Stylus Photo R200, R320, R800**

**R200:** \$100 street. OVERALL ●●●○ Text: 3; Graphics: 3; Photos: 4. **R320:** \$200. OVERALL ●●●○ Text: 4; Graphics: 3.5; Photos: 4.5. **R800:** \$400. OVERALL ●●●● Text: 3; Graphics: 4; Photos: 5. Epson America Inc., www.epson.com.

Epson seems to be on a crusade to make printing on CDs and DVDs a standard feature for ink jet printers. All three of the models we tested have this capability. And doing so is easy: Just flip the tray guide into place, load the CD tray into the guide, line up the arrows on the tray with

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**EPSON STYLUS PHOTO R320**

the arrows on the guide, and then print using Epson's supplied software.

The Epson Stylus Photo R200 prints from standard business applications well enough to serve as your all-purpose printer, as long as you don't demand too much speed. Its overall time of 28 minutes 17 seconds for business applications is significantly slower than some \$100 ink jets, but it is faster than others. Output quality rates as good to very good, with photos falling only a bit short of true photo quality.

The R200 is one of the better choices for a tight budget and certainly the only one in this price range that lets you print directly to printable CDs.

The R320 fills a gap in the Epson line between the R200 and the R800. Its performance is on a par with the R200's performance for both business applications and photos, but on output quality it comes close to matching the R800, even beating it for text quality.

Unlike the R200, it offers card slots for six memory card formats, plus Microdrive, and a USB port in front, so you can plug in a PictBridge camera, a storage device, or an optional Bluetooth adapter (\$70). You can also save photos from a memory card to a storage device plugged into the port. Built-in menus give you a reasonable amount of control over direct printing—allowing you, for example, to crop your

## PERFORMANCE TESTS

# What the Numbers Mean



Performance and features should always figure into your printer purchase decision, but cost per page is also a big issue as consumers scramble for cheaper ink and paper. We tested the performance for each printer and, for the four-color printers, the ink cartridge yield, to calculate their cost per page.

For the performance tests, we used QualityLogic's ([www.qualitylogic.com](http://www.qualitylogic.com)) PageSense 4.0 software and related hardware to control the tests and time the results. Our tests consist of two suites. For the business applications suite, we used plain paper for all output and the default settings for the printer drivers. For the photo suite, we used the printer vendors' recommended paper for photos, changing the settings in the driver to match. We also chose the highest-quality options in the driver that involve neither custom or advanced settings nor a mode that the driver warns will take large amounts of hard drive space or time.

The results for both suites were surprising. Historically, all-purpose ink jets have printed from business applications faster than photo printers. But the two fastest printers for the business applications suite in this group were the Canon Pixma iP3000 and iP4000—both photo printers. We were also surprised that the HP Deskjet 6540 all-purpose printer either tied or beat seven of the ten photo printers for photos. And both the Epson Stylus C66 and Lexmark Z816 all-purpose printers were slower than the slowest photo printers for the business applications suite. In short, you can no longer safely assume that a photo printer will be slower than an all-purpose printer for business applications or vice versa.

We made some changes in our rundown test for this roundup. The biggest change was replacing one test page that had text and graphics with one of just text, with 1,500 characters per page, and one of color graphics, with 5 percent coverage for each of the four ink colors. We then ran two sets of tests, one to get the black cartridge yield for the text pages, and one to get each cartridge's yield for the color pages. We tracked each cartridge separately, counting a tricolor cartridge as empty when any color ran out. If a printer offered high-capacity cartridges, we used them because they yield the lowest cost per page.

To determine cost per page, we divided each cartridge cost by

the yield for that cartridge and then added the results for the individual cartridges together. For vendors who don't give a claimed cost per page, we calculated claimed costs, using the cartridge costs and the claimed yields per cartridge.

Because each vendor uses its own approach to testing yield for cost per page, some of the vendors' claimed costs are closer to our results than others. For the same reason, our comparison of cost per page ranks the printers in a different order from that produced by comparing claimed costs.

Most dramatically, the Lexmark Z816 has the lowest claimed cost per color page in this group, but the highest tested cost per page. The lesson to be drawn from our tests is that claimed costs from different vendors are simply not comparable.—MDS

	BUSINESS APPLICATIONS (default settings)			
	Adobe Acrobat 6.0		Microsoft Excel 2003	
	4 pages, text and photos Portrait mode	Landscape mode	1-page table (A) With grid	Without grid
<b>ALL-PURPOSE PRINTERS</b>				
<b>Epson Stylus C66</b>	6:51	6:47	0:30	0:28
<b>Epson Stylus C86</b>	2:46	2:42	0:17	0:17
<b>HP Deskjet 5740</b>	3:03	2:52	0:36	0:20
<b>HP Deskjet 6540</b>	2:09	<b>2:00</b>	0:17	0:13
<b>Lexmark Z816</b>	5:48	4:30	<b>0:12</b>	<b>0:12</b>
<b>PHOTO PRINTERS</b>				
<b>Canon i9900</b>	2:13	2:07	0:24	0:23
<b>Canon Pixma iP1500</b>	4:35	4:15	0:18	0:18
<b>Canon Pixma iP2000</b>	3:56	3:48	<b>0:12</b>	<b>0:12</b>
<b>Canon Pixma iP3000</b>	2:02	2:08	0:13	<b>0:12</b>
<b>Canon Pixma iP4000</b>	<b>2:00</b>	2:06	0:14	0:13
<b>Epson Stylus Photo R200</b>	2:39	2:33	0:35	0:34
<b>Epson Stylus Photo R320</b>	2:42	2:40	0:34	0:33
<b>Epson Stylus Photo R800</b>	2:24	2:28	0:34	0:32
<b>HP Photosmart 8150</b>	2:14	2:03	0:21	0:17
<b>HP Photosmart 8450</b>	2:22	2:11	0:20	0:16

**RED** denotes Editors' Choice.



**EPSON STYLUS PHOTO R200**

photos as well as adjust contrast and brightness—but not quite as much as the HP Photosmart 8150 and 8450.

Output quality is at the high end for an ink jet. Text rates as very good, failing to reach excellent only because it had a slightly gray look. Graphics quality is just short of very good because of a tendency for pages with too much coverage to curl. Photos are just shy of excellent, flawed only by a brownish tint in the monochrome output.

Performance is reasonably good for photos. The total times on our photo suite—5:58 for three 4-by-6s and 12:21 for three 8-by-10s—essentially tie the R200's and beat all but the speediest of the photo

printers, most notably the Canon i9900. For business applications, the R320 was on the slow side but still in the tolerable range, with a total time of 28:49.

For those who demand true photo quality, the R800 delivers. Unlike the other two models, which use six separate ink cartridges, the R800 uses eight: cyan, yellow, magenta, red, blue, two versions of black, and a gloss optimizer cartridge.

The red and blue inks yield a larger than usual color gamut. The two different blacks—one for plain and matte paper and one for glossy paper—let it use black ink on all media, rather than mixing colors to create a composite black. The gloss optimizer adds a clear gloss as a finishing

**COST PER PAGE**

Low scores are best.  
Bold type denotes first place.

**MONOCHROME**

Claimed cost per page	Tested cost per page	PC Magazine ranking (mono text page)
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**COLOR**

Claimed cost per color page	Tested cost per color page	PC Magazine ranking (20% coverage)
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**TWO-CARTRIDGE PRINTERS**

Canon Pixma iP1500	2.2¢	6.3¢	4	10.9¢	11.8¢	4
Canon Pixma iP2000	2.3¢	6.7¢	5	10.9¢	12.5¢	6
HP Deskjet 5740	4.0¢	6.7¢	5	9.0¢	12.3¢	5
HP Deskjet 6540	3.7¢	6.2¢	3	7.8¢	11.0¢	2
Lexmark Z816	5.3¢	7.1¢	7	<b>6.7¢</b>	13.6¢	8

**FOUR-CARTRIDGE PRINTERS**

Canon Pixma iP3000	<b>1.8¢</b>	<b>3.6¢</b>	<b>1</b>	7.9¢	<b>10.0¢</b>	<b>1</b>
Epson Stylus C66	4.6¢	7.3¢	8	9.7¢	13.4¢	7
Epson Stylus C86	2.6¢	4.2¢	2	8.7¢	11.0¢	2

**◀ To compute cost**

**per page**, we tested the all-purpose ink jets and the three photo printers that are strictly four-color printers: the Canon Pixma iP1500, iP2000, and iP3000. Our rundown test, which is based on percentage coverage for each of the four colors in a four-color printer, is irrelevant for printers with more ink colors.

**PHOTOS (high-quality settings)**

Adobe Photoshop 7

TOTAL OUTPUT TIME  
4 x 6 prints      8 x 10 prints

1-page table (B), with background tints	1-page graph	3 pages, charts and graphs	Microsoft PowerPoint 2003 4 full-page slides	Microsoft Word 2003			12 pages, monochrome text	12 pages, color text	TOTAL OUTPUT TIME	TOTAL OUTPUT TIME	
1:52	1:44	4:35	7:10	0:58	1:52	1:43	5:23	14:31	54:24	13:51	31:30
0:45	0:44	1:49	2:45	0:33	0:54	0:51	2:35	6:12	23:10	8:36	19:14
0:52	0:53	1:57	3:02	0:36	0:52	0:55	2:33	3:35	22:06	8:42	21:27
0:37	0:37	1:23	<b>2:11</b>	0:24	0:38	0:35	1:49	3:27	16:20	5:09	12:13
1:13	1:05	2:59	4:25	1:59	2:01	2:29	<b>1:42</b>	7:55	36:30	11:18	30:18
0:31	1:46	1:42	5:14	0:55	0:56	0:55	4:02	4:11	25:19	<b>1:31</b>	<b>3:14</b>
1:03	0:59	2:32	4:15	0:29	0:59	0:55	1:58	7:17	29:53	7:29	17:43
0:57	0:54	2:21	3:45	<b>0:22</b>	0:54	0:50	1:43	6:54	26:48	7:54	15:54
<b>0:30</b>	<b>0:29</b>	<b>1:21</b>	<b>2:11</b>	0:29	<b>0:32</b>	<b>0:34</b>	1:48	<b>3:19</b>	<b>15:48</b>	3:22	7:41
0:31	<b>0:29</b>	<b>1:21</b>	<b>2:11</b>	0:30	0:33	<b>0:34</b>	1:47	<b>3:19</b>	<b>15:48</b>	3:16	7:47
0:45	0:43	1:51	2:39	1:07	1:08	1:06	6:11	6:26	28:17	5:54	12:10
0:44	0:43	1:54	2:50	1:07	1:08	1:08	6:16	6:30	28:49	5:58	12:21
0:41	0:44	1:39	2:28	1:05	1:06	1:03	6:11	6:04	26:59	6:22	14:16
0:37	0:37	1:24	2:16	0:30	0:42	0:40	2:21	3:40	17:42	5:37	13:09
0:41	0:40	1:31	2:21	0:29	0:45	0:40	2:03	3:37	17:56	7:49	16:14

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touch to areas with less ink to provide a consistent level of glossiness.

In addition to true photo quality, the R800 offers graphics output that rates as very good, missing excellent only because colors on plain paper have a pastel look. Text quality is good, with several of the fonts we tested readable even at 4

points; one, however, needed 12 points for easy readability.

On our performance suite, the R800 scored on the sluggish side, with a total of 26:59 for the business suite, 6:22 for 4-by-6s, and 14:16 for 8-by-10s. But even though it's not the fastest ink jet on the block, it is definitely the most versatile.

## HP Photosmart 8150, 8450 Photo Printers

**8150:** \$200 street. OVERALL ●●●●● Text: 3.5; Graphics: 3.5; Photos: 5. **8450:** \$300. OVERALL ●●●●● Text: 3.5; Graphics: 3.5; Photos: 5. Hewlett-Packard Development Co., www.hp.com.

The HP Photosmart 8150 Photo Printer is the smaller, less expensive cousin of the

## SUMMARY OF FEATURES

### Personal Printers

	ALL-PURPOSE INK JET PRINTERS					PHOTO PRINTERS		
	Epson Stylus C66	Epson Stylus C86	HP Deskjet 5740 Color Inkjet Printer	HP Deskjet 6540 Color Inkjet Printer	Lexmark Z816 Color Jetprinter	Canon i9900 Photo Printer	Canon Pixma iP1500 Photo Printer	Canon Pixma iP2000 Photo Printer
<b>TESTED CONFIGURATION</b>								
Street price	\$70	\$100	\$100	\$150	\$100	\$500	\$50	\$80
Dimensions (HWD, in inches)	12.0 x 17.2 x 18.1	12.1 x 17.2 x 18.1	6.3 x 17.7 x 8.4	5.7 x 17.7 x 14.5	12.1 x 17.3 x 16.9	7.2 x 22.7 x 13.1	6.5 x 16.4 x 8.1	6.6 x 16.5 x 10.2
Weight (pounds)	10.1	10.5	7.3	13.2	5.3	21.0	6.3	11.0
Duplexer	<input type="checkbox"/>	<input type="checkbox"/>	Optional (\$99)	Optional (\$79)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rated speed, draft mode: mono/color (ppm)	17 / 9	22 / 12	23 / 18	30 / 20	22 / 15	16 / 12	18 / 13	20 / 14
Rated speed, highest-quality mode: mono/color (ppm)	Not rated	Not rated	2 / 2	2 / 2	Not rated	Not rated	Not rated	Not rated
Highest text/color resolution or claimed visual equivalent	1,440 x 5,760 / 1,440 x 5,760	1,440 x 5,760 / 1,440 x 5,760	1,200 x 1,200 / 1,200 x 4,800	1,200 x 1,200 / 1,200 x 4,800	1,200 x 1,200 / 1,200 x 4,800	2,400 x 4,800 / 2,400 x 4,800	600 x 600 / 1,200 x 4,800	600 x 600 / 1,200 x 4,800
Direct connect ports	USB 1.1	Parallel, USB 1.1	USB 2.0	USB 2.0	USB 1.1	FireWire, USB 1.1, USB 2.0	USB 1.1	USB 1.1
Wireless connections	EpsonNet 802.11g (optional, \$179)	EpsonNet 802.11g (optional, \$179)	None	802.11b (optional, \$240)	None	None	None	None
Minimum/maximum paper size (inches)	3.5 x 3.5 / 8 x 14	3.5 x 3.5 / 8 x 14	3.5 x 3.5 / 8 x 14	3.5 x 3.5 / 8 x 14	3 x 5 / 8.5 x 17	4 x 6 / 13 x 19	4 x 6 / 8 x 14	4 x 6 / 8 x 14
Input/output tray capacity (sheets)	100 / Not rated	120 / Not rated	100 / 50	150 / 50	100 / 25	150 / 100	100 / 100	150 / 100
<b>INK AND COSTS</b>								
Number of ink cartridges/ink colors	4 / 4	4 / 4	2 / 4 or 6	2 / 4 or 6	2 / 4 or 6	8 / 8	2 / 4	2 / 4
Stops printing if one color runs out	■	■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	■	■	■
Cost per black cartridge (standard/high-yield)	\$25	\$25 / \$35	\$20 / \$30	\$20 / \$30	\$20 / \$25	\$12 / N/A	\$7 / N/A	\$7 / N/A
Cost per tricolor cartridge (standard/high-yield)	N/A	N/A	\$25 / \$35	\$25 / \$35	\$22 / \$30	N/A	\$19 / N/A	\$19 / N/A
Cost per tricolor photo ink cartridge (standard/high-yield)	N/A	N/A	\$25 / N/A	\$25 / N/A	\$25 / N/A	N/A	N/A	N/A
Cost per individual color cartridge	\$13	\$13	N/A	N/A	N/A	\$12	N/A	N/A
Claimed cost per monochrome page	4.6¢	2.6¢	4.0¢	3.7¢	5.3¢	1.6¢	2.2¢	2.3¢
Claimed cost per color page	9.7¢	8.7¢	9.0¢	7.8¢	6.7¢	N/A	10.9¢	10.9¢
<b>PHOTO-RELATED FEATURES</b>								
EXIF 2.2- / PIM-compliant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	■ <input type="checkbox"/>	■ <input type="checkbox"/>	■ <input type="checkbox"/>
Direct printing from memory cards/PictBridge cameras	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> ■	<input type="checkbox"/>	<input type="checkbox"/> ■
Preview screen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>NETWORK</b>								
Network ports	None	Ethernet (optional, \$99)	None	Ethernet (optional, \$159)	External Ethernet	None	None	None
<b>SERVER OS SUPPORT</b>								
NetWare 5.x / Linux	■ ■	■ ■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Windows NT 4.0 / 2000 / XP	■ ■ ■	■ ■ ■	<input type="checkbox"/>	■ ■ ■	<input type="checkbox"/> ■ ■	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	N/A	N/A	N/A	Most versions of Unix	<input type="checkbox"/>	None	None	None
<b>OTHER</b>								
Thumbnail/booklet/watermark printing	■ ■ ■	■ ■ ■	<input type="checkbox"/> ■	■ ■ ■	<input type="checkbox"/> * <input type="checkbox"/>	■ <input type="checkbox"/> ■	■ ■ ■	■ ■ ■

RED denotes Editors' Choice. \* Windows Only. N/A—Not applicable: The product does not have this feature. \* Price to be determined.

Photosmart 8450. Both can easily serve as all-purpose printers, with good performance across the board and output quality that ranges from just short of very good to excellent. But what makes them stand out is a color LCD and kiosk-style menu features that let you fix flaws in your photos when you print without a computer.

The 2.5-inch LCD on each front panel is complemented by about a dozen buttons and knobs, along with slots for six memory card formats. Each printer also has a USB port for a PictBridge camera, USB key, or \$50 Bluetooth adapter. The LCD lets you preview your pictures, and the built-in menus let you crop photos, remove red

**HP PHOTOSMART 8450 PHOTO PRINTER**



Download this table at [www.pcmag.com](http://www.pcmag.com)

Canon Pixma iP3000 Photo Printer	Canon Pixma iP4000 Photo Printer	Epson Stylus Photo R200	Epson Stylus Photo R320	Epson Stylus Photo R800	HP Photosmart 8150 Photo Printer	HP Photosmart 8450 Photo Printer
\$100	\$150	\$100	\$200	\$400	\$200	\$300
6.8 x 16.5 x 10.8	6.7 x 16.5 x 11.3	11.9 x 19.0 x 18.5	11.4 x 18.7 x 19.6	12.8 x 19.5 x 25.0	6.8 x 18.4 x 15.4	7.6 x 21.1 x 15.8
11.0	14.9	11.4	14.0	17.6	15.5	17.6
■	■	□	□	□	Optional (\$79)	Optional (\$79)
22 / 15	25 / 17	15 / Not rated	15 / Not rated	17 / Not rated	26 / 20	30 / 20
Not rated	Not rated	Not rated	Not rated	Not rated	1.8 / 1.8	2.1 / 2.1
600 x 600 / 1,200 x 4,800	600 x 600 / 1,200 x 4,800	1,440 x 5,760 / 1,440 x 5,760	1,440 x 5,760 / 1,440 x 5,760	1,440 x 5,760 / 1,440 x 5,760	1,200 x 4,800 / 1,200 x 4,800	1,200 x 4,800 / 1,200 x 4,800
USB 1.1	Parallel, USB 1.1	USB 1.1	USB 2.0	FireWire, USB 2.0	USB 2.0	USB 2.0
None	None	None	Bluetooth Photo Print Adapter (optional, \$70)	None	Bluetooth (optional, \$50)	Bluetooth (optional, \$50), 802.11b (optional, \$240), 802.11g (optional*)
4 x 6 / 8 x 14	4 x 6 / 8 x 14	4 x 6 / 8.3 x 23.4	4 x 6 / 8.3 x 23.4	4 x 6 / 8.3 x 23.4	4 x 6 / 8 x 14	4 x 6 / 8 x 14
150 / 100	150 / 100	120 / Not rated	120 / Not rated	100 / Not rated	100 / 50	100 / 50
4 / 4	5 / 4	6 / 6	6 / 6	8 / 6	2 / 4 or 6	3 / 7 or 8
■	□	■	■	■	□	□
\$14 / N/A	\$12 / \$14	\$18 / N/A	\$18 / N/A	\$15 / N/A	\$20 / \$30	\$20 / \$30
N/A	N/A	N/A	N/A	N/A	\$25 / \$35	\$25 / \$35
N/A	N/A	N/A	N/A	N/A	\$25 / N/A	\$25 / N/A
\$12	\$12	\$13	\$13	\$15	N/A	N/A
1.8¢	1.9¢	2.9¢	2.9¢	2.7¢	3.7¢	3.7¢
7.9¢	8.9¢	N/A	N/A	N/A	7.8¢	N/A
■ □	■ □	■ ■	■ ■	■ ■	■ □	■ □
□ ■	□ ■	□ □	■ ■	□ □	■ ■	■ ■
□	□	□	■	□	■	■
None	None	None	None	None	None	Ethernet
□ □	□ □	□ □	□ □	□ □	□ □	□ □
□ □ □	□ □ □	□ □ □	□ □ □	□ □ □	□ □ □	□ ■ ■
None	None	None	None	None	None	None
■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■

eye, adjust brightness, apply digital flash, and more. You can also pick a frame to print from a video clip.

The 8150 comes with one tricolor cartridge and one color photo cartridge. But you can replace the photo ink cartridge with a black cartridge or with a photo gray cartridge, which is intended for black-and-white photos.

The 8450, however, prints with as many as eight colors. It has room for three cartridges, which lets it hold a tricolor cartridge and a color photo cartridge at all times, plus your choice of either a standard black cartridge or a photo gray cartridge. In addition to a USB 2.0 port, the 8450 includes an Ethernet connection.

Output quality for both units is in the top tier for ink jets, rating just short of very good for text and graphics and excellent for photos. More than half our test fonts were easily readable at 4 points, although some stylized fonts required 12 points. Graphics suffered only from banding in default mode and a tendency for full-page output to make the paper curl.

Performance for the 8150 is also a plus. Its total time of 17:42 on our business applications suite is faster than nearly all ink jets and not much slower than the fastest here. For photos, the 5:37 total for 4-by-6s and 13:09 for 8-by-10s are also faster than most ink jets, although only about one-fourth the speed of the \$500 Canon i9900. For printing without a computer, the 8150 is your best choice among nondedicated photo printers.

The 8450's performance over the network was similar to the 8150's for our business applications suite, with a total time of 17:56. But it was slower for our photo suite. For 4-by-6s, it totaled 7:49 and 16:14 for 8-by-10s. Even though the 8450 is slower than the 8150, however, it's faster than the majority of ink jets for business applications. Unless you need your photo printer on a network, it's hard to recommend the 8450 over its smaller, faster, less expensive relative.

## DEDICATED PHOTO PRINTERS

## Print Small, Print Often

For snapshot fanatics who demand the ease and convenience of a dedicated photo printer, we tested six candidates. Most print no bigger than 4-by-6, and many are portable, making your pictures available at home and on the road.

The thermal-dye **Canon CP-330 Compact Photo Printer** (\$280 street, Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com) ●●●●○) runs off an included battery and has other notable features that justify its price. The battery is good for roughly 36 prints on 4-by-6 paper. A 36-print package of dye ribbon and paper for 4-by-6s costs \$19.99, or 56 cents per page. We like the back of the 4-by-6 paper, which is laid out as a postcard. Another extra is a choice in output size and media, including 4-by-8 paper, stamp-size labels, and credit card-size labels and paper.

The CP-330 prints from only a camera or computer. We saw consistent times of 1:26 to 1:33 using both methods. Output quality was nearly excellent, with some aliasing in one image, but this occurred only in borderless mode. Unfortunately, its initial price, high cost per page, and lack of support for memory cards keep this printer off our short list.

If you're looking for an easy way to print digital photos, the **Epson PictureMate** (\$200 street, Epson America Inc., [www.mypicturemate.com](http://www.mypicturemate.com) ●●●●○) has your name on it. This ink jet-based printer competes head-to-head with thermal-dye photo printers. It prints up to 4-by-6 photos at true photo quality. Unlike the Canon unit, the PictureMate lets you print from just about anything, including memory cards, USB keys, and PictBridge cameras. The built-in menus are helpful, but there's no color LCD to preview images; instead, you must print an index sheet, with 20 images per sheet.

Each 4-by-6 took from 2:15 to 2:22. Prints are a match for conventional film-based photos, and they're waterproof and smear-proof. Even better, they cost only 29 cents each.

The **Hi-Touch HiTi 730PS** (\$400 street, Hi-Touch Imaging Technologies Inc., [www.hitouchimaging.com](http://www.hitouchimaging.com) ●●●●○), prints up to 6-by-8-inch photos. It offers true photo quality and fast performance. The controls, including the LCD-based menu and preview screen, reside on a tethered remote and dock on the printer's side. The price works out to a somewhat high 40 cents to \$1 per photo, depending on the size. It prints from your computer or a memory card.

The 730PS printed 4-by-6 photos in 55 to 59 seconds, compared with over 2:00 for the PictureMate. Its times for 6-by-8 photos ranged from 1:18 to 1:20. Output quality was what we expect from thermal-dye technology, but wasn't as crisp as the PictureMate's. Most pictures showed no flaws, and the ability to print 6-by-8 photos nearly makes up for any slight loss of detail at smaller sizes.

The ink jet-based **HP Photosmart 375 Compact Photo**



SONY PICTURESTATION DPP-FP30

**Printer** (\$200 street, Hewlett-Packard Development Co., [www.hp.com](http://www.hp.com) ●●●●○) offers PictBridge compatibility and memory card slots, a 2.5-inch LCD to preview photos, and a kiosk-style menu to let you crop, edit, and print multiple photos per page. This printer even has an optional battery (\$80), so you can print anywhere.

Print times are right for this class of printer, at 1:29 to 1:45 printing from a computer and 1:50 to 2:10 from a camera. But the quality is lower than that of its competition. We saw some aliasing, and the punched-up colors, which can be attractive in many photos, were too punchy for our tests.

Surprisingly, the 375 does not offer waterproof and smudge-proof prints. Even after several days of drying, a drop of water or sweaty hands will stain or smudge a photo. Each 4-by-6 costs just 29 cents, but even with that and the extensive feature set, the 375's subpar quality drags its rating—and our recommendation—down.

Part photo printer, part camera dock, the **Kodak EasyShare Printer Dock** (\$149.95 list, Eastman Kodak Co., [www.kodak.com](http://www.kodak.com) ●●●●○) can produce good-looking output at reasonable speeds. But it is relatively expensive to run and makes the most sense if you pair it with a compatible Kodak EasyShare camera. This one, too, is limited to 4-by-6 photos. When you buy the ribbon and paper bundle, expect to pay 62 cents per photo.

If you don't have the right Kodak camera, you can print via PictBridge, a memory card (with an external adapter), or a computer. Print times were consistently 2:08 to 2:15 when printing from a camera, and 1:25 to 1:26 from a computer. Output quality was just short of excellent, marred only by a tendency to lose detail in extremely bright areas in a photo. Nevertheless, the high cost per page and lack of memory card slots make this printer hard to recommend over the competition.

The **Sony PictureStation DPP-FP30** (\$150 street, Sony Electronics Inc., [www.sonystyle.com](http://www.sonystyle.com) ●●●●○) prints from only a camera or computer, and the output is true photo quality at up to 4 by 6 inches. It took 1:28 to 1:40 to print from a PC and 2:06 to 2:10 from a camera. Most dedicated photo printers produce times in this range, although some print at the same speed from both computers and cameras.

More important, the output was as good as we've ever seen. Colors, including skin tones, were realistic, and the image retained remarkable detail. Running costs, however, are high. Sony's 4-by-6 dye roll and paper come to 56 to 62.5 cents per photo. That's a typical price for dedicated thermal-dye photo printers, but it's roughly twice that of the ink jet-based Epson PictureMate.—MDS

EPSON PICTUREMATE

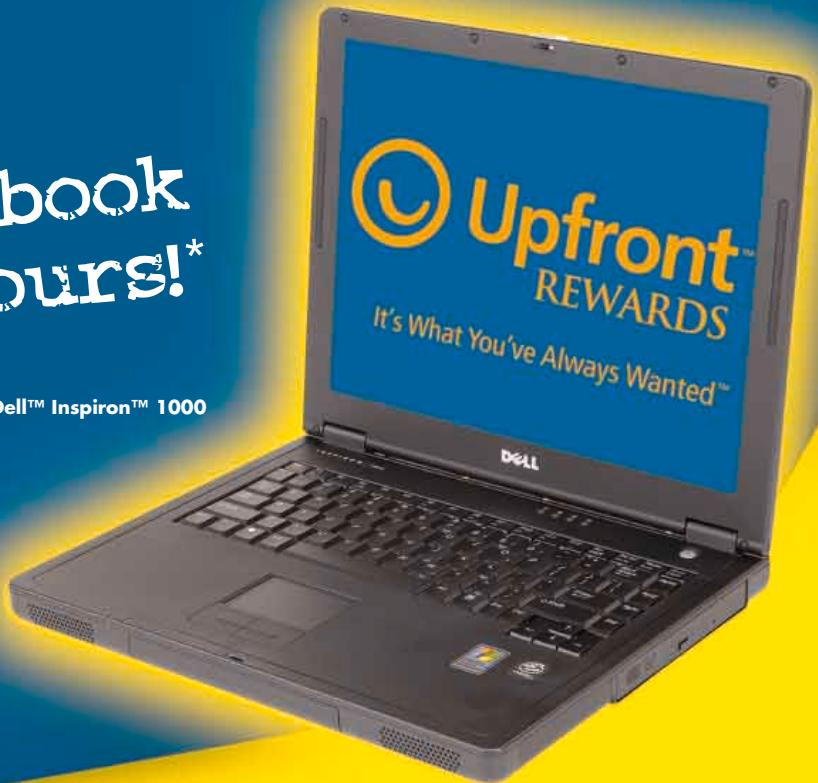


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# FOR THE Business

By Bill Machrone

Illustrations by Jack Harris

## READ ON TO LEARN:

- Which notebook is right for you to take on the road—and what types of features you can expect with each
- Whether a PDA or a smart phone is the best choice for your mobile needs
- How to choose the right accessories, such as a portable projector, printer, notebook carrying case, or travel router
- Which hotels and major airports offer hot spots and broadband connectivity

**E**xperienced business travelers know that getting there is way less than half the fun. And often, being there isn't so hot, either. Getting things done when you're on the road can be tough, but with the right products, you'll be able to work with maximum efficiency and ease. And the best part: The benefits of your travel gear will spill over into your everyday life and improve your all-around productivity.

The steady march of technology has made it possible to carry an entire office's worth of gear—even conference room equipment—in a reasonable-size carry-on. Computers on airplanes no longer elicit a second glance. The challenge today is to remember to turn off your wireless adapter so your computer doesn't attempt to establish peer-to-peer communications with all the other laptops in the cabin.

The PC is still the heart of your business-travel tool kit, but increasingly the firepower is moving to devices you're not likely to use on the plane, but will once you land—products such as portable projectors, smart phones, and even travel routers to let you share the high-speed connection that's now so prevalent in hotel rooms.

In this guide we'll take you through the latest technologies and the important factors for choosing the right notebook, PDA, portable printer, projector,



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# Traveler

## Don't Leave HOME Without...

and e-mail device. We'll also cover other hardware and software that make life on the road tolerable and productive, if not outright enjoyable.

### Notebooks

A few extraordinary individuals get by with no more than a PDA and a cell phone, but notebook computers are a travel must for the rest of us. In

fact, the notebook is more often than ever the only computer we use day to day.

The notebook market has divided itself into four main categories, based on size, weight, and capabilities. *Mainstream* notebooks are the most popular among business travelers. Some models can be a bit on the heavy side, but they typically offer the best combination of weight versus power and features. *Ultraportables* are the smallest and sleekest of the bunch and typically don't include an optical drive. *Tablets* are a notebook permutation somewhere between mainstream and ultraportable, with screens you can write on with a stylus. *Desktop replacements* are the heaviest, and while they're technically transportable, you'd have to be very determined to bring one on board. We'll start with the most popular for the business traveler.

#### MAINSTREAM

A favorite among road warriors, who value the perfect blend of portability and productivity, mainstream notebooks do all things well. These systems usually weigh from 4 to 7 pounds. They vary widely in price, from \$1,000 to nearly \$3,000, depending on how you configure them.

For the frequent flier, the 4.5- to 6-pound mainstream notebook is the sweet spot. Anything heavier will warrant expletives the next time you run to catch a connecting flight. (If your travels aren't frequent, you can get away with something a bit heavier, and likely less expensive.) Mainstream notebooks can come with a variety of processors, but for most travelers a low-voltage processor like the Pentium M is the ideal choice. This processor is a strong performer, and its reduced power consumption results in long-lasting battery life—typically 5 hours or more.

Wireless capability is also very important; integrated 802.11g is the preferred option, though the slower 802.11b is okay, too. As for hard drives, 40 to 60GB is more than enough storage for demanding applications and data, as well as some music and video files for the plane ride. And the system should come with at least a DVD/CD-RW combo drive, to play DVDs as well as burn CDs.

Screen size is one of the most important considerations. Although 14-inch screens are commonplace, 15- and 15.4-inch screens are becoming more popular. The additional screen real estate these offer can be useful, but will add weight. Frequent fliers should stick with the 14-inch displays, with native resolutions of either 1,024-by-780 or 1,280-by-1,024.

All mainstream notebooks have a full-size keyboard, at least two USB 2.0 ports, and, on an increasing number of systems, a FireWire port and memory card slot—useful on any notebook.

*If you travel a lot, tailor your travel bag for grab-and-go efficiency, because nothing's worse than being in some strange city and finding you've forgotten an essential piece of gear. Make an investment in your own peace of mind, and follow our essential what-to-pack check list.*

1. **A second cord and charger for your notebook.** You'll never need to have them shipped overnight to your hotel, and you can leave your office configuration untouched.
2. **Space-saving or retractable RJ-11 and RJ-45 cables.** The new, flat Ethernet cables can be rolled up small and secured with a rubber band.
3. **Blank CD-R discs.** When they inevitably ask, "Can you e-mail me a copy of your presentation?" you can do them one better and hand them discs.
4. **USB key drive.** Convenient for data transfers, these are the reason floppy disks are obsolete.
5. **Travel mouse (wireless or USB).** Let's face it, laptop pointing devices aren't in second place behind the mouse; they're in last place.
6. **Noise-canceling headphones.** They're bulky, but they work, and no one will try to chat you up while you're wearing them.
7. **USB light.** This miniature light shines bright in dim hotel rooms or overnight flights.
8. **Spare battery.** Now on long flights you can get your work done *and* watch a DVD. You also won't have to search for an AC outlet when you're changing planes.
9. **Backup or install discs.** Necessary insurance for your operating system and critical apps. Don't forget ones with your VPN and dial-up software, so you can stay in communication.
10. **Energy bars and pharmaceuticals.** Never expect the airlines to feed you. And after they've wrecked your schedule, you'll need something for the headache or the agita.

**Finally, remember:** Never surrender your luggage to anyone who is not a blood relative. Pack light and carry it on.



**NOTEBOOKS: WEIGHT MATTERS.** Mainstream laptops weigh between 4 and 7 pounds. These are ideal for road warriors who value the perfect blend of portability and productivity. Ultratables weigh less than 4 pounds, and are best for frequent fliers who value light weight most of all.

And although many systems still include two PC Card slots, the ubiquity of integrated wireless is making such slots nonessential. Same thing goes for legacy ports. If you need a parallel printer or PS/2 keyboard or mouse port, be sure your system has it. If you don't need these, opt for more USB ports.

You also want to ensure your system has a modem and Ethernet and VGA-out ports—all necessities for businesspeople.

## DATA on the Go

There are myriad ways to get your data from here to there. Below is a primer on the different wireless networks.

### LOCAL NETWORKS (INCLUDING PERSONAL)

**Bluetooth** Short-range wireless (about 30 feet) for connecting two devices.

**802.11a, "b," and "g"** Also known as Wi-Fi. A family of wireless specifications. 802.11a operates in the 5-GHz radio spectrum, with a distance range of about 75 feet and a real-world throughput rate of about 15 to 20 Mbps. 802.11b and 802.11g are more common, and operate in the 2.4-GHz radio spectrum, with a distance range of about 150 feet. "B" has a throughput of about 4 to 6 Mbps, whereas "g" has a higher throughput of 15 to 20 Mbps.

### WIDE-AREA NETWORKS

WANs are divided by generation into **2G**, a basic digital cell phone network for transmitting voice and data to cell phones; **2.5G**, which transfers data at anywhere from 30 Kbps to 100 Kbps; and **3G**, with data rates of at least 144 Kbps from a moving train, and much higher from a fixed location.

**CDMA 1xRTT** (2.5G) Basic data transfer system using the CDMA cell network, known as National-Access to Verizon Wireless customers and PCS Vision to Sprint PCS customers. Lets you connect through your cell phone at about 50 to 60 Kbps.

**CDMA2000 1xEV-DO** (3G) Verizon's replacement for 1xRTT, also known as BroadbandAccess. Lets you transfer data via PC Card or cell phone at an average of 250 to 300 Kbps over cell network. Currently available in 14 cities.

**EDGE** (2.5G) AT&T's national midspeed data system. Allows you to connect to the Internet through your cell phone or PC Card at an average speed of around 80 Kbps.

**GPRS** (2.5G) A common method of connecting cell phones to the Internet, used by GSM cellular providers AT&T, Cingular Wireless, and T-Mobile. Connection speeds are about 30 to 40 Kbps.

**UMTS** (3G) AT&T's fastest data service, with data rates of about 250 Kbps. In the U.S., it's currently available in six cities.—*Sascha Segan*

### ULTRAPORTABLE

Ultratable notebooks are for anyone whose first computing priorities are thinness and lightness. These demure systems weigh in at 2 to 4 pounds and are perfect for high-level executives who travel frequently and keep their road tasks mainly to light e-mailing, PowerPoint presentations, word processing, and Web surfing. Ultratables are a little more expensive than mainstream systems, usually from \$1,500 to \$3,200.

Ultratables have somewhat slower (1 to 2 GHz) low-power and ultralow-power processors to extend battery life and avoid cooling problems. But that's not to say these systems are slow; they are more than fast enough for any of the aforementioned business tasks.

If the idea of an ultratable interests you, don't settle for anything less than a standard keyboard and 12.1-inch screen with crisp XGA (1,024-by-768) resolution. Also, opt for at least 256MB of memory, and upgrade to 512MB for added system life if you can.

Many ultratables are now equipped with an SD (Secure Digital) or other memory card slot, one PC Card slot, and built-in wireless capability. (Again, if you have a choice, we recommend 802.11g over 802.11b.) You won't have trouble finding a LAN port, two USB 2.0 ports, and a VGA port for driving external monitors or projectors. FireWire ports on these smaller systems are rare.

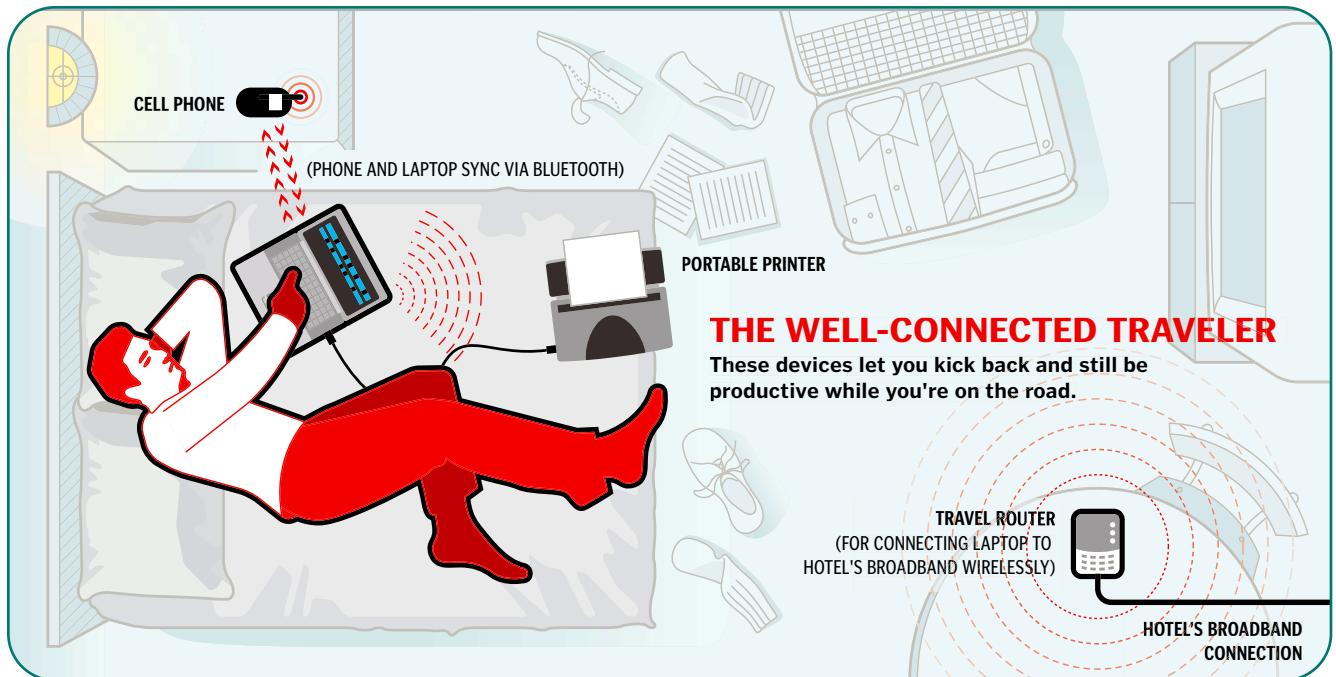
Also rare are on-board optical drives, but if you live by e-mail and your pre-loaded applications, that needn't be a limitation; you can also opt to attach an external drive if you need it. More limiting is the hard drive's decreased capacity and speed. Applications load more slowly, and if you're inclined to carry a large portion of your music collection or your own downloaded movies on your laptop, you may run out of room. While you can fit 5,000 songs or 40 hours of video in 20GB, you need at least 10GB for your operating system, applications, data storage, and temporary files, and a full or nearly full hard drive will hurt performance. Choose at least a 30GB to 40GB hard drive.

As for graphics, ultratables lack the high-performance graphics and faster bus speeds found on larger notebooks, so they are not a good choice for video editing or first-person shooter games.

### TABLETS

Tablets are a sort of subset of ultratable and mainstream notebooks. They come in two categories, convertibles and slates, and weigh about 2.5 to 4.5 pounds. For busy business travelers, convertibles are the way to go. These look and act very much like mainstream notebooks, down to the processors and graphics used inside; however, for those with a penchant for writing by hand, the display swivels, so you can write using a stylus and Microsoft Windows XP Tablet Edition. The best part is that there's also a keyboard for typing.

A slate tablet is simply a display with an embedded, low-power CPU and no keyboard. These are more popular with vertical markets and aren't as conducive to heavy productivity on the road. Slate prices vary, due to purchase orders. Convertible prices go from about \$1,400 to about \$2,500.



### DESKTOP REPLACEMENT

Desktop replacement machines, at 7 pounds and up, are meant to stay in one place. They trade portability for power by being able to handle the work of a desktop machine. These heavyweights are best for those who need to take work home with them occasionally, preferably by car.

Desktop replacements typically have huge 17-inch widescreen displays, and processor speeds can exceed 3 GHz. They also typically have around 80GB of storage, 512MB of RAM, a DVD burner, and a host of ports. For mobile gamers and video editors, desktop replacements are the call: They often include high-performance graphics chips and more video memory than on the other notebooks. Battery life is typically in the 2-hour range. Prices range from less than \$1,000 for value models to more than \$3,000 for high-end systems.

## PDAs and Smart Phones

A revolution in business travel was wrought by mobile

devices like the Palm Pilot, the RIM BlackBerry, and the Handspring (now palmOne) Treo. Building on the wire-snipping freedoms afforded by pagers and cell phones, mobile devices have retired many a day planner, address book, and calendar. But technology hasn't stood still.

PDAs, e-mail devices, and smart phones have morphed, grown, and cross-pollinated. Now you can find PDAs with phones, cameras, and wireless e-mail; e-mail devices with organizers and phones; and phones with calendars, cameras, networking, and QWERTY keyboards. Choosing the best one for your needs can be a challenge, as much for eliminating the capabilities that you don't need as selecting the ones that are essential. Since the categories overlap so much, it's best to focus on your needs rather than on an arbitrary classification.

Today's personal digital assistants are enormously powerful, with processor speeds up to 624 MHz and up to 256MB of memory. PDAs use either handwriting recognition and touch screens or tiny alphanumeric thumb keyboards. Thankfully, almost all have made the transition from replaceable to rechargeable batteries. For convenience, look for in-the-dock recharging, preferably right from your computer's USB port, rather than from a separate wall wart.

## In the Bag

Briefcase, shoulder bag, messenger bag, or backpack? Aluminum, leather, or canvas? Wheels or straps? Choosing a bag is strictly a matter of personal preference. But making sure you get the right features within your favorite style is of paramount importance.

The first order of business is protecting your laptop. Notebooks are most sensitive to damage at their corners. Cushioning the large top and bottom surfaces is window dressing; cradling the edges against drops is vital. Equally important is protecting your shoulders and back. If you choose a bag with a strap, make sure the strap is wide and comfortable. Some bags have a gel cushion in the shoulder pad, but generally anything cushioned helps.

The internal and external pockets also come in handy: This is where the place-for-everything mentality needs to kick in. Knowing where to find everything in your travel kit will add years to your life.

Make sure your bag is light and comfortable—as well as durable. If it's durable, but weighs 6 pounds, what's the point of getting a 3-pound system? Get something comfortable, and make sure it's sturdy.

**OUR CONTRIBUTORS:** Bill Machrone is a columnist and contributing editor of *PC Magazine*. Sascha Segan is a lead analyst at PC Magazine Labs. Associate Editor Jenn DeFeo was in charge of this story.

## CONNECTED Hotels & Airports

You spend your days in meetings and nights catching up on office work. If your hotel is circa last century (and many are), you may be in for late nights of grueling dial-up connections. The following is a list of U.S. hotels frequented by business travelers. Most offer high-speed connections, but to be sure, call before you book your next trip.

**Choice Hotels**, 877-424-6423, [www.choicehotels.com](http://www.choicehotels.com) (includes Clarion, Comfort Inn, Comfort Suites, Econo Lodge, MainStay Suites, Quality, Rodeway Inn, and Sleep Inn).

**Fairmont Hotels**, 800-257-7544, [www.fairmont.com](http://www.fairmont.com).  
**Four Seasons Hotel**, 800-819-5053, [www.fourseasons.com](http://www.fourseasons.com).

**Hilton Hotels**, 800-445-8667, [www.hilton.com](http://www.hilton.com).

**Marriott Hotels**, 888-236-2427, [www.marriott.com](http://www.marriott.com) (includes Courtyard, Fairfield Inn, Residence Inn, Spring Hill Suites, and TownePlace Suites).

**Starwood Hotels**, 888-625-5144, [www.starwood.com](http://www.starwood.com) (includes Four Points, St. Regis, Sheraton, Westin, and W Hotels).

Wireless hot spots can be found in many airport lounges and terminals. Many even allow for on-the-spot sign-up—just punch in your credit card. Below are the ten most frequently traveled, most unwired U.S. airports\*.

1. **Hartsfield-Jackson Atlanta International Airport (Atlanta)**, [www.atlanta-airport.com](http://www.atlanta-airport.com).
2. **O'Hare International Airport (Chicago)**, [www.ohare.com](http://www.ohare.com).
3. **Dallas/Fort Worth International Airport (Dallas)**, [www.dfwairport.com](http://www.dfwairport.com).
4. **Los Angeles International Airport (Los Angeles)**, [www.los-angeles-lax.com](http://www.los-angeles-lax.com).
5. **Denver International Airport (Denver)**, [www.flydenver.com](http://www.flydenver.com).
6. **Minneapolis-St. Paul International (Minneapolis)**, [www.msppairport.com](http://www.msppairport.com).
7. **John F. Kennedy International Airport (New York)**, [www.panynj.gov/aviation/jfkframe](http://www.panynj.gov/aviation/jfkframe).
8. **Miami International Airport (Miami)**, [www.miami-airport.com](http://www.miami-airport.com).
9. **San Francisco International Airport (San Francisco)**, [www.flysfo.com](http://www.flysfo.com).
10. **Newark Liberty International Airport (Newark, NJ)**, [www.newarkairport.com](http://www.newarkairport.com).

\*Data collected from Airports Council International, the Intel Corp., and Bert Sperlign's annual "Unwired" survey.

### HOT SPOT FINDER

■ A resource worthy of bookmarking:

[www.jiwire.com/search-hotspot-locations.htm](http://www.jiwire.com/search-hotspot-locations.htm). This list sorts hot spots by place, time, location, location type, proximity to your location (even phone booths), and wireless type.



**PDA CHOICES.** The lines are blurring among PDAs, smartphones, and e-mail devices, but so far, there's no perfect all-in-one device. When choosing a handheld, prioritize your needs. For example: If you're a heavy e-mailer, a comfortable thumb board should be your first concern.

While the simplest PDAs are electronic calendars and memo pads, exchanging data with your PC makes them much more useful. Their usefulness takes another leap when they go wireless. The original dedicated corporate e-mail devices—the RIM BlackBerrys—were built on pager technology to give you send-receive access to your e-mail wherever you go. That technology is still quite viable if you prefer to keep your phone and PDA separate. But modern PDAs and smart phones with wireless e-mail can now use cell-phone networks for connectivity. If you travel extensively, pay attention to the coverage areas.

Theoretically, you don't need anything more than monochrome to display contacts and calendars, but a color display increases usability and opens the door to many other applications. With the increased capacity and processing power of today's PDAs, you can also load an amazing variety of applications, from challenging games to detailed wine lists, plus many industry-specific vertical applications.

The 320- by 240-pixel screens on many PDAs look pretty good, but some of the newest devices now have full VGA (640- by 480-pixel) resolution, and the difference is impressive. Now your PDA can be the ultimate brag book, with bright, high-resolution photos, and, if you have sufficient memory, video.

Look for an expansion slot for additional memory and accessories. The slot is typically CompactFlash (CF) or Secure Digital (SD), and while both are good for memory, the larger CF slot allows some larger accessories, while the SD slot makes for a sleeker PDA. What kind of accessories? GPS receivers, cameras, Ethernet adapters, Wi-Fi adapters, cameras, and more. If you just stick with additional memory, you'll have plenty of room for digital music.

While you can add a digital camera via the memory slot, you're probably better off with a built-in camera, especially now that megapixel resolution is available. If you need to take spur-of-the-moment pictures, this is the way to go. And as with any camera phone, you can either e-mail your photos to others or easily transfer them to your PC.

Although the features of PDAs, e-mail devices, and smart phones have converged, it's still easy to recognize a smart phone—it looks more like a phone and less like a PDA. The wider, thicker PDAs work best with a headset. Although you can hold them to your ear, they're somewhat ungainly. Any time you have phone features on a PDA or PDA features in a phone, make sure you can turn off the phone part for air travel so you can use the PDA in flight. You'll also get extended battery life.

Naturally, the more features you add, the more the device costs. A simple PDA costs \$100 or less, and if all you're looking for is day-to-day organization



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- Toshiba port replicator \$179 CDW 577638
- Toshiba Services 3-year warranty upgrade \$165 CDW 289266

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- hp compaq 256MB memory upgrade \$90 CDW 573469
- hp care pack 3-year, next business day, 9 x 5, onsite warranty upgrade \$93 CDW 226432

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## TRAVEL ROUTERS: Wireless Access To Go

It's 11:30 P.M. You're exhausted. You have ten more e-mails to get to. Why not finish them from the comfort of your hotel bed?

Thanks to increasingly present high-speed connections in hotel rooms, the newest must-have travel accessory is a small wireless travel router for cable-free mobility. For \$100 or less, you can compute tether-free, and if you're traveling with coworkers, you can turn your room into a hot spot that can be shared by adjacent rooms. Although only a few vendors currently offer a truly pocket-size travel router, any small wireless access point will do the job. Such routers protect you with built-in firewalls, and they also let you set up a wireless print server in your on-the-road command center.

Computer security is an issue when you travel—especially when you might not want the person in the next hotel room sharing your connection and possibly hacking into your computer. Be sure to enable the highest level of security (WPA) that your travel router supports, and consider limiting access to your notebook or to your known traveling companions.

Travel routers cost less than \$100, and setup is straightforward. They're well worth the investment for any road warrior.



### PRINTERS, PROJECTORS.

Printers are lightweight and inexpensive. If you think you're going to need one, definitely bring it. If you bring a projector, bring an extra lamp, so if one blows before the big presentation you'll be covered.

of your contacts and calendar, this might be the way to go. There's a broad sweet spot in the \$300 to \$500 range, which will likely add Wi-Fi and Bluetooth for e-mail and Web browsing. And cell-phone-based devices are subsidized to varying degrees by the service provider. You may pay as little as \$100 to \$300 for a PDA phone or smart phone, but the real money is in the monthly fee.

## Printers and Projectors

Although you can often get away with borrowed printers on

the road, there are always the issues of having the wrong driver or the wrong cables, or problems getting on a network.

Portable printers are light, amazingly capable, and cost efficient, ranging from about \$250 to \$350. Many are color, with reasonable throughput, and still keep the weight to 4.5 pounds or less. While a few are battery-powered (make sure the battery is included in the quoted price), most require an AC outlet. In addition to work-critical documents, you can also print quality photographs or specialized output, such as labels.

Some portable printers double as scanners, but replacing the print head with a scanner head is a bit tricky and not likely to yield the best results. Portable scanners weigh less than a pound, so if you really need scanning on the road, choose a dedicated scanner. All current portables are USB-based, but available wireless, infrared, or Bluetooth connections may cut down on cable clutter. Just expect to pay a small premium, \$50 to \$75, for the additional portability features.

For portable projectors, the emphasis is on light—lots of it, but with little weight. Portable projectors run about \$2,000, so make sure you're getting exactly what you need. Virtually all of them put out 1,000 lumens or more, the amount you need for good visibility and range in a dim-but-not-dark conference room. Insist on a zoom lens, keystone correction, and quiet operation, under 40 dB, for the basics.

If you need to show video, look for S-Video or analog ports, and test the projectors before you buy. Many portable projectors have distracting artifacts when showing motion. If your presentations are mission-critical, pack a spare lamp. Even with 2,000 hours of life, a lamp can blow when you need it most, and you won't find one in the hotel gift shop. ☰

## MORE ON THE WEB

Looking to buy more computer-related products? Be sure to visit [www.pcmag.com/productguides](http://www.pcmag.com/productguides) to explore *PC Magazine's* Buying Guides for all kinds of products, including desktop PCs, servers, digital cameras, PDAs, printers, and networking equipment. Also take a look at the "Laptops & Notebooks" section of [www.pcmag.com](http://www.pcmag.com) for numerous in-depth notebook reviews and Editors' Choice analyses. Here you can apply what you've just learned to find the right notebook to take on the road.





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# REALITY



**It's time your home movies went digital. We help you pick the right camcorder to capture life in real time.**

By Jan Ozer

Photography by Thom O'Connor

**Y**ou know you've made a good buying decision if there are no surprises when you bring your camcorder home and a great one if there are no surprises in the first 12 months. To accomplish this, assess your current and future needs and weigh the trade-offs between price and performance *before* your purchase.

The one thing you should never compromise on is video quality. Unfortunately, specs just don't tell the complete story; rely instead on comparative quality reviews.

For example, in most instances a camera with three CCDs (charge-coupled devices)—the chips that convert the image from the lens into digital data—will usually produce higher-quality video than single-CCD units. But this isn't always the case, and in previous reviews, we've seen several single-CCD cameras that rated higher than more expensive three-CCD models.

## DVD CAMCORDERS

If you plan to edit video, stick with DV camcorders. DVD camcorders store video in MPEG-2 format—the same format used by Hollywood DVDs. The problem is, the MPEG-2 files they produce may not be compatible with your video editor. Additionally,



DVD camcorders process files in real time, which limits their ability to optimize the video. For more on the differences, see our sidebar, "DV Versus DVD."

Don't get us wrong; DVD camcorders have their place. They're great for shooting and then almost instantly watching your video on a DVD player. (You do have to finalize the DVD, which can take a few minutes and also renders the DVD non-reusable.) And DVDs are much more convenient than DV tapes for directly

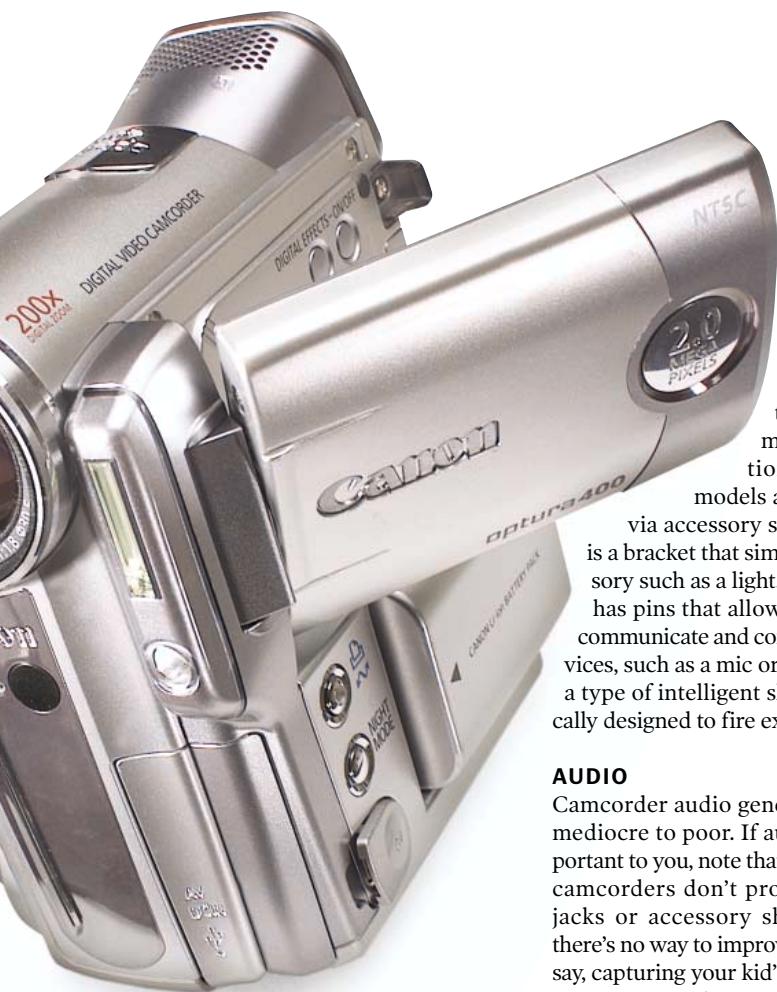
accessing scenes. But if you want to edit your video, DV offers better quality and is compatible with all video editors.

## FORM FACTOR

Tiny camcorders have undeniable gadget appeal and are certainly more portable. These, however, usually cost more and perform poorly indoors, because the

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lenses are simply too small to admit much light. In addition, many smaller models are not expandable via accessory shoes. A *dumb shoe* is a bracket that simply holds an accessory such as a light. An *intelligent shoe* has pins that allow the camcorder to communicate and control peripheral devices, such as a mic or flash. A *hot shoe* is a type of intelligent shoe that is specifically designed to fire external flashes.

#### AUDIO

Camcorder audio generally ranges from mediocre to poor. If audio quality is important to you, note that many inexpensive camcorders don't provide microphone jacks or accessory shoes. This means there's no way to improve audio quality for, say, capturing your kid's first onstage solo. More expensive camcorders sometimes

have a headphone jack for monitoring audio as it's recorded and *manual gain control*, which lets you adjust the recording volume. If the sound is too low, you can adjust the gain to increase the sensitivity of the microphone, often at the cost of increased noise and distortion.

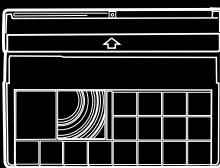
#### STILL IMAGES

Most camcorders can take stills as well as video—preferably to a memory card. Photo quality is often disappointing, usually because of limited image size, lack of a flash, or both. Few camcorders—including those with a multimegapixel CCD and flash—can match the quality of dedicated digital still cameras.

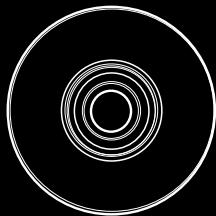
#### OTHER DESIRABLE FEATURES

If you have libraries of analog tape to edit, the ability to attach your camera to the output of a VCR or analog camera and convert that footage to digital video (usually

## DV Versus DVD



MiniDV



DVD-R

**DVD CAMCORDERS** offer two advantages over DV models. First, you can access any scene on the disc almost instantaneously, rather than having to rewind or fast forward as you would with DV tape. This means more accessible playback. In addition, you can easily finalize the disc and play it on most set-top players, making the camcorder-to-DVD player transition much faster than with DV cameras.

On the downside, DVD camcorders use MPEG-2 compression to capture video footage—the same kind of compression used on Hollywood DVDs. Unlike Hollywood cameras, however, which use non-real-time encoding systems with advanced techniques like variable-bit-rate encoding to optimize quality, DVD camcorders are limited to real-time, constant bit-rate encoding, commonly at 1 MB per second, as opposed to 3.6 MB per second for DV camcorders. The resulting quality is less than what you're used to on Hollywood DVDs and usually falls behind DV camcorders. This is most notable on higher-motion footage (such as our simulated juggling shot, above), which is inherently harder to compress.

In addition, while you can import DV into virtually all video editors, the MPEG files produced by DVD camcorders are often incompatible with many consumer and prosumer editors, limiting your editing options. Even compatible editors will likely perform more slowly when editing MPEG-2 than when editing DV, simply because MPEG-2 is more compressed and harder to decompress. —Jan Ozer and Glenn Menin



**CANON**

called *analog-input capabilities* or something similar) is invaluable.

Eventually, you'll begin chafing at automatic modes. While all camcorders offer manual focus, you get better control from a ring around the lens than from settings buried in the camera's menus. You'll also want exposure controls on the camcorder body, rather than in the menus, and back-light and/or spotlight modes that help handle challenging lighting situations.

**FEATURES TO IGNORE**

You can disregard a number of camcorder features. Chief among those are high levels of digital zoom, which seldom capture high-quality video beyond about 30X. Digital effects like sepia or fades have little value if you plan to edit on your computer, where you have more control over such effects.

Historically, optical image stabilization (OIS) has been favored over electronic image stabilization (EIS) for reducing shakes in handheld footage, but large CCDs have allowed EIS to catch up.

Many camcorders offer night modes, which use infrared signals or slow the shutter speed dramatically, allowing more light to enter the camera. The former approach, however, produces greenish video reminiscent of what you see through night vision goggles, while the latter produces extreme blurriness at even a hint of motion.

What follows are reviews of camcorders in three price ranges: \$500 and under, \$501 to \$800, and \$801 to \$1,000. There are extended versions of these reviews at [www.pcmag.com/camcorders](http://www.pcmag.com/camcorders). Read them before you go shopping and try out the camcorder of your choice before you buy. That way you can help ensure only pleasant surprises with your new camcorder.



**Canon Elura 60**

\$700 street. Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com).  
●●●○○

The Canon Elura 60 is an affordable, easy-to-use MiniDV camcorder that produces good video and stills. While leaner on features than its higher-priced siblings, the Elura 65 and Elura 70, it's still a good buy.

Eschewing the upright design of earlier Eluras, the Elura 60 has a more traditional look. It has no headlight, but it does have a dumb shoe as well as some in-camera digital effects, a print/share button, and networking options for use as a webcam.

The Elura 60's video quality was acceptable, though whites were a little blown out, and skin tones were slightly oversaturated. The audio, while loud and clear, had a bit of a hiss. On our resolution tests, the Elura 60 scored a decent 400 lines. Colors were accurate if a trifle warm, and the gray scale was shifted toward red. Our low-light frame grab was one of the brightest we've seen, albeit extremely noisy.

Still-image results were about what we'd expect from a 1.33-megapixel (MP) sensor; average resolution (vertical and horizontal) was 550 lines, and the average pixel transition ratio was 3.5 percent (5 percent or less is acceptable). Our simulated-daylight still life was warm, with oversaturated whites, and we noted some jagged edges.—*Glenn Menin*

**Canon Optura 30**

\$899 list. Canon U.S.A. Inc., [www.usa.usa.com](http://www.usa.usa.com).  
●●●○○

The Canon Optura 30 is a solid performer with many features aimed at enthusiasts. Compact, with good ergonomics, a 12X optical zoom lens, and a 2.5-inch articulated LCD, it delivers good video and better still images than most camcorders. It offers a bevy of automatic and preset modes as well as manual controls. While it has no headlight, it does have an intelligent shoe.

Video output showed well-saturated colors but was slightly overexposed with some whites blown out. The Optura 30 was quick to focus on our high-action clip, which was largely artifact-free. The camcorder's video resolution score of 400 lines is average for its class, but on the GretagMacbeth color chart colors were accurate and really popped.

The unit's 2.2-MP CCD scored an average of 600 lines of resolution (horizontal and vertical) and a decent average pixel transition ratio of 3.5 percent. Our simulated-daylight shot was reasonably sharp, with well-balanced exposure. Colors were well saturated but cool.—*GM*

**Canon Optura 400**

\$999 list. Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com).  
●●●○○

The feature-laden Canon Optura 400 shoots the best video in this roundup and good 2-MP stills. We have a few minor

**OUR CONTRIBUTORS:** Jan Ozer is a contributing editor of *PC Magazine*. Joseph A. Guilbeau IV is a technical analyst. Associate editor Sean Carroll and PC Magazine Labs lead analyst Glenn Menin were in charge of this story.



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gripes, but overall, this camcorder is a very good buy, and it's our Editors' Choice in the \$801-to-\$1,000 price range.

The unit offers many manual controls, several preset shooting modes, a flash for stills, and a reasonably effective miniature video light, as well as still-image capabilities like burst mode, AE bracketing, and panoramic stitch assist. It also lets you set audio-recording levels.

The camcorder scored 400 lines on our resolution test, which is average. Our jury liked its video sharpness and found the colors quite good. Details remained visible in highlights and shadows, with minimal AF lag and artifacts, though our low-light frame grab was dark and grainy. Audio performance was adequate.

Still images revealed a resolution average (vertical and horizontal) of 675 lines and a pixel transition ratio average of 3.8 percent—acceptable for a 2-MP sensor. Our simulated-daylight shot was a bit soft, though very well exposed, with some graininess in the background and slightly warm colors. On our flash shot, although the focus was decent, the flash fell short, resulting in unbalanced illumination, blown-out foreground whites, an overall blue cast, and noise.

While we wish the flash photos had been better, we recommend the Optura 400 for its video quality, rich feature set, and overall still-image capture ability.—GM

### Canon ZR85

\$500 street. Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com).



The compact Canon ZR85 offers good ergonomics and is fun and easy to operate. And its 20X optical zoom is impressive for the price. It has a dumb shoe for an external light but no built-in headlight or flash. While digital video beginners on a budget will appreciate the price, the JVC GR-D33US edges out the ZR85 where it's most important: video quality.

In video testing the ZR85 scored 400 lines of resolution, though the focus seemed soft when we examined the footage. Our jury found the video quality mediocre, with blown-out whites and bright colors producing a posterized effect. Colors were off a bit and ran warm. We also noted more video noise than we'd like to see, especially in darker conditions. Audio was acceptable.

Given its sub-1-MP image sensor, we didn't expect much in the way of stills, and we weren't surprised. The still-resolution test results averaged just 375 lines, and pixel transition results averaged a disap-

pointing 6.6 percent. Our still-life capture was soft and grainy, and colors ran too cool. On the other hand, these stills beat those of our EC, the JVC GR-D33US, by a significant margin.

The ZR85 is a wonderfully ergonomic entry-level camcorder with a few extras, but it comes up short even for the low price.—GM

### Canon ZR90

\$599 list. Canon U.S.A. Inc., [www.usa.canon.com](http://www.usa.canon.com).



The Canon ZR90 has some lovely touches, such as an included wide-angle lens attachment and 22X optical zoom. Video quality, however, is merely adequate.

This camera is intuitive, with simple toggles for switching between photo and video modes or programmable and automatic modes. Other buttons, particularly the night mode switch (for low-light shooting), are too easy to hit inadvertently. In addition, the accessory shoe isn't intelligent, and there's no external mic jack.

In video quality testing, the ZR90 trailed

\$500 and under: **JVC GR-D33US**

\$501 to \$800: **Sony DCR-HC40 MiniDV Handycam**

\$801 to \$1,000: **Canon Optura 400**

DVD camcorder: **Sony DCR-DVD201 DVD Handycam**



There's no reason why the old adage "you get what you pay for" shouldn't hold true for camcorders. That said, in each of the price ranges we looked at for this roundup—\$500 and below, \$501 to \$800, and \$801 to \$1,000—there are clear winners.

For those on the tightest budget, the JVC GR-D33US is our top choice.

While \$449 doesn't buy you the best camcorder in terms of ease of use or still-image capture, the GR-D33US does shoot the best video of any camcorder in that price range, and in the end that's what makes the camcorder.

The Sony DCR-HC40 MiniDV Handycam is our Editor's Choice for the \$801-to-\$1,000 price range. Extremely good video and good still-image capture combine with a good feature set (including an intelligent shoe and an external mic port) to offset some of the trouble we had reading menus in bright sunlight with this otherwise impressive \$700 camcorder. If stills are important to you, consider the \$649 Samsung SC-D6040 DuoCam, which receives an honorable mention. In addition to shooting good video, the SC-D6040 has a completely separate still lens and a 4-MP sensor; it takes images that stand up reasonably well against regular 4-MP still cameras.

If you can afford it, the \$999 Canon Optura 400 is the best of the \$801-to-\$1,000 camcorders we tested. This compact camcorder shoots very good video (the best in this roundup) and good stills as well; its 2-MP still images are beaten only by the Samsung SC-D6040 DuoCam's. And its well-rounded feature set completes the package for this compelling choice.

While its video quality doesn't quite measure up to that of the Optura 400, the Sony DCR-DVD201 DVD Handycam is clearly the best of the DVD camcorders we've reviewed, and earns an honorable mention. It combines the convenience of recording directly to DVD—a plus for those who don't plan to do a lot of editing—with solid video and stills, all in an attractive package.

the competition in its ability to capture fine detail. Video of our GretagMacbeth chart revealed that the ZR90 tends to mute almost all colors, particularly yellows and pinks. Under fluorescent lights (in automatic mode, after manual white balancing) the ZR90's videos were grayish, with a fine patina of noise particularly visible against light backgrounds. Outdoor videos in direct sunlight proved better, but colors were again perceptibly faded.

The ZR90's audio had noticeable background whine and voices sounded slightly metallic. In our still-image testing, the ZR90's performed well in terms of color handling, but whites were overexposed. Images looked soft with some jagged edges.—Jan Ozer

### JVC GR-D33US

\$449.99 list. JVC Company of America, [www.jvc.com](http://www.jvc.com).



To produce an inexpensive camcorder, a camera company must make trade-offs. Fortunately the JVC GR-D33US cut the fewest corners where it counts the most—



video quality. The camcorder may not be graceful or easy to operate (button layout is awkward and the EVF doesn't pivot), but it shoots good video and comes with an LED headlight, earning it our Editors' Choice in the \$500-and-under category.

On our video tests, the clips showed minimal artifacts, and the GR-D33US scored a respectable 400 lines of resolution. We found the auto-focus responsive, and video showed good color and dynamic range. Audio was acceptable but not as loud as other camcorders we've reviewed, and there's no external mic input.

The GR-D33US grabs still images from video footage, as opposed to shooting independent JPEGs. The resulting 720-by-480 bitmaps we took were of low quality, with jagged edges. ISO resolution averaged a dismal 300 lines, and the average pixel transition ratio was a miserable 7.6 percent.

The GR-D33US can be clunky to operate, but it's worth considering for its good video and LED headlight. For shooters on a budget, this is our top choice. But don't forget to bring your digital still camera along.—GM

### JVC GR-DX307U

\$799.99 list. JVC Company of America, [www.jvc.com](http://www.jvc.com). ●●●○

The star of JVC's Celebrity series is the compact, ergonomic JVC GR-DX307U, sporting a large 3-inch LCD. Our critics agree, however, that its performance just wasn't Oscar-worthy.

We don't love the hinged LCD; it has little give, which concerned us that it might be more vulnerable to damage. The DX307U has a three-LED headlight but no accessory shoe, though it does have a mic port. The controls are a snap to operate, and JVC provides multiple zoom controls for flexibility. We wish, however, that the unit had a manual focus ring.

The DX307U turned in merely adequate video scores in most juried categories, including our low-light test. It scored 400 lines on our resolution test, average for a sub-\$1000 camcorder. Colors were strongly saturated, but whites tended to be slightly overexposed. We also noted colors were a bit warm.

The unit can capture 1.33-MP still images to either MiniDV tape or Secure Digital media. It scored a decent 500 ISO resolution lines but a barely acceptable 4.8 percent average transition pixel ratio, which was reflected in the overall softness of our simulated-daylight still-life capture. Unfortunately, the image was poorly exposed, dark, and muddy, with some artifacts.

The JVC GR-DX307U offers an ergonomically pleasing compact design, large LCD, easy and flexible operation, but only decent video quality and problematic stills.—GM

### JVC GR-DZ7U

\$999.95 list. JVC Company of America, [www.jvc.com](http://www.jvc.com). ●●●○

The JVC GR-DZ7U is compact, comfortable to hold, and takes very sharp videos on DV. It also features a 1.9-effective-megapixel CCD and an auto-flash, but no headlight. We wish its menus and membrane-style touch-

sensitive control panel were a bit easier to use, however.

Our jury liked the clarity and focus of the camcorder's "talking head" clips, but whites sometimes appeared blown out. Colors were well saturated but a bit warm. Our high-action sequence was also crisp, though we did notice a slight auto-focus lag.

The GR-DZ7U also takes reasonably sharp 1,600-by-1,200 JPEG images. The device's ISO resolution averaged 600 lines,

which is quite good for this roundup. On the other hand, the pixel transition ratio averaged 4.4 percent—just acceptable. The unit's flash still life showed strong and balanced illumination. The simulated-daylight capture's colors, however, were too cool, with a slight blue tint.

Ultimately, the JVC GR-DZ7U's solid video and still images would make it a good choice. But at this price, we expect better video and photos.—GM

### Panasonic PV-GS120

\$699.95 list. Matsushita Electric Corp. of America, [www.panasonic.com](http://www.panasonic.com). ●●●○

The surprisingly affordable Panasonic PV-GS120 is the only camcorder we've tested to date that boasts three-CCD video for under \$1,000. It produces well-exposed digital video with accurate colors. Unfortunately, the sharpness of the video leaves much to be desired.

The PV-GS120 fits comfortably in the right hand, and the recessed EVF eyepiece can tilt 45 degrees. The 2.5-inch articulated LCD panel flips out 90 degrees and can swivel 270 degrees. The MiniDV-tape carriage is located on the right side of the camcorder and can be opened even while the device is mounted on a tripod.

In video testing, the PV-GS120 repro-





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duced colors well. Its video showed very good dynamic range and few artifacts. Unfortunately, on our video resolution test, it scored a terrible 325 lines. It performed well on our action sequence; the auto-focus was quick to adjust for movement. Audio fidelity was also good.

The PV-GS120's 1.2-MP JPEG still images fall short in terms of quality. In testing, our simulated-daylight still life was poorly exposed and grainy, with a blue cast and soft focus. Whites were blown out, and edges weren't well defined.—GM

### Panasonic VDR-M50

\$799.95 list. Matsushita Electric Corp. of America, [www.panasonic.com](http://www.panasonic.com). ●●●○○

The Panasonic VDR-M50 records directly to DVD. The convenience of the media, however, is more than offset by the mediocre video and still-image quality.

The VDR-M50 is small, slim, and easy to operate. The left panel flips out 90 degrees to reveal a 2.5-inch articulated LCD. The vertical DVD media tray on the right

side is accessible even when the camcorder is mounted on a tripod. The unit supports DVD-R media, but for nonlinear editing you'll need to use DVD-RAM, which won't play in most DVD players. The VDR-M50 also supports Secure Digital cards for still images.

Our jurors scored the VDR-M50's sharpness as good, but colors appeared too warm and oversaturated. Shadowy areas were very dark and did not afford much detail. The extensive motion artifacts we noted on the PC screen during the high-action footage (due to the MPEG compression) are much less noticeable on an NTSC TV monitor, which is how most VDR-M50 users are likely to view their video.

The VDR-M50, which takes 0.3-MP still images, scored an acceptable 350 lines of resolution in our still-image test shots. Our simulated-daylight shot, however, appeared dark and muddy with a magenta cast, and details were fuzzy.—GM



### Samsung SC-D6040 DuoCam

\$649 list. Samsung Electronics, [www.samsungusa.com](http://www.samsungusa.com). ●●●○○

The Samsung SC-D6040 DuoCam uses two separate lenses and CCDs for video and still images. While it's bulky and can be a bit awkward to use, it shoots good video. And its still images are the best of any camcorder we've seen, earning it an honorable mention.

On our tests, the SC-D6040 received average scores for color and sharpness, and its clips were largely artifact-free. We noted minor but acceptable auto-focus lag during our action sequence, and audio was satisfactory. Low-light test results ranked the SC-D6040 near the bottom of the group, as the image was too dark and extremely grainy. Note that although the SC-D6040 doesn't have a headlight or accessory shoe, it does offer a night-shooting mode and a mic port.

We are impressed with the SC-D6040's still-image capabilities; with its dedicated 4.13-MP CCD, it stands up against the average 4-MP still camera. The one downside is that the still-image lens is only a 3X zoom, whereas all the other cameras can use the full range of their video zoom (10X or greater in all cases) for stills. Images averaged a decent 1,025 lines of resolution and a good 2.8 percent transition pixel ratio, results that beat all the competition. Our simulated-daylight shot was sharp with excellent exposure and impressive colors. The flash shot (using the built-in pop-up flash) had very strong and balanced illumination.—GM

### Sony DCR-DVD101 DVD Handycam

\$899 direct. Sony Electronics Inc., [www.sonystyle.com](http://www.sonystyle.com). ●●○○○

The Sony DCR-DVD101 DVD Handycam is small and stylish. And we love the convenience of DVD, despite the format's limitations. But the Sony DCR-DVD201 is a better DVD camcorder, even at \$100 more.

Viewed on a PC monitor, the DVD101's video quality was poor. In our "talking head" scene, edges were jagged, with arti-

## PERFORMANCE TESTS

# Scoring Digital Video



A standard television masks many of a camcorder's limitations, but when you view your video on a PC, real differences emerge. We shot test video footage with multiple camcorders simultaneously to facilitate comparative analysis. We use Ulead VideoStudio 8 for editing and Windows Media Player 9 for viewing, except where the use of bundled applications is required, such as with Sony's DVD camcorders. Monitors were optimized using DisplayMate and set to the industry standard D50 color temperature, which is similar to the simulated-daylight conditions under which we shoot.

	TALKING HEAD					ACTION	
	Resolution	Dynamic range	Color realism	Audio	Artifacts	Auto-focus	Artifacts
Canon Elura 60	●●●	●●●	●●●	●●●	●●●	●●●	●●●
Canon Optura 30	●●●	●●●	●●●●	●●●	●●●○	●●●●	●●●●
Canon Optura 400	●●●●	●●●●	●●●●	●●●	●●●●	●●●●	●●●●
Canon ZR85	●●○	●●○	●●●	●●●	●●○	●●●	●●○
Canon ZR90	●●	●●●	●●●	●●●	●●●	●●●	●●●
JVC GR-D33US	●●●	●●●	●●●	●●○	●●●●	●●●●	●●●●
JVC GR-DX307U	●●●	●●●	●●●○	●●●	●●●●	●●●●	●●●●
JVC GR-DZ7U	●●●●	●●●	●●○	●●●	●●●●	●●●	●●●●
Panasonic PV-GS120	●●●○	●●●●	●●●●	●●●○	●●●●	●●●●	●●●●
Panasonic VDR-M50	●●○	●●	●●●○	●●●○	●●●●	●●●	●●●
Samsung SC-D6040	●●●●	●●●○	●●●	●●●○	●●●	●●●	●●●●
Sony DCR-DVD101	●●	●●●	●●●	●●●	●●●○	●●○	●●○
Sony DCR-DVD201	●●●○	●●●	●●●○	●●●	●●●	●●●●	●●●●
Sony DCR-HC20	●●●	●●●	●●○	●●●	●●○	●●●	●●○
Sony DCR-HC40	●●●●	●●●	●●●○	●●●	●●●●	●●●●	●●●●
Sony DCR-HC65	●●●●	●●●●	●●●●	●●●	●●○	●●●	●●○
Sony DCR-PC109	●●●	●●●○	●●●●	●●●	●●●	●●●○	●●●○

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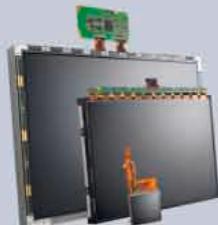
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facts and an overall loss of detail—especially in dark areas. Dynamic range seemed balanced with decent contrast. In low light on auto settings, the camcorder produced a dark, noisy picture. (Super Nightshot Plus mode lets you shoot in extremely low light using infrared illumination and slower shutter speeds.) In our high-action scene, auto-focus lagged badly, and motion artifacts were evident. Colors were mostly accurate.

We also viewed the video on a TV set, which masked many of the artifacts. But even so, the DVD101's video wasn't as good as that of the DVD201.

This unit's still-capture capabilities are about what we'd expect, considering its low 640-by-480 resolution. The DVD101's pixel transition ratio averaged a horrible 10.7 percent, and ISO resolution a dismal 262.5 lines. The simulated-daylight shot's focus was soft and grainy, with adequate exposure and warm colors. The camcorder has no built-in flash, though it does have a hot shoe.—*Joseph A. Guilbeau IV*



### Sony DCR-DVD201 DVD Handycam

\$999 direct. Sony Electronics Inc., [www.sonymystyle.com](http://www.sonymystyle.com).



The Sony DCR-DVD201 DVD Handycam has a larger CCD than the DVD101, but the design, features, and controls are the same. For just \$100 more, however, the DVD201 produces

much better video, and is our Editors' Choice DVD camcorder.

The DVD201's video quality was good, though it didn't quite measure up to that of the Canon Optura 400, the best MiniDV camera in this roundup. Its dynamic range and exposure were similar to the DVD101's, and detail was still lost in shadows. But the overall image was sharper and better focused. Our low-light test was dark but produced a less noisy picture than the DVD101.

In our high-action scene, the DVD201's auto-focus performed better than that of the Optura 400. There were some jagged edges due to the compression, but they weren't too disturbing. Video showed realistic colors that were more saturated and vibrant than the DVD101's, although the gray scale remained warm. Detail was crisp and sharp with no anomalies when we viewed the video on a TV.

The quality of this unit's 1-MP still images vastly improved on the DVD101's VGA images. The DVD201's pixel transition ratio averaged 6 percent—perhaps suitable for e-mailing or printing in small formats. ISO resolution, however, averaged a quite good 525 lines. The simulated-daylight still life was soft with some jagged edges, fine exposure and colors, and some graininess in the shadows. The camcorder has no built-in flash, but it does have a hot shoe.—*JAG*

### Sony DCR-HC20 MiniDV Handycam

\$449 list. Sony Electronics Inc., [www.sonymystyle.com](http://www.sonymystyle.com).



Although it's compact and easy to use, the Sony DCR-HC20 MiniDV Handycam delivers subpar video and still-image quality and lacks a few critical features. This makes it difficult to recommend for any class of user.

The unit lacks a built-in flash (though it has a dumb shoe), but with a maximum still-image resolution of 340,000 pixels, you wouldn't buy this camera for shooting stills anyway. It is also missing an analog

## PERFORMANCE TESTS

# Camcorder Still Images



We use the same test and configurations (maximum noninterpolated resolutions in JPEG format) for camcorder still-image capture tests that we do for digital still-image testing. Still pictures are analyzed on Sony Artisan Monitors in Adobe Photoshop. Pixel transition refers to the gray transition pixels between black and white edges; the fewer the better. We consider 5 percent to be the highest acceptable rating.

CAMERA	Effective Megapixels	RESOLUTION ▲		PIXEL TRANSITION ▼		
		Horizontal	Vertical	Horizontal	Vertical	Average
Canon Elura 60	1.2	550	550	3.0%	3.9%	3.5%
Canon Optura 30	1.9	600	600	3.5%	3.4%	3.5%
Canon Optura 400	1.9	700	650	3.8%	3.8%	3.8%
Canon ZR85	0.8	375	375	7.4%	5.8%	6.6%
Canon ZR90	0.7	350	350	6.9%	6.5%	6.7%
JVC GR-D33US	0.4	200	350	6.8%	8.4%	7.6%
JVC GR-DX307U	1.9	550	500	4.0%	5.5%	4.8%
JVC GR-DZ7U	1.9	600	600	4.3%	4.4%	4.4%
Panasonic PV-GS120	1.2	N/A	N/A	N/A	N/A	N/A
Panasonic VDR-M50	0.3	N/A	N/A	N/A	N/A	N/A
Samsung SC-D6040	3.8	1,000	1,050	2.8%	2.8%	2.8%
Sony DCR-DVD101*	0.3	225	300	8.4%	12.9%	10.7%
Sony DCR-DVD201*	1.0	475	575	4.9%	7.0%	6.0%
Sony DCR-HC20	0.4	300	250	11.7%	9.0%	10.4%
Sony DCR-HC40	1.0	400	525	4.3%	5.8%	5.1%
Sony DCR-HC65	0.3	250	325	7.5%	8.1%	7.8%
Sony DCR-PC109	1.0	400	500	4.1%	5.8%	5.0%
Olympus C-765 <sup>1</sup>	4.0	1,200	1,200	1.9%	2.1%	2.0%

RED denotes Editors' Choice. \* DVD camcorder output is MPEG video. <sup>1</sup>4 MP superzoom digital still camera—reported for comparison. N/A—not applicable: The camera was not tested.

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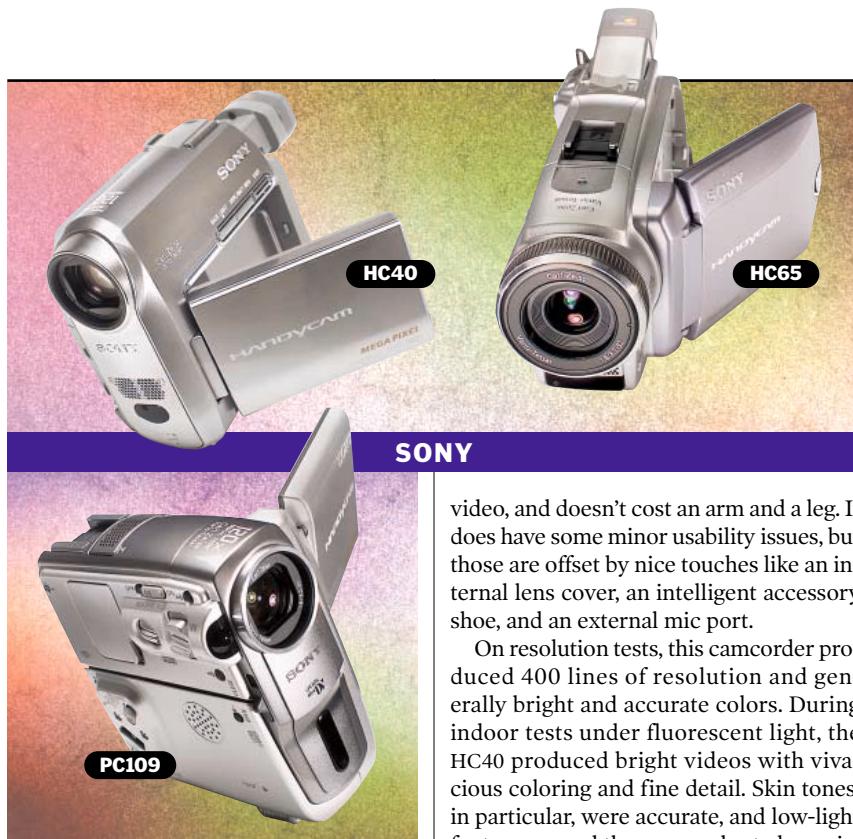
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to-digital conversion function.

The small 1/6-inch CCD delivered a paltry 350 lines of video resolution. Gretag-Macbeth color chart videos showed decent color accuracy, though there was some fringing between colors.

In our “talking head” trials, the image looked soft and lacked detail, with a touch of overexposure contributing to an overall drab appearance. The HC20 was one of the worst performers in terms of artifacts. Although auto-focus was responsive on our high-action tests, artifacts again brought the HC20’s overall score down into the bottom half of the pack. Low-light performance was weak, with very dark and grainy video.

Still-image trials were similarly poor, with the HC20 garnering a dreadful pixel transition average of 10.4 percent. Exposure was also an issue, as our simulated-daylight still life was so blown out that we deemed it unusable. Resolution averaged an acceptable 275 lines.—JO

#### Sony DCR-HC40 MiniDV Handycam

\$699 direct. Sony Electronics Inc., [www.sonystyle.com](http://www.sonystyle.com).

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The Sony DCR-HC40 MiniDV Handycam is our Editors’ Choice in the \$501-to-\$800 price range. It fits easily in a purse or large jacket pocket, produces very good audio and

video, and doesn’t cost an arm and a leg. It does have some minor usability issues, but those are offset by nice touches like an internal lens cover, an intelligent accessory shoe, and an external mic port.

On resolution tests, this camcorder produced 400 lines of resolution and generally bright and accurate colors. During indoor tests under fluorescent light, the HC40 produced bright videos with vivacious coloring and fine detail. Skin tones, in particular, were accurate, and low-light footage proved the camcorder to be resistant to visual noise (though the video wasn’t particularly bright). In outdoor shots, the HC40 again produced superior detail and color accuracy. The HC40 also recorded a strong, clear audio signal with only moderate background noise.

On our still-image tests, the HC40 scored 465 lines of resolution and a mediocre pixel transition ratio of 5.1 percent. Predictably, our simulated-daylight still life exhibited some jagged edges and was soft in a couple areas, but details were present and exposure and colors were good.—JO

#### Sony DCR-HC65 MiniDV Handycam

\$899.99 list. Sony Electronics Inc., [www.sonystyle.com](http://www.sonystyle.com).

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The Sony DCR-HC65 MiniDV Handycam is an easy-to-use midsize camcorder that offers impressive flexibility and configurability—as well as a huge 3.5-inch LCD and a manual focus ring. Other models, however, like the Canon Optura 400, offer not only more options but better video, with fewer artifacts and auto-focus problems.

The HC65 uses the same basic elec-

tronics as the more compact Sony DCR-PC109 MiniDV Handycam, so it isn’t surprising that the HC65 produced similarly good results. It scored 400 lines of video resolution, and footage of our Gretag-Macbeth chart showed realistic but grainy colors. The HC65 beat the PC109 on our “talking head” trials in resolution, dynamic range, and color realism. But in our high-action sequence, the HC65 lost focus several times and proved slow to refocus on moving subjects. Artifacts were also more noticeable here than with most other cameras.

Our simulated-daylight still image was a little soft in some areas and jagged in others, but it had plenty of detail. Exposure was well balanced, although we noted some graininess, especially in shadows. Colors ran slightly cool. ISO resolution averaged just under 300 lines—low for a 1-MP sensor. Additionally, the HC65’s pixel transition ratio was a terrible 7.8 percent, meaning images are suitable only for e-mailing.—JO

#### Sony DCR-PC109 MiniDV Handycam

\$899.99 list. Sony Electronics Inc., [www.sonystyle.com](http://www.sonystyle.com).

●●●●○

The Sony DCR-PC109 MiniDV Handycam offers good video quality in a glittering, highly portable package that’s sure to appeal to gadget freaks. It has some handy extras like a still-image burst mode, a timer, and analog-to-digital conversion. But the Canon Optura 400 offers slightly better video quality and larger still-image captures at only a small price premium.

The PC109’s 1/5-inch CCD performed very well in testing. Video resolution was around 400 lines, while our Gretag-Macbeth color chart tests showed highly accurate colors. On our “talking head” test, the PC109 produced sharp detail and good colors in both dark and light areas, with near-perfect exposure throughout and minimal artifacts. High-action tests showed some auto-focus lags, but quality was generally good. The only times the PC109 ranked in the bottom half of the pack were in our low-light conditions, where the camcorder produced overly dark and grainy images.

Still-image tests showed an average resolution of 450 lines and a just-acceptable pixel transition average of 5 percent. The PC109’s 1-MP simulated-daylight still life was soft with a hint of pixelation. Overall, however, while colors were a touch underexposed, the image was acceptable—certainly sufficient for the Web or for PC screens. The camcorder has no built-in flash, though it does have an intelligent hot shoe.—JO

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a. Total Number of Copies (Net press run)		1,086,494	1,025,815
b. Paid and/or Requested Circulation	(1) Paid In-Country Subscriptions Stated on Form 3541 (include advertiser's proof and exchange copies)	791,576	809,156
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 Signature: *Charles Mast*  
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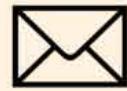
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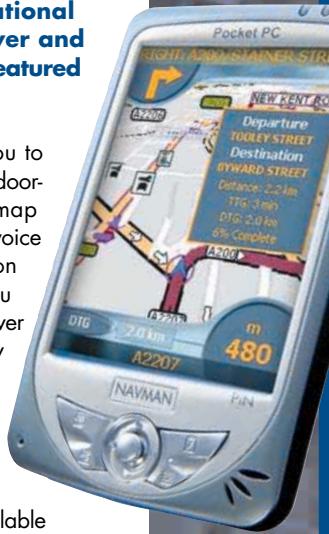
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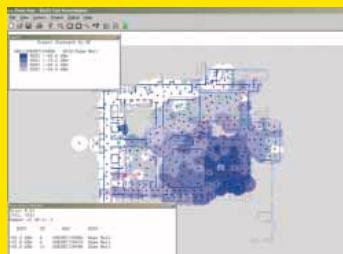
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# So rare that only a handful were made in 1923

In 1923, a Swiss watchmaker crafted the most advanced watch of its time. After 80 years, the Steinhausen watch has finally been "reborn," preserving its mastery of technology and classic design. Once only displayed in high priced collections, this rare timepiece from history can now be yours.

**S**tep back in time to Steinhausen, Switzerland circa 1923. A master watchmaker works for months, trying to create the world's most perfect watch. Finally he succeeds—the first of its kind to display the date, day and month, and the only one to designate AM/PM.

## Collectors Pay Thousands \$\$\$\$

He makes a limited number of these distinctive handmade timepieces, which eventually find their way onto the wrists of only the world's most distinguished gentry. Today, collectors are willing to pay thousands of dollars to add one of these original Steinhausen masterpieces to their own collection.

## Reborn After 80 Years

Until now, that was the only way you could own a Steinhausen, still one of the world's rarest and most prized wristwatches. But for the first time in 80 years, the original Steinhausen masterpiece is now being painstakingly reproduced for modern day collectors. Still manufactured by hand, this 21st-century reproduction carries the same graceful styling and features as the original. The scratch-resistant crystal comfortably rests in a surgical grade stainless steel case and bezel, which provides the ultimate in precision and protection.

## Powered by You

This handsome timepiece has been updated with a kinetic automatic movement that is powered by the motion of the wearer's arm, so the watch never needs winding or batteries.

## Hand-crafted Elite Movement

The Steinhausen movement consists of 185 parts, that are assembled entirely by hand. To prevent wear on gears, fine watches use tiny gemstones to reduce friction. The Steinhausen features up to 35 jewels, 15 more than most of the worlds elite watches. The movement is then rigorously tested for flaws and accuracy. Only 6% of the movements made ever meet the stringent requirements to be placed in this noble timepiece, making the Steinhausen one of the most accurate in the world.

## Adapted from Swiss Technology

A Swiss engineered movement comparable to the Steinhausen has never been produced at this low price. Each watch comes housed in a handsome storage case and includes two interchangeable leather wristbands in black and brown.

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## THE HISTORY OF WATCH MAKING

<b>1868</b>	Steinhausen masterpiece movement is created	<b>1923</b>	1st Automatic movement in a wrist watch	<b>1953</b>	Girard-Perregaux introduces the Swiss quartz watch	<b>2003</b>	Steinhausen masterpiece is reproduced for first time
Patek Philippe makes first wrist watch		Lips produced the first battery powered watch		1966			

\*\$14.95 Trial Offer entitles customers to receive one of our Steinhausen watches for review for 30 days with the right to return the watch in that period with no additional charges (minus s&h). Customers who elect to keep the watch will be billed the corresponding purchase price plus applicable taxes for the model they choose either in full or through available payment options.

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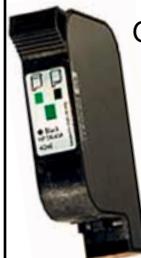
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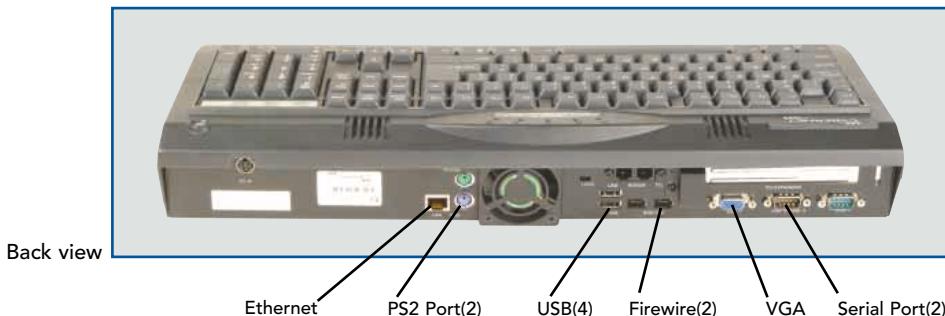
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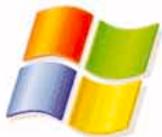
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# AFTER HOURS

TECHNOLOGY ON YOUR TIME

## Sound Tricks

BY DON LABRIOLA

Today's point-and-click video-editing and presentation programs make it easy to create great-looking output packed with jaw-dropping effects, 3D transitions, and animated titles. But they're not nearly as helpful in creating a sound track worthy of such visuals. Because so few of us have the skills needed to compose, arrange, perform, and record our own music, we have to track down and license third-party music, then spend hours or days painstakingly shoehorning it into our projects. • An easier solution is to use music generation software to create your own royalty-free sound tracks from scratch. These programs range from note generators that produce raw material you can massage into background music to sound-track production programs that craft orchestrated compositions tailored to the mood and duration of each slide or scene. Find out how easy it is to create an original sound track that sounds as if it were written expressly for your movie or PowerPoint presentation.



### A Musical Generator

a Musical Generator belongs to a class of programs known as *algorithmic composers*, which create music by using mathematical equations and number sequences to control parameters such as pitch, tempo, and rhythm. Most algorithmic-composition programs are a bad choice for end-user sound-track work: Not only do they require you to have knowledge of both mathematics and music theory, but many produce output that sounds like little more than a random stream of notes. Fortunately, this isn't the case with aMG.

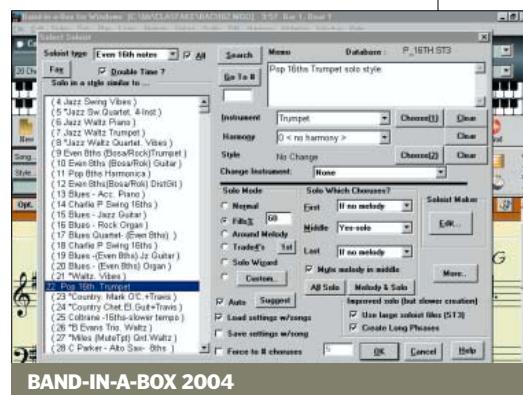
It's not nearly as intuitive as Movie Maestro or Jammer Pro, but aMG has an easy-to-learn interface that lets you create passable trance, ambient, and techno music by simply dragging mathematical objects onto four buttons that control the pitches, durations, start times, and volumes of notes. You can then save your compositions as Type 1 MIDI files or transmit them to an external recorder or tone module.

aMG ships with dozens of canned mathematical objects that range from simple trig functions and constants to complex 2D and 3D fractals. Surprisingly painless equation editors let you create new functions with just a few keystrokes. The program's weakest point is its primitive MIDI drum capabilities, which make the creation of convincing percussion parts difficult.

aMG isn't a perfect fit for all types of sound-track work, but it is an inexpensive, well-designed, and, frankly, fascinating program that can help you produce distinctive background music that's good enough to spice up many home-brewed video projects and presentations.

\$25 direct. MuSoft, [www.musoft-builders.com](http://www.musoft-builders.com).

●●●●



### Band-in-a-Box 2004

After more than 15 years, Band-in-a-Box continues to define cutting edge MIDI music generation software. This new release enhances the program's already expansive functionality with features like floating, dockable windows; compatibility with DXi DirectX plug-in software synthesizers; support for repeats and alternate endings; a graphical lyrics editor; and the ability to combine musical styles, producing hybrids. For example, we created a rock ensemble that includes a salsa piano and reggae bass. The program can now also correct pitch and add harmonies to vocal-audio recordings that you insert into an arrangement.

The top-of-the-line Pro version of the program that we reviewed ships with hundreds of music styles, a 300-song MIDI fakebook, a two-CD video tutorial, a Roland DXi soft synth, and 11 virtual soloists that improvise in the styles of musicians such as Bruce Hornsby and Lionel Hampton. Like previous versions, the program can compose multi-instrument MIDI music in the style of your choosing and save the results as a MIDI file or WAV transcription. It lets you adjust almost any parameter it uses to compose music or improvise solos and is especially useful for musicians who play guitar, ukulele, or other stringed instruments, offering features, such as a fret board playback display, a string tuner, and the ability to generate authentic guitar chord voicings, strums, and arpeggios.

The music produced by Band-in-a-Box can be a bit bland right out of the box. But in the hands of an experienced composer,

the program's automated-composition and -arrangement tools and its ability to pump out an endless stream of musical ideas can greatly streamline the sound-track creation process. And even if you have no musical skills whatsoever, you can still quickly produce acceptable (if unexciting) original music.

Band-in-a-Box 2004 Pro, \$249 direct;  
Band-in-a-Box 2004, \$88. PG Music Inc.,  
www.pgmusic.com. ●●●●●

## Jammer Professional 5

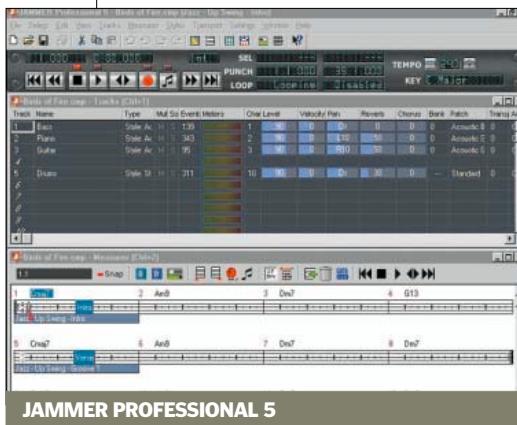
Although it can't match the breadth of functionality offered by Band-in-a-Box, Jammer Pro generates fully orchestrated MIDI compositions from scratch. But unlike its competitor, it complements this capability with a 256-instrument MIDI sequencer and a track-based interface that will seem familiar to anyone who's used sequencer software like Cakewalk Sonar. Jammer doesn't let you edit score notation or insert audio tracks into a project, but it provides sequencer-style Piano Roll and MIDI Event List views, a Chord Voicing editor, and an automatic six-part harmony generator.

Jammer also provides finer control over the length of each composition, making it possible to match the duration of its output to your visuals within a resolution of 1/120 beat. Its flexible sequencer capabilities let you perform useful tasks, such as quantizing, transposing, time-shifting, merging, splitting, and scaling the velocity of each track it creates.

The program's precise punch-in controls and ability to assign a different style to every measure let you create music that changes mood with every scene or slide in your project. Jammer also lets you lock tracks, making it possible to preserve your favorite instrumental parts when regenerating a composition or adding new material with a punch-in.

Most users will be content to let Jammer handle the details when creating a composition, but the program also lets you get under the hood to tweak the chord progressions, voicings, transitions, fills, grooves, and individual riffs with which it creates musical styles and virtual musicians. Our only real beef was the program's inability to export its MIDI output to an audio file.

Like Band-in-a-Box, Jammer doesn't always generate the most compelling musical material. But it



JAMMER PROFESSIONAL 5

offers an impressive combination of one-click music production capabilities and flexible power user tools that, with a little experimentation, will let you produce surprisingly listenable output.

\$129 list. SoundTrek, www.soundtrek.com.

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## Movie Maestro, Sonicfire Pro 3.2



Nobody knows more about automated sound-track generation than SmartSound. Both the Movie Maestro and Sonicfire product lines use the company's patented technology; also called SmartSound, this technology intelligently constructs slick, seamless output by splicing together snippets of live recordings. Every SmartSound production has a custom structure that includes a beginning and ending and is tailored to match the duration of your video clip with nearly frame-accurate precision.

Movie Maestro does a terrific job of incorporating this technology into a consumer-friendly application. Its simple interface and three-step process let even the most unsophisticated musician score a scene by merely loading a video, marking start and end points on a timeline, and then choosing the musical selection or



MOVIE MAESTRO

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sound effect to be fitted to the visuals.

SmartSound technology works only with specially encoded source material that has been divided into tiny slices and then assigned rules for how segments can be combined. When you specify a selection for your sound track, SmartSound figures out which sequences produce music of the right duration and then uses its rule base to decide which one is the most musical. Movie Maestro ships with a starter kit of 26 selections, and SmartSound offers many hundreds more in its large and constantly updated line of CD libraries.

Sonicfire provides a more flexible version of this functionality intended for professional video producers. Its Search



Assistant is one of the most sophisticated content search facilities we've seen, letting you specify four search criteria at the same time to locate selections on your hard drive, a library CD, or SmartSound's Web site.

It can limit searches to music that you already own, let you define favorites and keywords, and locate content by musical style, intensity, instrumentation, or text description. If you decide to purchase an online selection, a quick credit card transaction allows you to download the track on the spot. Sonicfire also provides low-level editing tools that let you manually build and edit sound tracks from SmartSound-encoded source material and even encode your own audio files into SmartSound content.

Both Movie Maestro and Sonicfire are refreshingly easy to use and produce output that's good enough for professional use. If you won't settle for less than the best, then these are the tools for you.

Movie Maestro, \$50 direct. ●●●●● Sonicfire Pro 3.2 (includes two CD music libraries), \$299. ●●●●● SmartSound Software Inc., www.smartsound.com.

# GEAR + GAMES



## Tall, Dark, and Vertical

**M**ousing with the **Evoluent VerticalMouse 2 Optical** feels more like shaking hands than steering an input device. You grasp the 3-inch-tall VerticalMouse 2 with your right-hand palm facing in, rather than down toward the floor, and the accompanying mouse pad cushions your wrist and keeps it at the appropriate angle. This relaxed position reduces strain on the wrist. With the four configurable buttons adorning the chassis and the optical sensor with 1,000-dpi resolution, even ergonomic-minded gamers will feel comfortable, as long as they don't mind the cord.—*Robyn Peterson*

\$74.95 direct. Evoluent LLC, www.evoluent.com. ●●●●○



## Wrist Rescuer

**W**rist pain is a computer user's nightmare. To squelch the soreness and treat your wrist right, pick up the **MouseBean** wrist rest. The MouseBean attaches to your mouse and cushions the heel of your hand, protecting you from carpal tunnel syndrome and making for some darn comfortable mousing—we noticed the difference immediately. MouseBean works on any surface and comes in several color combinations, including a staid black-and-gray for the office, of course. Your wrist will thank you.—*Kyle Monson*

\$11.95 list. MouseBean Limited, www.mousebean.com.

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## If Music's Your Bag...

**H**ere's a different take on portable-music player conveyance: the **Timbuk2 Digital DJ Hip Pack**. You'll have plenty of room for your MP3 or CD player, headphones, and other assorted items; wear it over your shoulder or at your waist (if that's not too eighties for you). Crafted from the same extremely sturdy ballistic nylon as other Timbuk2 bags, the Digital DJ Hip Pack comes in lime (shown), pink, gray, or all black.—*Carol A. Mangis*

\$50 list. Timbuk2, www.timbuk2.com. ●●●●○



## Ear Jamming

**G**et the bass thumping with the ingenious **Griffin EarJams**, headphone helpers that snap on to your iPod's earbuds to deliver big sound. EarJams work by creating a small resonating chamber on each earbud, which deepens the bass and amplifies the volume. They're not for everyone, though: They also can add a lot of fuzz to your songs and remove that fine digital clarity. We give them a thumbs-up for arena rock but a thumbs-down for string quartets. Each set comes with a carrying case and three pairs of flexible nubs (so you can choose the size that best fits your ears).—*Troy Dreier*

\$14.99 direct. Griffin Technology, www.griffintechology.com. ●●●●○



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# New PDA Apps

BY CAROL A. MANGIS

## Executive Planet

This handy app is a boon for all international travelers, but especially for businesspeople. It provides a culture and etiquette guide for 42 countries, covering potentially sticky topics such as how to accept and decline appointments, proper business dress, acceptable small-talk subjects, and even good and bad gift-wrapping colors. Don't ruin your trip or blow a deal because you didn't know what to expect—or what locals were expecting from you! You can find even more information and a bulletin board at the company's Web site.

For Palm OS. \$19.95 direct. Executive Planet Inc., [www.executiveplanet.com](http://www.executiveplanet.com). ●●●●○

## Farkle

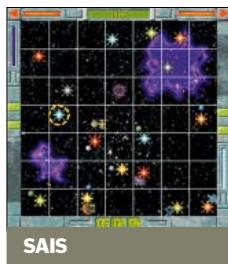
This Palm-only implementation of Farkle, a fast-moving dice-rolling/strategy game, works quite well on a small PDA screen. You're pitted against your choice of several AI opponents. Each one employs a different level of risk in its game-playing strategies, which makes each game's outcome unpredictable. You can add or subtract opponents to vary the experience even more. We like the dice-rolling sounds and the victory tune that plays when you win.

For Palm OS. \$14.95 direct. Smart Box Design LLC, [www.smartboxdesign.com](http://www.smartboxdesign.com). ●●●●○

## Inspiration

This handheld version of the excellent desktop software (a 2003 *PC Magazine* Editors' Choice winner) helps you brainstorm and develop creative ideas—for business projects, school assignments, or just about anything else. You build your concept using flexible, expandable, and customizable diagrams; numerous templates such as Concept Map, Goal Setting, and Assignment Plan are included, but you can also create your own. You can toggle between integrated-diagram and traditional-outline views. The program is easy and intuitive to learn and use. You can beam your results, sync them with the desktop version, or send them directly to a printer.

For Palm OS. \$29.95 direct. Inspiration Software Inc., [www.inspiration.com](http://www.inspiration.com). ●●●●○



## Strange Adventures in Infinite Space

And they do mean strange! You play as the captain of a space vessel who is sent on an assignment to explore, collect exotic lifeforms and treasures, and trade your way to riches. Upgrade your ship and weapons along the way. Every time you play (games can last from 5 to 20 minutes), you encounter a different configuration of planets, allies, enemies, phenomena, and treasures; each new game's star map and scenario is randomly generated, giving the game a whole lot of replayability (although we're not sure it's truly infinite).

One hitch is that fighting battles with the variety of hostile aliens you'll encounter can be tedious—and while you can speed them up, you're basically just watching the combat unfold. Still, SAIS is an original with great colors and sounds.

For Palm OS and PocketPC. \$19.95 list. Astraware Ltd., [www.astraware.com](http://www.astraware.com). ●●●●○



## WordPop!

If you like Boggle, Scrabble, and crossword puzzles, or if you're just a word buff in general, this addictive game will keep you happy

for hours. When you start, your screen is filled with letter blocks; you tap on connected ones sequentially to spell the longest words you can find. If you can empty the screen, you'll move ahead to another one.

You'll need to plan ahead so you won't end up with a surfeit of vowels—or just three Qs and a Z. Ratchet up the challenge with three levels of difficulty; really ambitious language mavens can download a free word list that lets you spell words up to 24 letters long. A Best Words screen keeps a record of your most glorious spelling triumphs; compare them with your spelling-bee-veteran friends.

For Palm OS. \$14.95 direct. Smart Box Design LLC, [www.smartboxdesign.com](http://www.smartboxdesign.com). ●●●●○

## QUICK CLIPS



## Madden NFL 2005

**PC** Madden NFL 2005 marks the 15th season of this superlative football game series. The biggest change is the addition of the Hit Stick. This feature takes a little getting used to, but it's worthwhile: You use the right thumb stick to deliver big hits on defense that can cause fumbles. Defensive AI has been improved, letting you change defensive assignments on the fly; this innovation goes a long way toward preventing offensive plays caused by a mismatch between defensive and offensive players. As for offense, formation shifts and custom hot routes make good additions to already excellent controls. And to help make decisions in Franchise mode, Storyline Central gives you help from radio host Tony Bruno and local and national newspapers—and that news can directly affect your team. This game is available for Microsoft Xbox, Nintendo Game Boy Advance, Nintendo GameCube, PC, Sony PlayStation, and Sony PlayStation 2 (tested).  
—Matthew D. Sarrel

\$50 street. Electronic Arts Inc., [www.easports.com](http://www.easports.com). ●●●●○

## EverQuest II

The world is much different 500 years after the events of EQ1, although some familiar places still exist. The moon Luclin has been destroyed in a cataclysmic event, and all races now start in two cities—evil Freeport or good Qeynos. EverQuest finally lives up to its name; the many available quests seem now to be the primary focus of the game, and players must join forces to complete the tougher ones. This proves to be a refreshing change from the mindless level treadmill that most MMORPGs employ. Graphically, EQ2 shines, with a close-to-photorealistic environment and terrific-looking character models.—John Blazevic

\$49.99 list, plus \$14.95 a month. Sony Online Entertainment, [www.everquest2.com](http://www.everquest2.com). ●●●●○





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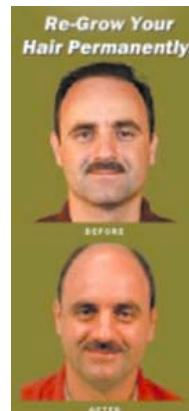
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Edited by Don Willmott

“ This channel gives me a direct outlet to the streets and our audience. We have the opportunity to go straight to our fans with whatever we want, wherever we find it. No middle man, no playlists, no bulls -- t.  
 And most of all, **no censorship.** ” - Eminem

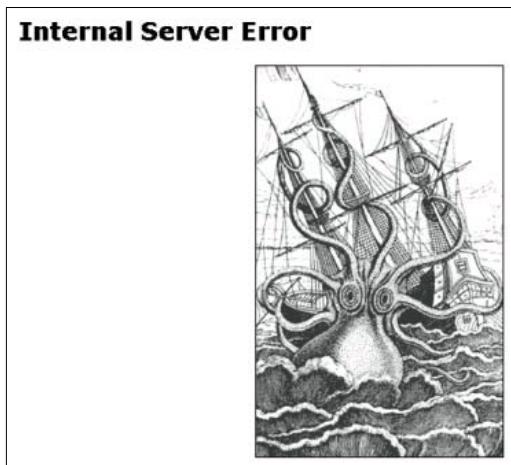
« Yeah, censorship is a bleepin' drag. (Sirius satellite radio site)

» This guy looks surprisingly happy, given the disappointing results. (Medical Hair Restoration ad)



We are sorry, but an error has occurred. We will be sure to give our web developers a swift kick in the butt and a pay cut.  
 Click here to go back to the previous page.

« And the programmer will have you to thank. (www.woot.com)



« Three cheers for artistically creative error messages. (www.x-rates.com)

» From the department of daffy dialog boxes. (www.polyphonicspree.com)



Birthday: April 12, 1930  
 Birth Place: New York, USA  
 Birth Name: Herbert Khaury  
 Date of death: November 30, 1996  
 Cause of death: Minneapolis, USA

« This biography of legendarily weird singer Tiny Tim lists a equally weird cause of death. (www.tvtome.com)

» Faithful reader Ron Gomes never did figure out why his networked Lexmark printer started displaying news headlines on its LCD screen.



If your entry is used, we'll send you a *PC Magazine* T-shirt. Submit your entries via e-mail to [backspace@ziffdavis.com](mailto:backspace@ziffdavis.com) (attachments are welcome) or to Backspace, *PC Magazine*, 28 E. 28th St., New York, NY 10016-7930. Ziff Davis Media Inc. shall own all property rights in the entries.

Winners this issue: Kevin Diltz, Victoria Edelman, Ron Gomes, Scott Johnson, Anatoliy Kats, Frank Shultz, and Michael Wacht.

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**Starting at \$899**  
*Notebook Essentials – Starting at 7.1 lbs.\**

- Mobile Intel® Pentium® 4 Processor (2.80GHz, 128KB Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 14.1" XGA TFT Display
- 256MB Shared™ DDR SDRAM
- 30GB\* Hard Drive
- 8x DVD-ROM Drive
- Integrated Intel® Extreme Graphics
- 90-Day Limited Warranty; 90-Day Mail-In Service & 1-Yr Tech Support

**\$1049** Ask about our financing plans for well-qualified customers.  
**E-VALUE Code: 01738-D81010m**

#### Make this your perfect PC:

- Dell™ 1350 Internal Wireless (802.11b/g), add \$39
- 24x CD Burner/DVD Combo Drive, add \$59
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- 512MB Shared™ DDR SDRAM, add \$100

### The Inspiron 1150, the perfect combination of mobility and affordability.

For starters, it's available with the Mobile Intel® Pentium® 4 processor, offering you the same great benefits as the Intel® Pentium® 4 processor, but with power-saving features to keep you mobile. Add an optional internal wireless card and you can connect to your network wirelessly and effortlessly.† And, if your needs change in the future, the memory is expandable up to 1GB. But best of all? You'll get Dell's 24x7 service and support. Simply call or go online today and get an out-of-this-world notebook at a price that's down-to-earth.

### Dell recommends Microsoft® Windows® XP Professional

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Corporate IT Buying Behavior and Customer Satisfaction Study  
Second Quarter 2004 – August 2004

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## A little something for everyone.

Dell recommends Microsoft® Windows® XP Professional



### Home Desktops & Notebooks

#### NEW DIMENSION™ 3000 DESKTOP

##### Outstanding Value

- Intel® Celeron® D Processor 320 (2.40GHz, 256KB L2 Cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- 256MB Shared® DDR SDRAM
- 40GB® Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., 27dp) E773 Monitor
- Integrated Intel® Extreme Graphics 2
- 48x CD Burner
- Integrated Audio; Dell A215 Stereo Speakers
- 6 Months of America Online® Membership Included<sup>1</sup>
- 90-Day Limited Warranty<sup>2</sup>; 90-Day At-Home Service<sup>3</sup> and 1-Yr Tech Support

**\$599** or as low as **\$18/mo.<sup>1</sup>**  
E-VALUE Code: 01739-D51005m

#### NEW DIMENSION™ 4700 DESKTOP

##### Enhanced Performance

- Intel® Pentium® 4 Processor 520 with HT Technology (2.80GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512MB Shared® Dual Channel DDR2 SDRAM
- 40GB® Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., 27dp) E773 Monitor
- Integrated Intel® Graphics Media Accelerator 900 (GMA 900)
- 16x DVD-ROM Drive
- Integrated 5.1 Channel Audio
- 6 Months of America Online® Membership Included<sup>1</sup>
- 1-Yr Limited Warranty<sup>2</sup>; At-Home Service<sup>3</sup> and Tech Support

**\$949** or as low as **\$29/mo.<sup>1</sup>**  
E-VALUE Code: 01739-D51009

#### DIMENSION™ 8400 DESKTOP

##### Cutting-Edge Technology

- Intel® Pentium® 4 Processor 530 with HT Technology (3GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- 512GB Dual Channel DDR2 SDRAM
- 160GB® SATA Hard Drive
- 19" (18.0" v.i.s., 24dp) M993 Monitor
- 128MB PCI Express® x16 ATIs Radeon™ X300 SE Graphics Card
- 16x DVD-ROM; 48x CD Burner (2" Bay)
- Sound Blaster® Audigy™ 2 (D)™ Sound Card
- Dell 5650 5.1 Surround Sound Speakers with Subwoofer
- 6 Months of America Online® Membership Included<sup>1</sup>
- 1-Yr Limited Warranty<sup>2</sup>; At-Home Service<sup>3</sup> and Tech Support

**\$1499** or as low as **\$45/mo.<sup>1</sup>**  
E-VALUE Code: 01739-D51014m

#### INSPIRON™ 1000 NOTEBOOK

##### Value Solution

- Mobile Intel® Celeron® Processor (2.20GHz, 256KB Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 14.1" XGA TFT Display
- 256MB Shared® DDR SDRAM
- 30GB® Hard Drive
- 24x CD Burner/DVD Combo Drive
- Integrated Graphics
- 90-Day Limited Warranty<sup>2</sup>; 90-Day Mail-In Service & 1-Yr Tech Support

**\$799** or as low as **\$24/mo.<sup>1</sup>**  
E-VALUE Code: 01739-D81007

##### Recommended Upgrades:

- Dell™ 1300 Wireless PC Card (802.11b/g), add \$39
- 3-Yr Limited Warranty<sup>2</sup>; Mail-In Service and Tech Support, add \$119

#### INSPIRON™ 5160 NOTEBOOK

##### Perfect Balance of Price and Performance

- Mobile Intel® Pentium® 4 Processor 518 (2.80GHz, 1MB Cache, 533MHz FSB)
- Microsoft® Windows® XP Home Edition
- 15" XGA TFT Display
- 512MB DDR SDRAM
- 40GB® Hard Drive
- 24x CD Burner/DVD Combo Drive
- 32MB DDR XGI® Volari™ XP5 AGP 4x Graphics
- Dell™ 1350 Internal Wireless (802.11b/g)
- 1-Yr Ltd. Warranty<sup>2</sup>; Mail-In Service and Tech Support

**\$1349** or as low as **\$41/mo.<sup>1</sup>**  
E-VALUE Code: 01739-D81013

##### Make this your perfect PC:

- Microsoft® Windows® XP Professional, add \$79
- 3-Yr Limited Warranty<sup>2</sup>; At-Home Service<sup>3</sup> and Tech Support, add \$269

#### INSPIRON™ 8600 NOTEBOOK

##### Power on the Go

- Featuring Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 715 (1.50GHz)
- Intel® PRO Wireless 2200 Internal Wireless (802.11b/g)
- Microsoft® Windows® XP Home Edition
- 15.4" UltraSharp™ Wide Screen XGA TFT Display
- 512MB DDR SDRAM
- 80GB® Hard Drive
- 24x CD Burner/DVD Combo Drive
- 32MB DDR NVIDIA® GeForce™ FX Go5200 AGP 4X Graphics
- 1-Yr Ltd. Warranty<sup>2</sup>; Mail-In Service and Tech Support

**\$1599** or as low as **\$48/mo.<sup>1</sup>**  
E-VALUE Code: 01739-D81015m

##### Make this your perfect PC:

- 8x CD/DVD Burner (DVD+RW/+R<sup>2</sup>), add \$160
- 3-Yr Limited Warranty<sup>2</sup>; At-Home Service<sup>3</sup> and Tech Support, add \$269



## Small Business Desktops

### DIMENSION™ 2400 DESKTOP

#### Economical, Essential Technology Desktop

- Intel® Celeron® Processor (2.40GHz, 256KB L2 Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- WordPerfect® Word Processing
- 256MB Shared® DDR SDRAM
- 40GB® Hard Drive (7200 RPM)
- Integrated Intel® Extreme Graphics
- 48x CD-ROM; Integrated Audio
- 90-Day Basic Ltd. Warranty; 90-Day On-Site Service; 1-Yr Tech Support
- Monitor Not Included

**\$349** E-VALUE Code: 01739-S51003m

#### Recommended Upgrades:

- NEW WordPerfect® Office 12, add \$49
- 17" (16.0" v.i.s.) E773 Monitor, add \$100

### OPTIPLEX™ 170L DESKTOP

#### Network-Optimized, Value Business Desktop

- Intel® Pentium® 4 Processor (2.80GHz, 1MB L2 Cache, 533MHz FSB)
- Microsoft® Windows® XP Professional
- 256MB Shared® DDR SDRAM
- 40GB® Hard Drive (7200 RPM)
- Integrated Intel® Extreme Graphics 2
- 48x CD-ROM
- Integrated 10/100 Ethernet
- 1-Yr Basic Ltd. Warranty; 1-Yr On-Site Service\*
- Monitor Not Included

**\$749** Lease as low as \$20/mo., (48 pmts.)\* E-VALUE Code: 01739-S31007m

#### Recommended Upgrades:

- 512MB Shared® DDR SDRAM, add \$55
- Microsoft® Office Basic Edition 2003, add \$130
- 17" Dell® E173FP Flat Panel Display, add \$449

### NEW DIMENSION™ 4700 DESKTOP

#### Exceptional Performance Desktop

- Intel® Pentium® 4 Processor 520 (2.80GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Home Edition
- WordPerfect® Word Processing
- 512MB Dual-Channel Shared® DDR2 SDRAM
- 40GB® SATA Hard Drive (7200 RPM)
- Integrated Intel® Graphics Media Accelerator 900
- 48x CD Burner/DVD Combo Drive; Integrated Audio
- Integrated Intel® PRO 10/100 Ethernet
- 1-Yr Basic Ltd. Warranty; 1-Yr On-Site Service; 1-Yr Tech Support
- Monitor Not Included

**\$899** Lease as low as \$24/mo., (48 pmts.)\* E-VALUE Code: 01739-S51008m

#### Recommended Upgrades:

- Dell® All-In-One Printer A960, add \$179
- 17" Dell® UltraSharp™ 1704FP Digital Flat Panel, add \$499



## Small Business Notebooks

### LATITUDE™ D505 NOTEBOOK

#### Business Essentials, Compact Design – Starting at 5.1 lbs.\*

- Intel® Celeron® M Processor 340 (1.50GHz, 512KB L2 Cache, 400MHz FSB)
- Microsoft® Windows® XP Home Edition
- 14.1" XGA TFT Display
- 128MB Shared® DDR SDRAM
- 30GB® Hard Drive
- Modular 24x CD-ROM Drive
- Intel® PROWireless 2100 802.11b Mbps® Mini-PCI Wireless Card
- Integrated Intel® Extreme Graphics
- 1-Yr Basic Mail-In Service Plan; Serial and Parallel Ports Included

**\$1049** Lease as low as \$28/mo., (48 pmts.)\* E-VALUE Code: 01739-S71010m

#### Recommended Upgrade:

- Additional Primary Battery (6-Cell), add \$99

### INSPIRON™ 8600 NOTEBOOK

#### Power on the Go – Starting at 6.9 lbs.\*

- Featuring Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 715 (1.50GHz)
- Intel® PROWireless 2100 802.11b Mini-PCI Wireless Card
- Microsoft® Windows® XP Home Edition
- WordPerfect® Word Processing
- 15.4" UltraSharp™ Wide Screen XGA TFT Display
- 256MB DDR SDRAM
- 30GB® Hard Drive
- Modular 8x DVD-ROM Drive
- 32MB DDR NVIDIA® GeForce™ FX GoS200 AGP 4X Graphics
- 1-Yr Ltd. Warranty; Mail-In Service and Tech Support
- Does Not Include Serial and Parallel Ports

**\$1199** Lease as low as \$32/mo., (48 pmts.)\* E-VALUE Code: 01739-S81011m

#### Recommended Upgrade:

- Advanced Port Replicator, add \$169

### NEW INSPIRON™ 700M NOTEBOOK

#### Lightweight Traveler – Starting at 4.1 lbs.\*

- Featuring Intel® Centrino™ Mobile Technology
- Intel® Pentium® M Processor 725 (1.60GHz)
- Intel® PROWireless 2100 802.11b Mini-PCI Wireless Card
- Microsoft® Windows® XP Home Edition
- WordPerfect® Word Processing
- 12.1" Wide Screen Crystal Clear XGA TFT Display
- 256MB Shared® DDR SDRAM; 30GB® Hard Drive
- 8x DVD-ROM Drive
- Integrated Intel® Extreme Graphics
- 1-Yr Ltd. Warranty; Mail-In Service and Tech Support
- Does Not Include Serial and Parallel Ports

**\$1449** Lease as low as \$39/mo., (48 pmts.)\* E-VALUE Code: 01739-S81014m

#### Recommended Upgrades:

- Microsoft® Windows® XP Professional, add \$79
- 65 Whr Lithium Ion High Capacity Battery (8-Cell), add \$129



## Small Business Servers & Workstations

### NEW POWEREDGE™ SC420 SERVER

#### Small Business Value Server

- Intel® Celeron® Processor at 2.53GHz
- Upgradable to Intel® Pentium® 4 Processor at 3.60GHz with 800MHz Front Side Bus
- New 256MB ECC DDR2 SDRAM (Up to 4GB)
- 40GB® (7200 RPM) SATA Hard Drive
- Upgradable to 500GB® of Internal Hard Drive Storage
- Embedded Broadcom® 5751 Gigabit® Ethernet Controller
- RAID 1 Optional
- 1-Yr Next Business Day On-Site Service\*
- Small Business Pricing

**\$499** Lease as low as \$14/mo., (48 pmts.)\* E-VALUE Code: 01739-S21004m

#### Recommended Upgrades:

- PowerConnect™ 2216 16-Port Fast Ethernet Switch; add \$69
- System Including Microsoft® Windows® Small Business Server 2003 (256MB SDRAM Min. Required); now \$998

### NEW POWEREDGE™ SC1420 SERVER

#### High-Speed Small Business Server

- Intel® Xeon™ Processor at 2.80GHz
- Dual Intel® Xeon™ Processor Capable (Up to 3.40GHz)
- New 256MB DDR2 SDRAM (Up to 8GB)
- 40GB® (7200 RPM) SATA Hard Drive
- Upgradable to 1TB® of Internal SATA Hard Drive Storage
- Embedded Intel® PRO Gigabit® NIC
- Two NEW PCI Express™ Slots (1x8, 1x4), 3 PCI-X Slots (64bit/100MHz), and 1 PCI Slot (32bit/33MHz)
- 1-Yr Next Business Day On-Site Service\*
- Small Business Pricing

**\$799** Lease as low as \$22/mo., (48 pmts.)\* E-VALUE Code: 01739-S21007m

#### Recommended Upgrades:

- PowerConnect™ 2608 8-Port All-Gigabit Ethernet Switch; add \$129
- System Including Microsoft® Windows® Small Business Server 2003; now \$1298

### NEW DELL PRECISION™ 370 WORKSTATION

#### Maximum Performance, Single Processor Workstation

- Intel® Pentium® 4 Processor (3.0GHz, 1MB L2 Cache, 800MHz FSB)
- Microsoft® Windows® XP Professional
- Dell™ OpenManage Client Instrumentation Software Optional
- 512MB Dual-Channel DDR2 SDRAM
- 40GB® (7200 RPM) SATA Hard Drive; 48x CD Burner
- 64MB PCI Express™ x16 NVIDIA® Quadro NVS 280 Graphics
- Integrated Intel® PRO 1000MT Gigabit® NIC
- 24x7 Dell Precision™ Dedicated Tech Support
- 3-Yr Basic Ltd. Warranty; 3-Yr On-Site Service\*
- Monitor Not Included

**\$1199** Lease as low as \$32/mo., (48 pmts.)\* E-VALUE Code: 01739-S41011m

#### Recommended Upgrades:

- 3-Yr Same-Day 4-Hour (5x10) On-Site Service; add \$199
- 19" Dell® UltraSharp™ 1901FP Digital Flat Panel, add \$699

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