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JULY 2005

NOTEBOOKS

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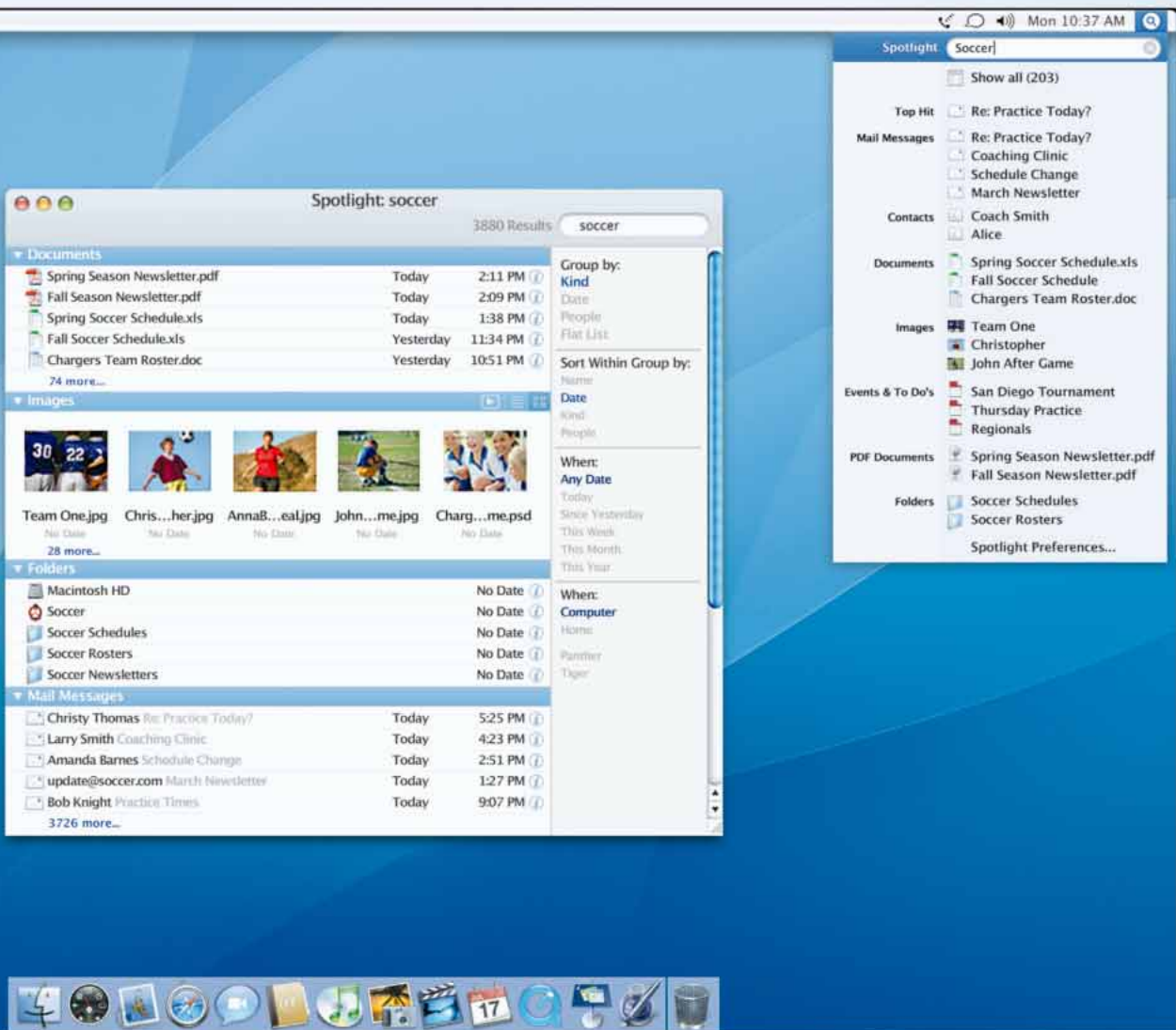


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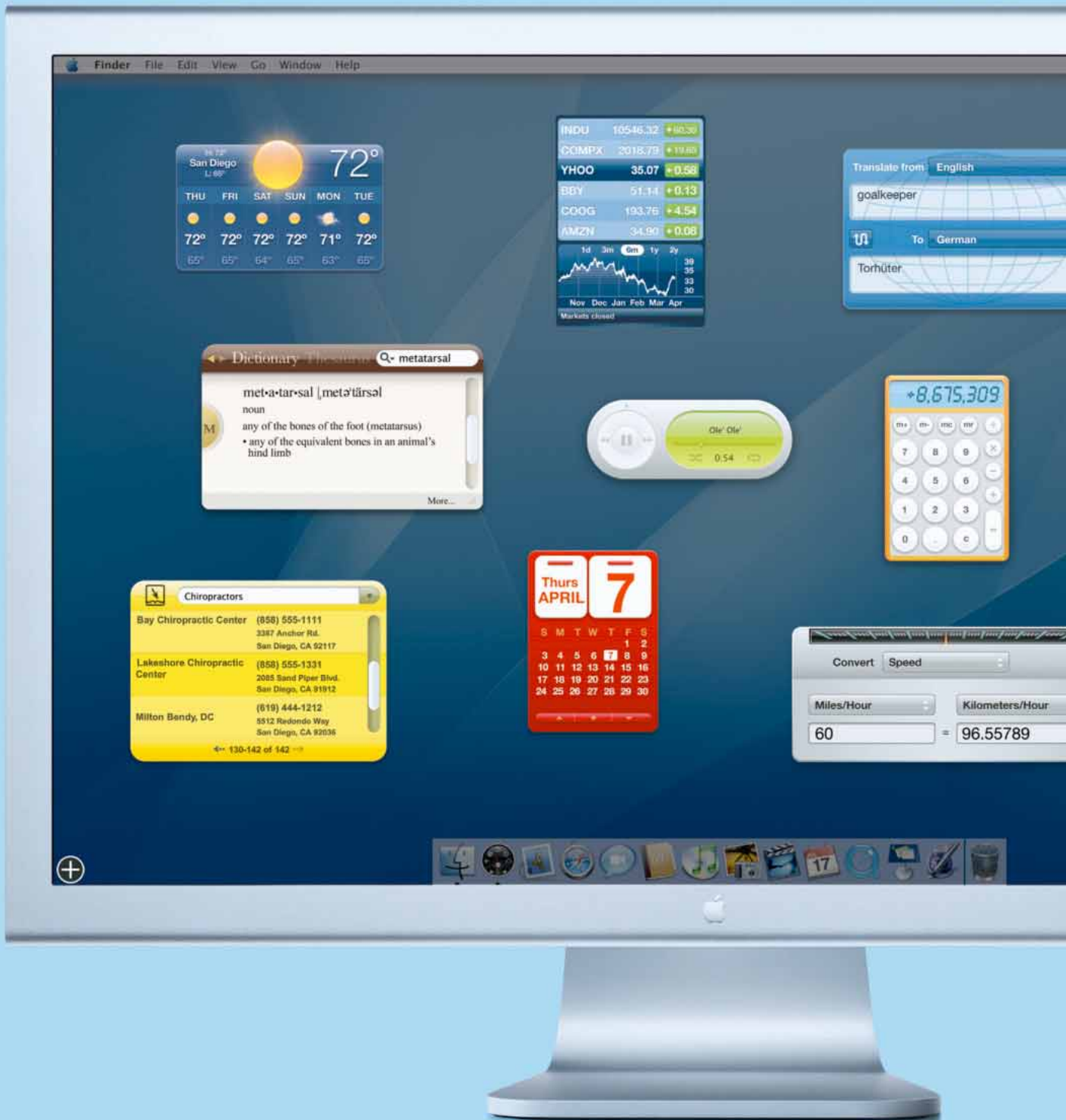
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Retrospect
September 2004



Forward Thinking



Pulling It All Together

I spent much of the past month on the road attending the industry conferences Interop, Electronic Entertainment Expo (E3), and the *Wall Street Journal's* D: All Things Digital. The common theme was convergence—not the nineties' notion of a single box that does everything, but convergence in the sense of every device becoming more feature-packed and powerful.

INTEROP: MAKING SECURITY EASIER

At Interop, networking equipment makers showed products aimed at big enterprises looking to tie together lots of equipment via a single management platform. The companies selling remote-access gear were pushing VPNs (virtual private networks) based on SSL security. I was impressed by a number of solutions for small businesses.

Gigabit switches and VPNs are no longer just for large companies now that less expensive, simpler packages are available. I saw several all-in-one security appliances, called *unified threat management appliances*, such as those we review on page 129 in this issue. These business appliances provide antivirus, firewall, intrusion detection, antispam, and often a VPN—all in one box. I'm convinced that pulling all these functions together will be attractive to more and more businesses.

E3: BATTLE OF THE GAME CONSOLES

At E3, the buzz was all about the Microsoft Xbox 360 and the Sony PlayStation 3. No longer just gaming machines, these consoles are now entertainment platforms. The Xbox 360 supports high-definition displays up to 1080i, about the limit of most HD displays today. Its new processor builds on IBM's Power architecture, with three processing cores that each can run two threads simultaneously, and a new graphics processor developed with ATI.

Microsoft says it will be backward-compatible with "the most popular" Xbox games. It also plays DVDs and music from an iPod, comes with built-in instant

messaging and chat to connect gamers, and can connect to other PCs in your house to retrieve and play back music and photographs. As a Media Center Extender, it can show TV programs recorded on a Media Center PC. And with an optional hard drive, it can store music and photographs as well. Some of the Xbox 360 games look wonderful, especially the sports titles from Electronic Arts and Microsoft's own *Kameo* role-playing game and *Project Gotham Racing 3*.

Sony plans to launch its PS3 in the spring of 2006, most likely in Japan, and then in the U.S. for the 2006 holiday season. I didn't see many games for it, but did see screen shots and an amazing trailer that looked great. Sony says the PS3 will have a Cell processor built by

Astaro Security Gateway 220



IBM, Sony, and Toshiba. It's based on the Power architecture, but has eight "synergistic processing units." Combined with an nVidia graphics chip that Sony calls the RSX, the PS3 reportedly performs at up to 2 teraflops—at least a couple of times faster than the Xbox 360.

Sony says it will be backward-compatible with all the old PlayStation and PlayStation 2 games. The company plans to support high-resolution HD displays (up to 1080p) and offer a Blu-ray optical drive that can store up to 54GB. The real proof will be how the quality of the PS3 games compares with that of Xbox games. Unquestionably, the PS3 is more ambitious than the Xbox 360. Sony is also promoting its media and online features, but it's clear that this year is Microsoft's big chance to get ahead.

MS Xbox 360



Despite all the attention on the new gaming consoles, the PC remains an incredibly strong gaming platform. I saw a lot of activity in multiplayer online games, like *World of Warcraft*, *Star Wars Galaxies*, and the new *City of Villains*. The new real-time strategy games, such as *Rise & Fall: Civilizations at War*, *Rise of Nations: Rise of Legends*, and *Star Wars: Empire at War*, take the concept even further, with more realistic graphics and more fun.

The Sony PS3

reportedly performs at up to 2 teraflops—at least a couple of times faster than the Microsoft Xbox 360. Unquestionably, the PS3 is more ambitious.

Forward Thinking

MICHAEL J. MILLER



If you're into first-person shooters (which I am not), Call of Duty 2, Quake 4, and Unreal Tournament 2007 look stunning. Personally, I might spend some more time with The Movies, which combines a simulation game (you run a movie studio) with the ability to create your own short films.

Whatever you like to play, the coming year looks to be an entertaining one.

D: THE DEMOCRATIZATION OF MEDIA

The idea that more people will create media and that it will be available to more people was a central theme of the *Wall Street Journal's* D conference. At one of the panel discussions, several prominent bloggers explained the surge in blogs, the emergence of more news sources, and the proliferation of voices.

There was widespread agreement with tech journalist Dan Gillmor's argument that blogs do not replace traditional media. "It's not blogging versus journalism," he said. "Blogging is just a part of journalism." He went on to say that the blog was just another tool and that the elimination of traditional journalism would be a real tragedy. Several members of the panel objected to a comment from the audience that bloggers don't take the truth seriously, and pointed to errors in the mainstream press.

During another session, a panel of execs running major media companies was quite open to new media, with the *Washington Post's* Don Graham likening bloggers to Benjamin Franklin, who had a unique voice without a big media company behind him. Tony Ridder explained how many of the Knight Ridder papers were now using blogging to expand their coverage. Barry Diller of IAC/InterActiveCorp said "content wins out" and stressed the importance of editors in directing customers to the best content. He noted that the barriers to content distribution are eroding, making right now a good time for independent content producers.

That certainly makes sense to me. It's interesting to see the parallel emergence of all the new platforms for content producers, from traditional desktops and multimedia notebooks to gaming machines and even mobile phones. While news, entertainment, and games may well be optimized for specific devices, in the long run, you're likely to get all sorts of content on any device you want.

The Multimedia Notebook

Today, just about any computer you buy is more than capable of handling photos, video, and music. And I don't mean just playing back files; I mean creating them. Not only do desktops have these features, but notebook computers do as well. And we're seeing more and more notebooks with widescreens and special features designed to make multimedia creation and playback easy. Our roundup on page 88 highlights some of the new capabilities of these machines.

Recently, I've read reports of big music recording studios closing, replaced by home studios made possible by new technology. Now musicians can have a full recording studio on a notebook computer. I've listened to a number of CDs that were recorded and edited on the road.

You can do basic video editing on any new notebook these days, a development that enables very



quick on-the-fly editing and capturing of video. But most people still use a desktop for real editing. You won't be creating *Shrek* or *Star Wars* on a notebook—or even on a dual-processor desktop just yet—but this is where the technology is heading. And I can imagine more drawing and photo editing moving onto notebooks, particularly when tablet computers become popular. Don't laugh! I'm still confident that this will happen.

The move to multimedia notebooks does not mean that the music, videos, or photos created on them will be any better than those produced on a desktop. But it does mean that more people will be able to create more content in more places.

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

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COVER STORY

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multimedia notebooks: movies, music, and mbas

Creating a high-quality presentation—complete with video and sound—on the road, showing it to your customers without packing a ton of projectors, speakers, and monitors, or playing a good DVD in your hotel room at the end of the day—these notebooks can do it all.

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PORTABLE MUSIC PLAYERS

119 More Room To Rock

Ready to take your music to the next level? We review ten portable audio players in two categories (small hard drive and large hard drive) to see which ones belong in your pocket. You'll realize that the iPod isn't the only game in town.



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129 One-Stop Security

All-in-one security appliances give small and medium-size businesses a relatively simple, inexpensive way to protect their networks. We review four of the top appliances that cost under \$5,000.

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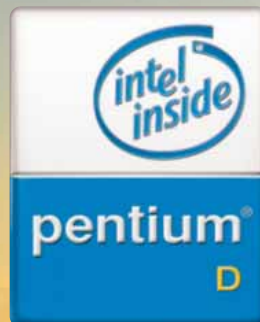
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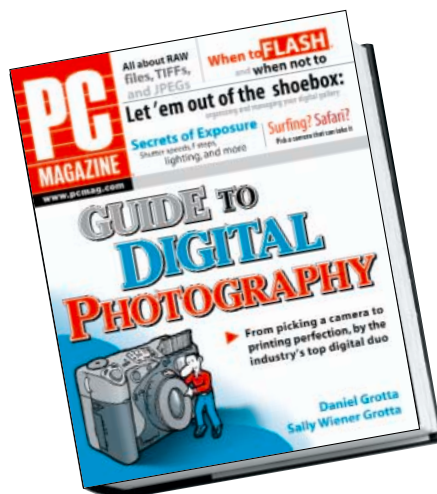
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TECHNOLOGY TRENDS & NEWS ANALYSIS

The Console Wars

Sony, Microsoft, and Nintendo ready big gaming advances.

THE ELECTRONIC Entertainment Expo (E3) is primarily about pumping up the volume on the \$28 billion worldwide video-game industry, and this year's extravaganza featured some major debuts. Microsoft, Sony, and Nintendo are readying next-generation game consoles, to be released over the next 18 months, which promise to blur the lines between gaming gadgets and entertainment hubs.

First to enter the ring is Microsoft's Xbox 360, expected this holiday season. Backward-compatible and packed with features such as a built-in Media Center Extender for Windows XP, DVD-ROM, Wi-Fi, high-definition graphics (1080i), and the ability to stream media from portable devices and rip music to the hard drive, the Xbox 360 is really part of Microsoft's continuing quest to be the dominant media source in the home. The jury is still out, though, on whether video gamers want their consoles to be übergadgets.

At E3 Sony promised a spring

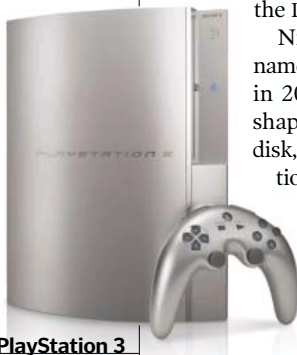


2006 release date for its PlayStation 3 (PS3). Also backward-compatible, the PS3 boasts true high-definition (1080p) display quality, plus support for DVD and higher-capacity Blu-ray discs. Its controllers will be redesigned, and up to seven can connect via Bluetooth. Sony also has a clear eye on the

PS3 as an entertainment hub. Sony officials dub the PS3, with its mix of current and cutting-edge media storage and connectivity, "future-

Microsoft's Xbox 360 proof." Meanwhile, in a shrewd marketing counterstrike, Microsoft will release Halo 3, the next installment of the popular Xbox game, on the same day the PS3 arrives.

Nintendo's new console, code-named Revolution and due sometime in 2006, abandons the GameCube shape in favor of a slick rectangular disk, but will play the current generation of GameCube titles. Revolution also offers the unique capability to download games popularized on the Nintendo systems of the past 20 years. Stay tuned for some action-packed competition. —Karen Jones

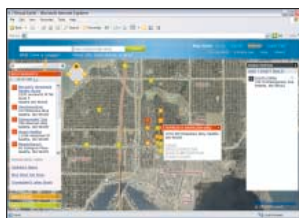


The Micro: A New Game Boy

At this year's E3 show, Nintendo showed off more than the next-gen Revolution game console: It also unveiled a lighter, sleeker Game Boy that looks right at home alongside grown-up gadgets. The silvery Game Boy Micro is about the size of an iPod mini—2 by 4 by 0.7 inches (HWD)—and weighs even less at just 2.8 ounces. The 2-inch screen is "the best and brightest screen we've ever put in a handheld," says Nintendo Executive VP Reggie Fils-Aime, and it has adjustable brightness for playing indoors or outside. It isn't a successor to the Game Boy Advance SP but can play any GBA games. Prices aren't set yet, but expect the Micros to arrive this fall. —Carol A. Mangis

GOOGLE PORTAL Google has launched new features allowing users to personalize their own Google home pages, available at <http://labs.google.com>. Similar to My Yahoo!, home pages can include Gmail, driving directions, and more content from sites such as BBC News.

Extreme Close-Ups



MICROSOFT HAS its eye in the sky. The company has announced MSN Virtual Earth, part of the company's expanding collection of search technologies. The new service displays a satellite view of any location on a map, with businesses, streets, and other information superimposed on it for what is being dubbed "an immersive local search experience," says Justin Osmer, MSN product manager. The first release will be available this summer. —Sebastian Rupley

Gaming on the Go

Mobile games were front and center at May's E3 show, and market researchers are forecasting that revenues from them will top \$400 million by 2009. Meanwhile, according to a survey from M:Metrics, two-thirds of the people who download mobile games are male.

U.S. Mobile Game Revenues (in millions)



Source: Jupiter Research, March 2005.

Phoning the Sages

If you're tired of getting subpar results from common, text message-based answering services, then Limor Garcia might have the ultimate solution. The recent graduate of NYU's Interactive Telecommunications Program is the creator of Cellphedia, a school project-turned-service that combines the community aspect of a wiki with the mobility of a cell phone.

When you register your number at www.cellphedia.com



.com, you sign up for various interest groups, such as entertainment, sports, and technology. You can then text-message the group with a question like, "Who invented the Internet?" and someone will reply. The answers, however, should be viewed with skepticism; we were told that Tim Berners-Lee invented the Internet, which is not entirely accurate.

"I wanted to create a thesis project on something that is emerging, something I have never experienced before," says Garcia.

Garcia moderates many of the answers that pass through the service. As she expands Cellphedia, she plans to extend users' correction capabilities and add more localized features. In the meantime, don't believe everything you read.—David Murphy

Talk to Your Phone

JUDGING FROM THE NEW VERSION 5.0 of its Windows Mobile software, Microsoft is aiming to give cell phones more PC-like capabilities and speech recognition. The OS includes updated Office software, Windows Media Player 10 Mobile for managing audio and video, and support for the hard drives in phones. It also offers support for 3G networks, Wi-Fi for smartphones, and improvements to Bluetooth features.

The release could "give wireless network operators and mobile device vendors the ability to deliver customized, differentiated services and devices," says Yankee Group senior analyst John Jackson. But Microsoft still has to contend with dominant phone and mobile software players, especially Nokia. As little as three years ago, when Microsoft was developing its Windows Mobile strategy, almost no phones were built on its software. The company now has 40 different manufacturers supporting Windows Mobile.

In his keynote address announcing Version 5.0, Microsoft chairman Bill Gates said speech recognition figures strongly into the future of applications for smartphones, because the chips in them are rapidly getting more powerful. Many smartphones already offer speech recognition for simple functions, but the command sets are limited. That may be about to change.

"As we move forward and get more CPU power and more software advancements, the size of the vocabulary will just get larger," said Gates, who has predicted that in the next ten years speech recognition will be heading for devices of all kinds.—SR

Sizing Down and Speeding Up

AS ANY CHIP designer will tell you, making some things smaller is often how you end up making other things faster. That's the idea behind a new file-miniaturization technology that its creators hope will make computing with mobile gadgets more efficient.

Eschewing the term *compression*, developers at WindSpring call their solution Data Miniaturization Technology, or DMT. They claim that unlike other compression schemes, DMT shrinks files while retaining full functionality.

"We took a San Diego map that was 125KB and ended up with a 24KB file that we sent to a mobile phone," says John



Archbold, WindSpring's CTO.

"You could still pan and zoom without going back to the server, so it was much quicker."

The technology accomplishes this legerdemain by examining a file, locating the most frequently recurring data, and then generating a sequencing data dictionary so that the file

WAR WATCH

Universal Display Corporation has been granted a \$1.7 million Department of Defense contract to develop a computing watch for a soldier's wrist. It will use a full-color, 4-inch diagonal, 320-by 240-pixel active-matrix OLED display. The communications device will be form-fitted to a soldier's wrist and communicate wirelessly to nearby computers enabling soldiers to see video and graphics information in real time. The display will reside on metal foil, so that it can be rolled out when in use and then retracted.

can be compressed. The miniaturized file can contain the dictionary and index pointers.

The initial \$24.95 WindSpring Mobile application for Pocket PC devices will work with applications like Microsoft Office. The company also hopes to license a version to service providers, starting at \$25,000.

Unfortunately, the technology will not compress every type of data, so it may see niche adoption. You cannot run an executable file that's miniaturized, for example, and the program cannot shrink already compressed, bandwidth-hogging files. Otherwise, it could be a game-changer.

—John R. Quain

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COMING ATTRACTIONS



Hi-Def in Your Hand

The Sony HDR-HC1 Handycam camcorder brings hi-def video shooting to a consumer level with its (comparatively) low price of around \$2,000. The new camcorder is the little sibling of Sony's \$3,700 HDR-FX1, the first 1080i high-definition camcorder. The HC1 has a smaller widescreen LCD (2.7 inches to the FX1's 3.5 inches) and 10X optical zoom instead of 12X. It adds touch-screen and still-shooting capabilities, and also includes a Carl Zeiss lens, image stabilization, an infrared night-shooting mode, and a pop-up flash for shooting 3-megapixel still images. —*Kyle Monson*
\$2,000 street. Sony Electronics Inc., www.sonystyle.com.

Archos Aims at the Entry-Level Crowd

Archos's next MP3 player embodies the principle of "less for less." Slightly smaller than the Apple iPod mini, the Archos Gmini XS 100 is a 3GB player available in four colors (black, silver, blue, and pink). Boasting a 1.5-inch grayscale LCD, the USB 2.0 player features Archos's characteristically broad file-format support and various shuffle playback modes. The Archos ARC-Library lets users sort, copy, delete, rename, and move files directly on the device. Archos participates in Microsoft's PlaysForSure program, so its new players are compatible with online music services that include MSN Music, Music-match, and Napster. —*Michael Kobrin*

\$179.95 direct. Archos, www.archos.com.



Surf Safely

The StealthSurfer II flash drive keeps your surfing habits and personal information private when you are plugged into a public computer. Available in capacities ranging from 128MB to 1GB, the device now has integrated Anonymous Surfing, an identity protection program with complete IP masking. A Firefox browser caches all the cookies and bookmarks onto the device and leaves nothing behind on the host PC, keeping your credit card number, log-ons, and other sensitive data safe. —*Molly K. McLaughlin*

\$99.29 direct and up. Stealth Ideas Inc., www.stealthsurfer.com.

Make Your iPod Better

The folks at Roxio have released The Boom Box: five software applets that work seamlessly with iTunes on the Mac to add features and functions we think most iPod owners will appreciate. The bundle includes MusicMagic Mixer, which helps you build better playlists by assessing the mood of a "seed" song and picking songs from your collection that match it. CD Spin-Doctor converts your analog music sources into AAC, Apple Lossless, or MP3 digital files. iSpeak It converts text files into spoken audio files. —*Jamie M. Bsates*
\$49.95 direct. Roxio, www.roxio.com.



RPTVs Slim Down

HP's new microdisplay rear-projection televisions have a slim design and a short panel in front that drops down to reveal a lighted audiovisual connection hub—no more wrestling with a nest of wires behind the TV. The displays also include HP's Visual Fidelity technology, which HP claims doubles the pixel resolution. The HDTVs range from 50 inches to 65 inches. —*KM*

Price not yet set. Hewlett-Packard Development Co., www.hp.com.



Lighten Up

DxO Optics Pro 3.0 image software for digital SLR cameras and lenses is easy to use and packed with features, including an innovative optics engine that can correct noise, adjust lighting, and remove distortion—and do it all automatically. The software includes two brand-new technologies: DxO Lighting, which brings out shadow detail while retaining a natural look, and DxO Noise Engine, which reduces image noise without sacrificing detail. —*MKM*

\$139 direct (Elite version, \$229). DxO Labs, www.dxo.com.



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HOW DID ONE COMPANY REDUCE ITS TCO? THEY SWITCHED FROM LINUX TO WINDOWS.



"When we calculated the total cost of ownership for Red Hat Linux using a 10-year Net Present Value Model, we were surprised at how much higher it was than for Windows®."

*—J.E. Henry, CIO,
Regal Entertainment Group*

Regal Entertainment Group, the largest movie theater operator in the U.S., ran its POS concession and ticket terminals on Red Hat Linux. However, they saw that it lacked the vendor support and remote management tools they needed to support their strategic plans. After an in-depth comparison, Regal found that Windows Embedded would deliver a lower TCO, improved security, and fewer risks. "With Windows, we get an integrated, easily managed platform that can extend from the data center to our POS devices," says Cliff DeYoung CTO at Regal.

To get the full case study, other case studies, or third-party findings, go to microsoft.com/getthefacts





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Better Media Centers

THE MAGAZINE
WORLD'S LARGEST
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BY JOHN R. DELANEY AND JOEL SANTO DOMINGO

As Microsoft Windows Media Center Edition 2005 continues to gain traction, PC manufacturers are executing their best MCE efforts yet. That's great news for buyers, as good or better models are available at every price level. We gathered four of the newest offerings, ranging from just under \$1,000 to almost \$3,500. Our favorite of the new crop is the Sony VAIO VGC-RA830G, which joins the previously reviewed HP Digital Entertainment Center z545 as Editors' Choice.

Gateway 832GM Media Center PC

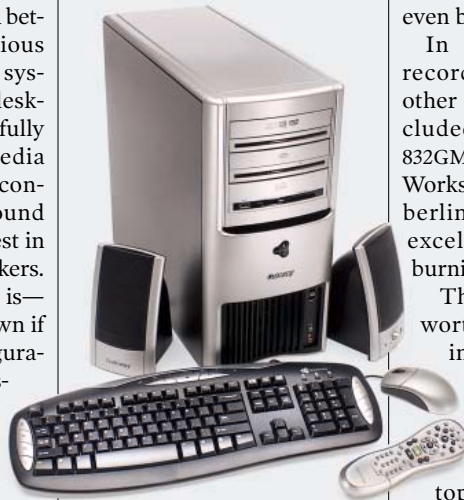
The new Gateway 832GM Media Center PC provides an affordable starting point for consumers looking to update their home entertainment centers or add a media-friendly PC to the home. The 832GM is housed in the same black and silver chassis as the high-end Gateway 9310 series, and it uses the new BTX (Balanced Technology Extended) design for near-silent operation. Unlike the WinBook MCE 410, which has a sleek, flat, component-style case that fits unobtrusively into a living room, the 832GM is a tad bulky in its desktop-like, tower form.

The system has two FireWire ports and a USB port on the front, and another six USB ports around back, along with a Gigabit Ethernet port and jacks for Intel's HD sound controller. Although the integrated audio solution is adequate for smaller rooms, a more robust sound card, such as the Cre-

ative Audigy 2 ZS, may be a better choice if you're serious about audio quality. The system ships with a pair of desktop speakers that are woefully underpowered for a Media Center, so unless you're connecting to an existing sound system, you'll want to invest in a set of multichannel speakers.

The 832GM is offered as is—meaning you're on your own if you want a beefier configuration—but the tool-free chassis makes it easy to replace or upgrade internal components on your own. The possibilities for upgrading the system are extensive, with two available PCI slots (one is 16X PCIe), two open hard drive bays, and two vacant memory slots.

With a 3.0-GHz Pentium 4 630 processor running on an Intel 915GSE motherboard, the 832GM has plenty of muscle to run MCE and home productivity applications. Graphics rendering comes by way of the Intel GMA 900 controller,



THE AFFORDABLE Gateway 832GM is a solid Media Center for budget-minded buyers.

which is fine for regular video, but garnered unimpressive 3D benchmark test results. Gamers will want to use the open 16X PCIe slot to add a high-end 3D card. The system comes with 1GB of DDR memory (expandable to 4GB) and a good-size 250GB SATA hard drive (7,200

rpm) for storing recorded TV programs, music, and other digital content. The multibay memory card reader and dual optical drives (a dual-layer/multiformat DVD burner and a CD-ROM drive), cover the gamut of removable and recordable media.

We were pleased by the clarity of the Hauppauge WinTV TV tuner card, which also has an FM tuner and an IR blaster with a remote control. On the other hand, we were disappointed with the PS/2 keyboard and ball mouse; an optical mouse would be nice, and a wireless setup would be even better.

In addition to the TV recording capabilities and other multimedia features included with MCE 2005, the 832GM comes with Microsoft Works 8 and Money 2005, Cyberlink Power2Go, and the excellent Nero 6 CD/DVD burning software.

The Gateway 832GM is worth a look if you're seeking an affordable, entry-level Media Center system, as long as you don't mind it coming in the shape of a desktop. More advanced users may be satisfied if they take advantage of the system's upgrade potential.

Gateway 832GM

With Intel Pentium 4 630 (3.0 GHz), 1GB 400-MHz DDR SDRAM, 250GB SATA hard drive, Intel GMA 900 Graphics, DVD±RW drive, 48X CD-ROM drive, Intel HD sound controller, Gateway GMAX 2000 2-piece speakers, Microsoft Windows XP Media Center Edition 2005, \$999.99 direct. Gateway Inc., www.gateway.com. **OVERALL:** ●●●○○○
Music: 76 (out of 100); Photos: 77; Video: 72; Gaming: 47.

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46 UniAccess 3.8
46 XitNotes 2.3
52 Canon Selphy CP400
52 Epson PictureMate
Deluxe Viewer Edition

54 Our Top Printers
58 Dell 1100MP
58 PLUS V-332
58 IBM E400 Projector
58 Toshiba TDP-S25U



60 Samsung SyncMaster 930mp
60 Our Top Displays
62 3Com Email Firewall
62 Visionael Security Audit 3.1
RED denotes Editors' Choice.

Sony VAIO VGC-RA830G



The Sony VAIO VGC-RA830G is Sony's latest high-end Media Center desktop tower. We've always liked the clean look and quiet operation of this computer family, and the RA830G raises the bar with loads of hard drive space, improved 3D performance, 5.1 speakers, and a wireless keyboard and mouse. It's remarkable enough to join the HP Digital Entertainment Center z545 as an Editors' Choice.

The RA830G has the DVD drives and media card slots hidden behind flip-down panels, resulting in a clean front panel. The machine is quiet, barely audible above the noise in a normal room. There is a lot more drive space than in earlier versions: 320GB, versus the RA820G's 200GB. This translates into about 60 additional hours of recorded video. There's an extra drive bay, so if you are a video enthusiast, you can fill it with a 400GB or 500GB SATA drive and record away.

Beyond media, the machine's Doom 3 (50 frames per second) and Halo (48 fps) scores show that these games

play fine on the RA830G at 1,024-by-768 resolution. Credit goes to the midrange nVidia GeForce 6600 graphics card.

Sony also sent us the Sony MFM-HT95, a 19-inch LCD/TV

the Sony VAIO VGC-RA830G. It's a capable and quiet Media Center that can serve video, photos, and music to other Sony VAIO PCs, Sony RoomLink media receivers, and Windows Media Extenders.



THE MONOLITHIC SONY

VAIO VGC-RA830G will look at home in most any room in the house.

monitor (\$799 direct). The MFM-HT95 is a very good SXGA (1,280-by-1,024) monitor with a built-in TV tuner of its own and the ability to display true 1080i HDTV with a set-top box. So far the RA830G PC is not available with an HDTV tuner. TV quality was nice on both the LCD's regular built-in tuner and the RA830G desktop's TV tuner.

All in all, we are big fans of

It is the evolution of an already wonderful design.

Sony VAIO VGC-RA830G

With Intel Pentium 4 550J processor (3.4 GHz), 1GB 400-MHz DDR SDRAM, two 160GB SATA hard drives (RAID Level 0), 256MB nVidia GeForce 6600 graphics, dual-layer DVD±RW drive, 16X DVD-ROM drive, Logitech X-530 5.1 speakers, Microsoft Windows XP Media Center Edition 2005, \$1,799 direct. Sony Corp. of America, www.sony.com. OVERALL: ●●●●● Music: 97; Photos: 85; Video: 98; Gaming: 86.

Voodoo Epic HTPC m:112i

The new Voodoo Epic HTPC m:112i home-theater desktop doesn't skimp on the gaming performance that earned the company its reputation, and it delivers a rare Media Center feature, thanks to its fanless design: silence. It can even power stereo speakers without an external amplifier or receiver. This high-end system also works well as a digital hub for your video, pictures, and music—all while sitting silently in your family room.

We've seen fanless computing from Voodoo before, with the Rage F:50, now known as the Voodoo Eden. Like the Eden, the Epic uses a series of cooling pipes and the system's case to disperse the heat generated by the processor and the graphics card. And like the Eden, the Epic's case acts like a giant heat sink, dispersing the heat over its surface. The Epic, however, is based on the cool-running Pentium M processor, which allows for a much smaller case than that of the Athlon 64-based Eden. The Epic is *quiet*: The only time you can hear the system is when it's spinning up a CD or DVD.

You'd expect a system that

PERFORMANCE TESTS: MEDIA CENTER PCs

	Processor	Graphics chipset	SYSmark 2004 Overall	3DMark05 1,024 x 768	Doom 3 (fps) Medium quality 1,024 x 768	Halo: Combat Evolved (fps) 1,024 x 768
Anti-aliasing/Anisotropic filtering ►				Off/Off	Off/Off	Off/Off
Gateway 832GM	Pentium 4 630 (3.0 GHz)	Intel GMA 900 (128MB)	N/A	283	7	13
HP Digital Entertainment Center z545*	Pentium 4 530 (3.0 GHz)	ATI Radeon X300 (64MB)	149	814	13	20
Sony VAIO VGC-RA830G	Pentium 4 550J (3.4 GHz)	nVidia GeForce 6600 (256MB)	198	1,950	50	48
Voodoo Epic HTPC m:112i	Pentium M 725 (1.6 GHz)	nVidia GeForce 6800 GT (256MB)	142	4,902	81	87
WinBook PowerSpec MCE410	Pentium 4 (3.0 GHz)	ATI Radeon X300 (64MB)	N/A	560	14	21

RED denotes Editors' Choice. * Reported for comparison. N/A—Not applicable: We could not run this test on the Gateway or WinBook entries.

costs almost \$3,500 to be fully loaded, but our test system didn't come with a keyboard, a mouse, speakers, or a monitor. Apparently silence is not only golden, it's expensive.

The system can hold up to two 400GB hard drives. The included MCE operating system and dual TV tuners give the Epic the ability to act as a media hub for your living room. (Voodoo says it's exploring HDTV tuner upgrades and will eventually make these tuner cards available.)

The Epic comes with an nVidia GeForce 6800GT graphics card, and this helps the system achieve very good 3D gaming scores on the 1,024-by-768 Doom 3 test and on our Halo test at both this resolution and at 1,600-by-1,200. Like all high-end, single-card graphics solutions we've seen, the Epic stutters a little on the Doom 3 test at the higher resolution. (So far, only dual-card SLI systems can break 60 frames per second at 1,600-by-1,200.) That said, the Epic will be able to handle strenuous gaming duties silently.

As with all Voodoo desktops and notebooks, the company can upgrade your system after it's purchased; you pay a labor fee (capped at 5 hours) and Voodoo sells you the upgrade parts at wholesale prices. Voodoo will even update all of your drivers and ship a new recovery DVD with your upgraded PC. We recommend using the company's upgrade service if you ever feel the need for more speed, since the cooling pipes make upgrading much more complicated than in a typical fan-cooled system.

If you already have a plasma screen, a surround-sound setup, and a home-theater cabinet, the Epic is a good fit for PC and DVR duties. Because of its fanless, quiet design and compact case, the Voodoo Epic HTPC m112i is a very strong effort at



SILENCE IS GOLDEN, and the Voodoo Epic delivers it—for a price.

the high end of the Media Center market.

Voodoo Epic HTPC m112i

With Intel Pentium M 725 processor (1.6 GHz), 1GB 400-MHz DDR SDRAM, 400GB SATA hard drive, 256MB nVidia GeForce 6800GT graphics card, dual-layer DVD±RW drive, four USB 2.0 ports, one FireWire port, Creative Sound Blaster Audigy 2 ZS sound card, Microsoft Windows XP Media Center Edition 2005, \$3,495 direct. Voodoo Computers Inc., www.voodoopc.com. OVERALL: ●●●○ Music: 77; Photos: 57; Video: 76; Gaming: 50.

WinBook PowerSpec MCE 410

The WinBook PowerSpec MCE 410 is an affordable way to bring PC power and Media Center functionality to your living room. Unfortunately, the lack of a

few key components detracts from an otherwise well-rounded Media Center.

On the outside, the MCE 410 looks like a stereo component. Its flat black case is offset by a glossy black trim, and there's a big chrome-covered volume knob (which kept popping off our early production test unit) on the front right side of the unit. On the left is a dual-layer, dual-format DVD burner, and below that is a panel that flips down to reveal one FireWire port and two USB ports, an S/PDIF input, and microphone and audio line-out jacks. Front and center sits a blue digital readout panel that displays DVD and CD titles and tracks, TV channels, and more. Below the readout is another flip-down panel, containing a 7-in-1 memory card reader and controls for CD and DVD playback.

The back panel is well stocked with audio connections, including two additional S/PDIF and two RCA audio jacks, and speaker jacks for 8-channel surround sound. The integrated sound solution is sufficient for small rooms, but a card like the Creative Audigy2 ZS (\$70) would add more chops to the overall audio experience. The same can be said for the included Altec Lansing three-piece speakers; they're adequate, but a multichannel speaker system is the way to go.

The system has more than enough power to run any MCE 2005 applications without a problem, and it will handle your basic home-office and multimedia project workload as well. The 64MB ATI Radeon X300 SE GPU is fine for playing DVDs and running other Media Center apps. Though the 160GB hard drive is by no means small, a Media Center requires a bigger drive to store recorded TV programs, music files, and digital photos, especially since there's no room for an additional drive inside the system.

Image quality from the Avermedia M-150 TV tuner card was less than stellar; live TV programs seemed slightly washed out, and a subtle jitter appeared at times. With only two small fans providing cooling, the system runs a little hot but is very quiet—a must for living-room systems.

Our MCE 410 arrived with the WinBook PowerSpec LC30D 30-inch widescreen LCD TV, an \$899 option. You can pair any monitor with this system, if need be, but the well-priced 30-inch widescreen certainly sweetened the deal.

Compared with the Gateway 832GM Media Center PC, which is similarly priced and configured, the MCE 410 wins points for style. But the 832GM tower has more upgrade potential and uses a better TV tuner card. And compared with the similarly designed HP Digital Entertainment Center z545, there's no contest. The z545 costs more (\$2,000), but it also gives you a lot more, like 360GB of drive space. But if you're looking for an inexpensive Media Center for the living room, WinBook offers a solid solution.

WinBook PowerSpec MCE 410

With Intel Pentium 4 530 (3.0 GHz), 512GB PC3200 DDR400 SDRAM, 160GB SATA hard drive, ATI Radeon X300 SE graphics card, DVD±RW drive, Microsoft Windows XP Media Center Edition 2005, \$1,099 direct. WinBook Computer Corp., www.winbook.com. OVERALL: ●●●○ Music: 88; Photos: 76; Video: 84; Gaming: 71.



THE WINBOOK POWERSPEC MCE 410 is one of the least expensive AV-style Media Center PCs around.



FIRST LOOKS

Top Products

Our Top Desktop PCs

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GAMING/MULTIMEDIA	PROS	CONS	BOTTOM LINE	SPECS AND SCORES
Dell Dimension 8400 \$2,999 direct ●●●●●○	 Complete multimedia software bundle. ATI Radeon X800 XT for high-end 3D gaming.	You'll need to add a media card reader.	The 8400 is an ideal PC for the user who wants to get into digital video and 3D gaming but doesn't want a flashy (or too pricey) gaming box.	Intel Pentium 4 560 (3.6 GHz), 1GB RAM, two 160GB hard drives, ATI Radeon X800 XT graphics. Doom 3 (10x7): 83 fps.
Dell XPS Gen 5 \$3,999 direct ●●●●●○	 Too many to list, but here are a few: dual-core processor, dual TV tuners, good gaming performance for a single-card solution.	When the case is upright, it's annoying to open because the kickstand can get in the way.	If you're ready for high-end computing, the XPS Gen 5 should be absolutely at the top of your list.	Intel Pentium EE 840 (3.2 GHz), 1GB RAM, two 250GB hard drives, ATI Radeon X850 XT PE graphics. Doom 3 (10x7): 87 fps.
Overdrive PC Torque.SLI \$6,499 ●●●●●○	 Blistering performance, with none of the water-cooled maintenance anxiety. Removable 300GB hard drive. Overclocked with care.	Pricey. Air-cooled overclocking still means lots of fans, even if they are pretty. At this price, an LCD monitor would be welcome.	If you want a system that will trump all of your friends' gaming PCs, then the Torque.SLI is worth a long, hard look.	AMD Athlon 64 FX-55 (2.8 GHz), 1GB RAM, three hard drives (448GB), dual nVidia GeForce 6800 Ultra graphics. Doom 3 (10x7): 132 fps.
Polywell Poly 939N4SLI-4000 \$3,599 direct ●●●●●○	 Relatively inexpensive for an SLI-powered system. Performance similar to that of the top dogs at a much lower price.	CRT instead of an LCD. Plain-Jane looks. Unruly cable management. Clock speed of the Athlon 64 4000+ is locked.	The 939N4SLI-4000 is the value leader among SLI gaming systems. If you can't spend \$6,000 on a system, this is a good choice.	AMD Athlon 64 4000+ (2.4 GHz), 1GB RAM, three hard drives (348GB), dual nVidia GeForce 6800 Ultra graphics. Doom 3 (10x7): 99 fps.
MEDIA CENTER				
HP Digital Entertainment Center z545 \$2,000 street ●●●●●○	 Excellent execution of a living-room Media Center PC. Quiet. Connects to legacy audio and video devices. Dual tuners.	Requires separate amplifier (or powered speakers). No HDTV tuner (yet).	The z545 is everything you'd want in a Media Center PC for the living room. It replaces the DVD player, CD changer, FM tuner, and DVR.	Intel Pentium 4 530 (3.0 GHz), 512MB RAM, 200GB hard drive, 160GB removable drive, ATI Radeon X300 SE graphics, MCE 2005.
NEW Sony VAIO VGC-RA830G \$1,799 direct ●●●●●○	 Liquid cooling means a quiet tower PC. Large storage capacity for videos. Better 3D performance than other Media Center PCs.	Tower chassis is less living room-friendly than models designed like AV gear. No HDTV tuner.	The VGC-RA830G is a near-silent desktop that can serve as both a PC and the central repository of your digitally connected home.	Intel Pentium 4 550J (3.4 GHz), 1GB RAM, two 160GB hard drives, nVidia GeForce 6600 graphics, MCE 2005. Doom 3 (10x7): 50 fps.
Velocity Micro CineMagix S95 \$2,360 direct ●●●●●○	Good performance. Mirrored data drives plus third drive for programs. Good TV quality.	Large tower case may be too big for the family room entertainment center.	The S95 stakes out the upper end of the market for Media Center PCs. It's a good system for gamers using a TV as their display.	AMD Athlon 64 3800+ (2.4 GHz), 1GB RAM, two 200GB hard drives, ATI Radeon X800 XL graphics, MCE 2005.
ALL-IN-ONE				
Apple iMac G5 \$2,103 direct ●●●●●○	 Simple, stunning design. Quiet. Just one cord (for power), thanks to optional Bluetooth keyboard and mouse. Gorgeous 20-inch screen.	Can't upgrade graphics. Built-in speakers don't deliver much bass.	Apple has another design coup on its hands with the iMac G5. It's about time someone designed a computer like this.	PowerPC G5 (1.8 GHz), 512MB RAM, 160GB hard drive, nVidia GeForce FX 5200 Ultra graphics, 20-inch widescreen LCD, DVD-R drive.
Sony VAIO VGC-V520G \$2,699.99 direct ●●●●●○	 Bright widescreen display. Great TV tuner. Wireless keyboard with built-in touch pad. Wireless mouse. Lots of included software.	A little pricey. No HDTV support. Needs TV/volume controls on the PC/TV case bezel.	In the spirit of the Apple iMac, the PC components reside behind the VGC-V520G's 20-inch LCD. But Sony adds a TV tuner and a DVR.	Intel Pentium 4 (3.2 GHz), 1GB RAM, 250GB hard drive, nVidia GeForce FX Go5700 graphics, 20-inch LCD. SYSmark: 174.
VALUE AND MIDRANGE				
Dell Dimension 4700 \$699 direct ●●●●●○	Recent technology, including PCIe and SATA. Fastest processor and chipset among systems in its price class. Fairly quiet.	No DVD writer, FireWire port, or memory card reader.	The 4700 leaves comparable value-priced desktops in the dust. Expansion possibilities protect it against obsolescence.	Intel Pentium 4 530 (3.0 GHz), 512MB RAM, 80GB hard drive, Intel Graphics Media Accelerator 900. SYSmark: 174.
Polywell Poly 2800NF2-MX \$699 direct ●●●●●○	 Dual-layer DVD±RW drive. Large-capacity hard drive. Plenty of room for upgrading.	No built-in modem, FireWire port, or memory card reader. Mediocre processor.	A solid value machine with some great features, the 2800NF2-MX is upgradable for taking multimedia to the next level.	AMD Sempron 2800+ (2.25 GHz), 512MB RAM, 120GB hard drive, nVidia GeForce4 MX440 graphics. SYSmark: 133.
Velocity Micro Vector SX-V \$999 direct ●●●●●○	 Better-than-average graphics card. Motherboard supports the latest technologies. Loaded with multimedia features.	Only one optical drive.	The Vector SX-V offers the latest technologies, a wide upgrade path, and enough horsepower to satisfy gamers and multimedia enthusiasts.	Intel Pentium 4 540 (3.2 GHz), 512MB RAM, 120GB hard drive, nVidia GeForce 6600 graphics. SYSmark: 188.
BUSINESS				
IBM ThinkCentre S50 \$1,200 street ●●●●●○	Comprehensive management tools. IBM guarantees that its systems will support the same software image for a full two years.	None significant.	Unsurpassed management tools, a stable platform, a serviceable chassis—we can't think of a thing not to like about the S50.	Intel Pentium 4 (2.8 GHz), 512MB RAM, 80GB hard drive, Intel Extreme Graphics 2. Business Winstone 2004: 19.0.



Phones of the Future, Here Today

BY CRAIG ELLISON

Videophones have been in the public consciousness since 1956, when Bell Labs showed a prototype of a two-way phone system (called the PicturePhone) that transmitted video images in addition to audio. So you would have thought that, 50 years into the future, we would all be communicating via video. But it seems there will be a flying car in every garage before there's a videophone in every kitchen—unless, that is, two new entries from Motorola and Packet8 can jump-start the videophone phenomenon.

MOTOROLA OJO PERSONAL VIDEO PHONE

There's a certain "wow factor" when people catch their first glimpse of Motorola's OJO Personal Video Phone. For most, however, that glimpse will likely have come from the prominent product placements on Fox's *24* and ABC's *Alias*. As the OJO is priced at \$799 (and you need at least two to have a video conversation), it is unlikely to make it into a lot of people's lives. That's a shame, because what really impresses us about the system is the video quality. Video remains smooth on the OJO, even at the relatively low bandwidth that causes a lot of

pixelation and low frame rates on competing products.

Unlike traditional Voice over IP (VoIP) phones, the OJO requires both a broadband connection *and* an analog phone line. To set up the phone, you register the OJO to your existing analog phone number, and then plug it into that phone line. When you initiate a phone call, OJO first checks its server to see if the number you're dialing is also an OJO subscriber. If so, a video call is initiated; the OJO server creates a peer-to-peer connection between your phone and the OJO that you're calling. If the number you're calling does not have an OJO subscription, your call is routed over your traditional phone line. So in addition to the cost of the devices, you must sign up for a subscription (\$14.95 per month) to enable your video calls—and you've got to maintain an analog phone line with your regional Baby Bell for non-OJO calls.

The shapely OJO features a 6- by 3-inch screen with a built-in camera. A detachable, rechargeable 2.4-GHz wireless handset rests unobtrusively on the screen's support bracket. Menu navigation, as well as dialing, is performed using that handset (a touch screen is being considered for a future model).

When you first connect to a video call, your camera is disabled to ensure your privacy. An on-screen prompt instructs you to hit the Select key to enable the camera. During a video call,



THE OJO delivers very good video quality.

pressing the Select key takes a snapshot of the incoming video. You can associate that screenshot with the caller's phone number to create an entry in your phonebook. When

you receive subsequent calls from that number, the stored image pops up on your screen.

Given the simple design, it will take you just a couple of minutes to learn to navigate the phone menus. There are only two choices on the opening screen: Phonebook and Main Menu. But we found that setup of the OJO can range from simple to complex. We tested the installation on a total of four routers. For two of the routers, configuration was a snap—plug-and-play at its best. The third router, however, required a firmware upgrade to the latest version before the OJO would work properly. We never got the OJO to work successfully on the fourth router, even when we put the OJO in the DMZ. Motorola's technical support was excellent and worked hard to resolve the issues.

It's clear that a great deal of engineering time and effort went into perfecting the video-compression algorithm. OJO uses an enhanced video codec (H.264) that provides superior video performance using limited bandwidth. By default, OJO is configured to use 150 Kbps. Given that 150 Kbps is only slightly more than twice the bandwidth used by traditional voice-only VoIP connections,

AOL: You've Got VoIP

America Online recently joined the swelling throng of ISPs offering VoIP (Voice over IP) telephone services. **AOL Internet Phone Service** is not the bargain we've seen from other VoIP carriers, but it does offer some clever integration with AOL's Internet service, making it an appealing choice for households that live on AOL.

AOL's unlimited local and long-distance plan costs \$39.95 (after a \$29.95 introductory rate for the first six months). That price includes AOL's Internet service, but not the cost of broadband

Internet access, which is required. Service is available in more than 43 markets, and includes Enhanced 911 support. In our tests, calls sounded as good as traditional phone calls.

Like other VoIP carriers, AOL offers centralized call management through a dashboard applet on your PC, with tabs for incoming calls, outgoing calls, and contacts. If you want to make a call to anyone on either your call list or your contact list, all you have to do is click on the person's phone number. When you receive a call, the AOL Callways screen

pops up on the computer that is logged on to the AOL account and displays the inbound phone number, location, time, and date.

AOLbyPhone is nicely integrated into AOL's VoIP offering. With it you can dial a toll-free number and retrieve either your voice mail or your e-mail via phone. Touch-tone options and voice recognition let you navigate between voice mail and e-mail, as well as between folders. E-mail is read to you by a realistic computer-generated female voice.—CE

AOL Internet Phone Service

\$39.95 per month. America Online Inc., www.aol.com.





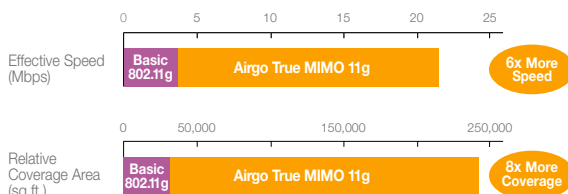
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The Tolly Group, July 2004

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FIRST LOOKS

Videophones

the video is pretty amazing. You can also configure OJO to use more bandwidth if you have it available—the higher the bandwidth, the more frames per second the camera can achieve. But even at the default settings, the video conferences we tested looked very good, and the audio was well synchronized with the video.

Motorola's OJO isn't for everyone. But if cost is no issue, and you want the best-quality videophone service from a phone with the coolest look, OJO is the choice for you.

Motorola OJO Personal Video Phone

\$799 list (plus \$14.95/month for video service). Motorola, www.motorola.com/ojo ●●●●●

PACKET8 DV326 VIDEOPHONE

Last fall, 8X8 brought the science fiction of videophones one step closer to reality with the introduction of its Packet8 Videophone service. And now the company is pushing to bring the Packet8 DV326 Videophone to the mainstream by offering it at a low price: just \$99 direct (plus a one-time \$29.95 activation fee and shipping charges of \$26.95).

You'll also need to commit to a two-year service agreement for 8X8's VoIP service, but it happens to be one of the best values we've seen: \$19.95 per month, which includes unlimited local and long-distance calling to all 50 states and Canada, along with unlimited voice and video calling to any other Packet8 subscriber.

Compared with the OJO, the DV326 is a steal. But there is a trade-off. The OJO's video quality proved obviously superior at low bandwidth. By default, the DV326's video quality is set to use 128 Kbps of band-

width. At this data rate, you'll get a fairly low frame rate. Stationary "talking head" shots will look okay, but too much movement in the frame will result in noticeable pixelation and poor synchronization between the audio and video portions of the call. We judged the audio quality on test calls to be on a par with other VoIP offerings we've tested.

If you have more bandwidth available, you can change the settings to 192, 256, 384, 512, or 640 Kbps. At each level of increasing bandwidth, you'll notice improved frame rates and less pixelation. Keep in mind, though, that since most consumer broadband connections are asymmet-

ric, the imposed cap on your upload bandwidth rate will limit the video quality on the other end of your connection.

tween the built-in camera and the audiovisual input jacks, or enable privacy (prevent your video from being sent). Input and output RCA jacks are also included, allowing you to connect to a VCR, DVR, or TV. With these features, you can stream video from one Packet8 videophone to another. All functions of the phone can be controlled through an easy-to-use on-screen menu system. The DV326 can be configured to auto-answer after a user-defined number of rings, so you could potentially use the phone for surveillance. And you can add entries to the 100-number phone book directly from the Received Calls or the Dialed Calls list. There's one hitch with this otherwise great feature: Inbound calls from non-Packet8 subscribers are stored as 10-digit numbers, but Packet8 requires a "1" prefix before all numbers you dial. Unfortunately, you'll have to add a "1" to the numbers of non-Packet subscribers before you can store them. Similarly, the return-last-call function, *69, will fail because of the need to dial "1" first.

The DV326 has the VoIP adapter built in, and for many people, this will be fine. Some may find it a limitation, however, as you can only place VoIP calls directly from the DV326. Other consumer VoIP offerings, including a nonvideo offering from Packet8, have separate ATA (Analog Telephone Adapters) that let you hook your VoIP line to a cordless telephone base station, or distribute a dial tone throughout your house using your existing phone wiring.

From the telephone, you can enable or disable call blocking of anonymous calls (*97 and *87). You can also enable and

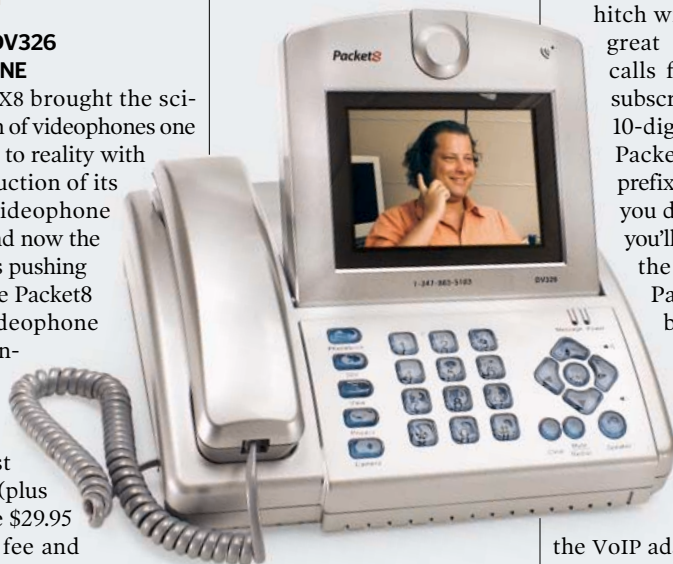
disable the "Do Not Disturb" feature, popular among those wanting an uninterrupted dinner. Like most other VoIP providers, 8X8 offers a choice of area codes as well as local-number porting (to transfer your existing phone number to your Packet8 service). The monthly price also includes three-way calling, caller ID, call waiting ID, and voice mail. While you can retrieve your voice mail from your Packet8 phone or via a toll-free number, 8X8 does not offer e-mail notification, e-mail attachments of your voice mail, or the ability to retrieve your voice mail via the Web as we've seen with other VoIP carriers. But as with other VoIP providers, call logs, billing details, and account setup are available through a Web portal.

8X8 offers a number of optional features to enhance the Packet8 service. You can add "virtual" phone numbers (secondary numbers that ring on your videophone) for \$4.95 per month. Toll-free service is also available (\$4.95 per month for 100 inbound minutes). E911 service is available in more than 2,000 rate centers covering 43 states (\$1.95 per month). Unfortunately, each optional service carries a \$9.95 activation fee.

Still, 8X8 offers an enticing value proposition for its combination of voice and video services. Though the Motorola OJO is superior in terms of video quality, it is far more expensive and lacks most of the voice features available with 8X8's service. If you know someone else with a Packet8 videophone, or want to set up an inexpensive way to video conference—whether with family and friends or for work—the DV326 videophone is the affordable way to go.

Packet8 Videophone

\$99 direct (with \$19.95 per month service agreement). 8X8 Inc., www.packet8.net ●●●●●



THE DV326 doesn't match the OJO's video quality.

ric, the imposed cap on your upload bandwidth rate will limit the video quality on the other end of your connection.

The bezel for the DV326's 5-inch screen houses the CCD camera, a built-in microphone, and brightness and contrast controls. An external microphone to improve the sound quality of the speakerphone is also included. Dedicated buttons on the phone can take you directly to the phone book, allow you to take a still shot of incoming video, switch be-



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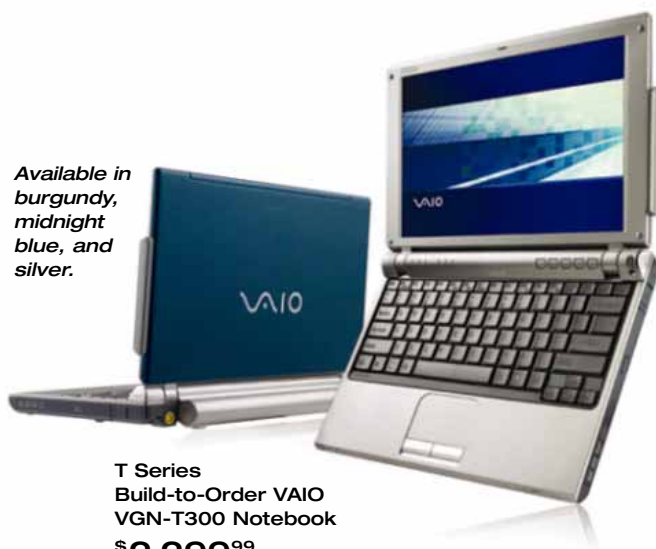
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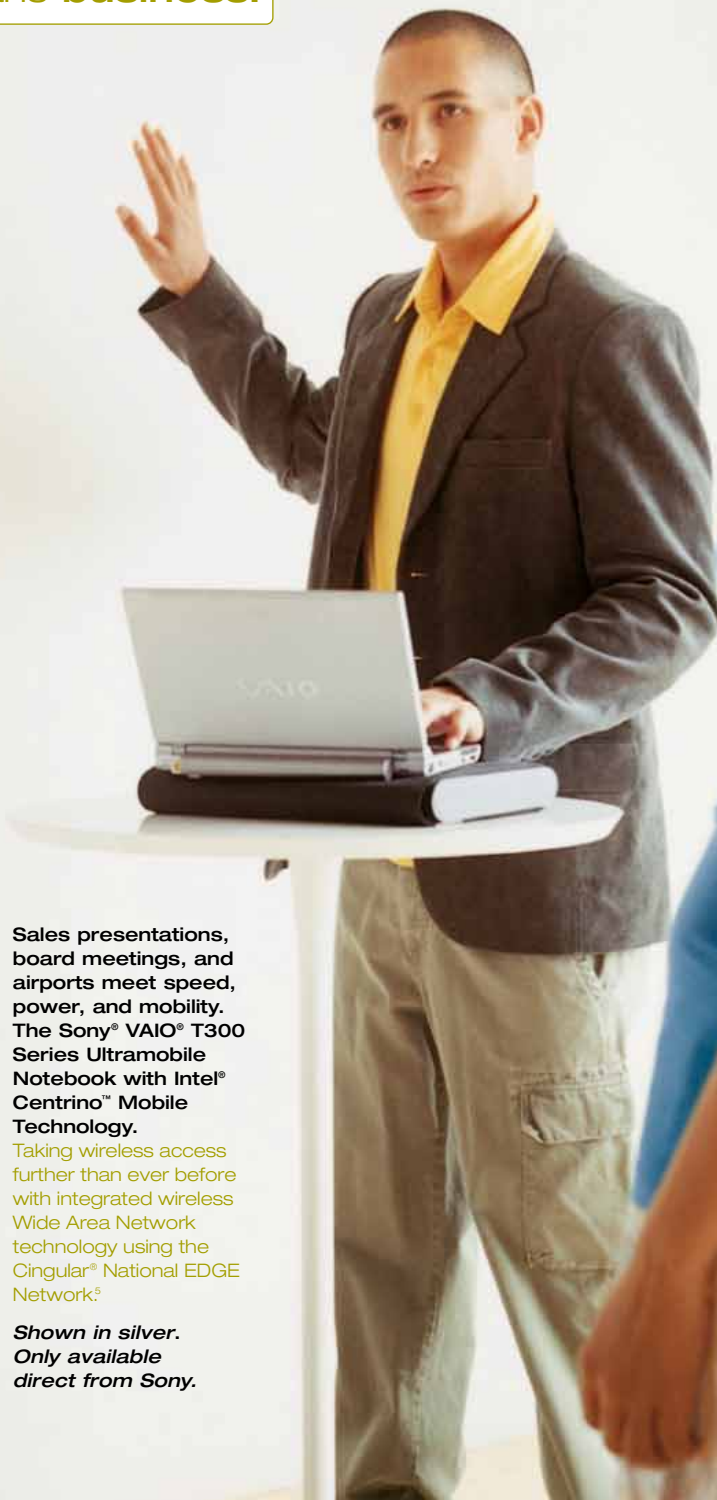
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Yahoo! Gets Music Right on Its First Try

BY TROY DREIER

Following closely on the heels of new Napster and Rhapsody music service offerings, Yahoo! has unveiled **Yahoo! Music Unlimited**, an online music store with an all-you-can-download music rental plan (including loading songs onto select portable players). The public beta still has some rough edges (namely, slow navigation between screens and some minor visual glitches), but from what we've seen so far, YMU has done things right.

One of the big draws, at least initially, is the price. Buy a full year's subscription at the introductory offer and you'll pay \$59.88, which works out to \$4.99 per month. By comparison, Rhapsody To Go is \$13.32 per month with a year's subscription. Subscribing to YMU month-to-month costs \$6.99, which is still much better than the \$14.95 per month that Napster and Rhapsody charge. The company won't commit to how long this introductory offer will last, however.

To use YMU, you'll need to download the Yahoo! Music Engine, which provides access to the store as well as organizing, ripping, and burning tools. You'll also get Yahoo! Messenger, which is configured to launch automatically at startup. It ties in, since you can share music with friends who subscribe to the service.

YMU boasts a library of more than one million tracks, which puts it on an equal footing with Napster, Rhapsody, and Apple's iTunes Music Store. We tested it against Napster by searching for the current top 20 albums on the *Billboard* chart, and found them roughly even (18

for YMU, 17 for Napster, including a few partial albums for both). But when we searched for the top 20 from *Billboard*'s chart from 15 years ago, YMU was much stronger (14 for

artist or to find fans of that artist and see what other bands they like. (This is similar to Musicmatch's AutoDJ, though YMU's approach is more convenient, since you can



THE INTEGRATED LaunchCast service will make a personal Internet radio station based on your musical tastes.

YMU, only 8 for Napster).

Yahoo! has benefited from its late start in the music market. By watching the others, it has learned how to create a simple and clear app that's full-featured yet easy to use. Artist and album pages contain links to bios, videos, and pictures, when available. These open in a browser

build a list directly from the album page.) The playlist tool is not fast, often taking 15 seconds to load album information, but the interface is clearer than Napster's. Yahoo! has also built in its LaunchCast radio service; subscribers get access to 150 commercial-free stations.

Downloads are all encoded as 192-Kbps WMA files, which is a higher quality than what most online stores give you. Streamed songs are 128 Kbps WMA, which is typical. The DRM scheme (and hence restrictions) for subscription content are the same as with Napster and Rhapsody: Songs will play only on the PC they reside on, or on the handful of certified Microsoft Plays For Sure devices.

Yahoo! lists only nine compatible models currently—and no, the iPod isn't among them, of course. Purchased songs are 99 cents each (or only 79 cents for

subscribers) and can be burned to CD or loaded onto any PC or player that can handle WMA files.

Yahoo! recently bought Musicmatch, and eventually YMU will be the surviving service. It's unclear whether the Musicmatch Jukebox applet will continue to be developed. YMU is actually pretty good as a jukebox, especially for a not-yet-Version 1. It's well laid out and easy to use. It has most of the features of Musicmatch Jukebox, and higher-rate encoding to boot. YMU's engine lets you rip CDs from your collection into AAC, MP3, OGG, WAV, and FLAC formats. Oddly, you can't make WMAs to match the service's downloads; we hope this oversight will be addressed soon. For AAC and MP3 files, you can encode at up to 320 Kbps.

If you have a library of poorly or partially tagged songs, you'll love that YMU can tag them for you, thanks to a new built-in service from Gracenote. It runs automatically to fill in missing metadata, or you can right-click on a song to have it suggest the metadata it thinks is right. We found that it was useful, if a bit inconsistent; for some albums, it suggested all correct tags, but for others it missed nearly half the songs.

The music engine still feels like a beta product and was often sluggish in our testing. And we found glitches while using the visualizer. For example, the Play and Stop controls often wouldn't work correctly while the visualizer was running. But such glitches aren't likely to deter many when the price is this low. If you're interested in a subscription plan, we say grab YMU while it's still an amazing deal.

Yahoo! Music Unlimited (Beta)

\$59.88 per year; \$6.99 per month. Yahoo! Inc., <http://music.yahoo.com/unlimited>.



YAHOO! MUSIC UNLIMITED's main screen is clean and uncluttered.

window, unfortunately, instead of in the music-engine app itself. We love novel features like the ability to make an instant playlist based on any



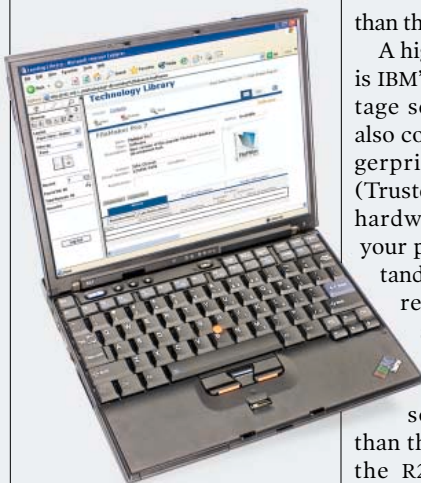
The Little ThinkPad Gets a Little Better

BY CISCO CHENG

The IBM X series has always been a rock-solid ultraportable for any businessperson on the move. The **IBM ThinkPad X41** changes very little, but now has Intel's latest Centrino components and a fingerprint reader.

When compared with the Toshiba Portégé R200, our Editors' Choice in this class, the X41 looks a little stodgy. The R200 is much sleeker and lighter (2.7 pounds) than the X41 (3.2 pounds), with many of the same features, including a 12.1-inch screen and full-size keyboard. And though there's nothing wrong with the R200's keyboard, the X41's is the best, hands down.

The X41 gets a significant performance boost over its predecessor, the X40, by moving to the next-generation Centrino platform. It also outperforms the R200, which uses an Ultra



THE LITTLEST
ThinkPad is still big on features.

Low Voltage Pentium M 738 (1.2 GHz). The X41 upgrades the X40's ULV to an LV Pentium M 758 (1.5 GHz), giving it more power but less battery life (5 hours 5 minutes, down from 5:56). That said, the X41 still lasted an hour and a half longer

than the R200 (3:32).

A highlight of the ThinkPad is IBM's renowned ThinkVantage security suite. The X41 also comes with a built-in fingerprint reader and TPM (Trusted Platform Module), a hardware chip that secures your passwords and works in tandem with the fingerprint reader for even tighter security. The company's Rescue and Recovery suite is a solid backup solution, much better than the one that comes with the R200. The entire suite is tied to one interface, and to get started all you need to do is press the blue Access IBM button. Toshiba offers EasyGuard, which is also very competent, to compete with these offerings, but it's not as well integrated.

The X41's 40GB hard drive is smaller than the R200's 60GB drive, and its optical drive is

external, located in the docking station that comes bundled for the price. You also have the option of purchasing an external DVD±RW drive (\$429). Toshiba offers an external USB 2.0 drive, without dock, for an additional cost.

With the new Centrino updates, the IBM ThinkPad X41 is the top performer in the ultraportable category, edging past the R200. It's an excellent choice for an ultraportable heavyweight. But the super-slim, super-sleek, and equally competent R200 is currently the most coveted of the ultraportables and retains our Editors' Choice.

IBM ThinkPad X41

With Intel Pentium M 758 (1.5 GHz), 512MB DDR2 SDRAM, 40GB hard drive, Intel Graphics Media Accelerator 900 GM, 12.1-inch screen (1,024-by-768), Intel Pro Wireless 2915ABG, Microsoft Windows XP Professional, \$1,899 direct. Lenovo/IBM, www.thinkpad.com.



The Best Slate Gets Even Better

BY CISCO CHENG



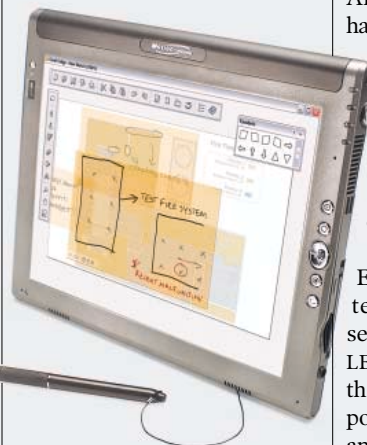
Few can duplicate what Motion Computing has done for tablets, so it's no surprise that the company's newest slate, the **Motion Computing LE1600**, supplants its predecessor (the M1400) as our new Editors' Choice for slate-style tablets. The LE1600 offers wide viewing angles and great pen-on-paper feel—a must for tablets. The LE1600 is also the first slate to integrate a built-in hardware security suite, which includes a fingerprint reader and the Trusted Platform Module (TPM).

The 12-inch LCD is still the best among tablets. We tilted the screen every which way, and saw crisp and colorful images from every angle. The back of the unit is made of

magnesium alloy, which keeps the unit cool while it rests in your arms. The LE1600 weighs a mere 3.3 pounds, and measures only 0.6 by 11.7 by 9.6 inches (HWD), a boon for those on the go.

The biggest improvements on the LE1600 are internal, thanks to the inclusion of the new Centrino components. The Pentium M 758 (1.5 GHz), 512MB DDR2 RAM, and Intel's integrated graphics provide a significant speed boost over the M1400.

As with any slate, if you prefer the more traditional form of computing you'll have to deal with adding a keyboard and an optical drive. (In fact, Motion no longer includes keyboards with any of its slates.) Both the convertible keyboard (\$159) and DVD±RW (\$199) are



A GREAT SCREEN helps make the LE1600 our favorite tablet.

external attachments.

In addition to having the Microsoft Windows XP Tablet PC Edition OS, the LE1600 comes with the MotionPak software bundle, which includes Micro-

soft Office OneNote 2003, Microsoft Streets & Trips 2005, Alias Sketchbook Pro, Short-hand (a new addition), and myriad other applications. Using the stylus with OneNote 2003 was comfortable—after an hour. The pen-on-paper feel is as good as the experience we found on the HP Compaq tc4200.

As Windows XP Tablet PC Edition continues to get better, so do the tablets themselves. The Motion Computing LE1600 is a prime example of this, and thanks to better components, a superior screen, and an airtight security suite, it gets our Editors' Choice nod.

Motion Computing LE1600

With Intel Pentium M LV 758 (1.5 GHz), 512MB DDR2 SDRAM, 30GB hard drive, Intel Graphics Media Accelerator 900 GM, 12-inch screen (1,024-by-768), Intel Pro Wireless 2200 802.11g, Microsoft Windows XP Tablet PC Edition 2005, \$2,199 direct. Motion Computing, www.motioncomputing.com.





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BUSINESS	PROS	CONS	BOTTOM LINE	SPECS AND SCORES
HP Compaq nc8200 \$2,699 direct 	Durable design. Light, despite a 15.4-inch widescreen display. Good battery life.	Client software is not as rich as that of IBM's ThinkVantage.	Even with a 15.4-inch screen, the nc8200 is well suited for the road. It's lighter and less bulky than you might expect.	Intel Pentium M 760 (2.0 GHz), 512MB RAM, 60GB hard drive, 15.4-inch widescreen. 6.2 pounds. SYSmark: 140. BatteryMark: 4:53.
IBM ThinkPad T43 \$2,199 direct 	Next-generation Centrino. Terrific typing experience and security options. Top-of-the-line management utilities.	Only two USB ports. No memory card slots.	Next-generation Centrino components and the robust security suite make the T43 the perfect business tool.	Pentium M (1.86 GHz), 512MB RAM, 60GB hard drive, 14.1-inch screen. 5.5 pounds. SYSmark: 134. BatteryMark: 4:49.
ULTRAPORTABLE				
Dell Latitude X1 \$1,650 direct 	Sleek, new design. Superlight. Affordable business solution.	Not a full-size keyboard. External optical drive can add to the weight.	The X1 is a great-looking, feature-rich business notebook that won't break your back or your budget.	Pentium M 735 (1.2 GHz), 512MB RAM, 30GB hard drive, 12-inch widescreen. 2.8 pounds.
NEW IBM Thinkpad X41 \$1,899 direct 	Good performance. Full-size keyboard.	External optical drive. Hard drive only 40GB.	The ThinkPad X41 is a very good ultraportable, with improved security and performance—plus great battery life for this class.	Intel Pentium M 758 (1.5 GHz), 512MB RAM, 40GB hard drive, 12.1-inch screen. 3.2 pounds. SYSmark: 105. BatteryMark: 5:05.
Sony VAIO VGN-T350P \$2,299 direct 	Built-in EDGE modem delivers high-speed wireless within Cingular's EDGE coverage area. Great little screen.	Smallish keyboard.	The VGN-T350P is a mobile dream. It's ultralight and can connect wirelessly via the EDGE network, as well as in 802.11 hot spots.	Intel Pentium M 753 (1.2 GHz), 512MB RAM, 60GB hard drive, 10.7-inch screen. 3.0 pounds. SYSmark: 95. BatteryMark: 6:20.
Toshiba Portégé R200 \$2,099 direct 	Supersleek and light design. Improved battery life. New security suite. Fingerprint reader.	External optical drive.	The R200 lightens your load while letting you stay productive on the road.	Intel Pentium M 753 (1.2 GHz), 512MB RAM, 60GB hard drive, 12.1-inch screen. 2.7 pounds. SYSmark: 100. BatteryMark: 3:32.
MULTIMEDIA AND GAMING				
Dell Inspiron XPS Gen 2 \$3,318 	Top-of-the-line graphics. Programmable lights.	Pointing stick is gone. Mouse buttons are a bit loud.	The XPS Gen 2's cool look and super set of cutting-edge mobile components make it the ultimate gaming machine.	Intel Pentium M 770 (2.13 GHz), 1GB RAM, 80GB hard drive, 17-inch widescreen. 8.5 pounds. SYSmark: 172. BatteryMark: 2:13.
HP Pavilion dv4000 \$1,429 direct 	Big screen. Four USB ports. QuickPlay. Affordable.	Average performance.	The dv4000 is a multimedia dream machine at a reasonable price.	Pentium M 750 (1.86 GHz), 512MB RAM, 80GB hard drive, 15.4-inch widescreen. 6.4 pounds. SYSmark: 131. BatteryMark: 3:17.
Toshiba Qosmio E15 \$2,899 list 	Gorgeous, bright screen. Multitude of AV connections. TV tuner and Windows Media Center operating system. Instant-on feature.	Needs a bigger battery.	The Qosmio E15 has the most elaborate set of multimedia features. It's a true entertainment center replacement.	Intel Pentium M 735 (1.6 GHz), 512MB RAM, 80GB hard drive, 15-inch screen. 7.8 pounds. SYSmark: 136. BatteryMark 2:12.
VALUE				
Averatec AV3270-EE1 \$949 direct 	Strong performance. Dual-format DVD burner. Light weight.	Flimsy lid-release mechanism. No FireWire port.	The AV3270-EE1 packs a lot into its lightweight frame and turns out strong performance for the value category.	AMD Mobile Sempron 2800+ (1.6 GHz), 512MB RAM, 60GB hard drive, 12.1-inch screen. 4.3 pounds. SYSmark: 114. BatteryMark: 2:25.
Dell Inspiron 6000 \$999 direct. 	Great battery life. DVD±RW drive. Fast 5,400-rpm hard drive. Latest-generation Centrino technology.	You must use the special e-Value code (1111-i6000PC) to get the price.	The 6000 is a feature-rich desktop replacement model. It delivers top-end components for an aggressive price.	Intel Pentium M 730 (1.6 GHz), 512MB RAM, 60GB hard drive, 15.4-inch widescreen. 7.0 pounds. SYSmark: 130. BatteryMark: 5:52.
TABLET PCs				
HP Compaq tc4200 \$2,099 direct 	Strong build. Intel's next-generation Centrino. Dual pointing devices.	Lacks a built-in optical drive.	The tc4200 convertible tablet offers a terrific blend of components and performance.	Intel Pentium M 750 (1.86 GHz), 512MB RAM, 60GB hard drive, 12.1-inch screen. 4.6 pounds.
NEW Motion Computing LE1600 \$2,199 direct 	Superior screen. TPM security suite. Improved components.	Needs an optical drive in the dock. No FireWire port.	The Motion Computing LE1600 offers improved components, a superior screen, and an airtight security suite.	Intel Pentium M LV 758 (1.5 GHz), 512MB RAM, 30GB hard drive, 12.0-inch screen. 3.3 pounds.

A New Driving Force in PDAs

BY SASCHA SEGAN

The first PDA on the U.S. market with a hard drive, the **palmOne LifeDrive** is a device that digital pack rats should love. This PDA is for the gadget fanatic who wants to do a bit of everything on a regular basis, whether play a movie, game, or music, pull up photos, do some tolerable Web surfing, view or work on the occasional Microsoft Office document, or look up an address. It's the first PDA we've seen that can actually handle all these tasks, even if it's not the best at any one in particular. Be forewarned, though: You'll have to recharge this model frequently, and we did encounter some irritating bugs and crashes during our testing.

Boxy yet sleek, the LifeDrive measures 4.8 by 2.9 by 0.7 inches, weighs 6.8 ounces, and accommodates a huge 320-by-480 screen and a 4GB Hitachi 3K4 Microdrive. It's not actually longer or wider than many other PDAs, but it's deeper. Holes on the back help vent the drive's heat; the LifeDrive gets a little warm, but never uncomfortably so.

The LifeDrive is designed to hold all your portable files; we filled ours with 600MB of MP3s, a full-length movie, and a flotilla of review notes, and it was still more than half empty. (Program files must live in 64MB of RAM, but that's plenty of room for Palm OS software, which is generally pretty compact.)

There's a slew of ways to get your files on and off the device, too: You can beam them over Bluetooth, drop them in via an SD Card, share them using built-

in 802.11b Wi-Fi, sync them from a PC with the included software, or just plug the LifeDrive via USB 2.0 into any PC or Mac, where it becomes an external drive without your having to add any other software.

palmOne marries the LifeDrive's massive storage to a very usable set of software. You'll find DataViz's DocumentsToGo 7, still the best Office document reader/editor suite on any handheld, already loaded on the product.

The LifeDrive

THE NEW LIFEDRIVE
features 4GB of storage
and good multimedia abilities.

also comes with Pocket Tunes, an MP3/WMA player that supports playlists and syncs with Windows Media Player 10; a basic built-in video player; and WiFile, a sleek interface for downloading files from shared drives over Wi-Fi, which we used with both PCs and Macs. Speaking of Wi-Fi, palmOne's implementation is smoother than Microsoft's in Windows Mobile 2003 SE: You can access any available network in a few clicks. palmOne's Blazer browser is decent enough, allowing you to browse the Web over Wi-Fi or via a Bluetooth mobile phone connection.

On the desktop, Palm Desktop and palmOne's Microsoft Outlook connectors are newly joined by LifeDrive Manager, which lets you sync folders between your PC and PDA. Palm Desktop automatically transcodes the most popular unprotected video formats into the right size and speed for the

handheld. We tried MPEG-1, MPEG-2, and DivX files, which became full-screen MPEG4 movies at a smooth, viewable 18 frames per second. Even Mac users get some love: Although LifeDrive Manager and video transcoding don't work with Macs, you can use Palm Desktop to sync PIM data and Drive Mode to transfer files. But there remains no support for copy-protected music or video files.

We did run into several minor but annoying bugs during our testing. For instance, LifeDrive Manager crashed one of our test PCs, and we managed to crash both Pocket Tunes and the USB Drive Mode application on the handheld. Audio in the popular Palm OS-based game, Bejeweled 2, was often choppy. Also, some Web pages would mysteriously pause in midload for up to a minute. And Palm OS 5, which wasn't designed for multimedia, is starting to look long in the tooth. There's no system-wide volume slider, it's difficult to interrupt Web page loads in progress, and forget about running things in the background: This is a one-thing-at-a-time machine.

Battery life is relatively short; it most likely suffers because of the hard drive. With Wi-Fi off, we got a little over 4 hours of PDA usage time and 3 hours of video playback. That's about half the battery life of the mid-range E2. Turning on Wi-Fi and Bluetooth dragged life down to about 2½ hours. Fortunately, charging goes fast (zero to 95 percent in around 90 minutes), and the nonperishable RAM means your data won't vanish when the battery does get run down. But note that the battery isn't user-replaceable.

palmOne LifeDrive

\$499 direct. palmOne Inc., www.palmone.com. **OVERALL** ●●●●●
Basic PIM ●●●●● Entertainment/
Gaming ●●●●● Mobile Professional
●●●●● Enterprise ●●●●●

Samsung SGH-p207

Pros: First phone to let you freely dictate text messages. Excellent voice dialing. Small and light.

Cons: No speakerphone or Bluetooth connectivity. Dictation software doesn't work with IM, MMS, or e-mail. Small keys.

Bottom line: The Samsung SGH-p207A is a cute handset with exciting new voice recognition technology. But we wish it had more hands-free options.

\$299; \$79.99 with two-year contract. Samsung, Cingular Wireless, www.cingular.com. ●●●●○



Samsung SGH-p777

Pros: Attractive design. Massive memory for MP3s, photos, and videos. USB cable included.

Cons: No speakerphone or Bluetooth connectivity. Camera takes a while to warm up. Awkward music transfer software. Small keys.

Bottom line: The Samsung SGH-p777A is a great-looking, powerful little slider phone with features that need a bit more refinement.

\$349.99; as low as \$299.99 with service. Samsung, Cingular Wireless, www.cingular.com. ●●●●○



Samsung SCH-N330

Pros: First phone with advanced VibeTonz vibration features. Excellent voice dialing. Small and light. Inexpensive.

Cons: Very small keys. So-so call quality. No MP3 ringtones.

Bottom line: The Samsung SCH-N330A is a unique-looking pop-up handset with fun vibration features. It's not the most feature-packed phone, but it's certainly inexpensive enough.

\$189.99 direct; as low as \$69.99 with service. Samsung, Verizon Wireless, www.verizonwireless.com. ●●●●○



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PDAs	PROS	CONS	BOTTOM LINE	SPECS
Dell Axim X50v \$499 list ●●●●○	Media Player 10 performance is amazing. New accelerated graphics architecture promises high-res gaming and video. Excellent value.	Few programs support new graphics architecture. Our tests show slower performance than other 624-MHz Pocket PCs. So-so battery life.	The X50v is an attractively priced VGA Pocket PC that has excellent multimedia features and promises a great gaming experience.	Pocket PC OS, 624-MHz CPU, 64MB RAM, 3.7-inch 640-by-480 display, 802.11b, Bluetooth, SD and CF slots, 6.2 oz. Battery life: 3:10.
HP iPaq hx4700 \$649 direct ●●●●○ 	Gorgeous screen. Fast. Welcome touchpad. New start page.	Heavy. Annoying nonremovable screen cover.	The gorgeous, superpowerful hx4700 is a good way to future-proof your PDA investment.	Pocket PC OS, 624-MHz CPU, 64MB RAM, 4.0-inch 640-by-480 display, 802.11b, Bluetooth, SD and CF slots, 6.6 oz. Battery life: 5:45.
NEW palmOne LifeDrive \$499 direct ●●●●○	Vast storage. Big screen. Excellent desktop and handheld software suite.	So-so battery life. Occasional crashes. No support for DRM media.	Nearly endless storage makes this a great device for toting and viewing lots of files.	Palm OS 5.4, 416-MHz CPU, 64MB RAM, 3.8-inch 320-by-480 display, Bluetooth, SD/MMC slot, 6.8 ounces. Battery life: 4:06.
palmOne Zire 72 \$300 street ●●●●○ 	First PDA with 1.2-megapixel camera. Video recording. Nice display.	No 802.11b wireless. A little slow in accessing and exiting the camera menu.	The Zire 72 delivers great PDA functionality and audio playback capability. It's a strong choice for people who want more.	Palm OS 5.2, 312-MHz CPU, 32MB RAM, 3.0-inch 320-by-320 display, 1.2MP camera, Bluetooth, 4.8 oz.
PHONE/E-MAIL DEVICES				
Audiovox XV-6600 \$549.99 list ●●●●○	EV-DO speed is excellent. Lots of memory. Good keyboard and convenient command buttons.	Large and heavy. Expensive.	Surf anywhere in 16 cities at near-broadband speeds with this big, powerful PDA/phone.	Pocket PC Phone Edition OS, 400-MHz CPU, 128MB RAM, 3.5-inch display, Bluetooth, SD slot, CDMA, EV-DO, 7.3 oz. Talk time: 3:18.
palmOne Treo 650 from Cingular \$549.99 direct ●●●●○ 	Good battery life. International voice and data roaming. Fast EDGE modem.	Service plan costs more than Sprint's Treo 650. No dial-up networking—yet.	The Treo 650 performs better on Cingular's network than on Sprint's, but you'll pay more for the speed.	Palm OS 5.4, 312-MHz CPU, 32MB RAM, 2.6-inch display, 0.3MP camera, Bluetooth, SD slot, GSM, GPRS/EDGE, 6.3 oz. Talk time: 7:33.
RIM BlackBerry 7100t \$199.99 direct ●●●●○ 	Looks and feels like a cell phone. First BlackBerry to include IM and full Web browser standard. Excellent push e-mail.	Small keys. Small type on screen. Few games or downloadable applications.	A new approach for RIM, the 7100t is the first BlackBerry device to work equally well for e-mail, IM, Web browsing, and as a phone.	RIM BlackBerry OS, 32MB RAM, 2.1-inch 240-by-260 display, Bluetooth, GSM, 4.2 oz. Est. talk time: 4:00.
PHONES				
Audiovox SMT 5600 \$199.99 with one-year contract ●●●●○ 	Smallest Windows smartphone. Excellent music and video support. Excellent battery life. Great design.	Can't play music or video over Bluetooth headset. Poor camera.	The SMT 5600 phone is your best option for taking Outlook PIM data and many kinds of music and video on the go.	GSM, GPRS, Windows Smartphone OS, 200-MHz CPU, 2.2-inch display, 0.3MP camera, Bluetooth, miniSD slot, 4.2 oz. Talk time: 8:23.
LG VX8000 \$269.99 list ●●●●○	Excellent camera, screen, and keypad. Good battery life. Lots of memory for photos and games.	V Cast video service isn't compelling. No e-mail, Web browser, or Bluetooth.	Verizon's best camera phone is its first EV-DO phone. Buy the phone but skip the V Cast EV-DO service for now.	CDMA, EV-DO, 2.1-inch 176-by-220 display, 1.2MB camera, 128MB RAM, 3.9 oz. Talk time: 4:25.
Motorola Moto Razr V3 \$299.99 with contract ●●●●○	Absolutely gorgeous. Thin as its name.	Screen attracts grease. Not a great camera.	The Razr V3 is the ultimate see-and-be-seen phone for style mavens.	GSM, GPRS, 2.2-inch 176-by-220 display, 0.3MP camera, 5MB RAM, Bluetooth, 3.3 ounces. Est. talk time: 7:06.
Motorola V551 \$209.99 direct ●●●●○ 	Bright, sharp screen. Good camera. Built-in IM client.	No external photo caller ID or speaker-independent voice dialing.	For making calls, sending pictures, and occasional laptop Internet access on the Cingular network, the V551 is your best choice.	GSM, GPRS, 2-inch 176-by-220 display, 0.3MP camera, 6MB RAM, Bluetooth, 4.3 oz. Talk time: 8:27.
Sprint MM-5600 by Sanyo \$429.99 ●●●●○ 	Spectacular screen. Loud speaker and speakerphone. Excellent PC connectivity. Good voice recognition.	Big. No e-mail. PC syncing requires third-party software. Photos show compression artifacts.	A big phone with big sound and a big feature set, this is Sprint's most powerful phone outside of its smartphone line.	CDMA, AMPS, push-to-talk, 2.1-inch 320-by-240 display, 1.3MP camera, 3MB RAM, miniSD slot, 4.5 oz. Talk time: 4:09.
WIRELESS HARDWARE AND SERVICE				
Kyocera KPC650 from Verizon \$99.99 with contract ●●●●○ 	Fastest EV-DO card on the market. Swiveling antenna.	At \$79.99 per month, the service is expensive. Works only in metro areas that have Verizon's EV-DO coverage.	Especially where signals are weak, this card delivers reasonable performance.	CDMA 1xRTT EV-DO, 850/1900 MHz.



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Google, MSN Toolbars Battle for the Desktop

BY TROY DREIER AND
JAMIE LENDINO

Google and MSN don't just want to be your Web search engine of choice: They want to be your partner on the desktop as well. New desktop toolbars from each aim to make surfing and searching (both Web and local) easier and more convenient. Though Google Toolbar 3.0 is still our favorite such utility overall, we love that MSN has integrated desktop search into its new offering.

GOOGLE TOOLBAR 3.0 (BETA)



The public beta build of Google Toolbar 3.0 is an effective, albeit minor, Internet utility update that manages to keep Google in the lead among its main toolbar competitors, Microsoft and Yahoo!. The beta adds several notable features, including an AutoLink function, a Web-form spell-checker, and a word translator.

AutoLink automatically highlights street addresses on a Web page and links them to Google Maps. It didn't always work, however. It consistently choked on street numbers with a dash—linking, for instance to a map of 53 Maiden Lane instead of 30-53 Maiden Lane—and occasionally missed on addresses without a dash. It also works with book ISBN numbers and even vehicle VIN numbers, though with mixed results there too. On one Web page that listed 41 books and their ISBN numbers, AutoLink recognized only 17 of them.

Even if AutoLink worked perfectly, we're not sure everyone would be pleased with it. Some Web designers might balk at software that modifies their pages. Small bookstores

on the Web won't appreciate that when AutoLink finds books' ISBN numbers, it automatically links them to Amazon.com, especially when Amazon's prices are lower. AutoLink is a clever idea, but it will be interesting to see how well it plays with the public.

WordTranslator is useful if English isn't your native language. Simply move your cursor over an unfamiliar word and you'll get a translation in one of several languages. We tested it in Spanish, and it worked on every word we tried. Unfortunately, it doesn't work in the other direction, which would have been a boon for reading foreign pages.

SpellCheck helped us out when using Web-based e-mail and filling out a technical-support form. It works in ten different languages, and when it finds a suspect word, you can click on the word and get a list of suggestions, or add it to your personal dictionary. This spell-checker isn't necessarily superior to similar tools found in, say, Hotmail, but it does add a few extras; not only does it have a personal dictionary like you'll find in Hotmail, it adds the ability to use it on *any* Web site.

Older features such as the pop-up blocker and PageRank feature work as well as ever, and Google Toolbar's original

function is still its most useful. Having instant access to Google's search engine at all times makes finding information on the Web as easy as



YOU CAN create Deskbar shortcuts to desktop searches in MSN Search Toolbar.

breathing. Google Toolbar is also heavily customizable; click on the Options button on the left side of the toolbar, and a three-tab Options window will pop up, with separate configuration screens for each of the toolbar's main features.

Google Desktop Search is still a separate application, however. MSN Search Toolbar with Windows Desktop Search managed to integrate desktop search fairly seamlessly. Google Desktop Search integrates well with Google Toolbar once you install both of them, and Google's method, unlike MSN Toolbar, actually lets you decide whether you want to install desktop search, something some will consider a benefit. Yahoo!, for its part, brilliantly integrates an antispyware filter into its toolbar. Google should do the same; antispyware

tools seem like a natural fit for the browsing experience.

Google Toolbar gives you several nifty shortcuts in addition to its profoundly useful search box. SpellCheck and WordTranslator are important additions, especially if you work with languages other than English. The jury is still out on AutoLink; we'll be following its development closely.

Overall, existing functionality combined with these relatively small, but important, changes solidify the Google Toolbar's lead. But Google will need to combine more tools and roll out greater innovation the next time around if it wants to stay ahead of the ever-improving MSN and Yahoo! offerings.

Google Toolbar 3.0 (beta)

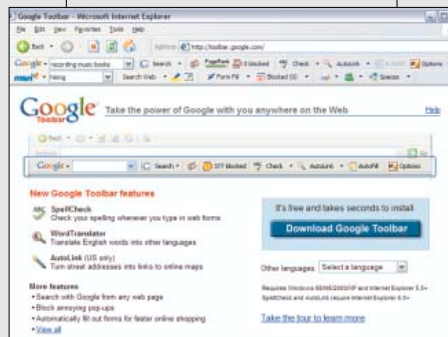
Free. Google, <http://toolbar.google.com>.



MSN SEARCH TOOLBAR WITH WINDOWS DESKTOP SEARCH

MSN Search Toolbar with Windows Desktop Search officially puts Microsoft in step with search competitors Yahoo! and Google, doing a good job of making search of all kinds ubiquitous on the desktop. In beta since last December, the final MSN Search Toolbar is essentially a suite of tools that includes search toolbars for Internet Explorer, Microsoft Outlook and Windows Explorer, and the MSN Deskbar for Windows' taskbar, all of which let you search local files and the Web.

MSN Toolbar has not changed much since last December, but the installation, along with the functionality and effectiveness of desktop search, which we reviewed in beta form here, has. The Toolbar installation now includes a wizard that asks you which drives and folders you want to index. That's a welcome change. There's also a new preview pane in local search results. It includes small



GOOGLE TOOLBAR 3.0 gives you a Web-form spell-checker, a word translator, and an AutoLink feature useful for ISBN numbers, VIN numbers, street addresses, and package tracking numbers.



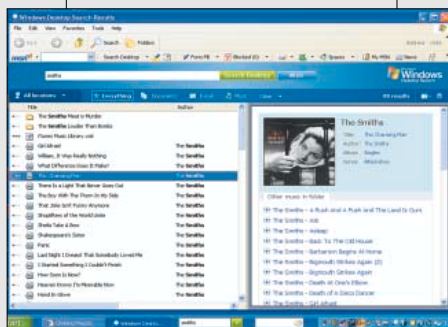
FIRST LOOKS

Utilities

formatted previews for most file types. A double click on the result link opens the original document. The search indexes over 200 file types, including mail, office documents, and meta-data in media files, but doesn't automatically include PDF or ZIP files.

As in beta implementations, the MSN Desktop is still the only place where you'll get instant results as you type in a search term. When searching from the toolbars available in Internet Explorer, Windows Explorer, or Outlook, you need to type the whole term, then hit Enter to see your results, just as on an Internet search site or the Google desktop search product. We wish Microsoft had added instant search in all the search boxes.

When we installed MSN



WINDOWS DESKTOP Search can be handy for finding almost anything that resides on your PC, including music files.

Search Toolbar, we overrode its default settings (e-mail and My Documents) and selected all the folders we wanted indexed on our 2-GHz test system, for a total of 56,000 items. The initial background scan took roughly an hour. After that, the program adds new documents as you save them, so we were able to search against new files and informa-

tion instantly.

New to this final version is the ability to select where to store your index file. It's one of many choices you'll find in the Desktop Search Options dialog box, which you access by clicking on the magnifying glass icon in the Windows Task Tray. (Desktop Search is Microsoft's term for local file and e-mail searching.) Having the

MSN Search installed didn't noticeably reduce other applications' performance.

Microsoft has built a few other useful tools into the desktop search, like the ability to create shortcuts that let you open frequently used applications or documents with only a few clicks. If this was done with a graphical interface it might find an audience, but the

text-only commands will seem too confusing to most users.

Microsoft also teased us a bit here at *PC Magazine* with an impressive new bit of Internet Explorer functionality. One of the nonpublic betas we received actually added tabbed browsing to IE, a useful feature that has, unfortunately, been held back for further performance testing, according to Microsoft. The company says it will be available in the near future as a free add-on (check addins.msn.com).

MSN Search Toolbar does not necessarily lead the desktop toolbar pack, but it is fast, achieves an admirable level of integration and, thanks to a preview pane, returns search results in an attractive and usable format.

MSN Search Toolbar with Windows Desktop Search

Free. Microsoft Corp., www.microsoft.com. ●●●●●

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E-Mail Converters Bring Old Messages Back

BY EDWARD MENDELSON

The longer you've been using e-mail, the less likely it is that all your mail is in the same place. Three well-designed, no-nonsense utilities can help you reclaim old messages from a now-abandoned mail format.

Aid4Mail Professional 1.03

cleanly and quickly converts 30 different mail formats into the formats used by Outlook, Outlook Express, PocoMail, Thunderbird, and other Mozilla-based mail programs. It can also generate generic mail files usable by Unix-based systems, or files viewable in your Web browser, Microsoft Excel, or a database. Unlike other mail converters, Aid4Mail can also export mail files into ZIP archives viewable in Microsoft Windows XP Explorer or utilities such as WinZip. It performs these tasks with impressive speed and with time-saving conveniences, such as optionally finding your current mail files.

A wizard interface includes options to add exported messages to an existing mailbox and filter out duplicate messages from the original file. A unique feature extracts addresses from e-mail messages into a separate file so you can build a mailing list or a new address book. In our testing, even with large mail files Aid4Mail produced problem-free exports in a few seconds. One minor limitation: When exporting from other formats to Outlook Express, Aid4Mail creates separate EML files for each message, not a single DBX mail folder, so you have to create a new folder by hand in Outlook Express and drag all the new EML files into it.

You won't find support for 1980s-vintage formats like those used by the CompuServe

mail or MCI Express, but you can send sample files to the company and ask for support to be added. We recommend the Professional version for most users, but for those on a budget, a \$29.95 Personal Version omits support for Outlook PST files and won't create ZIP archives.

Behind its simple wizard-driven interface, **UniAccess 3.8** offers industrial-strength features not found elsewhere, including the unique ability to convert mailboxes to and from remote IMAP mail servers, Outlook and Lotus Notes databases, and enterprise groupware formats not supported elsewhere. It also converts smoothly to and from Outlook Express, and, unlike Aid4Mail, creates DBX folders when exporting to Outlook Express (and optionally converts address books, task lists, and contacts lists).

Once you have chosen the mailbox formats to convert and the destination files, an

and the exceptionally lucid help file explains optional command-line switches that can be used for automated conversions via batch files. Command-line switches can also be used to fine-tune conversions with options that

(SSL), so we couldn't connect with an IMAP server that requires SSL. But we won't complain, since we don't know of any other software that even attempts to convert remote IMAP mail into other formats. A license for one user's data costs \$49, with volume discounts available.

XitNotes 2.3 is the one-trick-pony of the group: It converts Lotus Notes databases into Outlook PST files via a wizard-style menu. That's all it does, but for the many companies that switched from Notes to Microsoft Exchange, that's all that's needed. Like UniAccess, XitNotes can convert

messages, calendars, tasks, and contacts and groups. You can choose to export either plain text only or formatted text, at one-third the speed of plain-text exports. The licensing cost is based on the number of databases that you convert, ranging from \$99 for one mailbox file to \$49,500 for 10,000.

Installation and operation couldn't be easier. You run a configuration program that finds an installed copy of Notes 5 or 6 on your system, or lets you enter the path to your copy of Notes by hand. You'll need a copy of Notes 5 or 6 for XitNotes to do its job (as with UniAccess, a free demo version of Notes is enough) but you can convert databases created by versions as early as 4.5.

Aid4Mail Professional 1.03

\$49.95 direct. Fookes Software, www.aid4mail.com. ●●●●○

UniAccess 3.8

Single user, \$49 direct. ComAxis Technology, www.comaxis.com/ua.htm. ●●●●○

XitNotes 2.3

Single Notes mailbox, \$99 direct. Kim Beros Consulting, www.beros.com.au. ●●●●○



UNIACCESS's wizard interface is designed for simplicity, and advanced options can be specified as command-line parameters.

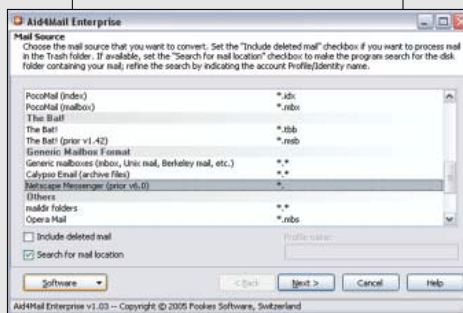
aren't accessible from the wizard-style menus.

UniAccess converts mail from legacy formats such as cc:Mail, MHS (Message Handling System), and CompuServe 2.0 mail stores, plus formats not supported by other programs: Calypso Mail, DaVinci Mail, ExpressIT, GroupWise, and Networth.

With all these systems, UniAccess can optionally convert address books, calendars, and tasks. Unless you apply a command-line switch, the program exports plain text only, not the formatted mail supported by modern mail clients. The program converts mailboxes from Notes 4.0 as long as you have Notes installed on your system. Fortunately, you don't

need the exact Notes version that created your database files, so you can simply download a free demonstration version of Notes 6.5 from www.lotus.com (as we did for our testing).

The program doesn't support Secure Socket Layers



AID4MAIL helpfully displays all its options on a single screen so you don't have to click on a dropdown list to find what you need.

option menu lets you select messages that contain specific strings, and an ingenious name converter can convert addresses from the form used by one program into the different format used by another. Conversions are quick and accurate,

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ThinkPad T42

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(monitor not included)

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A Better, Faster Epson PictureMate

BY M. DAVID STONE



The original Epson PictureMate impressed us enough to earn the Editors' Choice for dedicated photo printers, and it has held on to that position against all comers. The **PictureMate Deluxe Viewer Edition** maintains all the features we liked in the first PictureMate (from true photo-quality output to a low cost per print) and adds still more, most notably a color LCD to let you preview prints.

Like the original, the 5.5-pound PictureMate is designed for portability. But the Deluxe Viewer Edition also has a battery option (\$69 direct), so you can take it with you to print photos on the spot.

Setup is just as easy as with the original. Simply slide the single six-color ink cartridge into the slot in the back, load the photo paper, connect the power



SEE AND PRINT
with PictureMate.

cord, and you're ready to print from a camera, external CD or ZIP drive, a USB memory key, or any type of memory card, although you'll need an adapter for miniSD cards and some Memory Stick formats. To print from your computer, the only additional steps are to connect by USB cable and run the automated install program. You

can also add Epson's optional Bluetooth adapter (\$69 direct) for wireless printing.

The most obvious differences from the original model are the color LCD and the slightly different set of menu control buttons. We found the menus easy to understand and use, and the LCD bright and easy to read. The menu choices are well thought out, with options, for example, to mark individual photos or print everything.

You can also set the defaults to match the settings you use most often. And you'll find options to crop and resize photos, adjust brightness, add frames, and more.

The Deluxe Viewer Edition also improves on the original's performance. We timed it at 1 minute 19 seconds to 1:45 for each photo, whether printed from a computer, memory card,

or Canon PowerShot S60 camera. That's roughly a 45-second improvement in speed. Even better, the image quality is just as good, which makes it a match for film-based photos.

Both models use the same ink and paper, so the photos from the Deluxe Viewer Edition are also waterproof and smear-proof, even immediately after printing, and they cost only 29 cents per print. That's a big saving compared with thermal-dye printers, whose prints can cost more than twice as much.

When we reviewed the original PictureMate, we said that we'd like it even better if it had a color LCD for previewing images. The new model adds that color LCD, as well as faster printing and other tricks. And, indeed, we like it even better.

Epson PictureMate Deluxe Viewer Edition

\$249.99 direct. Epson America Inc.,
www.mypicturemate.com. ●●●●●○

Canon's Photo Printer Does Postcards

BY M. DAVID STONE

Add the **Canon Selphy CP400** to the growing list of dedicated photo printers for 4- by 6-inch photos. Similar in many ways to other printers in this category, it's easy to set up and use; it can print directly from PictBridge cameras or from computers (but not memory cards); and its output is smudge- and waterproof thanks to thermal-dye technology (also known by the misnomer "dye sublimation"). It also brings a few extra tricks to the table, including the ability to print on a variety of paper sizes, from credit card size to 4 by 8 inches (though most people print at 4-by-6).

At 2.1 by 6.7 by 4.7 inches (HWD) and weighing just 1 pound 13 ounces, the CP400 is small enough to be portable.

Print speed is in the usual range for this class of printer, but on the fast side of that range. On our tests, printing 4-by-6 photos from a computer took 1 minute 30 seconds to 1:40, depending on the image. Printing from a Canon PowerShot S60 camera took 1:25 to 1:27.

Alas, output quality is uneven. Although most of the photos in our tests were excellent by any measure, a few showed serious flaws, holding the overall rating down to the high end of good. In general, the printer handled midtones well, but lost detail in light and dark areas. In one case, this made a photo look overexposed in some areas and underexposed in others. An-



PRINT
SNAPSHOTS and
even postcards, fast.

other problem showed up with the spokes of a bicycle wheel, turning straight spokes into jagged lines.

Running costs are typical for a thermal-dye printer, at 56 cents per 4-by-6 photo with the 36-photo pack of dye roll and paper, or 46 cents per photo for the 108-photo pack. Either price

is substantially more than you'll pay to develop a photo at most drugstore chains or with the ink jet-based Epson PictureMate photo printer family (see above), which we love for its true photo quality. One nice touch is that the photo paper includes a postcard format on the back—including an outline for the stamp—so you can easily turn your vacation photos into postcards even while you're traveling.

The uneven output makes the CP400 a marginal choice for photo enthusiasts, but if all you want is something appropriate (and portable) for printing your snapshots, it's a more than reasonable choice.

Canon Selphy CP400

\$149 direct. Canon U.S.A. Inc.,
www.usa.canon.com. ●●●●●○



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FIRST LOOKS

Top Products

Our Top Printers

Here are our current favorites among the hundreds of printers tested by PC Magazine Labs. Visit go.pcmag.com/printers for the full reviews of these and scores of other printers.

PERSONAL PRINTERS	PROS	CONS	BOTTOM LINE	SPECS AND SCORES
Canon Pixma iP4000 \$149.99 direct 	Fast performance for photos and business applications. Direct printing from cameras. Duplex printing. Two input paper trays.	No memory card slots.	The iP4000 is a good choice thanks to its speed, very good output quality, and unusually sophisticated paper handling for an ink jet.	All-purpose ink jet; 4 colors; legal size; direct printing from cameras. Business app suite: 15:48; 4x6 photo: 1:05.
Konica Minolta magicolor 2400W \$399 direct 	Inexpensive. Fast performance for a four-pass design. Impressively easy setup. Excellent text quality.	Photos and graphics are less than the best quality available from a color laser.	The 2400W drops the entry cost for color laser printing and strikes a winning balance among speed, output quality, and price.	Color laser; 5 ppm color; 20 ppm mono; legal size; optional networking; optional duplexing. Business app suite: 19:52; 4x6 photo: 0:25.
Samsung ML-2250 \$230 street 	Compact size. Excellent text quality. Good performance. Ample paper handling for a personal printer.	Photo quality is at the low end for inexpensive monochrome lasers, though it's acceptable for newsletters and the like.	The ML-2250 is faster than most personal monochrome lasers, and the 550-page maximum capacity is enough even for sharing the printer.	Monochrome laser; 22 ppm; legal size; optional networking; optional duplexing. Business app suite: 8:09.
PERSONAL AND PHOTO AIOS				
Brother MFC-8840DN \$650 street 	Good performance. High-quality text and better-quality photos than from most mono lasers. Duplex printing and 50-sheet ADF.	Graphics and photos show subtle dithering patterns.	The MFC-8840DN offers lots of features, including a built-in fax modem. Output quality is better than for most monochrome printers.	Print, scan, copy, fax; monochrome laser; 21 ppm; legal size; Ethernet. Business app suite: 8:42.
Canon Pixma MP760 Photo All-in-One \$299.99 list 	Good to very good print quality. Fast performance. Transparency adapter for slides and 35-mm film. Can print directly from slides.	No ADF. No fax features.	Equipped with a transparency adapter, the MP760 can scan and print directly from slides and film.	Print, scan, copy; photo or all-purpose ink jet; direct printing from cameras and cards. Business app suite: 15:27; 4x6 photo: 1:08.
Canon Pixma MP780 Photo All-in-One \$299.99 direct 	Fast performance for photos and business applications. Direct printing from cameras. Duplex printing and 35-page ADF.	Fax driver but no dedicated fax utility, so you need to send a document from within the program you created it in.	The MP780 Photo packs a printer, scanner, standalone fax, and a copier. It's a good choice for text, graphics, and photos.	Print, scan, copy, fax; legal size; direct printing from cameras. Business app suite: 15:41; 4x6 photo: 1:06.
Epson Stylus Photo RX620 \$300 street 	Good to very good print quality. Can print directly from slides, film, memory cards, and cameras.	No ADF. No built-in fax.	The RX620 can print photos directly from 35-mm slides and film, which makes it a photo lab as well as a printer, scanner, and copier.	Print, scan, copy; photo or all-purpose ink jet; direct printing from cameras and cards. Business app suite: 26:46; 4x6 photo: 1:49.
HP Officejet 7410 All-in-One \$499.99 direct 	Fast. Very good graphics and photos. Ethernet and wireless networking. 50-page ADF. Prints from memory cards and cameras.	Text quality is acceptable for most users but less than ideal for those who need extremely small type.	The 7410 offers fast performance, good to very good quality, a 50-page ADF, and Ethernet and 802.11g wireless connections.	Print, scan, copy, fax; 6-color ink jet; legal size; direct printing from cameras. Business app suite: 16:11; 4x6 photo: 1:51.
PHOTO PRINTERS				
Canon i9900 Photo Printer \$499.99 list 	Fast printing on photos. True photo-quality output. Direct printing from PictBridge cameras. Fast enough to serve as an all-purpose printer.	No memory card slots.	Eight ink colors give the Canon i9900 true photo-quality output; 6,144 nozzles enable it to print photos at breathtaking speeds.	Photo or all-purpose ink jet; 8 colors; 13x19; direct printing from cameras. 4x6 photo: 0:30.
Canon Pixma iP8500 Photo Printer \$349.99 list 	Impressively fast, high-quality photos. Separate cartridge for each ink color. Direct printing from PictBridge cameras.	No memory card slots. Text/graphics quality and speed are good but not in the same league as photo quality and speed.	Eight ink colors yield a wide color gamut, and 6,144 nozzles let the iP8500 print photos at high speed.	Photo or all-purpose ink jet; 8 colors; letter size; direct printing from cameras. Business app suite: 22:57; 4x6 photo: 0:47.
NEW Epson PictureMate Deluxe Viewer \$249.99 direct 	Prints from computers, memory cards, PictBridge cameras, and USB drives. True photo quality. Color LCD to preview images.	Limited to a maximum of 4- by 6-inch photos.	This PictureMate offers high-quality output, plus the ability to preview images on a color LCD before printing. It can even run on battery.	Photo ink jet; 6 colors; 4x6; direct printing from cameras and memory cards. 4x6 photo: 1:30
NETWORK PRINTERS				
HP Color LaserJet 4650n \$2,099 direct 	Fast performance. Excellent text quality, near-excellent graphics, and good to very good photos.	Claimed 1.6 cents per monochrome page is a higher cost than that for an equivalent monochrome printer.	The 4650n delivers fast performance, good to excellent output quality, and good paper-handling options.	Color laser; 22 ppm mono and color; legal size; Ethernet; optional duplexing. Business app suite: 9:27; 4x6 photo: 0:53.
Xerox Phaser 5500DN \$3,399 direct 	Blazingly fast. Outstanding output quality. Paper-handling capacity and options suitable for departmental printing.	Paper-handling options turn it into a floor-standing unit.	The 5500DN offers high speed, high quality, and heavy-duty paper handling.	Mono laser; 50 ppm; tabloid size; Ethernet; duplexing. Business app suite: 3:51.



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Linksys and the BIG Trade-In!



What If Someone Told You They Could Make Obsolescence Obsolete?

Even the fleetest PC Magazine reader can't keep pace with every technology. Now, imagine a world where technology changes, but Linksys invites you to come along for the ride. For free!*

That world may not exist for your 3 megapixel camera, your pre-Centrino laptop, or your camera-less cell phone, but the Linksys Big Trade-In Program offers you both Wireless-G and VoIP technology when you trade in your old wireless routers – no matter what brand!

First Generation Wireless Routers Let PC Users Out of their Corners

The router is the heart of your network, moving packets of data to their proper devices. It is the enabling device that lets us share an Internet connection and enjoy a digital experience from any computer in any room in the house. Early routers used wires and required physical connections between devices to transmit signals; wireless routers transmit signals through radio transmissions.

What does this mean for consumers? It means a changed mindset. People no longer think of home computing as something you do in an isolated corner of your home. The computer becomes a ubiquitous tool – whether you are listening to MP3s in the living room, playing a video game in the den, or using an Internet recipe in the kitchen.

Reaping the Benefits

Upgrading to the Linksys Wireless-G Router with 2 Phone Ports brings a number of immediate benefits without sacrificing compatibility. You'll get:

Backwards Compatibility

Since the Wireless-G router is backwards compatible with Wireless-B devices you don't need to rush out and buy all new Wireless-G compatible equipment. You can still use your existing Wireless-B enabled laptop. This means you protect your existing 802.11b investment and migrate to the faster Wireless-G standard as your needs grow.

The Wireless-G Standard

Wireless-G is the 802.11g standard that's almost five times as fast as the widely deployed Wireless-B (802.11b) products found in homes, businesses, and public wireless hotspots around the country. The speed increase will enable you to stream MP3s and video from computer to computer in your home, play head-to-head gaming on your PCs or video game machines and transfer large files, seamlessly and fast. And with VoIP, you can do all this at the same time you're talking to friends and family, using a single Internet connection.

Voice Over IP

The Linksys Wireless-G router comes with 2 phone jacks that allow you to use your existing phone for VoIP phone service through Vonage®, a VoIP service provider. With VoIP you can lower your monthly phone bills by using the IP infrastructure. (A typical VoIP rate is under 4 cents a minute.) You'll enjoy exceptional Voice Mail Capabilities, such as message playback online or via email, and be able to access voicemail from any computer connected to the Internet. You'll have access to a host of features like Caller ID, Call Waiting, Three Way Calling and more, at a fraction of the cost of traditional phones. And a variety of consumer and business service plans cater to your needs.

If you want to experience the latest technologies – Wireless-G and Voice Over IP - take advantage of this limited time trade-in offer. Start saving money on your phone calls while experiencing wireless speeds up to 5X faster.

The Next Generation: A New Router Adds New Dimensions

The newest routers use the Wireless-G 802.11g standard. The Linksys Wireless-G Broadband Router with Voice Over IP is really four devices in one box:

- A Wireless Access Point connects both fast Wireless-G (802.11g at 54Mbps) and Wireless-B (802.11b at 11Mbps) devices to the network.
- A built-in 4-port full-duplex 10/100 Switch connects your wired-Ethernet devices together.
- A router lets your network share a high-speed cable or DSL Internet connection.

A phone adapter using VoIP lets you experience a high-quality feature-rich telephone service through your high-speed Internet connection instead of a traditional analog phone line. Just plug in any standard phone and talk with your friends while surfing the internet. This Wireless-G Router contains two standard telephone jacks, each operating independently. It's the equivalent of having two phone lines so you can use one for fax and one for phone if you'd like.

Go Faster! Save Money!



- ▶ Upgrade to Wireless-G
- ▶ Upgrade to Voice over IP

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Offer Ends **July 23, 2005**
While Supplies Last

WRT54G
Wireless-G Router with Phone Ports



How it Works

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*The Linksys WRT54G router is free after rebates. Vonage rebates require 90 days enrollment in a Vonage service plan and return of old router. Allow 12 weeks for processing after receipt of application and 90 days enrollment. Broadband Internet connection and Credit Card required. Monthly plans from \$14.99. Termination fee may apply. Satellite TV and alarm systems may require land line connection. Dialing 911 requires activation and operates differently than traditional 911. See Vonage website for details regarding 911 dialing. Other restrictions may apply. See www.vonage.com for additional details.



Dell Gets Business Projection Right

BY ALFRED POOR



If a key factor in making a successful product is attention to detail, then Dell has a winner on its hands with the **Dell 1100MP**. In spite of its bargain price (\$799 direct), the 1100MP is a first-class projector with plenty of features.

This 4.9-pound DLP projector has SVGA resolution (800 by 600 pixels) which is fine for making typical slide presentations. Unlike some competing models at similar prices, the 1100MP is a complete package, from the rigid carrying case to the full complement of computer and audio/video cables. There's a pass-through VGA connector for a monitor, an excellent printed manual, and a remote control with a dedicated auto-sync button. There's even an automatic keystone adjustment feature.

ment feature.

The projector has a few shortcomings. It has a USB connection, but instead of providing full remote mouse control through this data port, you only get Page Up and Page Down button access. This is fine for presentations, but falls short for general applications.

The image quality is generally good, as we discovered using DisplayMate (www.displaymate.com). Auto-sync

worked perfectly, and we saw no apparent pixel defects. Color ramps were smooth, color tracking was good, and there was no ghosting. The only noticeable flaws were that the focus was very soft in the top corners, and, as with most DLP data projectors, yellows were muddy. But these are forgivable flaws, given the price.

In terms of measurements, the 1100MP outperformed its specification (1,400 ANSI lumens) with 1,429 lumens on the brightness test. This should be sufficient to project a good image of useful size under normal ambient lighting. The contrast ratio was an outstanding 480:1, and the brightness variance ratio of 1.25:1 reinforces our observations that brightness uniformity was very good.



DON'T LET the bargain price fool you; the 1100MP delivers plenty.

Dell 1100MP

\$799 direct. Dell Inc., www.dell.com/projectors. ●●●●●



IBM E400 Projector

Pros: Lightweight and low-cost, yet full-featured. Bright image. Designed for business use.

Cons: Fairly noisy. Substantial heat and light escape from the front of the projector. Small buttons on the remote.

Bottom line: This SVGA DLP projector costs less than \$1,000, yet does the job of larger, more expensive units. Computer and video connectivity make it versatile, and image quality is generally very good.

\$999 direct. Lenovo, www.ibm.com.

●●●●○



Toshiba TDP-S25U

Pros: Dual analog inputs and monitor pass-through. Good on-screen menu system. Good contrast measurement.

Cons: No USB connection and no remote mouse support. Noticeable image flaws. No auto-sync button on remote.

Bottom line: Priced at just under \$1,000, the Toshiba TDP-S25U has some attractive features, such as dual computer inputs and a monitor pass-through connection. But it is hampered by image-quality flaws and the lack of a USB connection. It does support an optional document camera, but that's not a compelling reason to pick it over some of its more able (and similarly priced) competitors, such as the IBM E400 or bargain-priced Dell 1100MP.

\$999.12 direct. Toshiba America Inc., www.toshiba.com. ●●●●○

Big View in a Small Package

BY ALFRED POOR



The **PLUS V-332** weighs less than three pounds, yet delivers an attractive XGA-resolution image that is suitable for applications as demanding as Microsoft Excel.

This DLP projector has a number of clever features. For example, the lens cover has a built-in shutter that protects the lens when it's not in use, so there's no separate lens cap to lose. And you can unplug the projector and pack it up immediately after turning it off; no frustrating cool-down period is required.

The V-332 has both manual and digital zoom, and a credit card-size remote with an auto-sync button. The projector has a USB connection,

but a cable isn't included, and mouse control via the remote is an extra-cost option.

Our tests with DisplayMate revealed generally good image quality. The auto-sync feature worked well, response to both dark and light gray shades was excellent, color ramps were smooth, and color tracking was good. There were no noticeable pixel defects,



THE TINY Plus V-332 delivers a big, bright image.

ghosting, or brightness uniformity problems. The focus was a bit soft in the lower left corner, and as with most DLP projectors, yellows looked muddy. Still, most users will be satisfied with the image produced.

We measured the brightness at 1,037 lumens, which is close to the specified level of 1,200 lumens and should be bright enough to project an image under most normal lighting conditions. For video, the projector is functional, but not as good. We observed posterization in some graduated shading images, such as facial tones. But all told, the V-332 is a convenient and capable presentation tool.

Plus V-332

\$1,995 direct. PLUS Vision Corp. of America, www.buyplusdirect.com.

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† DAT 72 tape comparison



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Multipurpose Gem for Office, Home

BY JOHN DELANEY



Excellent viewing-angle performance, above-average image quality, and a solid showing on our lab tests are reason enough to recommend the 19-inch **Samsung SyncMaster 930mp** LCD monitor. The built-in TV tuner, FM receiver, and speakers are icing on the cake.

The 930mp has a relatively wide silver bezel, which houses a set of Dolby speakers below the 1,280-by-1,024 LCD panel. There are six clearly marked function buttons on the lower right side for accessing the on-screen menu, activating the auto-adjustment function, selecting a video source, and turning on the FM radio and PiP (picture-in-picture) TV features. A convenient four-way rocker switch lets you quickly change channels and adjust the



WATCH TV while you work with the 930mp.

volume. AV connections are plentiful and include component video, S-Video, and DVI ports. There's even a remote control included.

We love Samsung's Magic-Bright feature, which gives you

a choice of three preset brightness settings (Normal, Medium, High) depending on the task at hand and your room lighting conditions (or you can create your own setting). Samsung also provides its Natural Color utility for matching the monitor's image to your printer's output.

We tested the 930mp in analog mode with DisplayMate (www.displaymate.com) and were generally pleased with the results, especially on the dark-grayscale and color-saturation portion of the tests. Overall color purity and uniformity were very good, and the panel's viewing-angle performance was exceptional (up to 75 degrees from all four sides). Text readability was high, even at the smallest font setting. There was noticeable

image smearing during our PC Magazine Labs motion tests and while in full-screen TV mode, but this is to be expected from a display with a 25-ms pixel-response rating. Even so, the TV tuner did a fine job of processing the cable signal without jitter or artifacts, and the speakers had surprisingly rich tone, as long as we didn't crank the volume up too far.

The SyncMaster 930mp is an ideal choice for those seeking a high-quality 19-inch LCD monitor with lots of multimedia features and a variety of connectivity options. Business users will appreciate its readability, and home users can bring TV functionality to their desktops without having to install additional hardware.

Samsung SyncMaster 930mp

\$700 street. Samsung Electronics America Inc., www.samsung.com.
●●●●○

Our Top Displays

Visit go.pcmag.com/displays for the full reviews of these and scores of other monitors, projectors, and HDTVs.

MONITORS	PROS	CONS	BOTTOM LINE	SPECS
Dell Widescreen UltraSharp 2405FPW \$1,199 direct ●●●●○	Impressive image quality. Exceptional resolution (1,920 x 1,200 WUXGA). Aggressive price. Built-in 9-in-1 memory card reader.	Minimal picture adjustments in DVI mode. Takes up a lot of room for a desktop LCD.	This is an astonishing value for a 24-inch, widescreen LCD, delivering a bright, gorgeous picture.	24-inch LCD (1,920 x 1,200), 16:10 aspect ratio, 12-ms claimed pixel response rate.
Samsung SyncMaster 213T \$899 list ●●●●○	Portrait-mode rotation. Excellent image quality. Analog and digital connections and cables.	Weak printed documentation. Smearing on moving images.	The SyncMaster 213T is an excellent monitor, from the high-quality LCD panel to the design detail throughout.	21.3-inch LCD (1,600 x 1,200), 4:3 aspect ratio, 25-ms claimed pixel response rate, portrait mode.
NEW Samsung SyncMaster 930mp \$700 street ●●●●○	Excellent viewing angle. Good image quality. Built-in TV and FM radio tuners.	Stand lacks height adjustment and does not swivel. Does not include DVI cable.	Featuring built-in TV and FM radio tuners and a wide array of connection options, this multi-purpose display is worth every penny.	19-inch LCD (1,280 x 1,024), 4:3 aspect ratio, 25-ms claimed pixel response rate, TV tuner, FM tuner.
PROJECTORS				
Toshiba TDP-T91U \$1,899 direct ●●●●○	Removable document camera. High brightness. Comes with two remote controls.	Larger than some other projectors. No autosync button on remote control.	The TDP-T91U delivers excellent image quality, room-filling brightness, and a document camera, making it a versatile choice.	XGA (1,024 x 768) DLP engine, 2,000 claimed lumens (2,018 tested), document camera, 8.2 pounds.
NEW Dell 1100MP \$799 direct ●●●●○	Lots of premium features at an extremely low price. Generally good image quality. Rugged carrying case.	Focus is soft in upper corners. No mouse function on remote. Standard warranty covers only one year.	Dell has created a winning projector by paying attention to detail. The 1100MP delivers much more than its stripped-down competitors.	SVGA (800 x 600) DLP engine, 1,400 claimed lumens (1,429 tested), 4.9 pounds.
NEW Plus V3-332 \$1,995 list. ●●●●○	Small and lightweight. Quick unplug and go feature. Clever lens-cover design.	Remote mouse support is optional. No video or sound cables included.	The V-332 weighs less than three pounds and projects a bright image with good quality.	XGA (1,024 x 768) DLP engine, 1,200 claimed lumens (1,037 tested), 2.8 pounds.



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Is Your Network Safe?

BY OLIVER KAVEN

By now, every large company has secured its gateways and perimeters with firewalls and security appliances, but vulnerability assessment should still be a critical element of an overall security strategy. One product that can help is **Visionael Security Audit 3.1**, a vulnerability-management software solution for large businesses and enterprises.

Security Audit's strength is the integration of all audit-related processes into one coherent workflow for the administrator. The process starts by discovering assets and devices on the network, using ICMP ping sweeps. This includes OS detection through TCP stack fingerprinting to identify the host OS. The next step is the vulnerability scan itself, which probes network devices and hosts for threats. These scans can be custom-configured or based on pre-



VISIONAEL'S WEB-BASED DASHBOARD lets administrators set up scans, see results, and check on the status of remediation steps.

defined templates, which include scans that contain tests specific to Unix- or Windows-based systems, as well as scans that run only the SANS Top 20 (www.sans.org) vulnerabilities.

The real value of Security Audit becomes apparent when you look at the next stage in the assessment process: reporting. Security Audit compiles the identified risks and correlates

the results with the asset value of the device that displayed the vulnerability—plus the critical rating of that vulnerability. To underline the importance of identifying the most critical systems, Visionael provides a Business Ranking chart that shows the number of vulnerability risks, ranked by criticality, to the organization.

The next steps in the assess-

ment process are job ticketing and remediation tracking, which can be done either through Visionael's proprietary interface or by linking the application to a trouble ticket system such as Remedy. As a final step, Security Audit lets the administrator verify that fixes to problems have been successfully applied by performing vulnerability validation.

Tying all these features together is Visionael's easy-to-use Web-based dashboard. It provides access to all aspects of the application, including scan configuration, asset management, reporting, and threat evaluation and remediation.

Overall, we are very impressed with Visionael's solution. Any large organization that needs a vulnerability assessment platform should definitely take a look at Security Audit.

Visionael Security Audit 3.1

\$11,000 direct and up. Visionael Corp., www.visionael.com. ●●●●●

Automated E-Mail Security

BY LARRY SELTZER

As your business network grows, your need for managed e-mail solutions becomes acute. The **3Com Email Firewall** is a reasonably priced appliance that can perform your e-mail security tasks admirably with little assistance from the administrator, yet it has the power and depth to allow significant customization.

Although the device is a 3Com product, it is based on software from BorderWare. It focuses solely on e-mail, to block both spam and (using a Kaspersky-based engine) e-mail-based malware. But the device does not protect against network-layer attacks like Sasser and various DDoS attacks, and the antivirus engine

checks only SMTP traffic.

We tested the firewall for almost a month and ran more than 20,000 messages through it, the majority of which were spam. It uses a variety of techniques to detect spam, including STA (Statistical Token Analysis). It also learns over time what mail is legitimate by observing outgoing mail.

By the end of the test period, a mere trickle of spam was getting through the box to the internal mail system. Just one e-mail-based threat made it

through in the entire period, a brand-new Bagle variant later detected by Kaspersky as "Email-Worm.Win32.Bagle.pac."

The real strength of the system is when you get it tuned right and then don't have to log into it anymore. At that point it runs beautifully, sending users blocked-mail digest messages that allow them to recover messages, sending reports to administrators, and updating itself often. But even weeks after we began running the system, we had trouble locating options in the browser-based

administration system when we went in to do so.

Though appliances are meant to simplify administration, the 3Com Email Firewall doesn't make things quite as easy as all-in-one solutions do. You will still need a network firewall and possibly other devices, such as a content filter plus an intrusion detection and prevention system, not to mention more comprehensive network antivirus. Smaller companies not already invested elsewhere for those functions will do well with the 3Com Email Firewall, but others might want to look for a more comprehensive solution, such as the CipherTrust IronMail 345.

3Com Email Firewall

\$2,799 list (includes one-year license for 100 users). 3Com Corp., www.3com.com. ●●●●●



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FEEDBACK

How about a new product that doesn't require a dozen security patches?

INTERESTING TIMES

The last line of Michael J. Miller's "ThinkPads in China" (Forward Thinking, June 7) reminded me of the ancient Chinese curse: "May you live in interesting times." I'm not about to buy a new ThinkPad until Lenovo's version of it has a multiyear track record and the reputation of IBM's notebooks has been superseded by Lenovo's reputation. I'm sure that many corporations that were buying IBM will think long and hard about buying Lenovo.

I only hope that the temporary loss of business doesn't result in a reduction in quality to keep costs down. Only by maintaining the quality of the hardware over the next three to five years will Lenovo be able to regain the market share I expect it'll lose over the next two years.

ALAN E. WEINSTEIN

BROWSER WARS REDUX

The sleeping giant finally woke up. After several years of doing nothing to advance the Internet, Microsoft has seen its browser's market share slipping and decided to do something about it.

As a webmaster, I don't look forward to the harebrained innovation this will cause. Browser wars caused me to eat lots of aspirin in the 1990s. On the other hand, you can't fight progress. My main concern is that Microsoft has never fully subscribed to the idea of supporting Web standards, no matter what it's said.

ActiveX, VBScript, and proprietary tags were bad ideas and showed disdain for Web standards and security. The fact that these three concepts still exist shows that the folks at Microsoft have difficulty pulling back from bad ideas. It shows a desire to totally dominate the market. Don't get me wrong, I feel no rancor because of their success. I own many of their products. I am upset that it leads them into some really stupid programming in the hopes of gaining an edge on the competition. I would like them to think more about us end users and less about their competition. How about a new product that does not require a dozen security patches?

PAUL WILSON

DESKTOP KNOPPIX

As an enthusiastic Knoppix user, I was delighted to see such a big write-up on it ("Intro to Knoppix," June 7, page 98). I'd like to add



that Knoppix can be installed to your hard drive. I've been running a dual-boot setup since November 2004, and now use Knoppix a lot more than I use Microsoft Windows XP.

Knoppix on my desktop was at first a way to avoid Windows' online vulnerabilities. Then I upgraded my e-mail client to Thunderbird, installed it to both Windows and Knoppix, and configured TBird Linux to share the Windows Inbox.

I found that I could rip and burn CDs as well in Knoppix as I could in Windows XP, with K3b. They play great with the Kaffeine media player, even the WMA files. Knoppix does a better job of playing my DVDs than Windows XP does. The Ogle DVD player software gives me complete access to all the DVD menus. I can download files, surf the Net, and even back up my hard drive while a DVD plays, and it will not even hiccup in the audio or video.

I didn't like Open Office, so I installed AbiWord plus supporting packages. It is very fast, and it even reads my WordPerfect files! I've figured out how to get Photoshop to run in Knoppix, via Wine.

As your article indicates, it's been a "roll your own" experience. Challenging, yes, but the last time I had this much fun tinkering with software was years ago when I bought a book called *Underground WordStar* to teach me how to hack that DOS word processor. But this is a whole OS!

SAKI ZENZAKI

LINKSYS: ROUTED?

I was very surprised at your findings regarding the fastest router and the best all-around product ("Unwired for Speed," June 7, page 112). I have used both the Linksys and Belkin routers tested in your article, and my results were completely the opposite. The Belkin cost nearly \$120 less than the Linksys did, is easily twice as fast, and gives me way more range.

This is my first Belkin after three successive Linksys routers. I would have stayed with Linksys, but the price, \$279 Canadian (about \$220 U.S.), was so ridiculously high that I switched to Belkin. I am totally satisfied with the switch.

BARRY MCCLOSKEY

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Corrections and Amplifications

■ In our story on input devices (After Hours, May 24), in a review of the Belkin MediaPilot we stated incorrectly that "the hard plastic wrist rest doesn't attach to the base station, so it doesn't stay in place." The wrist rest actually does attach to the base.

■ In our Utility Guide (May 24, page 89), we reported an incorrect price for CrossEyes 3.0. The price is \$49.99 for direct download, and \$69.99 for the software on CD-ROM and a printed manual. Annual maintenance updates cost 20 percent of the purchase price.

■ In our review of the Siemens SX66 mobile phone (June 7, page 58), the picture shows the older model SL56 instead.

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John C. Dvorak



Baffling Engineering

There are exactly two points of sanity in the world of high technology. One is the recharging connector for Nokia phones. The other is the recharging connector for Toshiba notebooks. The manufacturers don't keep changing them.

I probably have ten Nokia chargers, so if I want to charge a phone, there is one around someplace. The same with the Toshiba. I know of only one model of Portégé that used a different connector, and it wasn't on sale for very long. Thus when I grab my notebook, I can easily find a power supply for it, since all the old ones work with the new machine. This isn't rocket science, but you'd think it was when you look around.

Here's an example that is typical and galling. I'm a fan of the Minolta DiMAGE X50 pocket camera. It appeared on the market after its predecessor, the DiMAGE Xt. Can someone at Minolta in Japan explain to me exactly why the company changed the mini-USB connector from a fairly standard mount to something different? It's idiotic.

Why do we see so many kinds of mini-USB connectors, anyway? I have four different ones. Meanwhile, the form of their other end, the large USB connector, stays rock-solid and consistent. I can understand how different companies would make varying versions, but this connector changes from model to model even within the same brand. Olympus has pulled this, too! Why? Is this arbitrary? Did it run out of the other connector?

Much of the general public is unaware of this, because they don't go through as much gear as someone like me. But eventually this problem gets them, when they grab an old cable and discover that something is wrong.

CEOs should fire engineers who make decisions that diverge from rock-solid standards, even if it is not a standard defined by the company itself. The public needs to be served here.

What triggered this column (besides the X50 connector) was a visit with Sony Ericsson in Sweden to talk about the latest developments and how Sony and Ericsson got together. I brought up the fact that I liked the new phones, except the power connector is a kludge—a clunky, rubbery nightmare device that has to be worked in and out of the crackpot connection. It has to be flip-flopped and futzed with, and it seems as if it's eventually going to break. So I asked: "Why don't you simply use the Nokia plug?" It would

benefit the public, because everyone has phone chargers. I'd advise Samsung, Motorola, and everyone else to use this connector too. It's the way to go!

One of the engineers told me that such a move would somehow benefit Nokia, saying something like, "Nokia would win." Win what? If anything, I'd think that Nokia would be incredibly annoyed by everyone standardizing on its plug. It's surely not covered by any patents, since it's a standard-pin power plug. All the work Nokia did to make the plug a standard would be poached to benefit the competition. So how does Nokia win? I'd bet some engineers at Nokia are scratching their heads over why this hasn't been done already.

If you want to be different, put the charger in red plastic and gold-tip the plug. That would further annoy Nokia.

What many technology companies seem to overlook is that consistency is a sign of good quality. Having ten different chargers or ten different USB connectors does not instill public confidence in a manufacturer's engineering department. It means things are obviously being debated. Nobody actually knows what is best. This pattern happens only when uncertainty runs the roost.

The public senses the flakiness of this sort of engineering department, and an unfathomable mistrust slowly emerges. It starts with the vague thought, "Why can't the company make up its mind about what is best?" Then it evolves to, "These guys do not know what they are doing." And after a few more tries, the process results in a lost sale.

Unfortunately, some of this may have nothing to do with the engineering department, but with marketing folks and bean counters getting involved in specs.

I can imagine a meeting where the idea of the Nokia charger is poooh-pooohed by both marketing and bean-counter types, since it will kill the sales of replacement chargers—a lame rationale if I ever heard one. I blame the CEOs for allowing that sort of anticustomer thinking. Whatever the case, buyers sense this sort of scam, and the company loses sales in the long run. This kind of shortsighted decision works only if you are a pure monopoly and can get away with anything. I guess everyone thinks they are a monopoly.

Having ten different chargers or ten different USB connectors does not instill public confidence in a manufacturer's engineering department.

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

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Inside Track

Whither WiMAX Dept. Most of the chip companies and wireless mavens like WiMAX, the wireless broadband initiative, and its promise of **mobile broadband connectivity**. Now you can put the laptop next to the barbeque and surf the Net while flipping burgers. That's if you can actually see and read the screen, of course. The first stages of official WiMAX implementation should appear at the end of 2005 with a 20-Mbps Internet connection. If this comes to pass, it should **kill off DSL**, right? Probably not. The DSL folks, who seem slow to move in this country, will shift to a 30-Mbps system as soon as WiMAX appears. Things will certainly liven up with three technologies (WiMAX, DSL, cable) competing for hegemony, as well as dozens of companies. Finally!

Unholy Alliance Dept.: In a decidedly under-the-radar move in April, **Microsoft** and **Germany's SAP AG** announced a joint venture called **Mendocino**. This product will allow the Microsoft Office suite to integrate fully with the SAP business management system, which Microsoft uses internally.

SAP, as you may know, is arguably the world's most popular enterprise resource planning (ERP) product and is used by many large corporations, supposedly to take **the drudgery** out of day-to-day business. The product works so well that companies often turn over the business to the computer and the SAP software for all decision making and analysis. In some companies, it appears as if SAP is actually the CEO, not just the little devil on the shoulder of the CEO telling him what to do.

It's impossible to discover what's behind the SAP management theories, since it's **impossible to find a critical review** of SAP or find an interview with any of its founders. What you'll find are a lot of well-orchestrated articles about how someone implemented SAP and discovered **millions of dollars** in bookkeeping errors created by the system that was in place before. There is no question that something is going on with this software, since today's megacorporations would probably be **unmanageable** without SAP and other software-based management tools. Whether this is a benefit to society is another question.

Microsoft was rumored to be interested in buying SAP outright and must have later realized that there is more to its system than just software. Mysterious business-management theories are embedded within. Who needs to deal with that?

Genuinely Interesting Software Dept.: Perhaps a more practical addition comes from a small developer in Virginia called Levit & James Inc. Tired of the fact that there is **no way to see all the code** in a



In some companies, it appears as if SAP is actually the CEO, not just the little devil on the shoulder of the CEO telling him what to do.

Microsoft Word document the way you can with WordPerfect, the company developed an add-in called that fixes this flaw. Exactly why Microsoft, after hearing years of complaints, doesn't buy this product and incorporate it into Word is baffling. I'm guessing that the SAP software running Microsoft **told** it not to.

Anyway, go to the Web site www.levitjames.com and download a copy. It's a **powerful** tool for \$50. Take a look at the company's other offerings, too.

Me and My Imaginary Friend Dept.: I was reading an article in *EE Times* about the new Intel Professional Business Platform. This is some sort of scheme to convince us that a new, more robust platform can be implemented that is customized for the office power user who may not know anything about computers. Or something—it's vague. But **what got me** was this paragraph: "Computers based on the design platform would be the first to incorporate a management technology that allows others, typical information technology administrators, to monitor and interrogate PCs even when they're turned off or have crashed, Intel said." **Let me get this straight.** The computer crashes and then is turned off and somehow the sys admin can "interrogate" the PC? I thought about this for a minute and realized that, yeah, they can interrogate all they want. But they ain't getting no information! "We never said we'd find out anything! We said we'd ask." Ah!

How About Linux on This Box Dept.: The specifications for the Sony PlayStation 3 beg that it become more than an elaborate game-playing box. Here is what Sony is claiming will be in the final box: a **2-teraflop** 3.2-GHz 7-core CPU, a 550-MHz RSX nVidia 256MB GDDR graphics chip that can support two displays, two gigabit Ethernet ports, 802.11g Wi-Fi, and Bluetooth. All for \$99! Well, **maybe not \$99**, but probably \$400 or less. Sounds like an **inexpensive supercomputer** to me. It won't ship until spring of next year, though.

Meanwhile, Microsoft is hoping to take advantage of a marketing lead that it seeks to capture with its **Xbox 360**, scheduled to ship by this holiday season. Microsoft is using a special souped-up multicore version of the PowerPC chip and a similar array of **hot specifications**, including a **16:9 HDTV output** with both 1080i and 720p. Already some people have managed to put software that will be running on the Xbox 360 **onto a Macintosh**. Will OS X running on the Xbox be far behind? I guess when Microsoft switched over from the Intel architecture for its game machine it figured that if the Xbox is going to **cannibalize** any hardware, it should be the Mac and not the PC.



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Jim Louderback

Keyboard Happiness



I'm a bit of a keyboard bigot. Ever since my first IBM PC, I've been partial to the traditional "buckling spring" keyboard that delivers solid mechanical thwacks and clicks when you type. But IBM abandoned the business ten years ago, and my last keyboard finally succumbed to an encounter with a tall latte last week.

I could have replaced it with an Avant Stellar, one of the few mechanical keyboards still available. But I'm a cheap geek and couldn't justify spending more for my keyboard than for my CPU. Instead I did what many of you do when something fails—made a frantic dash to the mall for an emergency replacement. But can you really find keyboard happiness in a \$15 package? I set off to find out, buying the cheapest ones I could find at an assortment of computer, office supply, and electronics stores.

Inexpensive keyboards are big sellers. At Best Buy, the rock-bottom \$15 offering was sold out, with the next one pushing \$30 (I passed). The \$13 Nexxtech from Circuit City is a best seller, too. "I sell at least two a day," said the salesclerk, "and I've never had one returned."

I also picked up CompUSA's lowest-price model, a \$20 ViewSonic that is hardly a bargain. At OfficeMax I found a \$12 Belkin, and to compensate for Best Buy, a \$15 Logitech. Why the Logitech? The company's more expensive models score well, and I wondered if the cheaper version would too.

I was put off by Target's lowest-price offering—a \$40 wireless keyboard-and-mouse combo from the cheap-chic Michael Graves product line. Not cheap, but stylish, so I bought it anyway. I liked the radical orange serif font used to ink characters on the keys—until they were obscured by glare in my home office.

I connected each in turn to my DIY system, built around an ASUS SK8V motherboard and an AMD 64-bit CPU. And that's when I realized—even before typing a single word—that all keyboards are not created equal.

I prefer USB, but only the ViewSonic offers this feature; the others rely on the DIN connectors in vogue back when IBM still made keyboards. All but the Nexxtech include a snap-on wrist rest, which makes for more comfortable typing. Cable length varies widely, too. The Nexxtech and Belkin cords measure less than 4 feet, which barely wrapped around the back of my desk and required reposition-

ing my PC so they would reach. The 5-foot cables on the Logitech and ViewSonic, by contrast, fit just fine.

Target's pricey wireless model has a 6-foot range, which is good, but it cuts a fatal corner: no on-board lights for Caps Lock, Num Lock, and Scroll Lock. The Target combo also includes a computing dinosaur: a roller-mouse that morphed into a schmutz magnet on my dirty desk. It barely lasted a week before stuttering.

But what about typing? The ViewSonic was terrible. "Keys mushy," say my notes, and "really need to bang on them to get a feel." The Nexxtech fared little better. "Easy to make mistakes," I wrote, and "needs significant pounding." The Belkin, Logitech, and Target keyboards ranged from passable to good.

Best place to buy keyboards: OfficeMax, hands down. A wide range of models were available, and the two under \$15, the Belkin and Logitech, are my top-rated products.

Low-cost winner: At just \$12, the Belkin Classic Keyboard is good enough to take the crown. The box claims "Input with quiet accuracy," and although it still seemed just as noisy as the others, it had a decent feel and was easy to type on. No frills, though—not a single extra key, and the cable is uncomfortably short. No style either—the keyboard looks like a slice of Wonder Bread, cut horizontally instead of vertically.

Best overall: Spend three more dollars and pick up the winner, the Logitech Access Keyboard. It delivers the best typing feel of all, and the long cable, dedicated application keys, and oversize volume controls are a bonus. But the capper, at least for clumsy me, is 14 drainage holes. This one should survive my next adventure with a top-heavy latte.

Cheap Geek Tip: Rescuing beverage-drenched keyboards. Even without a Logitech, spills need not spell certain doom. Most of today's keyboards are simple devices: Rubber domes sit on top of a flexible plastic circuit board, without moving parts to gum up or fry out. To save your keyboard, unplug it immediately after a spill, turn it upside down, and let it drain overnight. In a hurry? Use a hair dryer set on low. Chances are your keyboard will survive to type another day.

MORE ON THE WEB: You can contact Jim Louderback at Jim_Louderback@ziffdavis.com. For more of his columns, go to go.pcmag.com/louderback.

The Logitech Access Keyboard delivers the best typing feel, and the long cable, dedicated application keys, and oversize volume controls are a bonus.



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Bill Howard



The Infotainment Bubble

Killing me softly with 99-cent songs.” That’s the tune you’ll be singing when you tally up the money you’re spending on entertainment, information, and communication. No one expense will kill you, but the sum of it all may be a drain. As former Senator Everett Dirksen is reputed to have quipped, “A billion here, a billion there, and pretty soon you’re talking about real money.” Same thing here, except this time it’s your money, not the government’s or your company’s.

As bright as the future is for new forms of content delivery, people need time to get used to how much they’ll spend for entertainment and communications that didn’t exist ten years ago. It’s one thing to shift over from LP record albums to CDs, and possibly to 99-cent downloads, because most of us can see a continuum of spending for music you own. But music by the month? Videos downloaded to a mobile phone? The comic-strip arrow that pointed to Dick Tracy’s two-way wrist TV didn’t mention how much Dick was paying for monthly service.

The average American family earns \$46,000 a year. If you’re making more, somebody else is making less, and you both want an iPod, an HDTV, and broadband Internet access. And you still want to see some of the new movies when they come out in theaters. For a lot of people, the cost of all this is a stretch. Most research tallies up only the entertainment portion or the communications portion of the cost of new technology; to me, they flow together. For the \$45 you pay for broadband, you get a lifeline back to the office, to shopping for vacations and dishwashers, and for your kids to play games with their friends.

Unlike the real-estate bubble, the infotainment bubble won’t burst. The worst that will happen is that consumers will move ahead more cautiously. If it’s not clear which technology is going to win out, buyers will do the logical thing and hold off so they’re not stuck with dead-end products. For example, I believe we’re not too far from high-definition DVDs.

Here are some things you might think about to keep your spending at a reasonable level.

If high-definition DVDs really are just a year or two away, you don’t want to go overboard buying standard-def DVDs now. Go ahead and buy standard-def *Police Academy* for \$10 (how could high-def improve it?) but certainly don’t spend \$22 on *Lawrence of Arabia*, a film that benefits from high-res.

High-definition camcorders are here now. But even if \$2,000-plus is too rich for your blood, you still may not want to buy too costly a standard-def DV camcorder.

On the other hand, I don’t see anything wrong with buying an HDTV now, because what programming there is—mostly satellite and digital cable TV—is better in HD. But buy one knowing that the sets will be cheaper and better a year from now, and only then will they have the two-way CableCard slot you really want. If you’re spending \$150 a month for TV entertainment, though, you’ve already paid more than an entry-level HD set costs.

Give thought to by-the-month music subscriptions. For a serious music buff, someone who owns or would like to own several hundred CDs, or for someone whose taste is changing, a subscription is probably cheaper in the long run. Competition from newcomers such as Yahoo! will cap prices in the short term, and the threat of piracy will eventually cap rates. If rates go up to \$25 a month, people might search for, ah, alternative sources of supply. And no scheme can stop a digital-to-analog-to-digital copy.

With mobile phones, you should rate call quality first and price second, unless you’re in an area where every provider has four bars or better. As for cellular data, it’s cool, but \$80 a month is a rate that screams “business users only.” On the road, I prefer to stay in hotels that roll broadband access into the room rate, especially now that daily rates are pushing past \$12.

You might see if the other broadband provider—DSL if you have cable, or vice versa—has a cheaper rate (not just a three-month introductory rate). Or you could investigate whether you can drop back to slower broadband service. For a lot of people, it’s not the throughput that’s crucial, but the fact that you’re always connected.

For most of us, \$200, maybe even \$300 a month for TV, broadband, phone and mobile-phone service, music, in-car entertainment, and movies (in theaters, pay-per-view, and DVDs) makes our lives more enjoyable, and in some ways richer. But not every infotainment provider who wants \$9.99 a month or 99 cents a download can succeed. Moore’s Law does not cover spending.

If high-definition DVDs really are just a year or two away, you don’t want to go overboard buying standard-def DVDs now.

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

SOLUTIONS

MAKING TECHNOLOGY WORK FOR YOU

Undiscovered Office Extras

The leading productivity suite includes a slew of little-known but effective tools. **BY M. DAVID STONE**

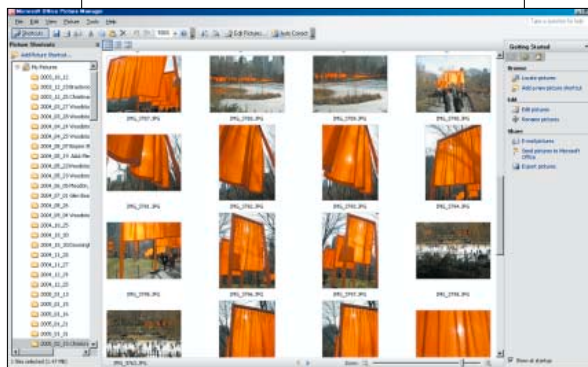
You use Microsoft Office for its primary applications: Word, Excel, Outlook, and, depending on your edition of Office, PowerPoint, Access, and more. But if you have Office 2003, regardless of edition, you'll find several other useful tools tucked away in the *Microsoft Office | Microsoft Office Tools* group on the Windows *Start* menu.

If you use Office's default installation settings, either eight or nine Office tools will show up in the menu; the Microsoft Office Access Snapshot Viewer installs only with editions that include Access. Some of the menu items will actually point to programs on your hard drive. The rest install the apps the first time you try to run them (so make sure you have your Office CD handy or know where the files are on your network). Four of the tools are mini-applications; the rest are utilities. Here's a quick introduction to each.

Microsoft Office Picture Manager effectively replaces the Photo Editor app that came with earlier versions of Office, although it offers fewer editing features. As its name suggests, it's much more concerned with *managing* photos and other images than with editing them. In fact, it's similar to—and actually as capable as—some standalone album programs that come bundled with scanners and cameras, and it goes far beyond the simple viewing features in, say, Windows Picture and Fax Viewer. It's a highly useful tool for organizing and viewing images, as well as for basic editing of images in BMP, EMF, GIF, JPEG, PNG, TIFF, and

WMF formats. In addition, it will let you compress files in most of these formats and convert from one format to another.

The interface superficially resembles Windows Explorer set to *View | Thumbnails*, but it has many more features. Picture Manager's left pane does not show the complete hierarchy of folders on your hard drive, as Explorer does. Instead, the pane shows shortcuts to specific folders. If you have images in folders scattered across



MICROSOFT OFFICE PICTURE MANAGER lets you organize and view pictures, perform basic image editing, and compress and convert files.

your drive, or on multiple drives, you can create shortcuts directly to each folder.

If you want to be able to move anywhere on your drive, you can do that too. Just add a shortcut to a folder that contains subfolders, choose the shortcut, then move to the subfolders. If you add a shortcut to, say, your C: drive, you'll be able to navigate to anywhere on the drive.

To add a shortcut, choose *File | Add Picture Shortcut*, then navigate to the folder you want the new shortcut to take you to. To add shortcuts automatically, choose *File*

| *Locate Pictures*, use the task pane to enter a location to look in, and click *OK*. If you choose to look in *Local Drives*, for example, Picture Manager will search all your drives and add shortcuts to any folder that includes files in the right format. You can also delete any shortcuts you don't want by right-clicking on them (or selecting them and hitting Shift-F10) and choosing *Remove Shortcut*. Do not select *Delete*, which will delete the actual folder and any files in it.

One useful feature is the ability to convert files to other formats. Select a file or files, choose *File | Export*, then pick the format to convert to—BMP, GIF, JPG, PNG, or TIFF—from the *Export With This File Format* drop-down list.

You'll also want to experiment with the editing tools on the *Picture* menu, which let you do things like crop, rotate, adjust brightness and contrast, remove red-eye, and resize and compress the image. If you make a change you don't like, *Edit | Undo* will let you back up multiple steps. More important, changes aren't permanent until you give the *File | Save* command. When you close Picture Manager, if you haven't saved your changes, the program will ask whether you want to.

Microsoft Office Document Scanning and Microsoft Office Document Imaging work together.

Capture a page in the Document Scanning tool and it will hand the scanned image over to the Document Imaging tool. If you start a scan from Document Imaging, it will call on the Document Scanning tool for the actual scan. These apps are worth knowing about because,

in combination with Windows XP, they give you a poor man's document-management capability similar to what you'll find in the bundled software for document scanners. This is too often missing from low-cost, desktop flatbed scanner packages. And it goes light-years beyond the wimpy Windows Scanner and Camera Wizard, which has no OCR feature.

When you open Document Scanning, it may ask for a scanner to use. If it doesn't, and you have more than one scanner driver installed, click the *Scanner* button and

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Tips and tricks.

pick the scanner you want from the drop-down list. You'll also see two check boxes in the dialog box. If you want to open the driver before scanning each time, so that you can check or change settings, be sure to put a check in the box labeled *Show Scanner Driver Dialog Before Scanning*.

You can control most settings through the program's presets. To see the settings, highlight each in turn, click the *Preset Options* button, and then click *Edit Selected Preset*. (Notice that you can create additional presets by choosing *Create New Presets*.) Work through the tabs and *Advanced* button options to see or change the settings.

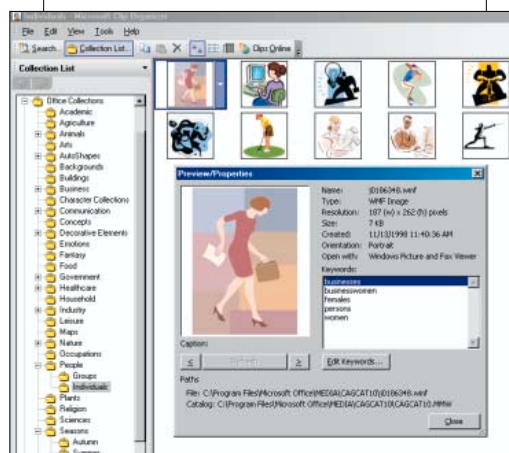
Two options are worth special mention. Choose the *General* tab, and you'll see a *Create Shortcut* button. Click it to add a shortcut to the current Preset on your desktop, so you can scan simply by double-clicking on the shortcut. If there's a type of scan you regularly repeat, this can be handy.

Choose the *Processing* tab, and you'll see an *OCR* option to recognize text in the scanned image. The OCR feature makes the file searchable in Document Imaging and readable by the Windows XP Indexing Service to give you basic document-management capabilities. Go to *Start | Search*, search for a word or phrase in the file, and then open the file in *Document Imaging*. You can then search for the word or phrase within the document using *Edit | Find*. The ability to create an indexable file is a big strength of the combined apps. In informal tests, we were able to find all the references we searched for.

You can also export the text to a Word document from Document Imaging with *Tools | Send Text to Word*. (And if you didn't recognize the text when you scanned the document, you can choose *Tools | Recognize Text Using OCR* first.) The Document Imaging tool offers other features too, like the ability to add annotations. The options are largely self-explanatory. Work your way through the menus to see what's there.

Another useful feature is that you can change the order of pages in a multipage document by dragging and dropping. You can also drag pages from one Document

Imaging window to another. You'll notice that Document Imaging supports two file formats: TIFF and MDI (Microsoft Document Imaging). To share your files with others, you may want to use TIFF; if, however, someone saves a TIFF file in another program, the text information will be lost if you've recognized the file with OCR, so you'll have to recognize it again. MDI has the advantage of producing smaller files. In a quick test, we saved a 1.2MB TIFF file



MICROSOFT CLIP ORGANIZER comes with a collection of clip art and provides additional clips you can download; you can add your own as well.

as a 333KB MDI file.

Microsoft Clip Organizer is both the organizing tool its name promises and a collection of clip art, some of which installs on your system and some of which is available for downloading from the Web through *Tools | Clips Online*. The *File | Add Clips To Organizer* option works similarly to the equivalent in Picture Organizer, to let you add clips manually or automatically.

Here again, the program is straightforward, and you can learn it easily by exploring the menus and the choices on the task pane. Be sure to try out *View | Search*, which lets you search within clip art collections or across multiple collections for keywords. You can also add or delete keywords from a clip by right-clicking and choosing *Edit Keywords*.

Microsoft Office 2003 Save My Settings Wizard is just that, a wizard for saving the settings of your Office applications. It can also restore settings you've already saved.

Once you've saved the settings to a file, you can move the file to another machine to change the Office 2003 programs on that system to your preferred settings all at once. This is a convenient way to customize the settings on a new system when you're upgrading your computer, for example.

Microsoft Office Application Recovery will close down an Office application that's stopped responding. It also gives you the option to recover your work.

Microsoft Office 2003 Language Settings lets you set the language options for Office programs by adding or removing languages from the *Enabled* list. You can also change the default language for Office programs. Change from English (U.S.) to English (U.K.), for example, and Word's spell-checker will start accepting *colour* as right and marking *color* as wrong.

Microsoft Office Access Snapshot Viewer lets you view Access report snapshots, which you can create using Access itself. The utility comes with versions of Office that include Access. You can create report snapshots to share information with people who don't have Access, and either send a copy of the viewer along with them or send a link to a site where the viewer can be downloaded. (By default, the program Snapview.exe is located in C:\program files\common files\microsoft shared\snapshot viewer. You can also download it from Microsoft's Web site.)

Digital Certificate for VBA Projects lets you create a self-signed digital certificate. Without the certificate, the Office macro security feature will treat macros you created yourself as suspect and, depending on the security setting, may either ask whether to enable them each time you open a file with macros or simply disable them. You can use the self-signed digital certificate to tell Office to trust the macros.

You're bound to find some useful programs within that often neglected *Microsoft Office Tools* menu, whether it's for managing your photos and other image files, setting up a document-management system, creating certificates for your macros, or publishing your Access data. Once you try them, you may find that they're valuable additions to your toolkit.

DESKTOP

Optimizing PDF Files

Here are nine tips for creating the best PDFs. **BY JAN OZER**

Many factors have contributed to the success of Adobe's PDF format. One key benefit is that you can put all kinds of content inside a PDF and know it won't get changed. Also, the content is accessible to almost everyone through the free Acrobat Reader.

But the format is not perfect, as anyone who encounters a huge, lumbering PDF file knows. It's tricky to reduce file size without diminishing the quality of your content. And the target user must be able to open your file.

You can make PDFs with a variety of tools, including most desktop publishing and graphics programs and some word processors. If your program doesn't output PDF files natively, you can buy Acrobat from Adobe or a host of third-party tools that present PDF creation as a driver you access like a printer. Whatever tool you use, three factors you should consider are file size, quality, and compatibility. Here are nine rules for optimizing your files.

Find a preset. Unless you're familiar with concepts like color space conversion, image resolution, and compression, you'll produce better results using an output preset in your content creation program. For example, Adobe InDesign has seven output presets ranging from Screen to Prepress, while the Acrobat Printer Properties window, accessed from programs like Microsoft Word, has presets like "High Quality" and "Smallest File Size." Experiment with the presets. If necessary, tweak them rather than starting from scratch.

Choose your output: screen or print. A critical decision in image-rich documents is the resolution of the images. Computer screens display images at 72 dpi, so images encoded at this resolution look perfect and can be very compact. By contrast, most

printers output at 300 dpi or higher, so 72-dpi images will look grainy and blurry. If you output at 300 dpi, though, you'll greatly boost file size. (Our story "Prints and the Resolution," at go.pcmag.com/printsresolution, shows why 300-dpi resolution may not be necessary.)

When you're optimizing PDFs for on-screen viewing, print them before distribution to assess quality. If high-quality print output is necessary, consider producing and posting two files, one for quick viewing and one for printing.

Compress just once.

It's helpful to compress images for image-rich files. You can apply compression either when outputting from your content creation program or later within

Acrobat itself. If you compress your images at both stages, however, you'll compound compression artifacts and degrade quality.

The best option is to produce your final PDF file with your content creation program, using either native controls or an Acrobat or third-party printer driver, and to skip reencoding within Acrobat. If that's not possible, you can output without compression from your content creation program and then compress to the final target in Acrobat.

Go grayscale.

Using grayscale images rather than color can reduce file size by as much as 25 percent.

Use RGB for screens. When producing for screen-based displays, always output in RGB color rather than CMYK. You may achieve savings of 50 percent or more.

Find the fat before you cut. Acrobat's PDF Optimizer can perform a "Space

Audit" that marks the components of the PDF file by size and percentage, so you can focus your file-size cutting efforts (click *Advanced | PDF Optimizer*, then the *Audit Space Usage* button). For hands-on users optimizing in Acrobat, this tool is the place to start.

Use common fonts. In text-intensive PDFs, embedded fonts can use lots of space. You can remove them, saving as much as 40KB per font. But if the viewer's system doesn't have them, Acrobat uses a substitute, which can lead to garbled results. If you need to save on file size, use only common fonts such as Arial and Times Roman, which you can safely leave out of the document.

Don't forget about compatibility. Adobe adds more advanced compression techniques to each version of Acrobat, producing ever-decreasing PDF file sizes, but readers then need the latest viewer to open the file. You can use Acrobat's *File | Reduce File Size* command to apply a later Acrobat version to your PDF file, but in a corporate setting with fixed configurations, choosing too recent a version can produce a document that no one is able to read.

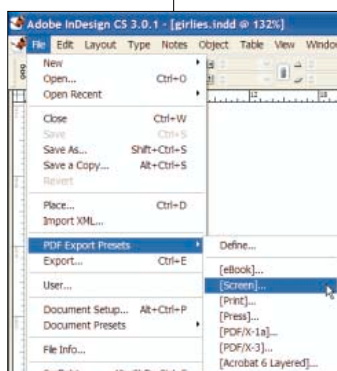
Compress multimedia files before embedding. When embedding audio and video files into PDF documents, compress them beforehand to more compact, streaming formats like QuickTime or Microsoft Windows Media.

You can typically encode speech audio to around 48 Kbps without any obvious degradation, while music needs at least 96 Kbps. Video encoded at 300 to 400 Kbps at 320-by-240 resolution can look good, but below 200 Kbps quality gets dicey. Even at these stingy compression rates, file size adds up quickly, so mind your file size when adding multi-

media content to your PDFs.

Using these tips, you should be able to greatly decrease the size of your PDF files, often without your readers noticing any difference in quality.

Jan Ozer is a contributing editor of PC Magazine.



USING YOUR content creation program's presets can be the best way to optimize PDFs.

Description	Bytes	Percentage
Images	4,527,696	59.82 %
Content Streams	149,438	1.97 %
Fonts	70,667	0.93 %
Acrobat Forms	118	0.00 %
Comments	2,372	0.03 %
Document Overhead	43,347	0.57 %
Color Spaces	9,873	0.13 %
Extended Graphics States	278	0.00 %
Cross Reference Table	12,000	0.16 %
Embedded Files	2,753,154	36.37 %
Total	7,568,143	100 %

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- Scan resolution: 19,200 dpi enhanced and 48-bit color
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- 1-year limited warranty

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CDW 680780

\$20 HP AWARD CARD
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OFFER BEGINS 6/20/05

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- Print resolution: 4800 x 1200 dpi optimized
- Scan resolution: 2400 x 4800 dpi optical with 48-bit color
- Direct photo printing with PictBridge and integrated memory card slots
- USB and Ethernet ports
- 1-year limited warranty

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\$30 HP AWARD CARD
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Installing a New Motherboard

Connecting your computer's main board is easier than you might think. **BY LOYD CASE**

If you've been thinking about building a new PC or upgrading an existing one, but the prospect of installing a motherboard seemed too daunting, have no fear. All it takes is patience, a few tools, and a willingness to work inside the cramped quarters of a PC case. Here we'll assume that you're starting with an empty case or that the old motherboard has been removed.

The tools you will need are a Phillips No. 2 screwdriver, forceps or needle-nosed pliers, and a flashlight. An antistatic strap and mat are highly recommended, espe-

cially in dry climates; at the least, you will need to be near a light switch or metal lamp to ground yourself frequently. Your workspace should be well lit and have a table big enough to hold the case horizontally. Installation should take about an hour, if you're starting with an empty case.

We'll focus on motherboards that adhere to the ATX specification, though a few new ones may be in BTX format. If you're installing a Micro-ATX motherboard, the process is similar, but with fewer screws.

Set up the case. If you have a tower case, lay it on its side on the table. Remove any

panels and internal drive bays—and maybe the power supply—to maximize your work space. Check the location of the motherboard mount points, which are either bumps or hex-head nuts that will accept the mounting screws. Test the screws in the mount holes *before* you try to install the motherboard.

Install the I/O shield. The I/O shield is a thin aluminum plate—with holes cut for the keyboard, USB connectors, serial ports, and the like—that you need to insert into a corresponding cutout on the rear of the case. (If you forget to do this, you will have to remove and reinstall the motherboard.)

You may have to punch out additional flashing on the I/O shield to make room for optional I/O connections for your particular motherboard. Do this before installing the I/O shield.

Insert the motherboard. Decide if you want to install the processor, CPU cooler, and memory before you install the motherboard. With some small PC cases, it's easier to do it that way; with others, it's

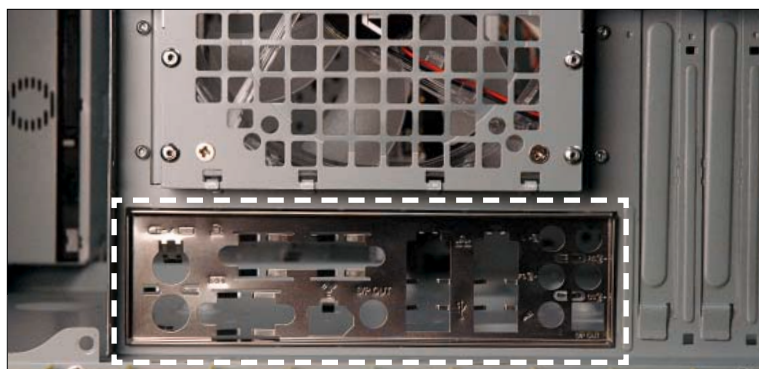


FIGURE 1: The ATX I/O shield. Make sure that you install the I/O shield *before* you install the motherboard.

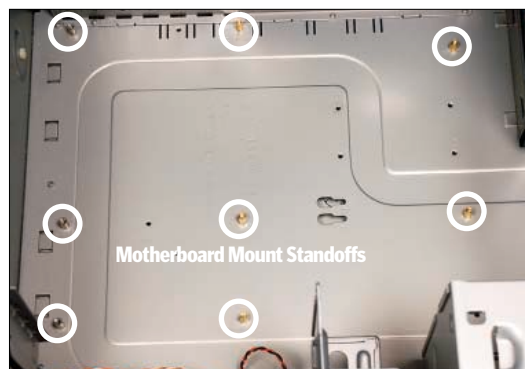


FIGURE 2: The board can be screwed into place once its screw holes are aligned with the mount points.

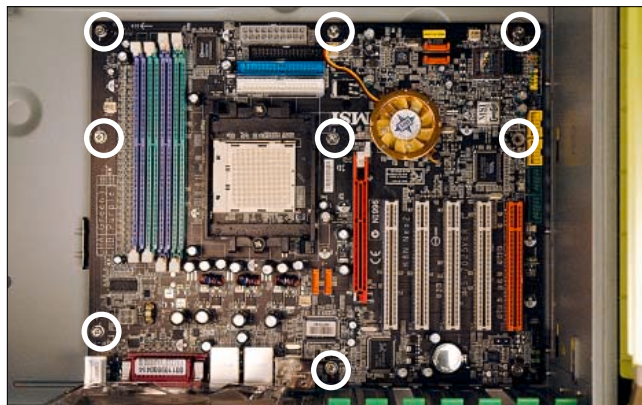


FIGURE 3: The motherboard, with screws in place. (Be sure not to tighten the screws too much.)

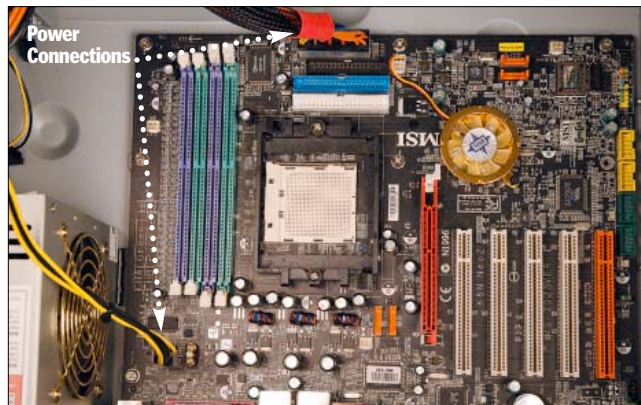
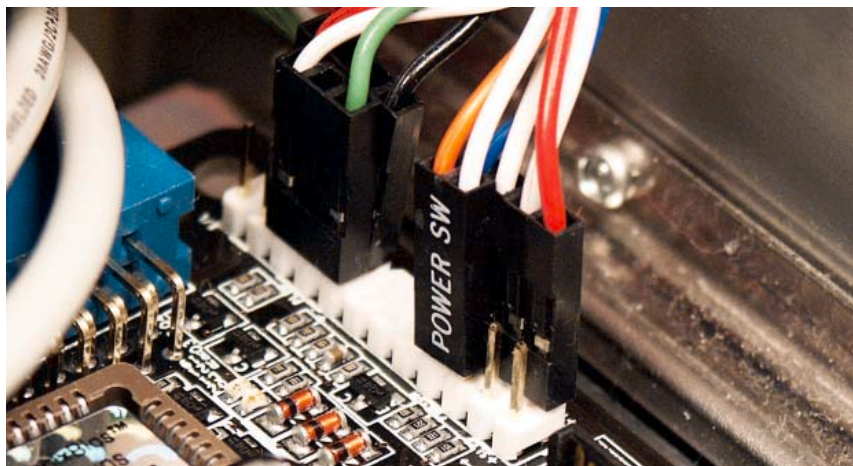
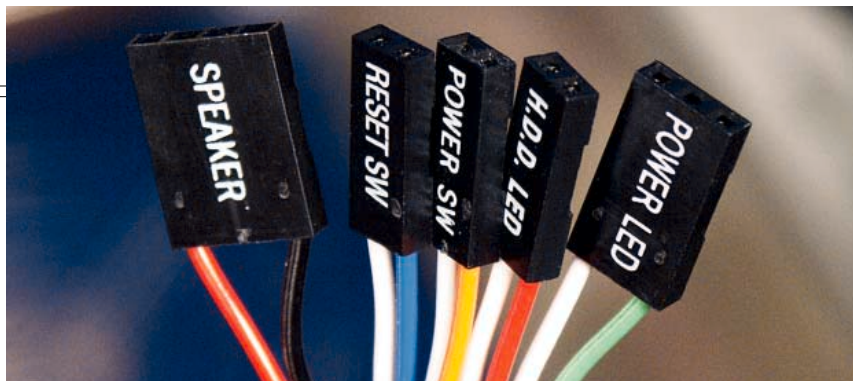


FIGURE 4: The motherboard with both the primary and secondary power connectors attached.



easier to add these components later. (Unfortunately, there is so much variation between cases that we can't give specific recommendations.) If you have an after-market CPU cooler that requires a bottom plate underneath the motherboard, you'll have to put that in before installing the motherboard.

The installation is pretty simple. First, be sure to ground yourself. Align the motherboard so that the back-panel I/O ports slip into the matching holes on the back of the I/O shield. You may have to fold some flashing out of the way on the shield itself. Once the ports are through the holes in the shield, the motherboard should be almost aligned with the mount points.

Get a screwdriver and screw ready, then put one hand on the back of the motherboard (the side closer to the *front* of the case) and gently apply pressure toward the rear of the case to align the screw holes with the mount points. The first screw you should attach is the center one on the motherboard. Do *not* screw it all the way in.

Attach the remaining screws, one by one, around the edge of the board. You may need to wiggle the board a bit—don't try to force a screw in, or you'll risk stripping it or its mount point. Stop tightening as soon as you meet resistance. An electric screwdriver with adjustable clutch set to minimum force works well here. If you

FIGURE 5: The front-panel connectors typically attach to a cluster of pins near the rear of the motherboard.

drop a screw into a tight space, use the forceps or pliers to retrieve it. If the motherboard is partially screwed down, you can even upend the case.

Attach wiring. The power connections are pretty simple. Newer desktop motherboards have a primary 24-pin connector and a secondary 4-pin connector to deliver dedicated power to the CPU. Some server or workstation boards may have an 8-pin secondary connector instead of a 4-pin one. Older ATX boards have a 20-pin primary connector and the 4-pin secondary connector.

The front-panel connectors are typically at the rear of the motherboard (nearer the *front* of the case). These include connectors for the power switch, reset button, power LED, and hard drive LED. They may be color-coded, and are usually in a tight cluster.

Most motherboards have connectors for more USB or FireWire ports if you need them. Follow the instructions in your manual to install these.

Once you've attached all the wiring, you're done. You still have to install the processor, memory, and expansion cards—but those are topics for another time.

DO-IT-YOURSELF

TO DO...

More Cool Projects to Try

>> Can you turn a Microdrive into a Flash card? Not really, but this hack lets you use a Microdrive (or CompactFlash



Type II card) in a CompactFlash Type I PCM-CIA Adapter. Although their electrical interfaces are identical, CF Type I cards are 3.3 mm thick, while CF II cards (and Microdrives) are 5 mm thick. By removing the metal covers from a PQI Flash Card CompactFlash adapter and breaking off two interfering tabs, you can get the adapter to accept Microdrives and CF II cards as well as the CF I cards it was designed for. See www.camerahacker.com/CompactFlash/Type_II_to_Type_I/index.html for Chieh Cheng's details.

>> The Sony Librie has a beautiful 6-inch screen that gives it one thing most e-book readers have lacked: readability. But it's built for the Japanese market, and even the ones that Dynamism (www.dynamism.com/librie) sells here have Japanese menus. BerliOS has developed a firmware hack that converts the Librie's user interface into English. (See http://download.berlios.de/librietrans/HOWTO_FW06160RIEN.txt for download and installation instructions). Now, all it needs is English versions of its proprietary e-books.

>> Tired of your cell phone running out of juice at your most mobile of moments? If you want to use a 9-volt battery to recharge it in transit, all you



need are the following inexpensive parts: an LM7805 voltage regulator; a flat, female USB connector; and a 9-volt battery and connector. You'll need to strip one end of the USB connector—the end you aren't attaching to your cell charger—and connect the wires to the regulator in a specific manner, as Jason Striegel illustrates at www.hackaday.com/entry/1234000270029372. Being able to charge your phone fully while you're on the go is definitely worth the few minutes of work.

SECURITY WATCH

Make Your Network Safer by Attacking It

A number of excellent tools can help you find out where you're vulnerable. **BY LARRY SELTZER**

If you think you have your computers and your network locked down pretty well, you might be humbled by running a vulnerability scanner on it. A vulnerability scanner is a program that probes computers on the network for potential weaknesses and perhaps even gives you instructions for fixing them.

Many excellent commercial scanners are available. Even Microsoft has a free

Scanner (Internet Security Systems, www.iss.net), are able to scan for a large number of known security issues and are updated as new threats are discovered. You can specify a particular system to scan or give these products an address range; they'll find all the systems and scan them. AppDetective focuses on finding security holes and misconfigurations in database applications. For more details on vulnerability scanners, see "Network Security: Know Your Weaknesses" at go.pcmag.com/vulnerabilityscanners.

To test the free NeWT Security Scanner (Tenable Network Security Inc., www.tenablesecurity.com), I gave it my complete internal address range. The program found one computer I had forgotten about and discovered issues on some others that I wasn't aware of. I ran this scan from inside my network, so the vulnerabilities were from the perspective of a user already inside the network. But because the Servgate security appliance at the perimeter

of my network would prevent many of those attacks, I decided to run the scanner from outside my network as well and tell it to scan my outside IP address.

So I ran the NeWT Security Scanner again from the outside. The results were exactly what I wanted and expected. A few ports were open, but only ones I had specifically opened, like port 25, port 80, and IKE.

Ports are the entry points through which computers on the Internet communicate, and many specific port numbers are reserved for particular applications. Port 25, the SMTP (Simple Mail Transfer Protocol) port, is used by mail servers on the Internet to send mail to one another. Port 80 is the default port used by World Wide Web servers. IKE (Internet Key Exchange) is a

THE LOOKOUT

FIREFOX EXPLOIT SENDS MOZILLA SCRAMBLING

In early May, for the fourth time in three months, major security flaws in the Firefox Web browser pushed volunteers at the Mozilla Foundation into damage-control mode. The open-source group rushed out a partial fix for a pair of "extremely critical" vulnerabilities after zero-day exploit code leaked onto the Internet. They promised that a comprehensive patch would be available soon. The vulnerabilities have been confirmed in Firefox 1.0.3.

Firefox users are urged to disable JavaScript and to disable the browser's software installation feature by unchecking the *Allow Web sites to install software* box, which can be found by selecting *Options* on the Tools menu and then *Web Features*.

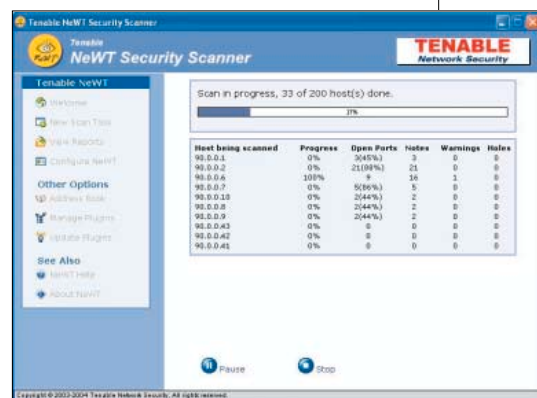
The flaws and accompanying attack scenario were first discovered by security researchers at the GreyHats Security Group, which published a detailed technical explanation of the exploits (www.greyhatsecurity.org/firefox.htm). The research firm was quietly working with the Mozilla Foundation to create and deploy a patch but was forced to go public after the FrSIRT (French Security Incident Response Team, www.frsirt.com/exploits) published the exploit code. —Ryan Naraine

protocol for negotiation and authentication of IPsec-based virtual private networks.

The fact that my network is more accessible on the inside than the outside is not surprising. This reflects a deliberate decision: When it comes to protecting against intruders, I care about the outside more. But of course you do need to be conscious of security inside your network as well. If some malware were to get loose on the inside, or if a hacker were to gain entry to your network, vulnerabilities and weak protections on the inside of the network could allow damage to spread further than it should.

Vulnerability scanners can generate a flood of warnings, many of them merely informing you that you did something you plainly intended to do (like opening port 80 on your Web server). So don't assume the scanner knows more than you do, especially when it gives the warning a low priority. Consider the information you get from these programs as advice to help you secure your systems.

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



NeWT CAN check for a number of vulnerabilities, including buffer overflows in IIS and Sendmail; open ports; and misconfigured e-mail, FTP, and Web servers.

tool, the Microsoft Baseline Security Analyzer (www.microsoft.com/technet/security/tools/mbsahome.mspx), which scans a single system or a range of systems across a network for common system misconfigurations and missing security updates. This tool is definitely worth running, but it doesn't replace scanning for known vulnerabilities.

Third-party scanning tools, such as AppDetective (Application Security Inc., www.appsecinc.com), Retina (eEye Digital Security, www.eeye.com), and System



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BUSINESS

A Virtual Student Body

A behind-the-scenes look at Thefacebook.com, the college world's most popular online social network. **BY DAVID MURPHY**

Were you to consider the social circles of the digital world in terms of a weather map, the various climates would fit like a puzzle. The Livejournals, Deadjournals, and other bloggers would be a gentle front, moving slowly toward the future but content with the pace. Sites like Friendster and My-space would be akin to thunderstorms—powerful but strengthening and weakening throughout their long existence.

Enter Thefacebook, cyberspace's tornado. Shortly after founder Mark Zuckerberg began the college social network at Harvard University in early 2004, the popularity of the service took campuses by storm. "The number of kids at Harvard who signed up within the first few days blew all of us away. It was more successful than anything that Mark had done in the past and looked to be something that would work not just at Harvard but also at other schools," says Chris Hughes, Thefacebook spokesperson.

Over 2.4 million people across 573 college campuses are currently registered on Thefacebook, with nearly 10,000 joining daily to use the site's numerous features. You can list your vital information in a comprehensive profile, create lists of your friends at colleges across the nation, search for friends using a variety of parameters, and create groups for people to join under fun—but often absurd—premises.

The complexity of Thefacebook's social functions is balanced by the simplicity of its hardware setup. Penguin Computing helps supply the site's dual-processor, rackmount servers. On the code side, Thefacebook avoids heavy resource loads by using PHP-caching to minimize server processing. Borrowing a line from its traffic-heavy peers—Slashdot and Wikipedia—it also uses the distributed memory caching system memcached to retrieve database information from memory, rather than relying on server caching.

Thefacebook runs on Apache Web servers and uses MySQL database software to handle the bulk of user and college

information, the latter updated voluntarily by users. For instance, Thefacebook stores the majority of each college's classes; users can run searches using class numbers, add the courses they're in, and quickly find other Thefacebook users to commiserate with over papers. Each branch site (or "college chunk") exists as a separate database instance across Thefacebook's distributed network of servers, though the site still maintains centralized servers for global searching.

"It's relatively stable, except when we are doing intense growth during a launch and our fanatical new users abuse the site—and their mice," says Hughes. "We've had occasional crashes, but nothing we couldn't recover from. The site is set up in such a way that occasional crashes may affect a handful of schools at a time, but usually the site itself stays up."

The process of adding new colleges to Thefacebook is user-driven. Those interested in expanding Thefacebook will

"vote" either by submitting suggestions through the site or by filling out a detailed form about the specifics of their college. Thefacebook updaters create a list of all submitted colleges, ranked by interest, and, starting at number one, add new schools when space is available.

As Thefacebook has expanded, the site has created a host of new features and options for social connectivity, based on a combination of the founders' ideas and user input. A new My Parties option lets you create an invitation for any upcoming event you're throwing. The announcement is displayed in the My Parties section of your college site, and you can establish certain criteria for the affair: party type, location, and RSVP settings.

Thefacebook aims to shift to more general upgrades. "Our first priority is expanding the network so that it includes as many U.S. colleges as possible. We also want to spruce up the design of the site and improve its usability. Finally, we want to make sure students are able to use the site as efficiently as possible when they're not at their home college—after graduating or during the summer—by increasing our users' freedom to interact with people in their geographical location," says Hughes. "We're always looking to make the site more useful and enjoyable."

Click to Cliques

Thefacebook includes over 2.4 million people from 573 college campuses, and nearly 10,000 people join daily. You can list your vital information, create enormous lists of your friends at colleges across the nation, and search for friends using a variety of parameters.

Profile (This is you)

John Blutarsky
 Member Since: August 2004
 Last Update: April 26, 2005
 Basic Info:
 Age: 19
 School: Berkeley
 Major: Political science
 Hobbies: Bird-watching
 Residence: Delta Chi

Larry Kroger
 Member Since: April 26, 2004
 Last Update: May 11, 2005
 Basic Info:
 Age: 20
 School: Northwestern
 Major: Journalism
 Hobbies: Photography
 Residence: Delta Chi

Eric Stratton
 Member Since: May 4, 2005
 Last Update: May 5, 2005
 Basic Info:
 Age: 21
 School: Syracuse
 Major: Biology
 Hobbies: Triathlons
 Residence: Delta Chi

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USER TO USER

PC MAGAZINE'S COMMUNITY OF EXPERTS AND READERS

Inserting an Address Bar Code in Word

In Microsoft Word 2003, is there a way to get the address bar code on a letter for use with a windowed envelope?

WILLIAM LANZANA

It's easy enough to add a bar code when you're using Word's *Envelopes and Labels* dialog to print the envelope. You just check the box *Delivery point bar code* in the *Envelope Options* dialog. But when you're using

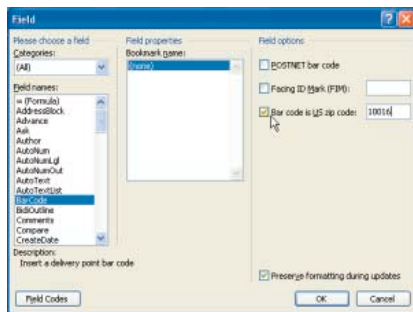


FIGURE 1: When you want to insert an address bar code into a Word document, you need to insert it as a field.

windowed envelopes, the entire address, including the bar code, has to be printed on the letter inside the envelope. In that case, you use a bar code field:

- Select *Insert | Field* from the menu.
- Choose *Barcode* from the list at left.
- Check the box titled *Bar code is US zip code*.
- Enter the ZIP code.
- Click *OK*.

If you see something like `BARCODE \u "10016" \* MERGEFORMAT`, press Alt-F9 to switch from viewing field codes to viewing field results.—Neil J. Rubenking

Plugging in a Fax

The fax feature in my HP Officejet 7410 works with the phone jack I initially plugged it into, but when I moved the printer to a different phone jack, it kept insisting the phone was off-hook. My temporary solution was to move the

Officejet back to the original position, but I'd rather have it in the second location. Do you have any idea what the problem might be at the second jack and how to fix it?

CHARLES NILSSON

The most likely explanation is that you're using a standard telephone cable. The solution is to replace it with the one HP provided, or get a new one with the right cabling. Not so incidentally, the same issue can crop up with other AIOs designed for worldwide use, and it's caused by having to accommodate different phone systems.

The RJ-11 connector has six pins. In standard phone cables, the middle four—pins 2, 3, 4, and 5—are connected, with 3 on one side connected to 4 on the other, and 2 on one side connected to 5 on the other. In the U.S., a jack wired for one phone line will use pins 3 and 4. If there's a second line, it will use pins 2 and 5. The phone cable that comes with the 7410 for use in the U.S. uses only pins 3 and 4 on both sides. To accommodate European phone systems, the fax circuit inside the AIO needs to connect pins 3 and 4 to pins 2 and 5. If you use a standard four-wire cable on a two-line jack in the U.S., this shorts the phone lines and creates problems. The fix is to use a cable that connects only pins 3 and 4.—M. David Stone

XP Desktop Icon Labels Lose Transparency

Windows XP has the ability to display desktop icon labels with a transparent background and drop-shadow effect. When you have a nice picture for a desktop background, this looks a lot better than having the labels backed by blocky rectangles of the default desktop color. Sometimes, though, even when you have the system configured to use drop shadows, you still get those ugly rectangles. This occurs when your configuration requires use of a feature called Active Desktop. In earlier versions of Windows, you could turn this feature on and off; in Windows XP, it's enabled automatically when needed. To turn it off, you need to find out why it got turned on.

If you seem to have this problem, start

by making sure the drop-shadow option is actually enabled:

- Right-click My Computer.
- Choose *Properties*.
- Click the *Advanced* tab in the resulting dialog.
- Click the *Settings* button in the *Performance* panel.
- Click the *Visual Effects* tab in the resulting dialog.
- Check the box whose title begins *Use drop shadows for icon . . .*
- Click *OK, OK*.

There are three main reasons you may still have rectangular icon labels: Your desktop background is a transparent or animated GIF image; you have placed Web

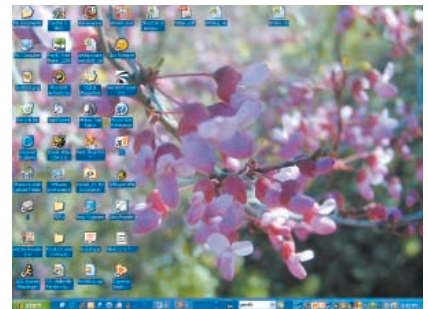


FIGURE 2: If Active Desktop is turned on, you'll see blocky icon labels on your XP desktop.

content on the desktop; or you have chosen to lock Web content on the desktop. You can check for and correct all three in the *Display Properties* dialog, invoked by right-clicking on the desktop and choosing *Properties*. First click the *Desktop* tab, select one of the default Windows background images, and click *Apply*. Next, click the *Customize Desktop* button and click the *Web* tab in the resulting *Desktop Items* dialog box. If there are any checked items in the *Web pages* list, uncheck them. Also uncheck the *Lock desktop items* checkbox. Click *OK*, and *OK* again. Your desktop icons should now have a transparent background for their labels, with a drop-shadow effect.—NJR

In Windows XP, Active Desktop is enabled automatically when needed.

Eventually, validation will be mandatory for all versions of Windows.

Getting Rid of Unwanted Names in Outlook

A while ago we changed ISPs and, consequently, e-mail addresses. Now, every time I try to send my wife an e-mail, AutoComplete pops up both the old and new addresses. I have tried to get rid of the old ones. I've searched the entire computer for references to them and deleted them. Every time they pop up in the address field using AutoComplete, I highlight the old one and press delete . . . but it still comes back. Where do I have to go to delete the old address once and for all?

JAMES M. WALKER

If these were indeed AutoComplete entries, you would be able to get rid of them the same way you get rid of unwanted items that appear when you're entering data in a Web form. That is, you would press the down arrow to highlight the item and then press the Del key. But since you've already tried that solution without success, we must assume those names are coming from Outlook's nickname cache.

The official solution for this problem is to delete the nickname cache. First, make sure Windows Explorer is configured to show hidden files and folders. Specifically,

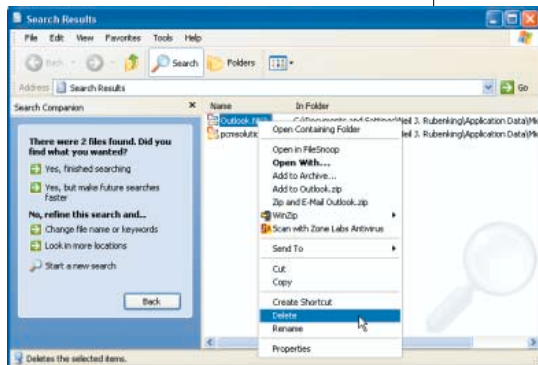


FIGURE 3: To keep Outlook from displaying old e-mail addresses, you have to delete Outlook's nickname cache.

select *Folder Options* from the *Tools* menu, click the *View* tab, and check the *Show hidden files and folders* option. Now use the *Search* option on the *Start* menu to search for files matching *.NK2. It should turn up one such file for each Outlook profile defined on the system. Simply delete the one corresponding to the profile that's having the problem—you can do it right in the *Search Results* window. That will solve the problem for now. If it recurs,

delete the nickname cache again. When you do this, you'll lose all the names in the nickname cache, but Outlook will regenerate them.—NJR

Genuine Microsoft Windows

I got a call from one of my students who's in a panic because the Dell computer his son gave him came with what Microsoft said was a bootleg copy of Windows XP Professional. He was trying to download the free Microsoft antispyware application and innocently went ahead with the "validation." What should he do?

KEN BUCKNER

Many download pages at Microsoft.com now contain a note indicating that the download is intended for customers running "genuine Microsoft Windows" and inviting visitors to validate their copy by clicking a button. At present, validation is optional, but Microsoft recently made it mandatory for those using Norwegian, Czech, and simplified Chinese versions of Windows XP. Eventually validation will be mandatory for all versions. If you see the "Validation Recommended" message, we suggest you click *Continue* and make sure that your copy of Windows passes the validation routine.

Usually the validation system will accept your Windows installation and you'll return to the download page, now showing the message "Genuine Microsoft Software." In some cases you'll have to enter the 25-character Product Key (found on the Windows XP CD or on a sticker on the PC's case). But what happens if you can't find that key, or if the validation routine rejects it? For now, you can slide along without validation, but eventually, if you want any Microsoft downloads beyond automatic Critical

Updates, you're going to have to bite the bullet and purchase a valid copy of XP.

Microsoft strongly recommends that you reinstall Windows XP on your computer using the new CD. (See our guide at go.pcmag.com/reinstallwindowsxp. You may also find "How to Migrate to a New PC" at go.pcmag.com/migration helpful.) The company admits, however, that you may well be able to get by without this somewhat daunting step. Simply run through the

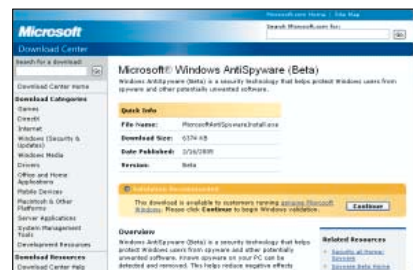


FIGURE 4: Many downloads from Microsoft now ask visitors to validate their copies of Windows by clicking a button.

validation sequence again and supply the Product Key from your newly purchased software. As long as the original installation used a key from the retail channel, this should serve to validate your installation.—NJR

Degrees, Minutes, and Seconds in Excel

I needed to convert coordinates from decimal to DMS (degrees, minutes, seconds). I found a way to convert from decimal to DMS using LEFT and MID, but it seems to take several steps and leaves me with the individual parts, which I can't figure out how to assemble. I need to be able to go, for example, from 40.32139 (decimal degrees) to 40 degrees, 19 minutes, and 17 seconds.

JAMES BLAIR

While LEFT and MID have their uses, they are most appropriate when working with text values. If you want to split a value expressed in decimal degrees into separate quantities representing degrees, minutes, and seconds, you need mathematical operations.

Suppose the value in decimal degrees is stored in cell A2. The formula =INT(A2) will return the integer portion of that value—the number of whole degrees. The formula =MOD(A2,1) returns just the fractional portion. In order to get the number of whole minutes, we multiply that fractional portion by 60 and again use the INT function to discard the fractional part. The formula =INT(60*MOD(A2,1)) is very nearly what we need. If, however, the original value is negative, the negative sign should apply only to the number of degrees, not to the minutes or seconds. Hence the final formula for the whole number of seconds is =INT(60*MOD(ABS(A2),1)). Here ABS returns

It's not at all hard to enable one or more alternate keyboard layouts in Windows XP.

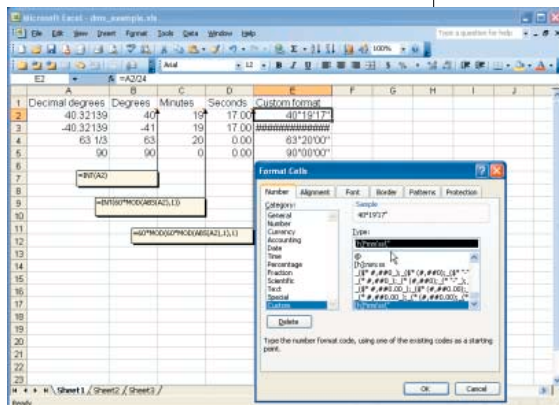


FIGURE 5: If you want to split decimal degrees into degrees, minutes, and seconds, you need mathematical operations. But if you want just to display the decimal degrees as DMS, you can do it with formatting.

the absolute value of the input number. To get the number of seconds, we simply multiply the fractional portion of that last value by 60. So the formula for seconds will be $=60 * \text{MOD}(60 * \text{MOD}(\text{ABS}(A2), 1), 1)$. If it's necessary to truncate the seconds to a whole number, just use the INT function again.

All of the above assumes that you actually require separate quantities representing the degrees, minutes, and seconds. If all you really need is to display the decimal degrees as DMS, you can do that with a simple trick. In another cell, enter a formula that divides the decimal degrees by 24. Then use a custom Time format to display it as hours, minutes, and seconds, like this: `[h]^o mm^s s\'`. The `[h]` portion displays the hour (degree) without constraining it to a 12- or 24-hour day. The `mm` and `ss` portions display the minutes and seconds. Because the double quote is a special character within custom formats, we must precede it with a backslash in order to use an actual double quote. Note, too, that this works only for positive values—Excel doesn't recognize the possibility of negative one o'clock.—NJR

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Viewing Excel Attachments in Outlook

Lately, when I try to launch Excel attachments from Outlook, Excel starts but the file won't load. Sometimes Outlook displays an error, "The system cannot find the file specified."

What's going on?

SUSAN MICHAUD

The problem—and the solution—is in Excel, not Outlook. Somehow a setting that tells Excel to ignore other applications got toggled on. The fix is simple. Go to *Tools | Options*, click on the *General* tab, and deselect that option.

Now your attached spreadsheets will load as they should.—Ben Z. Gottesman

Use a Foreign Keyboard in XP

I live in the U.S. but I occasionally correspond with people in Norway. I use Windows XP. Is there a way to set up my keyboard so that I can use the three extra Norwegian letters? Of course it would be nice to be able to turn this off when not communicating with Norwegians.

GARY NORSK

In Windows XP it's not at all hard to enable one or more alternate keyboard layouts and switch between them. Open Control Panel and launch Regional and Language Options. Click the *Languages* tab, then the *Details* button, then *Add*. Select the desired language and keyboard layout and click *OK*. Now click the *Language Bar* button, check *Show additional Language bar icons in the taskbar*, and click *OK* again and again until all dialog boxes are closed. This lets you switch to the Norwegian keyboard. You will, of course, have to learn the correct key locations for the Norwegian keyboard layout.

Another option, which does not require using a different keyboard layout, is to learn the ANSI codes for the additional Norwegian letters. To enter one of these letters in most programs, hold down the Alt key, tap out the

numeric code on the keypad at right (not the top-row number keys), then release Alt. Here are the codes: Æ = 0198, æ = 0230, Ø = 0216, ø = 0248, Å = 0197, å = 0229. You could also use *Insert | Symbol* to enter the characters, but if you know the codes, it's probably quicker to enter them by hand.—NJR

Importing Bookmarks into Firefox

The PC Magazine Top 100 Sites story (go.pcmag.com/top100websites) lets you download all the links. But how do I install them in Firefox?

BART GOLD

The 2005 Top 100 Favorites download (go.pcmag.com/favorites) includes two elements. One is a program that will install all of the sites as Internet Explorer Favorites (with the option to uninstall using Add/Remove Programs). The other is a simple HTML file that can be imported into Firefox, Netscape, or Opera. If you choose *File | Import* from Firefox's main menu, however,

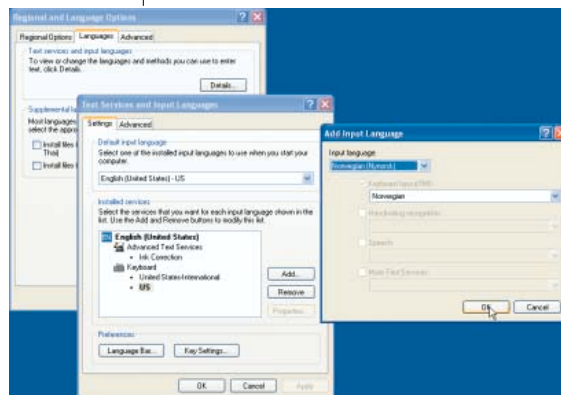


FIGURE 6: In Windows XP it's easy to enable alternate keyboard layouts and switch between them.

you don't get an option to import bookmarks from a file—all you can do is import the entire configuration from whatever other browser Firefox finds.

To import this or any other bookmark file into Firefox, first select *Bookmarks | Manage Bookmarks*. In the resulting *Bookmarks Manager* screen, select *File | Import*. This time you'll get an option to import *From File*—select it, click *Next*, and follow the prompts.—NJR

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





multimedia notebooks movies, music, and mbas

These 13 luxury notebooks offer everything you need to take care of business first, then relax with some movies or music. One of them's got your name on it.

NEARLY EVERY NEW NOTEBOOK ON THE market can handle multimedia content, whether it's music, movies, or photo slide shows. But not all notebooks are created equal. Some go far beyond simple DVD and music playback, even letting you create and display presentations on the road—without packing a workstation and a projector.

In this story we review 13 notebooks from \$1,199 to \$2,999 and from less than a pound to just over 10 pounds. We organize them into three categories. The high-end systems have

all the bells and whistles (and weights that match their everything-but-the-kitchen-sink design philosophy). The mainstream multimedia notebooks we review in this story sacrifice features for a lower price and, in some cases, less weight. And, if you don't mind forgoing full-fledged keyboards, for instance, or touchpads (most have pointing sticks instead), consider multimedia minis, some of which are the size of a video cassette.

High-end multimedia notebooks aren't highly portable; their 17-inch LCDs with wide viewing angles that allow four or five people to watch at once can replace sales reps' notebooks and LCD projectors. If carrying around 8 to 10 pounds of notebook lets you show a detailed rendering of a proposed office building, the chemical structure of a pharmaceutical, or a TV commercial, that's a small burden to bear. But those same pounds may seem a bit much to carry home every night just so you can do e-mail on the

By Bill Howard • Photo by Jens Mortensen

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train the next morning.

Extra bright active-matrix displays with wide viewing angles and glossy screens may be these luxury machines' most striking attributes, but what's under the hood impresses too. Editing and watching video and cutting-edge presentations eats up disk space (an hour of digital video can swallow 15GB), so these machines have up to 120GB hard drives. You can offload content via plus/minus format DVD drives; dual-layer drives can burn 8.5MB per disc.

You'll also get up to six USB 2.0 jacks and FireWire, too; the best add component, composite, and S-Video connectivity. Secure Digital (SD) and Memory Stick combo media card slots make importing stills easy. Dedicated multimedia keys (Play, Rewind, and such) assist in video playback—often giving access to DVDs without booting the operating system. This video may be provided by a fast chipset. Reasonably good speakers also let several people listen to movies or presentations without headphones.

These features make multimedia notebooks great for gaming, but they don't compare to dedicated gaming notebooks. They're a bit heavy to lug to class, but they make great dorm-room enter-

tainment centers, with a remote control, a TV tuner and DVR (digital video recorder), Windows XP Media Center Edition 2005 (MCE 2005), and digital audio output to external speakers.

The mainstream multimedia models are chunkier than the 5-pound mainstream notebooks that dominate outside the multimedia world, but are a pound or two slimmer than high-end models. They have 15-inch screens and tend to have fewer ports. Their drives top out at 60MB to 80MB.

The mini multimedia notebooks may depend on external DVD drives for video playback. (Note that there is a whole other class of notebooks—the ultraportables—which includes Sony's T series, IBM's X series, and Toshiba's Portégé R series, but these machines focus more on business productivity than on multimedia). Also, as size and weight go down, keyboards get smaller and more cramped—or disappear altogether. Most minis require a dock.

In the following story, we review 13 of the top notebooks across the multimedia spectrum. Read on to find the one with the right balance of functionality, price, weight, and size for you.

mainstream

ALL REVIEWS BY CISCO CHENG

Apple PowerBook G4 (15-inch)

(As tested) 1.5-GHz PowerPC G4, 512MB DDR, 80GB hard drive, 64MB ATI Mobility Radeon 9700, 15.4-inch LCD, 802.11g, 5.6 pounds, DVD±RW SuperDrive, two USB 2.0, two FireWire, Mac OS X 10.4, \$2,499 direct. Apple Computer Inc., www.apple.com.

●●●●○

The Apple PowerBook G4 (15-inch) may look exactly like other PowerBooks before it, but this one has some updates that make it even better. It still seems a bit on the pricey side, though, despite a modest recent price drop and a host of improvements to the system.

Perhaps the most significant addition is Apple's new Sudden Motion Sensor, which protects your hard drive. It is similar to the Active Protection System found in the IBM/Lenovo ThinkPad line: If your notebook experiences a sudden jolt (if, say, you drop it), the system parks the heads of the hard drive away from the spinning disks.

The PowerBook also kicks Bluetooth up a notch by including Version 2.0 with the faster Enhanced Data Rate technology. We haven't seen this in a notebook before. EDR triples the current maximum data rate speed to 3 Mbps. You won't see an immediate benefit to the enhanced speeds without a Bluetooth 2.0 peripheral, but those should start arriving soon.

The touchpad, also improved, can scroll both vertically and horizontally. The aluminum chassis is strong, and the 15.4-inch widescreen is bright. One of our favorite PowerBook features is the ambient-light keyboard, which responds well to changes in lighting conditions.

We would love to see Apple add an extra USB port to the two already on the PowerBook, which does come with both FireWire 400 and FireWire 800 ports. Video connections include DVI-I and S-Video-out ports. Our unit came with a 1.5-



Apple PowerBook G4 (15-inch)

GHz processor and an optional 8X DVD±RW SuperDrive (\$150 extra). On our DVD playback tests, the PowerBook could muster only 2 hours 12 minutes' worth of battery life, which is average for this type of system. We found it much more capable for music and photos than for gaming and

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Fujitsu LifeBook N3510

video. Apple's excellent software bundle includes GarageBand 2, iDVD 5.0, iMovie HD, and iPhoto 5.0.

With newly added features like the scrolling touchpad, the Sudden Motion Sensor, and the faster Bluetooth EDR, the PowerBook is better than ever.

Note that Apple has refreshed the PowerBook since we tested this system; for \$2,299, the machine now features a 1.67-GHz processor, so buyers may actually experience slightly better performance than we saw in our lab testing.

Fujitsu LifeBook N3510

1.73-GHz Pentium M 740, 512MB DDR2, 60GB hard drive, 64MB ATI Mobility Radeon X300, 15.4-inch LCD, 802.11g, 7.8 pounds, dual-layer DVD±RW, four USB 2.0, one FireWire, Windows XP Pro, \$1,499 list. Fujitsu Computer Products of America Inc., www.fujitsu.com. ●●●●●

Are you worried that your new multimedia notebook will be obsolete in six months? The Fujitsu LifeBook N3510 safeguards against this with a solid mix of hardware, including an ExpressCard 34/54 slot. It also hits the sweet spot with a TV tuner, a 15.4-inch screen, and a dual-layer DVD writer.

The N3510 has a charcoal-black plastic exterior, which is attractive but easily scratched. The 15.4-inch widescreen is the first in the LifeBook line and is very impressive. The LCD is a Crystal View screen, which uses Fujitsu's color enhancement technique to liven up images and videos.

The TV tuner uses an external coax dongle, which we could do without. It works with the Microsoft Windows-based InterVideo WinDVR 5.0, which isn't as good as MCE 2005. The interface is primitive, and scheduling TV programs is like filling in an Excel spreadsheet. The N3510

mainstream | HP Pavilion dv4000

high-end | Toshiba Qosmio G25-AV513

mini | Toshiba libretto U100



The best multimedia notebooks offer the right balance of weight, connectivity, and performance. The HP Pavilion dv4000 is the follow-on to a previous favorite, the Pavilion dv1000. This reasonably lightweight, very modestly priced machine has a brilliant BrightView screen, Harmon Kardon speakers, good QuickPlay buttons, and solid, if not exceptional, performance across the board on our lab tests. Apple puts up a good fight, however, with the PowerBook G4. The latest edition of this popular machine includes all sorts of extra goodies, like Bluetooth Version 2.0 with Enhanced Data Rate technology, a vertically and horizontally scrolling touchpad, and a Sudden Motion Sensor, which protects hard drives from jolts.

At the high end, the Toshiba Qosmio G25-AV513 is a beast in terms of weight (at 9.4 pounds), storage space (120GB), and connectivity. Its 11 multimedia keys are the most we've seen on a notebook. This, combined with the notebook's rich connectivity—including four USB ports, a built-in component-video-out port, and composite-in and S-Video-in ports—makes this Media Center PC the best AV notebook out there. It doesn't hurt that the Qosmio's gorgeous TruBrite screen is one of the brightest we've seen. The only disappointment is in battery life, at 1 minute 59 seconds. For better battery life, check out the Dell Inspiron 9300, which beats the Qosmio by more than an hour. (The Gateway M680XL's battery lasts 5 hours, but its other features don't quite measure up.)

Toshiba scores again with the 2.1-pound libretto U100, our multimedia mini EC. TruBrite technology shines here too. The libretto's 7.2-inch screen is the brightest among the minis and is great for watching DVDs (though it can be hard on the eyes for productivity apps after a while). The battery lasted an impressive 3:57 on our Battery-Mark tests. We'd recommend picking up the minidock for its built-in DVD±RW drive, however, to make this unit qualify as a true multimedia device. If 2 pounds is just too heavy, you might try the 0.9-pound OQO model O1, but with its 5.1-inch widescreen, you'll be giving up a lot of screen real estate.

does, however, offer a preboot application called Instant MyMedia that lets you play DVDs and TV shows without booting the OS. Unfortunately, Instant MyMedia isn't much better than WinDVR in practice, and it works only in preboot mode. We suggest buying a TV-tuning program such as SnapStream's very good Beyond TV 3.

Another reason to consider the N3510 is the dual-layer DVD writer, which provides an extra layer for a total storage capacity of up to 8.5GB. Additionally, the system's ExpressCard 34/54 slot allows for fast data transfer to compatible devices.

Performance didn't live up to our expectations for this Centrino system. SYSmark scores were below those of comparable older notebooks, and battery life was just 2 hours 45 minutes.

Nevertheless, the Fujitsu LifeBook N3510 is a reasonable gaming machine, thanks to PCI Express graphics from the ATI Mobility Radeon X300. If you choose this notebook, just be aware that you'll have to spend more for additional multimedia software to make the hardware sing.

HP Pavilion dv4000

1.86-GHz Pentium M 750, 512MB DDR2, 80GB hard drive, 128MB Intel GMA 900 GM, 15.4-inch LCD, 802.11g, 6.4 pounds, DVD±RW, four USB 2.0, one FireWire, Windows XP Home, \$1,349 direct. Hewlett-Packard Development Co., www.hp.com.

●●●●●



The HP Pavilion dv1000 easily won our Editors' Choice for multimedia notebooks. Its successor, the dv4000, is similarly victorious. It's got the same look and feel, plus a 15.4-inch widescreen (the dv1000's is just 14.1 inches). Though performance isn't dazzling—nor are the integrated graphics—newer Centrino components help. As with the earlier model, you get oodles of multimedia goodies at a great price of \$1,349 direct.

The dv4000 weighs in at 6.4 pounds, one pound more than the dv1000 because of the larger screen. A BrightView screen is included in the price; if the glare is too dazzling for you, you can get the dv4000 with a matte display for \$25 less. HP has adjusted the mouse buttons (which are quite responsive), elevating them slightly



HP Pavilion dv4000

so that your thumb doesn't rub against the surrounding case as you use them.

HP offers QuickPlay, a great feature that gives you instant access to DVDs and music without having to power up the system. Two multimedia keys (one for DVDs and one for audio CDs) launch QuickPlay, and you can navigate via the keyboard. You can also access your Windows My Music folder without booting the OS. A remote control like the one that resides in the dv1000's PC Card slot is a \$14 upgrade.

Our system was configured with the 1.86-GHz Intel Pentium M 750 processor and the 128MB Intel Graphics Media Accelerator 900 GM. HP doesn't offer a discrete graphics solution for this series. The newer integrated graphics are a slight improvement, but don't expect to run 3D-intensive games. The dv4000's SYSmark 2004 performance scores haven't improved much, nor has its BatteryMark 2004 score, which was 3 hours 17 minutes—7 minutes more than the dv1000's. The extended-life battery costs an extra 25 bucks.

The dv4000 adds an ExpressCard 34/54 combo slot for WAN capabilities. It also integrates a fourth USB port. A good set of Harman Kardon speakers sits in the front panel, right where it belongs. And instead of the CD-RW combo drive found on the dv1000, the dv4000 includes a DVD±RW drive.

If you're in the market for a smart-looking multimedia system with a great collection of extras, you can't go wrong

with the HP Pavilion dv4000.

Note that as we went to press the 1.86-GHz version of the dv4000 wasn't available; HP was unable to say how long this situation might continue. As we write, the highest processor available from the company for this system is a 1.73-GHz; a dv4000 configured with this processor costs \$1,299.

Sony VAIO VGN-FS570

1.73-GHz Pentium M 740, 1GB DDR, 100GB hard drive, 128MB Intel GMA 900 GM, 15.4-inch LCD, 802.11g, 6.2 pounds, dual-layer DVD±RW, three USB 2.0, one FireWire, Windows XP Home, \$2,000 street. Sony Corp. of America, www.sony.com.



Stylishly thin with an amazing screen, the Sony VAIO VGN-FS570 (\$1,999 as tested) is one of the few notebooks offering a dual-layer DVD±RW, an enormous 100GB hard drive, and a generous 1GB of memory. The next-generation Centrino components make it purr. Still, we don't love its integrated graphics.

The attractive FS570 looks more like an Apple design than a traditional VAIO. The off-white case is very thin, and at 6.2 pounds, it's less of a burden than some other mainstream notebooks. The 15.4-inch XBrite widescreen is gorgeous and bright, with reasonable glare. The keyboard is comfortable and the touchpad is very responsive.

FS570 buyers should also pick up some 8.5GB DVD media for the dual-layer DVD burner, which supports plus and minus formats. Three USB ports, a FireWire port, a VGA port, and a Memory Stick reader are located along the right side. Headphone jacks are in the front—great for headsets but awkward for speakers. The software bundle includes the highly praised Sony VAIO Zone, an excellent suite that gives MCE 2005 a run for its money, managing TV recording, photos, videos, and DVDs. Also included is Click to DVD, DVgate Plus, and SonicStage 2.1.

The system's integrated Intel Graphics Media Accelerator 900 GM is fine for DVD movies, but not for 3D gaming or graphics creation. Sony includes the nVidia GeForce Go 6200 graphics chipset on this system, though it wasn't available when we tested it. The FS570 supports DDR2 memory but ships with regular DDR. Luckily, Sony includes 1GB's worth—something we don't

often see in mainstream notebooks. A 1.73-GHz Pentium M 740 helped this VAIO perform quite well on SYSmark 2004 tests. Battery scores were below average at 2 hours 5 minutes.

Close to press time, Sony announced that the FS570 had been replaced by the FS600 series, which we look forward to examining. Still, if you can find FS570 for a



Sony VAIO VGN-FS570

reasonable price now that it's discontinued, it's well worth consideration.

Toshiba Satellite A75-S231

3.33-GHz Mobile Pentium 4 548, 512MB DDR SDRAM, 100GB hard drive, 64MB ATI Mobility Radeon IGP 9100, 15.4-inch LCD, 802.11g, 7.6 pounds, DVD±RW, three USB, one FireWire, Windows XP Home, \$1,499 list. Toshiba America Inc, www.toshiba.com.



The Toshiba Satellite A75-S231's desktop-like build is neither slim (at 7.6 pounds) nor particularly attractive, but it does pack some decent multimedia features. The 3.33-GHz Mobile Pentium 4 548 processor, 100GB hard drive, and DVD±RW drive are especially useful for home video editors. On the other hand, battery life is poor, the built-in speakers are tinny, and graphics are integrated.

The notebook's 15.4-inch widescreen incorporates Toshiba's TruBrite technology, giving it a glossy finish movie watchers will enjoy. The full-size keyboard is typ-

more on the web

For more notebook reviews (and more on the notebooks reviewed here), visit our Web site at go.pcmag.com/notebooks.

Notebook Accessories

Even with so many features built into current notebooks, the right accessories can really add versatility. Here are some of our favorites.—*Bill Howard*



ONE BRICK, TWO POWER SUPPLIES

With the **Mobility Electronics iGo EverywherePower 7500** (\$110 street), one husky transformer with interchangeable tips provides up to 90W of charging power for many popular notebooks, cell phones, music players, cameras, PDAs, and portable printers. Targus makes a similar universal charger with interchangeable tips, and Mobility Electronics offers a device that can charge two accessories (but not notebooks) at once, the iGo EverywherePower 3500.

Mobility Electronics Inc., www.mobilityelectronics.com.

DOCK FOR ALL REASONS ►

Want to add a docking station now, even if you might own a different brand of notebook in six months? Enter the **Targus Universal Notebook Docking Station with Video** (\$140 street). More a port replicator than a dock, it uses a USB 2.0 connection rather than a single-brand connector, yet still provides connections for keyboards, mice, printers, speakers, USB, Ethernet, and video-out (a first for USB connection port replicators). Video tops out at 1,024- by 768- by 16-bit color.

Targus Inc., www.targus.com.



INSTANT AUDITORIUM, JUST ADD SPEAKER

When you give presentations to small groups, you never know whether good loudspeakers will be available. So the **Interlink GoSpeak!** (\$325 street) lets you bring your own. This NXT-based flat-panel speaker set sits on a table near the presenter. A little bigger than a notebook PC, it offers enough amplification for an audience of 100 people, and inputs for both microphone and notebook audio. It provides reasonable-quality music, too.

Interlink Electronics, www.interlinkelectronics.com.

SOUNDS GREAT, LESS FILLING

The Bose QuietComfort 2 active noise-canceling headphones are a status symbol among frequent fliers. But passive noise cancellation—physically blocking noise—works well, too, as proven by the **Etymotic ER6** (\$120 street) earphones.

These great-sounding phones form a snug fit in the ear canal using foam or silicone tips and reduce outside sounds by about 30 dB. Just make sure to carry spare tips with you because these detach easily. Also check out our review of the Etymotic ER6i headphones in After Hours on page 152.

Etymotic Research Inc., www.etymotic.com.



BEAUTY AND THE BEAST

Finally, a laptop bag for women that doesn't look like a laptop bag. The **Targus Jackie** (\$130 street) has plenty of room for a 15-inch notebook, transformer, music player, cell phone, and more. It's available in red and black. On the other end of the spectrum, if maximum protection is important and black ballistic nylon is fashionable enough for you, check out the **Brenthaven Duo 15** (\$149 direct). Its stiff foam walls and extra padding leave less room than bags of similar size, but it's still big enough for a 15-inch notebook and lots more.

Targus Inc., www.targus.com. Brenthaven, www.brenthaven.com.

LOOKS ODD, SOUNDS GREAT

Even the best multimedia laptop can produce only so much sound. The **Virgin Electronics Boomtube** (\$100 street) gives you enough volume for great audio on the road, and it's small enough to bring along. The Boomtube is a cylinder. Twist off the caps, they're the speakers; the midsection is the power and controls. For \$200, the bulkier Boomtube EX provides even louder sound.

Virgin Electronics, www.virginelectronics.com.

POINT. CLICK. ADVANCE.

A remote pointing device makes showing slides a snap. The **Interlink Presentation Pilot Pro** (\$60 street) gets the basics done without breaking the bank. See our review in After Hours on page 154.

Interlink Electronics, www.interlinkelectronics.com.

JUST LISTEN

One comfortable headset works several ways: At home or in the office, the **GN Netcom GN 6210** (\$150 street) works with standard telephones; on the road, it's a headset for any Bluetooth cell phone. (If your cell isn't Bluetooth, you can add a Bluetooth adapter for \$50 street.) And in a hotel room, it can be a headset for any Bluetooth notebook for VoIP calls. The only thing it lacks is wind noise cancellation.

GN Netcom Inc., www.gnnetcom.com.



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HP has over 40 years of experience in meeting your IT needs. We are recognized throughout the industry as a leader in service and support. In fact, HP was just awarded two SSPA STAR Awards from the Service & Support Professionals Association.¹² But that's what we do. HP provides IT support, solutions and service on all our products, including the HP Compaq Business Desktop dx2000 Microtower with the Intel® Pentium® 4 Processor. HP even has Online Chat to answer your questions about anything from the right product and service to solutions for your business. HP product experts are waiting to help you. With HP Smart Office solutions, you get more advice before you buy, more technology when you do and more support after.



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HP recommends Microsoft® Windows® XP Professional.



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Toshiba Satellite A75-S231

ing-friendly, and the touchpad is right in the middle and not too far back from the keyboard, which we like.

The A75-S231 comes with cool stuff for aspiring home video editors, such as a whopping 100GB hard drive and a DVD±RW optical drive. It has a FireWire port to connect to a camcorder, three USB ports for the rest of your peripherals, and S-Video and VGA ports on the back. Player controls (Play/Pause, Stop, Rewind, Forward) lie next to the keyboard, giving you easy access to DVD movies. A button above the player controls launches a pre-boot function to play audio CDs only. But the speakers are awkwardly close to the palm rests, and they sounded a bit tinny to our ears.

While other systems in the class use slimming Pentium M processors, Toshiba still includes the battery-eating Mobile Pentium 4 desktop processor. Although its SYSmark 2004 scores were impressive, the notebook sustained only 1 hour 58 minutes on BatteryMark tests. The inclusion of the ATI Mobility Radeon 9000 integrated graphics was also perplexing on such a powerful machine; we usually see discrete graphics with a processor of this caliber. If you're looking to do any 3D graphics, you'll need a serious upgrade; for video editing, on the other hand, graphics aren't as important.

Poor battery life makes this a mediocre choice for business travelers, but if you're searching for a notebook that'll stay put most of the time and can handle video, A75-S231 is worth a look—if you don't mind its looks.

high-end

Dell Inspiron 9300

2.0-GHz Pentium M 760, 1,024MB DDR2 SDRAM, 80GB hard drive, 256MB nVidia GeForce Go 6800, 17-inch LCD, 802.11g, 8.1 pounds, DVD±RW, six USB 2.0, one FireWire, Windows XP MCE 2005, \$2,853 direct. Dell Inc., www.dell.com.

●●●●●

The Dell Inspiron 9300 with MCE 2005 is a complete entertainment hub to go, thanks to a gorgeous 17-inch widescreen. Performance-seekers will love Intel's next-generation Centrino components and screaming graphics. We only wish the TV tuner weren't an extra, and the 80GB drive feels small. Otherwise, this is a very good system.

The stylish arctic-silver unit weighs 8.1 pounds due largely to the high-resolution screen, which delivers superb picture quality for HD content or regular DVD movies. The full-size keyboard is fine, but the touchpad is unresponsive. DVD-player controls are on the front panel for easy access, and the speakers get a boost from the built-in subwoofer. You get six USB ports in the back, along with FireWire, S-Video, and

DVI-D ports. The system has a DVD±RW drive to burn multimedia content. We recommend upgrading to a 100GB hard drive, but this costs \$199 more. Dell offers snap-on covers so you customize the unit's look.

You can manage videos and record TV using MCE 2005. One gripe: The tuner is external (connecting via USB) and costs an extra \$149. Competing notebooks like the Toshiba Qosmio have integrated tuners. The 9300 introduces Dell Media Direct for resuming DVD and CD playback quickly from hibernate/suspend, but not when the system is completely shut down.

Performance is strong, thanks to the 2.0-GHz Intel Pentium M 760 and 1GB of DDR2 RAM, with blistering graphics provided by the nVidia GeForce Go 6800. The 9300 outlasted all its high-end peers, except the Gateway, passing the 3-hour mark on battery-life tests.

The Dell Inspiron 9300 is a very good system, and better still if you shell out an extra \$350.

SUMMARY OF FEATURES

Multimedia Notebooks

	MAINSTREAM			
	Apple PowerBook G4 (15-inch)	Fujitsu LifeBook N3510	HP Pavilion dv4000	Sony VAIO VGN-FS570
■ YES □ NO				
Price (tested configuration)	\$2,499 direct*	\$1,499 list	\$1,349 direct	\$2,000 street
Processor	PowerPC G4 (1.5 GHz)*	Pentium M 740 (1.73 GHz)	Pentium M 750 (1.86 GHz)	Pentium M 740 (1.73 GHz)
Installed RAM	512MB DDR	512MB DDR2	512MB DDR2	1GB DDR2
Hard drive capacity	80GB	60GB	80GB	100GB
Screen (diagonal, in inches)	15.4	15.4	15.4	15.4
Widescreen	■	■	■	■
Built-in wireless type	AirPort Extreme 802.11g	Intel Pro 2200BG	Intel Pro Wireless 2200BG	Intel Pro Wireless 2200BG
System/travel weight (pounds)	5.6 / 6.2	7.8 / 8.7	6.4 / 7.2	6.2 / 7.2
Graphics chipset	ATI Mobility Radeon 9700 (64MB)	ATI Mobility Radeon X300 (64MB)	Intel GMA 900 GM (128MB)	Intel GMA 900 GM (128MB)
Optical drive	DVD±RW SuperDrive	DVD±RW dual-layer	DVD±RW	DVD±RW dual-layer
Key pitch (mm)	19	19	19	19
S-Video/VGA ports	1 / 1	1 / 1	1 / 1	0 / 1
USB/FireWire ports	2 / 2	4 / 1	4 / 1	3 / 1
Memory card types accepted	None	MS, MSP, SD	MMC, MS, MSP, SD, SM, XD	MS, MSP
Standard lithium ion battery (Wh)	50	78	48	49

RED denotes Editors' Choice. * Tested configuration. See the review on page 90 for updated pricing and processor speed.



Dell Inspiron 9300

Fujitsu LifeBook N6010

3.2-GHz Mobile Pentium 4 538, 1,024MB DDR2, 100GB hard drive, 128MB ATI Mobility Radeon 9700, 17-inch LCD, 802.11a/g, 10.1 pounds, DVD±RW, four USB 2.0, one FireWire, Windows XP Home, \$2,399 list. Fujitsu Computer Products of America Inc., www.fujitsu.com.

●●●●○

The Fujitsu LifeBook N6010 has a great screen and connectivity options, but it doesn't offer Media Center software—and its alternative isn't impressive. Tipping the scales at 10.1 pounds, this bulky notebook has a full-size keyboard with an adjacent

numeric keypad. A good set of speakers is located below the palm rest.

You'll find plenty of media controls and TV/DVD instant-on switches and controls. With the My Instant Media TV tuner software, you can watch TV or play a DVD or CD without booting into Windows. But the software doesn't organize music or work with photos. Fujitsu uses Windows XP Embedded to run Instant My Media. This solution accesses media faster than booting into Windows but is slow to launch. MCE 2005 isn't an option, and Microsoft's InterVideo WinDVR 5 is a below-average DVR solution.

The N6010 has multiple connectivity options: RCA jacks, S-Video-in and -out ports, a TV tuner port, a VGA port, four USB ports, and a FireWire port. The DVD±RW is handy, and the 3-in-1 card reader (Memory Stick, Memory Stick Pro, and Secure Digital) makes transferring images to the 100GB hard drive a snap.

The 3.2-GHz Mobile Intel Pentium 4 processor, 128MB ATI Mobility Radeon 9700 graphics, and 1GB of DDR2 RAM generated good SYSmark scores. But the battery lasted a subpar 2 hours 1 minute; only the Toshiba Qosmio scored worse in this class.

The Fujitsu LifeBook N6010 is a reasonably good notebook, but battery life aside,

the Qosmio is lighter and quieter, and it comes with the superior MCE 2005, making it a much better choice.

Gateway M680XL

2.13-GHz Pentium M 770, 1,024MB DDR2, 60GB hard drive, 128MB ATI Mobility Radeon X700, 17-inch LCD, 802.11b/g, 8.3 pounds, DVD±RW, four USB 2.0, one FireWire, Windows XP Pro, \$2,645 direct. Gateway Inc., www.gateway.com.

●●●●○

The M680XL is thinner and lighter than many systems with 17-inch widescreens, and it has the best battery life of any note-

Fujitsu LifeBook N6010



Download this table at
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	HIGH-END						MINI		
	Toshiba Satellite A75-S231	Dell Inspiron 9300	Fujitsu LifeBook N6010	Gateway M680XL	Sony VAIO VGN-A690	Toshiba Qosmio G25-AV513	Fujitsu LifeBook P1000	OQO model 01	Toshiba libretto U100
	\$1,499 list	\$2,853 direct	\$2,399 list	\$2,645 direct	\$2,799 direct	\$2,999 list	\$1,199 list	\$1,999 direct	\$2,099 list
	Mobile Pentium 4 548 (3.33 GHz)	Pentium M 760 (2.0 GHz)	Mobile Pentium 4 538 (3.2 GHz)	Pentium M 770 (2.13 GHz)	Pentium M 750 (1.86 GHz)	Pentium M 760 (2.0 GHz)	Transmeta Crusoe TM5800 (800 MHz)	Transmeta Crusoe TM5800 (1.0 GHz)	Pentium M 753 ULV (1.2 GHz)
	512MB DDR	1,024MB DDR2	1,024MB DDR2	1,024MB DDR2	1,024MB DDR2	1,024MB DDR2	256MB DDR	256MB DDR	512MB DDR
	100GB	80GB	100GB	60GB	100GB	120GB	30GB	20GB	60GB
	15.4	17.0	17.0	17.0	17.0	17.0	8.9	5.1	7.2
	■	■	■	■	■	■	■	□	■
	Atheros 802.11g	Intel Pro Wireless 2200BG	Atheros Super AG	Intel Pro Wireless 2915ABG	Intel Pro Wireless 2915ABG	Intel Pro Wireless 2915ABG	Intersil Prism 802.11b	Atmel 802.11b	Intel Pro Wireless 2200G
	7.6 / 9.2	8.1 / 9.3	10.1 / 11.9	8.3 / 9.3	8.6 / 10.3	9.4 / 10.9	2.2 / 2.7	0.9 / 1.6	2.1 / 2.8
	ATI Mobility Radeon 9100 (64MB)	nVidia GeForce Go 6800 (256MB)	ATI Mobility Radeon 9700 (128MB)	ATI Mobility Radeon X700 (128MB)	ATI Mobility Radeon X600 (128MB)	nVidia GeForce Go 6600 (128MB)	ATI Rage Mobility-M (8MB)	Silicon Motion Lynx3DM (8MB)	Intel 82855 GME (64MB)
	DVD±RW	DVD±RW	DVD±RW	DVD±RW	DVD±RW dual-layer	DVD±RW dual-layer	CD-RW/DVD-ROM (external, optional)	None	DVD±RW (docking station)
	19	19	19	19	19	19	16	17	14
	1 / 1	1 / 1	2 / 1	1 / 1	1 / 1	2 / 1	0 / 1	0 / 0	0 / 0
	3 / 1	6 / 1	4 / 1	4 / 1	3 / 1	4 / 1	2 / 0	1 / 1	2 / 1
	MMC, MS, MSP, SD, SM, XD	SD	MS, MSP, SD	MS, MSP, SD	MS, MSP	MS, SD, XD	None	None	SD
	95	80	98	98	44	48	21	15	38

CF—CompactFlash, MD—Microdrive, MMC—MultiMediaCard, MS—Memory Stick, MSP—Memory Stick Pro, SD—Secure Digital, SM—SmartMedia.



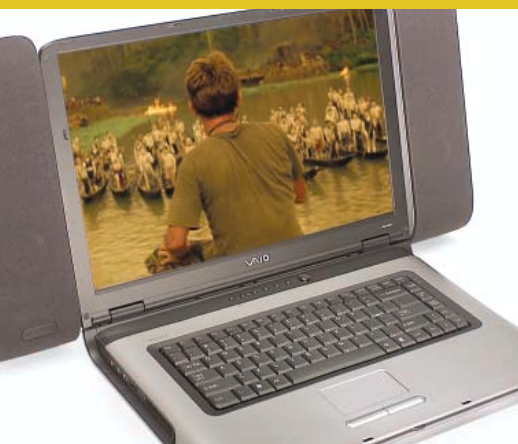
Gateway M680XL

book in this roundup. Still, we'd like to see a bigger hard drive, a TV tuner, and an MCE operating system.

The new slimmer design can be attributed to the move from the Pentium 4 desktop processor to the lighter and more efficient Pentium M. Still, at 8.3 pounds, the M680XL is no lightweight. Features are typical, though not exciting, for a high-end multimedia system: four USB ports, one FireWire port, and a DVD±RW drive. Unfortunately, the hard drive is just 60GB. We recommend upgrading to 100GB for \$85 more, even though you get a slower (5,400-rpm) hard drive. And it doesn't come with a TV tuner or a Media Center operating system. The high-gloss, 17-inch widescreen, however, is excellent.

The combination of the Pentium M processor and the extended life 98-Wh battery rocketed the M680XL's BatteryMark score to 5 hours 11 minutes. Its SYSmark scores were equally impressive, thanks to 1GB of DDR2 SDRAM and the 2.13-GHz Pentium M 770 processor. The ATI Mobility Radeon X700 PCI Express

Sony VAIO VGN-A690



graphics produced good gaming scores, as well as improved 3DMark 2005 test scores and very good Doom 3 scores. If the M680XL packed in more multimedia features, we'd be completely sold.

Sony VAIO VGN-A690

1.86-GHz Pentium M 750, 1,024MB DDR2, 100GB hard drive, 128MB ATI Mobility Radeon X600, 17-inch LCD, 802.11a/b/g, 8.6 pounds, dual-layer DVD±RW, three USB 2.0, one FireWire, Windows XP Home, \$2,799 direct. Sony Corp. of America, www.sony.com. ●●●●●

The Sony VAIO VGN-A690 is a multimedia notebook to be reckoned with. While we love the screen and big hard drive, the biggest lure is VAIO Zone, a suite that gives multimedia capability comparable to that provided by MCE 2005. Too many of the A690's functions are built into the clunky dock, though.

The A-series notebooks were early adopters of the Pentium M processor, allowing for slimmer, lighter designs, though at 8.6 pounds, this system is thinner than it is light. The 17-inch XBrite screen has a mind-blowing resolution of 1,920-by-1,200—ideal for movies and photo editing.

The VAIO Zone suite offers an audio player with recording functionality and manages TV recordings, photos, videos, and DVD movies, all via translucent menus and icons. Our biggest gripe: The TV tuner is built into the bulky docking station, along with a variety of AV ports, like composite-in, DVI-D, and optical-out.

A multimedia system with a great DVR solution needs storage, and Sony accommodates with a 100GB hard drive and a DVD±RW dual-layer burner. The A690 is built with a 1.86-GHz Pentium M 750, 1GB of DDR2 RAM, and an ATI Mobility Radeon X600. SYSmark 2004 scores were average, and BatteryMark was disappointing at 2 hours 15 seconds.

The Sony VAIO VGN-A690 is a very good multimedia notebook. Though we wouldn't mind a few more built-in AV ports, you can't go wrong with this notebook.

Toshiba Qosmio G25-AV513

2.0-GHz Pentium M 760, 1,024MB DDR2, dual 60GB hard drives, 128MB nVidia GeForce Go 6600, 17-inch LCD, 802.11a/b/g, 9.4 pounds, dual-layer DVD±RW, four USB 2.0, one FireWire port, Windows XP MCE 2005, \$2,999 list. Toshiba America Inc., www.toshiba.com. ●●●●●



The Toshiba Qosmio G25-AV513 is our Editors' Choice for high-end multimedia notebooks, thanks to a terrific screen and the most built-in AV ports we've seen on a notebook. Two caveats: We wish this system had considerably better bat-

tery life, and, at 9.4 pounds, it's heavy for a Centrino system.

The TruBrite screen is even brighter than the Sony VAIO VGN-A690's XBrite display. The dashboard features 11 multimedia keys, including player controls like Play/Pause, Stop, Rewind, and Forward—even a Record key for live TV. Express Play TV and Express Play DVD give instant access to live TV and DVDs without booting the OS. The S-Video key is unique and allows quick toggling between Windows and your camcorder or gaming console.

The TV tuner is built in, which we like. You can output high-quality video from your notebook to your HDTV. Composite-in and S-Video-in ports let you connect gaming consoles and camcorders. The



Toshiba Qosmio 25-AV513

Qosmio's dual 60GB hard drives can be configured in a RAID 0 array, creating plenty of room for DVR needs, and the dual-layer DVD±RW is in front for easy access. Harmon Kardon speakers give this notebook exceptional sound quality.

The 2.0-GHz Centrino Pentium M 760, 1GB of DDR2 RAM, and nVidia GeForce Go 6600 graphics performed well on both 3DMark 2005 and Halo in native resolution (1,440-by-900). SYSmark Internet Content Creation scores were high, at 173. The 48-Wh battery, on the other hand, lasted a disappointing 1 minute 59 seconds.

The Toshiba Qosmio G25-AV513 is the best in the game when it comes to integrating AV features in a notebook, thanks to excellent connectivity and a magnificent screen. But if you buy one, be sure to pick up an extra battery—you'll need it.

DIY Multimedia: Software Upgrades

Most new notebooks are powerful enough to rip music and edit photos, and many have enough oomph to edit video, too. Given enough disk space (it takes about 15GB to store an hour of AVI video, for example), a couple tweaks turn most new notebooks into at least moderately capable multimedia computers, taking you beyond the basic DVD-playing, MP3-ripping, photo-viewing capabilities of Windows XP. For business users saddled with corporate notebooks, a few software upgrades make for more entertaining evenings alone in far-flung hotels.

Apple's iLife suite of multimedia applications sets the standard for creating and presenting media on personal computers. The closest you'll come on the PC is **Easy Media Creator** (\$100 street; Roxio, www.roxio.com ●●●●○).

Version 7.5 adds more tools from new parent Sonic Solutions. The interfaces of the different apps don't have a single common look, but the main menu is dead simple to use, and so are the apps. A close second is **Nero 6 Ultra Edition 6.6** (\$80 street; Nero Inc., www.nero.com ●●●●○). It's nearly as good, but a bit harder to use. Both edit music, movies, and photos and have a few more playback tweaks than Windows. If you didn't get Windows Movie Maker 2.1 with Windows XP Service Pack 2, you might download that first, but you'll probably want to upgrade soon after if you're serious about making movies.

If you're more interested in DVD playback than creation, get a copy of InterVideo's **WinDVD 6 Platinum** (\$70 direct; basic version: \$50; InterVideo Inc., www.intervideo.com ●●●●○). You get reverse playback, instant replay of a favorite scene, multiple surround-sound modes, and WMV high-def support. Most important, it does a better job decoding and presenting your DVDs than Windows Media Player.

CyberLink PowerDVD 5 (deluxe: \$70 direct; standard: \$40. CyberLink Corp., www.gocyberlink.com ●●●●○) offers similar picture-quality enhancements. At press time, Version 6 had been released but not yet tested. **CyberLink PowerCinema 3** (\$50 direct, ●●●●○), gives you DVR functionality, TV



Nero 6 Ultra Edition 6.6 is an impressive all-in-one suite, though it can't match Apple's iLife.

use it instead of Windows Media Player.

Our experience with MCE look-alikes is that while they're better than vanilla Windows XP, MCE provides the best 10-foot interface. Some PC makers bundle a version of PowerCinema

with reduced features, such as Dell with its Dell Media Experience software. Unfortunately, the only practical way to get MCE on your notebook is to buy a new notebook. We think any notebook with a screen of 14 inches or more ought to have MCE offered as an option, if only for tracking from across the room the music you're playing in a hotel or in a dorm room. Still, almost any notebook with a low-cost remote is fine for watching DVDs in a pinch.

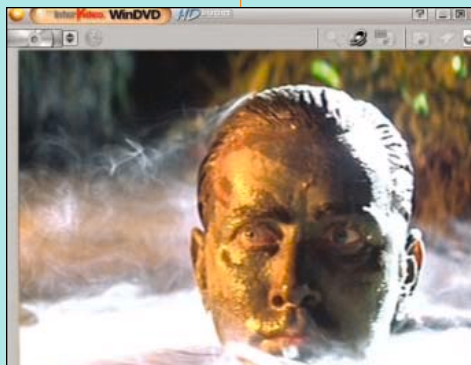
If you just want to show off your photos as a slide show with background music and cool transitions (have pity on your audience—don't go overboard and try all 48 transitions), download a free copy of **Microsoft Photo Story 3** (www.microsoft.com). It will do everything you want except burn a slide show to optical disc. Many of the CyberLink and InterVideo multimedia packages also have slide show software bundled with their suites.

Most notebooks are powerful enough to play back all multimedia content. If you're editing as well, you should consider bumping the memory up to 1GB (certainly to 512MB). For sharing a movie with a friend in a public place, pick up an **Echo Indigo DJ** audio card (\$180 street; Echo Digital Audio Corp., www.echoaudio.com, not rated) with two headphone outputs. Since movies are high-drain applications, carry a spare battery or upgrade to an extended (9 or 12 cells) battery.—BH



Microsoft Photo Story 3 is a great application for creating slide shows that highlight your best photos.

Many of the CyberLink and InterVideo multimedia packages also have slide show software bundled with their suites.



WinDVD 6 Platinum makes your DVDs look better than Windows Media Player can.

mini

Fujitsu LifeBook P1000

800-MHz Transmeta Crusoe TM5800, 256MB DDR, 30GB hard drive, 8MB ATI Rage Mobility-M, 8.9-inch LCD, 802.11b, 2.2 pounds, two USB 1.1, Windows XP Home Edition, \$1,199 list. Fujitsu Computer Products of America Inc., www.fujitsu.com.

●●●○○

The tiny Fujitsu LifeBook P1000 notebook looks like an oversize organizer, but

thanks to its fully functional OS, it works more like a notebook. While it's the right size for business travelers, its underpowered components limit productivity to e-mail, light typing, and occasional Web browsing.

The P1000 is slightly larger than a VHS tape and weighs just 2.2 pounds. Its key-

board is slightly bigger (84 percent of a full size) than the Toshiba libretto U100's. Typing was rough at first, but you'll adjust, assuming you don't have enormous hands or plan on heavy composing. The 8.9-inch widescreen is larger than the libretto's 7.2 inch, but the libretto's is brighter and has a higher resolution. Like the Sony VAIO VGN-U750p and the OQO model 01, the P1000 includes a touch screen and a stylus, stored at the top of the screen. It has a pointing stick, not a touchpad, to save space.

The P1000's 800-MHz Transmeta Crusoe TM5800 processor is underpowered,

PERFORMANCE TESTS

How We Tested



In addition to scrutinizing widescreens and counting AV ports, we also investigated notebook performance. We ran *PC Magazine's* BatteryMark 1.0.1, BAPCO's SYSmark 2004, and our 3D gaming benchmark tests (FutureMark's 3DMark 2005, Halo, and Doom 3) to assess performance. Pentium M notebooks—the majority loaded with Intel's Sonoma components—tended to outperform their Pentium 4 counterparts.

The Gateway M680XL had the best BatteryMark score. Its 98-Wh battery was a factor, but the Pentium 4 Fujitsu LifeBook N6010 had the same battery rating, and the Gateway lasted over 3 hours longer thanks to its efficient Pentium M processor.

The Toshiba A75-S231's 3.33-GHz Mobile Pentium 4 548 processor got the best overall SYSmark score in the mainstream category.

Overall, the high-end Gateway M680XL led the way in SYSmark 2004 performance, beating the Pentium 4-based notebooks. Despite not acing any of the tests, the HP Pavilion dv4000 remains the best all-around mainstream multimedia notebook.

The best overall gaming performance belonged to the Dell Inspiron 9300; the Toshiba Qosmio G25 ran a close second. The Qosmio's nVidia GeForce Go 6600 is a step down from the GeForce Go 6800 graphics chipset, but the Qosmio did well on 3DMark 2005 and Halo at native resolution (1,440-by-900); its connectivity and other features put it over the top in the EC competition.

The Toshiba libretto was the only mini to generate a SYSmark score. The OQO model 01 doesn't produce the necessary resolution, and the Fujitsu LifeBook P1000's Transmeta Crusoe processor and 256MB of system memory could not support the tests.

For more on our testing methods, visit go.pcmag.com/notebooktesting.—Analysis written by Cisco Cheng

High scores are best. Bold type denotes first place within each category.	Business Winstone 2004 BatteryMark (hr:min)	SYSMARK 2004			3D BENCHMARK TEST		GAMING TESTS			
		Office Productivity	Internet Content Creation	OVERALL						
					3DMark05		Doom 3		Halo	
Resolution ▶					1,024 x 768	Native	1,024 x 768	Native	1,024 x 768	Native
Anti-aliasing/anisotropic filtering ▶					0X/0X	4X/8X	0X/0X	4X/8X	2X/2X	4X/8X
MAINSTREAM										
Fujitsu LifeBook N3510	2:45	121	143	132	791	N/A	18.2	N/A	22.6	N/A
HP Pavilion dv4000	3:17	112	154	131	163	N/A	3.9	N/A	8.2	N/A
Sony VAIO VGN-FS570	2:05	130	159	144	213	N/A	3.7	N/A	10.6	N/A
Toshiba Satellite A75-S231	1:58	120	183	148	N/A	N/A	6.1	N/A	8.6	6.9
HIGH-END										
Dell Inspiron 9300	3:15	113	175	141	2,916	1,282	76.7	N/A	69.8	28.6
Fujitsu LifeBook N6010	2:01	111	175	139	1,299	N/A	22.9	N/A	28.4	14.1
Gateway M680XL	5:11	123	193	154	2,432	819	45.2	N/A	49.0	24.0
Sony VAIO VGN-A690	2:15	107	169	134	1,247	272	22.6	N/A	28.4	10.7
Toshiba Qosmio G25-AV513	1:59	119	173	145	2,472	1,421	64.5	N/A	61.0	42.9
MINI										
Fujitsu LifeBook P1000	3:28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toshiba libretto U100	3:57	88	105	96	N/A	N/A	N/A	N/A	N/A	N/A

RED denotes Editors' Choice. N/A—Not applicable: The notebook could not complete the test. The Apple PowerBook G4 and the OQO model 01 are not listed here because they could not run our tests.



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Fujitsu LifeBook P1000

and the 256MB of included RAM is skimpy. Though we couldn't run SYSmark, we observed notable wait times when booting up, opening applications, and opening multiple browsers. BatteryMark results were good at 3 hours 28 minutes, but inferior to the libretto's 3:57.

The P1000 costs less than the libretto, but you get only a 30GB hard drive—the libretto's is twice the size. The P1000's wireless is only 802.11b, and its two USB ports are 1.1, not the speedier 2.0. A VGA port is available only through a dongle—not the best solution, as dongles are too easily lost. The system comes with an external floppy drive. A USB CD-RW/DVD-ROM drive costs \$152 more.

The Fujitsu LifeBook P1000 hasn't been updated in the past year, so it could use some fine-tuning. In the meantime, the Toshiba libretto U100 is a better bet.

OQO model 01



OQO model 01

1.0-GHz Transmeta Crusoe TM5800, 256MB DDR, 20GB hard drive, 8MB Silicon Motion Lynx3DM, 5.1-inch LCD, 0.9 pounds, 802.11b, one USB 1.1, one FireWire, Windows XP Pro, \$1,999 direct. OQO, www.oqo.com. ●●●○○○

For a Windows XP PC that doesn't weigh much more than a PDA and won't be used for heavy-duty typing or computing, the model 01 is a worthy contender. But the tiny screen, USB 1.1 connectivity, 802.11b wireless, and difficult navigation may encourage you to look elsewhere.

The model 01 measures 4.9 by 3.4 by 0.9 inches (HWD) and weighs just under a pound. Its 5.1-inch widescreen LCD (800-by-480 resolution) is remarkably viewable except in direct sunlight, but is hard on the eyes after a while. A sensor automatically adjusts screen brightness, and a removable slip-on cover protects the screen.

Sliding the screen up reveals a thumb keyboard with an oversize TrackStik and mouse buttons stacked to the left. The model 01 includes a digital pen for maneuvering through windows. Unfortunately, the imprecise stylus makes navigation tough.

The 1-GHz Transmeta Crusoe TM5800 processor and Silicon Motion Lynx3DM graphics chip combo wouldn't run our benchmark tests, but Office and Web surfing performance seemed fine, until we ran several applications at once. OQO says the battery should last 2 to 3 hours.

The model 01 has one USB 1.1 port, a FireWire port, built-in 802.11b wireless, and Bluetooth. There are no speakers, just a headphone jack. We marveled at the cable that attaches to the included dock—a single trunk giving FireWire, power, USB, audio-out, and monitor ports (up to 1,280-by-1,024 resolution).

The OQO model 01 could appeal to salespeople who need a scaled-down PC for running custom CRM or inventory applications on the road.

Toshiba libretto U100

1.2-GHz Pentium M 753 ULV, 512MB DDR, 60GB hard drive, 64MB Intel 82855 GME, 7.2-inch LCD, 802.11g, 2.1 pounds, DVD±RW (dock), two USB 2.0, one FireWire, Windows XP Home, \$2,099 list. Toshiba America Inc., www.toshiba.com. ●●●●○



The Toshiba libretto was ahead of its time when it made a brief U.S. appearance in 1997. Lately, however, a flock of minis have paved the way for its return. This time around it's the 2.1-pound libretto U100, which packs a great screen, a big hard drive,

and a battery that lasts. It's great for meeting notes, downloading e-mail, listening to MP3s—even creating PowerPoint presentations. We wish its ergonomics were better, but it's still the best multimedia mini.

The libretto U100 is just 8.3 by 5.7 by 1.2 inches (HWD). The keyboard takes some getting used to, but we were able to pull off short e-mails with practice. It has a pointing stick instead of a touchpad; this is fine, but it's between the mouse buttons, making two-handed navigation more comfortable than our usual one-handed style.

The libretto's 7.2-inch widescreen is by far the biggest of the minis, and thanks to Toshiba's TruBrite technology it's nice and bright. Its 1,280-by-768 resolution is great for DVDs, but tough on the eyes because



Toshiba libretto U100

the text and icons in Microsoft Word documents are very small.

There are two USB 2.0 ports, a FireWire port, a 10/100 Ethernet port, and a modem jack. The libretto's VGA-out capabilities require an easily misplaced dongle. It also has an SD slot and a PC Card slot for removable storage, built-in Atheros 802.11g wireless, and a switch to deactivate wireless. The hard drive's an impressive 60GB. A minidock is \$379.99 extra; it includes a built-in DVD±RW drive, perfect for watching DVDs on business trips.

The libretto came in at 3 hours 57 minutes on our BatteryMark tests. SYSmark scores were satisfactory, with the system's 1.2-GHz ULV Pentium M processor and 512MB of RAM.

If you need something small to keep you caught up while on the go, the libretto should be your tiny notebook of choice. ▢

OUR CONTRIBUTORS: Bill Howard is a contributing editor. Features editor Sean Carroll and lead analyst Cisco Cheng were in charge of this story.

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TRAVEL

HOME CONTACT

Paris, France
Champs-Élysées

No other city in the world can boast an avenue as magnificent as the 1 mile Champs-Élysées – at least that's what the French claim. The boulevard, laid out according to plans by Le Mûre, the landscape architect famous for his designs for Versailles, runs in a straight line from the Tuilleries Gardens, through the former marshlands and up the slope to the Arc de Triomphe at Place Charles-de-Gaulle/Étoile. The platform on top of the arch affords a magnificent view along the extension of the "voie royale" to La Défense to the west and towards the Louvre in the other direction.

Architectural highlights along the Champs-Élysées include the Grand Palais and Petit Palais museums, built for the 1900 World Exhibition, and the French president's official residence: the Élysée Palace. These are complemented by a series of impressive administrative buildings constructed in the Belle Époque style of the early 20th Century, the area in which the Champs-Élysées became a fashionable place, where everyone went to see and be seen. Nowadays, the area is dominated by commonplace boutiques, chain restaurants, ice-cream parlors, cinemas.

Paris, France
Champs-Élysées
Eiffel Tower
Galerie Lafayette
Louvre
Montmartre
Musée d'Orsay
Notre-Dame
Latin Quarter
Disneyland Paris
Paris – The City of Love

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Composite	2016.42	+ .67
Banks	3017.16	+ 2.89
Biotech	662.51	+ 2.55
Computer	899.90	+ .05
Financial	3653.61	+ 5.74
Industrial	1716.02	- .53
Insurance	3323.04	- 7.48
Telecommunications	183.17	- .32
Transport		

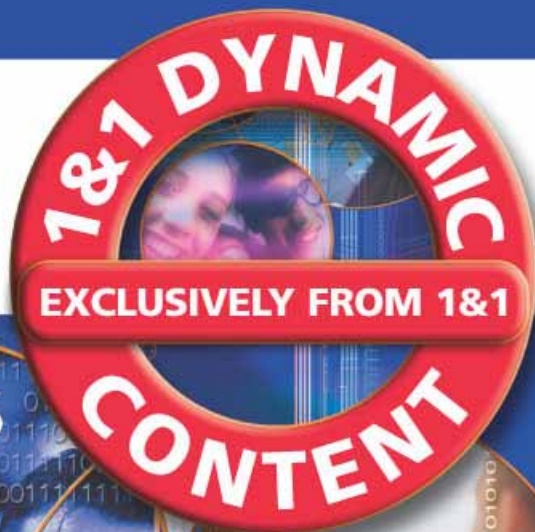
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Name	Close	Change
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Banks	3017.16	+ 2.89
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Financial	3653.61	+ 5.74
Industrial	1716.02	- .53
Insurance	3323.04	- 7.48
Telecommunications	183.17	- .32
Transport		

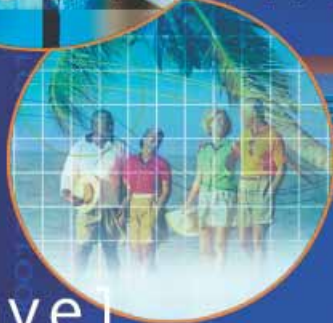
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Medicine



Politics



Travel



Weather



Culture

Paris, France

Champs-Élysées

No other city in the world 1 mile Champs-Élysées – boulevard, laid out accord architect famous for his d from the Tuilleries Garden the slope to the Arc de Tri The platform on top of the extension of the "voie roy the Louvre in the other di

Architectural highlights along Palais and Petit Palais must the French president's office complemented by a series d constructed in the Belle Épo which the Champs-Élysées went to see and be seen. N commonplace boutiques, of the offices of international a

Paris, France
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Travel

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Top-Seeded Huskies to Meet Louisville

The Washington Huskies got an early start on playing at another level. The Huskies flew to Albuquerque, N.M., the site of their regional semifinal against Louisville, on Monday to get accustomed to the city's 5,314-foot altitude. The team normally would have left campus a day later to prepare for Thursday's game, but coach Lorenzo Romar wanted his players to build up their endurance.

Arizona St. Shocks Notre Dame 70-61

Arizona State's aggressive defense, timely shooting and gritty determination earned the Sun Devils that coveted trip home for the Tempe Regional.

AP Photo – GARY KAZANJIAN

NFL Committee Makes 19

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Monday, April 18, 2005

Temperature: 62° **Weather:** partly sun

Wind: 2 mph **Wind Direction:** NW

Chance of Precipitation: 10% **UV Index:** 3

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A screenshot of an 'Order Form' template. It features a pink header with the title 'Order Form'. Below the header are several input fields for user information: Name (Chris Myers), Address (945 Newbury Street), City (Boston), State (MA), ZIP (02116), and E-mail (ChrisM@myhost.com). At the bottom, there is a checkbox labeled 'Digital camera' and an 'Order!' button.

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■ Logfiles	✓	✓
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■ Chat channels	1	1
■ 1&1 WebStatistics	✓	✓
SITE-BUILDING TOOLS		
■ 1&1 Dynamic Content Catalog	✓	✓
■ PDF2Web Converter	✓	✓
■ DynamicSiteCreator	✓	✓
■ Graphic archive	✓	✓
■ WebsiteCreator	12 pages	12 pages
■ Software suite worth \$600	✓	✓
■ FrontPage extensions	✓	✓
■ CGI library	✓	✓
■ Active Server Pages	–	✓
DOMAIN NAMES		
■ Included Domains	1	1
■ Subdomains	10	10
■ Run multiple independent sites	✓	✓
■ Full DNS management	✓	✓
E-MAIL		
■ E-mail accounts w/ 1 GB space each	200	200
■ Aliases, auto-responders, forwarding	✓	✓
■ 1&1 WebMail	✓	✓
■ Spam filtering for all accounts	✓	✓
■ Virus protection for all accounts	✓	✓
SECURITY FEATURES		
■ Protected by up-to-date firewall	✓	✓
■ Daily backups	✓	✓
■ Password protected directories	✓	✓
■ Dedicated SSL Certificate	optional	optional
SUPPORT		
■ 24/7 phone support	✓	✓
■ 24/7 e-mail support	✓	✓



– Linux packages



– Microsoft packages

BUSINESS PACKAGE

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INCLUDES 3 DOMAINS

PACKAGE FEATURES		
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■ Monthly transfer volume	50 GB	50 GB
■ FTP accounts	5	5
■ 1&1 Control Panel	✓	✓
■ Logfiles	✓	✓
MARKETING TOOLS		
■ Chat channels	5	5
■ 1&1 WebStatistics	✓	✓
■ In2site Live Dialogue	✓	✓
■ 1&1 Newsletter Tool	✓	✓
■ 1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
■ 1&1 Dynamic Content Catalog	✓	✓
■ PDF2Web Converter	✓	✓
■ DynamicSiteCreator	✓	✓
■ Graphic archive	✓	✓
■ WebsiteCreator	18 pages	18 pages
■ Software suite worth \$600	✓	✓
■ FrontPage extensions	✓	✓
■ CGI library	✓	✓
■ Active Server Pages	–	✓
■ Perl, PHP3, PHP4, and PHP5	✓	–
■ 1&1 WebDatabase	✓	✓
■ Database	1 MySQL	MS Access
■ Cron Jobs	✓	–
■ SSI (Server side includes)	✓	✓
DOMAIN NAMES		
■ Included Domains	3	3
■ Subdomains	50	50
■ Run multiple independent sites	✓	✓
■ Full DNS management	✓	✓
E-MAIL		
■ E-mail accounts w/ 1 GB space each	500	500
■ Aliases, auto-responders, forwarding	✓	✓
■ 1&1 WebMail	✓	✓
■ Spam filtering for all accounts	✓	✓
■ Virus protection for all accounts	✓	✓
SECURITY FEATURES		
■ Protected by up-to-date firewall	✓	✓
■ Daily backups	✓	✓
■ Password protected directories	✓	✓
■ SSH Secure Shell Access	✓	–
■ Dedicated SSL Certificate	optional	optional
SUPPORT		
■ 24/7 phone support	✓	✓
■ 24/7 e-mail support	✓	✓

DEVELOPER PACKAGE

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INCLUDES 5 DOMAINS

PACKAGE FEATURES		
■ Web space	4,000 MB	4,000 MB
■ Monthly transfer volume	100 GB	100 GB
■ FTP accounts	25	25
■ 1&1 Control Panel	✓	✓
■ Logfiles	✓	✓
MARKETING TOOLS		
■ Chat channels	10	10
■ 1&1 WebStatistics	✓	✓
■ In2site Live Dialogue	✓	✓
■ 1&1 Newsletter Tool	✓	✓
■ 1&1 WebElements	✓	✓
SITE-BUILDING TOOLS		
■ 1&1 Dynamic Content Catalog	✓	✓
■ PDF2Web Converter	✓	✓
■ DynamicSiteCreator	✓	✓
■ Graphic archive	✓	✓
■ WebsiteCreator	25 pages	25 pages
■ Software suite worth \$600	✓	✓
■ FrontPage extensions	✓	✓
■ CGI library	✓	✓
■ Active Server Pages	–	✓
■ ASP.NET, .NET Framework	–	✓
■ Perl, PHP3, PHP4, and PHP5	✓	–
■ 1&1 WebDatabase	✓	✓
■ Database	3 MySQL	MS Access, MS SQL
■ Cron Jobs	✓	–
■ SSI (Server side includes)	✓	✓
■ Perl Script Output Monitor	✓	–
■ Perl Syntax Checker	✓	–
DOMAIN NAMES		
■ Included Domains	5	5
■ Subdomains	200	200
■ Run multiple independent sites	✓	✓
■ Full DNS management	✓	✓
E-MAIL		
■ E-mail accounts w/ 1 GB space each	1,000	1,000
■ Aliases, auto-responders, forwarding	✓	✓
■ 1&1 WebMail	✓	✓
■ Spam filtering for all accounts	✓	✓
■ Virus protection for all accounts	✓	✓
SECURITY FEATURES		
■ Protected by up-to-date firewall	✓	✓
■ Daily backups	✓	✓
■ Password protected directories	✓	✓
■ SSH Secure Shell Access	✓	–
■ Dedicated SSL Certificate	✓	✓
SUPPORT		
■ 24/7 phone support	✓	✓
■ 24/7 e-mail support	✓	✓

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- Intel Pentium 4, 2.4 GHz
- 1,024 MB DDR-RAM
- 80 GB IDE hard drive
- 1,200 GB monthly transfer volume

\$89 PER MONTH

\$99 PER MONTH

\$109 PER MONTH

SERVER III

- Intel Pentium 4, 3.06 GHz Processor with Hyper-Threading
- 2,048 MB DDR-RAM
- 120 GB IDE hard drive
- 1,500 GB monthly transfer volume

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\$129 PER MONTH

\$149 PER MONTH

\$99 one-time setup fee

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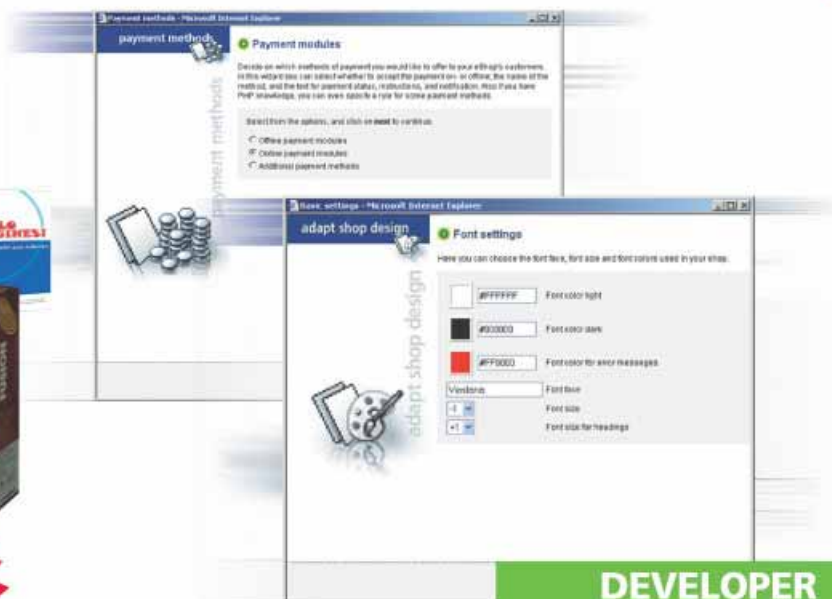


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PORTABLE MUSIC PLAYERS

more room to rock

- ● ● We review ten groovy new hard drive audio players to carry your tunes. Here you'll find old reliables as well as brand-spanking-new models for every type of music lover.

You can distill the current fleet of hard drive audio players into a single phrase: More for your money. Prices have fallen steadily while storage capacity has risen dramatically over the past year, making 60GB and larger players a reality. Many players out there also double as photo viewers, recorders, and USB storage devices. But the success of no-frills music players such as the outrageously popular Apple iPods and the competitors from Creative, Dell, and Rio demonstrate that music is the main ingredient. And that's where we've put our focus in choosing devices and running them through our array of audio tests.

Over the past several years, our reviews have evolved into a more critical look at audio performance. Although our barrage of testing revealed some newfound audio flaws in some of the most popular players, the majority of the devices in this roundup are outstanding—especially in the small hard drive category. This area has become very competitive recently, since people are attracted to the roomy storage capacity and advanced features in a small and light package.

● ● by Bill Machrone ● ● photography by Thom O'Connor

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Small hard drive players are beginning to trump flash-based MP3 players for taking tunes on the road. Flash players do have their advantages, such as their tiny size—perfect when you're working out or commuting. But we've decided to cover hard drive players exclusively in this story because they represent the best combination of value, features, audio quality, and now, portability.

Small hard drive players are designed for people who want little devices that can store a good chunk of their music collections. (A 5GB player can store over 1,000 songs.) Large hard drive players are for folks who want to store most or all of their music collections and don't mind carrying a little extra weight. Many owners of large hard drive devices also use them to replace USB devices, storing documents, photos, and other data on them.

Another consideration is which online music store, jukebox, or subscription service you prefer. Apple has done a fine job of integrating the iPod and iTunes music store to make downloads almost effortless. But if you're not a fan of iTunes and would rather use Musicmatch, Real Rhapsody, or another online service, a non-Apple product will suit your needs better.

Our discussions with readers have shown that they're using their digital audio players for more than just commuting or working out. They're spending serious money on earphones, connecting players to high-end home stereos and car systems, and downloading their entire music collections to them. Accordingly, we've made our audio testing far more stringent, with both critical listening and an instrumented suite of test tones.

All these players can play loud enough to cause hearing damage, and we tested their in-ear loudness with a sound level meter coupled to an accurate rubber model of a human ear. If you listen to music in noisy environments, you should invest in noise-canceling headphones rather than cranking up the volume. (For more on noise-canceling headphones, see After Hours, page 152.)

The extras that manufacturers are building into their players can often seal the deal. If you travel with a digital camera, for instance, a player that is also a USB host, such as the Gateway MP3 Photo Jukebox or the Samsung YH-925, lets you empty your camera's memory onto the player's hard drive. And companies are offering greater compatibility for audio formats such as Audible (for listening to audio books) and WMA, including players that are certified by Microsoft's PlaysForSure to interoperate with its DRM.

Some players have FM radio, which can be a refreshing alternative to your music if you walk, jog, or commute by train. Players that can record voice are handy for audio note taking and are rapidly replacing cassette tape recorders.

Battery life has improved on all the players, and those that we tested can outlast a coast-to-coast plane flight or several days of commuting. A feature we like in players is a user-replaceable battery or one that can be recharged from the USB port.

Considering all of the excellent choices, picking the right MP3 player is not easy. The good news is that the following pages contain the information you need to make the right choice. So are you ready to rock—or bop, or boogie, or shake, or . . . you get the idea.

small hard drives

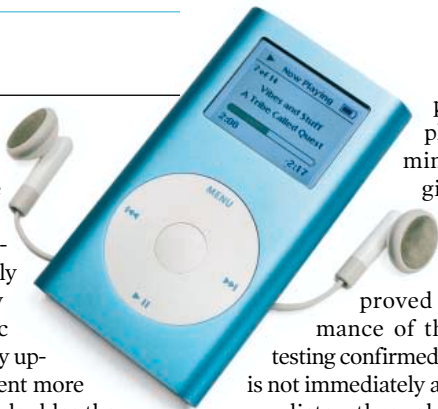
Apple iPod mini

6GB, \$249 direct. Apple Inc., www.apple.com. ●●●●●



We liked the original Apple iPod mini for its superior ergonomics, easily readable screen, jazzy colors, and good music performance. This timely upgrade gives you 50 percent more storage with more than doubles the battery life (up to 18 hours), and comes in vibrant new colors. Although our new tests found some audio flaws, the iPod mini is nonetheless a fine player worthy of the hype—and an Editors' Choice.

The new iPod mini's features are mostly unchanged, except for one cute addition: It automatically pauses when you pull out the earphone plug. That makes a nice counterpoint to the automatic start when you insert the earphone plug. The alarm is louder, too, but still hard to hear in anything other than a quiet room. Unlike other players here (such as the iriver H10 and Rio Carbon Pearl), the iPod mini still does not include FM radio or voice recording.



Apple iPod mini

In the past, audiophiles have complained that the iPod mini just doesn't give them enough kick at the low end. Although Apple has improved the bass performance of the iPod mini, our testing confirmed this. The extra bass is not immediately apparent unless you listen through something other than the stock earbuds.

From 30 Hz on up (the range where most music lies), the iPod mini is in full control, reproducing sound cleanly and accurately. And unlike some other players, the iPod mini remains largely clean with the equalizer (EQ) on. What increased harmonic distortion we did see was well within acceptable limits.

The 6GB iPod mini is a worthy upgrade to a wildly popular player. With the addition of an FM receiver and perhaps a recording function, it would be perfect.

Creative Zen Micro

5GB, \$200 direct. Creative Technology Inc., www.creative.com. ●●●●●



After nearly nine months in a fast-moving market, the Creative Zen Micro is wearing its age very well—in its nine different colors. We are pleased with its audio performance, ease of use, drag-and-drop file management, and nonproprietary USB cable. And the FM radio and voice recording are icing on an already tasty cake. Thus it shares an Editors' Choice with the Apple iPod mini in this category.

The touch controls are not as intuitive as those of the iPod mini. But Creative has overcome early reliability issues with the controls. And the monochrome screen remains the second-most legible monochrome, behind the iPod's.

The Zen Micro syncs with Outlook, so you can carry read-only versions of your tasks, calendar, and to-do list. The FM



Creative Zen Micro



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radio is good when signals are strong. Voice recordings are low-bit-rate ADPCM files and easily overloaded but handy for audio note taking.

When we turned on the EQ, we found the same flaw that bedevils many other players: large amounts of harmonic distortion, which was clearly audible and clearly visible on our spectrum analyzer. The Zen Micro has another audio trick up its sleeve, however: Smart Volume. Creative describes this as an automatic volume manager that keeps the volume uniform from song to song, but it does much more. It removed virtually all the harmonic distortion from the EQ settings. As long as you keep Smart Volume on, distortion is not a problem, but it may reduce battery life.

Along with the Rio Carbon Pearl, the Zen Micro is still a value leader among small hard drive players.

Small hard drive | Apple iPod mini and Creative Zen Micro

Large hard drive | Apple iPod



Selecting the Editors' Choices among the small hard drive players was no easy task: Every player was exceptional in its own way. Most of the flaws we found were relatively minor or easily remedied. But we decided that the Apple iPod mini and the Creative Zen Micro should retain the Editors' Choices we had previously bestowed on them. Kudos to Apple for making a great player even better. The new version bumps the capacity of the iPod mini to 6GB, increases the battery life, and offers new funky colors—all at a lower price. Not to mention the excellent user interface and integration with iTunes.

The Creative Zen Micro is also deserving as a true alternative to the iPod mini. It has more features than the iPod mini, including an FM radio, voice recording, and Outlook syncing. Its file management utility is easy to use, and its Smart Volume feature fixes most of the audio problems with its EQ settings. Although its navigation takes some getting used to, it's a full-featured, user-friendly player that comes in many cool colors.

In the large hard drive category, the decision wasn't as difficult. The Archos and Dell entries are good players, but the Apple iPod has yet to be dethroned. The fourth-generation player is not much different from the third-gen one, but it doesn't need to be. So the kabillions of iPod owners bebopping around with white wires poking out of their ears can feel assured that the iPod is not just a status symbol. It's also a darn good player.



Gateway MP3 Photo Jukebox

6GB, \$249 direct. Gateway Inc., www.gateway.com.



Considering that Gateway originally had no background in portable audio devices, the Gateway MP3 Photo Jukebox is a surprisingly good music player. With the upgrade from 4GB to 6GB, it becomes a viable choice for storing a large

portion of your music collection.

The Photo Jukebox is well constructed and has nice controls. The battery is user-replaceable, and the hard drive is better cushioned against shock than in some other players. An included drawstring pouch protects the player.

With the provided cable, the Photo Jukebox can off-load photos from most digital cameras without a PC. You can store pictures in the Upload folder for transfer to your PC or move them to the Pictures fold-

er and view them on the color screen. You can also download JPEG images, but the color screen is lackluster and doesn't let you zoom or pan.

In testing, we were pleased with what we heard when we loaded our music files. On our spectrum analysis, harmonic distortion, and other tests, the Photo Jukebox passed with flying colors. Its EQ presets are subtle and don't introduce any appreciable harmonic distortion. It is not as loud as some players, but it still managed 102-dB peaks

Gateway MP3 Photo Jukebox

SUMMARY OF FEATURES

Small Hard Drive Players

Download this table at www.pcmag.com

■ YES □ NO	Apple iPod mini	Creative Zen Micro	Gateway MP3 Photo Jukebox	iriver H10	Rio Carbon Pearl
Price (direct)	\$249	\$200	\$249	\$249	\$199
Dimensions (HWD, in inches)	3.6 x 2.0 x 0.5	3.3 x 2.0 x 0.7	3.8 x 2.3 x 0.7	3.8 x 2.1 x 0.6	3.3 x 2.5 x 0.6
Weight (ounces)	3.6	3.8	3.4	3.5	3.2
Color display	□	□	■	■	□
Storage capacity	6GB	5GB	6GB	5GB	5GB
Rated battery life (hours)	18	12	10	12	20
Playback formats	AAC, AIFF, Audible, MP3	MP3, WMA	JPEG, MP3, WMA	Audible, JPEG, MPEG, MP3, TXT, WMA	MP3, WMA
Microsoft PlaysForSure supported	□	■	■	■	■
FM radio	□	■	□	■	■
Voice recording	□	■	□	■	■
Software included	iTunes	Creative MediaSource	Windows Media Player 10, Gateway Firmware Update Utility, Napster Client 3.0.3.7	iriver firmware	Rio Music Manager
Compatible with Mac OS	■	□	□	□	■
Accessories included	AC adapter, belt clip, earbuds, USB cable	AC adapter, belt clip, earbuds, USB cable	AC adapter, earbuds, soft-cover bag, USB cable	AC adapter, case (with belt clip), USB cable	AC adapter, case, earbuds, USB cable

RED denotes Editors' Choice.



through the provided earbuds on our standard rock loudness test track.

If you're searching for a top-notch music player with clean sound and some extras, the Photo Jukebox is worth a look.

iriver H10

5GB, \$249 direct. [iriver America, www.iriver.com](http://iriver.com).



With its color screen, touch scroll, and slim case, the iriver H10 is a pleasure to use, marred only by the poorly designed forward/pause/back buttons on the side. With an FM receiver, excellent audio recording, and a photo viewer, the H10 does more than much of its competition.

Contrast and brightness on the color screen are very good, but it is unreadable once the backlight goes off. The FM radio is easy to use, letting you record from FM, too.

The quality of voice recording at medium and high settings is remarkably good. The H10 records directly to MP3 and can record line-in audio as well as audio from its built-in microphone.

You can download photos to the H10 from a PC, but the screen is small and the resolution is low.

You can also transfer and read text files. And the bat-

tery is removable and easily replaceable.

The vertically oriented touch surface controls menu navigation and volume, but you can't tap the surface to select an option. Three buttons on the side control forward, back, and stop playback. The buttons are almost identical to the touch, and we had to press carefully to get the right one.

Early versions of the H10 suffered from severe distortion with all EQ settings, but new firmware has cured this. Audio performance with or without EQ is clean. It includes SRS surround effects, but these detract from the audio quality.

Although somewhat more expensive than competitors, the H10 is a good value and delivers improved audio quality.

Rio Carbon Pearl

5GB, \$199 direct. [Rio Audio, www.rioaudio.com](http://rioaudio.com).



The Rio Carbon Pearl combines sleek good looks with top-notch audio performance and easy drag-and-drop file management. This makes for a pocket- and ear-pleasing audio player that also records voice.

The screen is small but highly legible, and you get two ways to navigate: with the rocker/center button or the side-mounted wheel. The voice recorder is adequate, and there's a digital stopwatch for timing your workout. The protective carrier is much improved, but the Carbon Pearl



Rio Carbon Pearl

feels so nice in your hand that you'll want to keep it out of the case all the time.

Our only complaint is with the menu structure. When we're playing a selection from a specific artist or album, we'd like to go back to that artist or album when pressing the menu button, not to the top of the music menu. It's only a couple of clicks to get back, but it's nonetheless an annoyance.

The Carbon Pearl navigated our audio obstacle course with aplomb, showing very low harmonic distortion until the last three notches on the 30-step volume control. At that point, harmonic distortion kicked in, but the unit was also delivering 105 to 110 dB through the earbuds, so we can't complain. Unlike with other players here, neither the Carbon Pearl's preset nor custom EQ settings introduce harmonic distortion.

Given the aggressive pricing of the Carbon Pearl, it's a very attractive and diminutive alternative to the iPod mini. By the time you read this, Rio will also have a 6GB version for \$229 direct.



iriver H10

Audio Format Glossary

AIFF (Audio Interchange File Format) Apple's answer to Microsoft's WAV. Encoding a file in AIFF is about as uncompressed as you can get. To save some space, try encoding your files in Apple's new Apple Lossless format instead, which offers identical quality at nearly half the size.

ATRAC3 (Adaptive Transform Acoustic Coding) Sony's proprietary audio format for compressing audio for use on its portable audio and MiniDisc players. ATRAC3's quality is comparable to an MP3 recorded at a bit rate of 128 Kbps.

Audible Audible.com's proprietary format for its audio books. Audible comes in four different formats. The first three vary in size, depending on the quality of the recording, while the fourth uses MP3 compression. The formats are also digitally protected.

AAC (Advanced Audio Coding) A proprietary compression codec that Apple uses for its iTunes music store. AAC also supports Apple's own DRM; purchased tracks from the iTunes Music Store are copy-protected. AAC also produces smaller file sizes than MP3 at the same quality.

FLAC (Free Lossless Audio Codec) Files compressed using the open-source FLAC suffer absolutely no quality loss—perceptible or otherwise—from the original recording. FLAC is not compatible with many players out there, though iAudio and Rio make compatible devices.

MP3 The most popular compressed music-sharing standard. Developed by the Fraunhofer IIS, MP3 uses psychoacoustic theories to achieve smaller file sizes. The higher the bit rate, the higher the quality. Files encoded at a bit rate of 160 or 192 Kbps sound close to CD quality.

MPC (Musepack) A lesser-known lossy audio compression codec. MPC offers superb quality when encoding audio at higher bit rates. Very few if any portable audio players support it, however. It's designed mainly for listening to music on a PC.

OGG (Ogg Vorbis) A lossy audio format similar to MP3. It's an open-source format that can produce files with better results than MP3. Although hardware support for this codec isn't as widespread, the format is quickly gaining popularity.

WAV A format developed by Microsoft and IBM for storing high-quality, uncompressed audio. WAV became the standard on PCs, but because of the large file sizes it requires (about 10MB per minute of music), most people convert WAV files to compressed formats (MP3, WMA, and so on) for transfer to portable audio devices.

WMA (Windows Media Audio) Windows' answer to MP3. Meant primarily as a streaming format, WMA uses smaller file sizes. Some WMA files contain built-in digital rights management to check the legality of your purchased music.

—David Murphy

large hard drives

Apple iPod

20GB, \$299 direct. Apple Inc., www.apple.com.

●●●●●



It's a platform, it's a social phenomenon, and it's a robust device with millions of satisfied users. Apple didn't do much new when it introduced the fourth-generation iPod, but it didn't need to. No one has yet beaten Apple at the portable audio player game. Even though we found some audio flaws after extensive testing, the iPod is still the best thing going for large hard drive players, retaining its Editors' Choice.

The integrated click wheel and buttons that work so well on the iPod mini are now on the full-size iPods, too. It's an improvement over separate buttons, and it keeps the iPod at the forefront of user-friendliness.

We also wonder why hardly anyone else can make a screen this readable. Only the Creative Zen Micro comes close among monochrome screens. The big iPods now recharge from USB, and battery life is up to around 12 hours.

Like some other players we tested, the iPod distorts, sometimes heavily, when you use the EQ settings. Harmonic distortion is minimal with no EQ, but at higher volume levels, most of the EQ settings showed audible distortion. When we couldn't hear it, we could see it plainly on our audio spectrum analyzer. As long as you don't use the EQ settings, you will have a fine listening experience.

Another reason to own an iPod is the slew of accessories. You can extend its capabilities with hardware and software to perform PDA functions, gaming, recording, wireless transmission, and more. Despite our carping about distortion, the human factors are still the best, and there's some excellent usability engineering in this fourth-generation player.



Apple iPod

Archos Gmini XS200

20GB, \$250 direct. Archos Inc., www.archos.com.

●●●●○

The Archos Gmini XS200 doesn't do any more or any less than an iPod or a Dell player, though it's smaller (and less expensive than the iPod). But we did uncover some sonic flaws, as well as some other shortcomings that brought its score down a bit.

The solid feel of the XS200 belies its 4.3-ounce weight, and the silver-painted metal case feels substantial and doesn't show fingerprints. The provided earbuds are slightly deficient in bass but comfortable. They also include a handy in-line volume control.

On the interface side, we like the Archos file system, because it doesn't require any special software to load on your PC. You just connect it and start copying songs. The player's ArcLibrary software indexes the songs by artist, title, album, genre, and year, and you can set it up to index automatically when you add songs. ArcLibrary also lets you build playlists on the fly and do file maintenance chores, although naming folders with the virtual keyboard is tedious.

The player showed distortion on some of its five EQ settings. The Rock and Techno settings are the worst, with clearly audible distortion, as well as muddy bass and hissy sibilants. Jazz and Classical are clean, and the five-band custom EQ setting is adequate as long as you don't push the sliders beyond the 4-dB boost.

The XS200 is one of the smallest 20GB players out there, offering a lot of music for the money. Although it has some sonic flaws (and no FM radio or voice recording), it's a good player for those who want lots of storage in a small package.

Dell DJ 30

30GB, \$239 direct. Dell Inc., www.dell.com.

●●●●○

When we reviewed the Dell DJ 30's predecessor, the DJ 20, it had just undergone a restyling into its sleek, flattened-aluminum-tube design that resists finger-



Dell DJ 30

prints and scratches. With an extra 10GB, the DJ 30 is an even better bargain if all you want is a solid, no-frills music player with lots of room for your music.

We found that the DJ 30's blue backlight reduces contrast and makes the display somewhat harder to read. It includes Dell's distinctive roller switch to scroll through menus. The roller is very easy to use, and there are no overshoot or sensitivity problems, which can affect touch-sensitive scrollers. The forward and back buttons have a well-implemented acceleration feature that scrolls through a file faster the longer you hold them. While a song is selected, a pop-up submenu lets you play it, view details, add it to a playlist, or clear it. There's also an alphabetic search function, handy if you get close to filling all 30GB.

When we subjected the DJ 30 to our usual gauntlet of audio tests, we found that it can play very loudly through the provided earbuds and that there's no appreciable harmonic distortion when the EQ is off, even at full volume. Most of the EQ presets, however, introduced significant distortion. The Rock preset was the worst, with clearly audible muffling of the music.

The DJ 30 is smaller and sounds better than the original. True to Dell form, it also has an inviting price for a 30GB player.

Samsung YH-925

20GB, \$299 list. Samsung Electronics America Inc.,

www.samsung.com.

●●●●○

The 20GB Samsung YH-925 has some nice features beyond the standard digital audio duties: It can record directly to MP3 from line sources at 160 Kbps; it has a bright, informative 1.8-inch color screen; it displays photos and slide shows. But for all these nice extras, the YH-925 has some annoying usability drawbacks—not to mention the poor audio performance.

The YH-925 requires you to install a dri-



Archos Gmini XS200



SUMMARY OF FEATURES

Large Hard Drive Players

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	Apple iPod	Archos Gmini XS200	Dell DJ 30	Samsung YH-925	Toshiba gigabeat MEG-F60
Price	\$299 direct	\$250 direct	\$239 direct	\$299 list	\$400 street
Dimensions (HWD, in inches)	4.1 x 2.4 x 0.6	2.9 x 2.3 x 0.7	4.0 x 2.5 x 0.7	4.2 x 2.4 x 0.7	4.1 x 2.5 x 0.8
Weight (ounces)	5.6	4.3	6.5	4.8	5.8
Color display	□	□	□	■	■
Storage capacity	20GB	20GB	30GB	20GB	60GB
Rated battery life (hours)	12	10	12	10	16
Playback formats	AAC, AIFF, Audible, MP3	MP3, WMA	MP3, WMA	Audible, JPEG, MP3, WMA	MP3, WMA
Microsoft PlaysForSure supported	□	□	□	■	□
FM radio	□	□	□	□	□
Voice recording	□	□	□	■	□
Software included	iTunes	ARCLibrary	Dell DJ Explorer, Musicmatch Jukebox 9.0	GraceNote Music Management	gigabeat room
Compatible with Mac OS	■	■	□	□	□
Accessories included	AC adapter, earbuds, FireWire cable, USB cable	AC adapter, earbuds, USB cable	AC adapter, case, dock, earbuds, USB cable	AC adapter, belt clip, case, earbuds, line-in cable, USB cable	AC adapter, earbuds with remote control, cradle, USB cable

RED denotes Editors' Choice.

ver on your PC. Without it, the player won't recognize music files that you transfer to it. But with the software installed, you can use Windows Media Player 10 to select and sync tracks. Navigation is excellent, with pop-up menus that let you add a track to the playlist, delete it, and perform other context-sensitive tasks.

Although we prefer a standard USB cable to the YH-925's proprietary cable,

it does let you connect a digital camera and copy photos to the player, as well as delete images from the camera's memory. On our tests, the

harmonic distortion was minimal while the EQ was off, but every other

setting unleashed a lot of distortion, easily detectable to the untrained ear. The YH-925 is also absurdly loud. With the earbuds, it

Samsung YH-925

had no trouble maintaining 105-dB levels on our classic rock test track, with 120-dB peaks.

Were it not for its audio problems, the YH-925 would be a desirable player. Iriver solved a similar problem with a firmware upgrade. We hope that Samsung will do the same in solving the problems of an otherwise promising player.

Toshiba gigabeat MEG-F60

60GB, \$400 street. Toshiba America Inc., www.gigabeat.com. ●●●○○○

The Toshiba gigabeat MEG-F60 will attract attention wherever you go. The huge color screen and the plus-shaped control surface stops gadget freaks dead in their tracks. It's got colorful screen wallpaper, eye-catching animations, and a silver-and-brushed-steel body. If only the audio delivered what the visuals promise.

The gigabeat packs 60GB into its nicely styled case, but our initial enthusiasm for the control surface was quickly dampened when we realized that it's just five touch-sensitive switches. And though the horizontal arms are touch sensitive, they are not pressure sensitive, meaning that pushing harder won't increase scroll speed. You can transfer music only through the dock. Each audio file transferred gains an SAT suffix when you transfer it to the gigabeat and is not playable on any other device.

The gigabeat is also a photo viewer, but you can transfer images to it only with Toshiba's provided software, gigabeat

room—and the photo browser never successfully scanned our hard drive or transferred images. You can back up your digital camera to the gigabeat, but only via the dock, and you can't view the pictures.

We'd forgive much of the above if the gigabeat were a great music player, but it's suitable only with the EQ turned off. Its harmonic distortion is worse than most, masking the music with layers of harmonics and adding wolf tones to our audio sweeps on many EQ settings. When the EQ is flat, however, the gigabeat is delightful, with clarity, expression, and good dynamics, suitable for driving your home stereo through its line-out jack.

Fortunately, virtually everything that's wrong with the gigabeat is in its firmware. A marathon session of tweaking and tuning would turn it into a really nice player. ■

**Toshiba gigabeat MEG-F60****more on the web**

Point your browser to go.pcmag.com/mp3players for expanded versions of the reviews found in this story and additional reviews of portable music players.

OUR CONTRIBUTORS: Bill Machrone is a contributing editor of PC Magazine. More on his audio testing is available at his home page, www.billsbest.com, and you can read his regular column at go.pcmag.com/machrone. David Murphy is an editorial intern at PC Magazine. Staff writer Erik Rhey was in charge of this story.

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infrastructure is required. **1100MP Lumens:** Based on ANSI/NAPM IT7.228-1997 tests of 58 units, December 2004, with average ANSI Lumens 2113. Lamp brightness degrades with usage. Dell recommends replacing your lamp after 2000 hours of usage (up to 2500 hours in Eco-mode). **Hard Drive:** For hard drives, GB means 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less. For hard drives, one TB = one trillion bytes; actual capacity varies with preloaded material and operating environment and will be less. **Mail-in Rebate:** Rebate coupon requests must be postmarked within 30 days of ship date and rebate checks are ordinarily processed within 8-10 weeks. See <http://www.dell.com/smallbizrebates> or call 1-877-773-3355 for rebate coupon and details. **Printer Toner Yield:** Laser monochrome print cartridge yield based on 5% page coverage; color print cartridge yield based on 20% page coverage. Yields vary with usage and environmental conditions. **Free 3-5 Day Shipping:** Free shipping is lowest cost (3-5 day) shipping. Valid for U.S. Small Business new purchases only. Available in Continental (except Alaska) U.S. only. To qualify for free shipping, minimum purchase thresholds may apply. Call or go online for details. Systems free shipping offers exclude Software and Peripheral (S&P) orders under \$59, all S&P orders placed by phone, and S&P orders placed in systems configurator pages. S&P free shipping offers apply to S&P orders purchased in the S&P Online store and/or by phone. Free shipping on S&P does not apply to S&P in the online system configuration pages, but can be combined with other offers. **Trademarks/Copyright Notices:** Dell, the stylized E logo, E-Value, Dimension, Inspiron, Latitude, OptiPlex, PowerEdge, Dell Precision, PowerConnect, CompleteCare, ExpressCharge, Tri-Metal and UltraSharp are trademarks of Dell Inc. Intel, Intel Inside, the Intel Inside logo, Intel Centrino, Intel Xeon, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Digital Light Processing, DLP, the DLP logo and the DLP medalion are trademarks of Texas Instruments. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. EMC is a registered trademark of EMC Corporation. ©2005 Dell Inc. All rights reserved.



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ONE-STOP SECURITY

ALL-IN-ONE APPLIANCES UNLEASH MULTIPLE FORMS OF THREAT PROTECTION FOR YOUR NETWORK, SIMPLY AND INEXPENSIVELY BY OLIVER KAVEN // ILLUSTRATION BY MICHAEL DELAPORTE

Just about everyone knows that security should be one of the top concerns for a company. Yet many small and medium-size businesses (SMBs)—particularly those that are strapped for cash—still approach security as an afterthought.

This continues to surprise us, because there's a simple answer for these businesses, one that costs under \$5,000 and requires little expertise or maintenance—security appliances.

There are various types of security appliances, but the ones we're talking about are called Unified Threat Management (UTM) appliances. They combine four key technologies in one box: a firewall, antivirus and antispyware protection, and either intrusion detection or prevention. Many include

and VPN capability as well. These appliances give businesses control over their assets without much of a hassle, and they take security to a level far beyond what a standard firewall can do.

These handy appliances are catching on; their sales grew 60 percent during 2004, and they now make up 12 percent of the overall security appliance market, according to IDC. Still, significant numbers of SMBs either outsource their security services or use separate solutions for each individual type of threat.

Greg Young, research vice president of network security for Gartner, believes it's only a matter of time before more businesses drop their traditional firewalls in favor of security appliances. They're just waiting for those firewalls to reach the end of their useful life, he says.

"The timing of refresh cycles for incumbent hardware is the biggest barrier to deployment right now for these appliances," Young says. "The typical refresh cycle for a firewall is three to five years. If you bought one in the last two years, it's hard to go back to the boss and say you need something else."

Typical all-in-one security devices cost

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between \$2,500 and \$5,000, and it is easy for qualified consultants, VAR workers, or full-time IT staff to set them up. The appliances can be conveniently configured to update themselves automatically, cutting down on management costs. And because all the services are packaged into one product, businesses can go to one manufacturer for customer support, instead of having to keep track of four.

Any company that chooses to go with an all-in-one security appliance should make sure its equipment is properly configured to match its infrastructure's needs. Only this will guarantee that the appliance will adequately keep the network secure. Also, any security solution should be accompanied by a clear set of company security policies. The SANS (SysAdmin, Audit, Network, Security) Institute is a great resource for getting started creating policies (www.sans.org/resources/policies).

MORE ON THE WEB

Point your browser to go.pcmag.com/securityappliances for more reviews of networking products and a sidebar on outsourcing your company's security needs.

UTM appliances aren't a fit for every SMB. Some choose security solutions à la carte because they want more control over which firewall, antivirus, antispam, and intrusion detection or prevention solution they use, instead of having the appliance manufacturer do the choosing for them. But many of the devices include best-of-breed services from the top manufacturers.

Other businesses may avoid appliances because they worry about having a single point of failure. Many of these devices,

however, provide automatic failover to a secondary unit. And companies that can't afford two devices can work with their VAR or the manufacturer to ensure that they have next-day replacement service on their appliance.

Still other businesses, which don't want any responsibility in managing their own networks, choose to outsource their security completely. More and more offerings are becoming available for these businesses, Young says. Providers such as AT&T and Vigilant Minds are catering "in the cloud" outsourcing for SMBs. Those security services are run on the premises of the provider, so there's no on-site equipment for the business to monitor. (For more on outsourcing, go to go.pcmag.com/securityappliances.)

Following are reviews of four UTM security appliances designed for businesses with fewer than 250 employees.

Astaro Security Gateway 220

\$4,035 direct. Astaro Corp., www.astaro.com.

●●●●●



The Security Gateway 220 is an impressive, medium-size appliance that has no user license limit and integrates an updated version of Astaro's stellar threat-management software, Astaro Security Linux (ASL). The software won our Editors' Choice last November, and the Gateway 220 earns our award in this roundup.

The Astaro 220 supports up to 280 Mbps throughput on the firewall, more than any other appliance here, and up to 105 Mbps throughput for the VPN. It also comes with eight 100-Mbps Ethernet ports, plus a 1.2-GHz Pentium III processor, 512MB of RAM, and a 40GB hard drive. This should offer plenty of space for all log file and reporting data.

The ASL software impresses us with its ease of use and attention to detail. In fact, it has satisfactorily addressed many of the gripes we had with the multifunction security appliances in our March 2003 roundup, such as quarantine queues that cannot be sorted or searched, or units that lacked IDS (Intrusion Detection).

Built on a mix of open-source and commercial components, the firmware provides six pillars of security for the network: a firewall, antivirus (Kaspersky Labs' engine), in-



ASTARO'S Daily Executive Report can be viewed in a browser, printed, or automatically e-mailed to the administrator.

trusion protection, content filtering, spam protection (provided by McAfee), and a VPN gateway. The full-featured firewall supports Network Address Translation (NAT), including source/destination NAT, IP masquerading, and load balancing. It provides very granular intrusion detection, with the ability to block suspect traffic. We like that the 2,000-plus rules are grouped in service categories, and that administrators can observe which rules are being triggered by violations—very helpful in troubleshooting bad traffic. The firmware includes several proxy servers—an HTTP cache proxy, a SOCKS proxy, and an SMTP relay with anti-spam and AV, just to name a few.

A new firmware addition with Version 5.2 is spyware protection, which blocks in-

coming spyware and adware and prevents malicious programs from sending confidential information outside of your network. The full-featured VPN endpoint allows for in-depth configuration and complete control over policies.

The Astaro 220's logging and reporting sections are equally outstanding: They offer querying, searching, sorting, and live log views. We especially like that the proxy queue, which holds questionable e-mails, can be searched by the sender, the receiver, or other free-form configurable strings to track down a message that might have been caught erroneously. In addition, the administrator can configure the system to send a daily spam digest to all users with valid e-mail addresses.

The appliance can send encrypted backups of its configuration files to the administrator on a set schedule. It also supports remote syslog and accounting. Remote management and user authentication against AD, LDAP, RADIUS, or SAM are further indications that the Astaro Security Gateway 220 is an extremely well-rounded, capable, and powerful product.

Fortinet FortiGate 200A

\$3,495 direct. Fortinet Inc., www.fortinet.com.

●●●●●

The Fortinet FortiGate 200A is a polished and mature solution with one drawback—it lacks an integrated spam quarantine. It's easy for Fortinet to justify this, because the company has another product, FortiMail, which quarantines spam. Nonetheless, we

believe an all-in-one security appliance such as the FortiGate should include this feature. (The SonicWALL Pro 2040 also lacks a spam quarantine.)

The FortiGate 200A includes a four-port switch, dual DMZ interfaces, and dual WAN ports for redundant Internet connectivity. It's loaded with options, including a DHCP server that can be configured



THE INTEGRATED setup wizard makes getting started with the Fortinet 200A straightforward.



on a per-interface basis, virtual domain support, granular routing, firewall scheduling, antivirus, antispam, and intrusion prevention.

The advanced feature set even includes DSCP (Differentiated Services Code Point), a model in which traffic is treated by intermediate systems with relative priorities based on the type of services. DSCP is essentially a combination of IP Precedence and Type of Service fields.

Setup is a snap, thanks to Fortinet's easy

setup wizard. Though it's not as extensive as SonicWALL's wizard, it worked flawlessly.

The integrated help system, a link to contact customer service, and the ability to have URL ratings reevaluated right from the management interface all demonstrate the maturity of Fortinet's products.

When it comes to antivirus support, Fortinet's proprietary solution has an edge over the competition: It's the only device in this roundup that supports push updates of virus signatures from the manufacturer. The other appliances can at best be configured to check for updates every hour.

Astaro Security Gateway 200



All the products in this roundup offer a strong set of features and are of high quality, but the Astaro Security Gateway 220 is our top choice among them: It has an extremely well-rounded set of features, the best-designed interface, and the most valuable reporting for the administrator. Daily executive reports, searchable logs, live logs, daily spam digests for each individual user, and a fully featured SMTP proxy gateway are among the unique features that impressed us.

Trailing close behind the Astaro were the appliances from Fortinet and ServGate. The ServGate, however, fell short in its logging and reporting features, and the Fortinet's lack of a spam quarantine hurt its overall rating. We believe that catching spam at the gateway is a more desirable option than tagging it and funneling it through your mail server to the individual user.

The Fortinet and ServGate appliances are both quite capable and would serve businesses well, but the Astaro Security Gateway 220 simply offers the most complete package, the most flexibility, and the best bang for the buck.

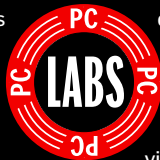
Although, as we mentioned before, Fortinet's spam solution lacks a quarantine, it does include complete analysis of incoming e-mail and goes beyond mere blocking based on RBLs. That's one step above SonicWALL's antispam solution.

Logging and reporting is extensive and configurable. But the unit does not have an internal hard drive, so you should log to an external destination. Fortinet offers a few choices to get around this. For one, you can purchase the company's FortiLog logging and reporting appliance. You can also get an external syslog server, or take advantage of the 200A's built-in WebTrends connector to link to a WebTrends analysis server.

The FortiGate 200A is undoubtedly an

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The rating for **setup and deployment** reflects all the steps needed to integrate each appliance into an existing or new network infrastructure. For **versatility and features**, we look at the feature set and options that allow for a flexible deployment in advanced networks, including gateway functions, available network topologies, and remote VPN connectivity. For **management interface**, we analyze each device's interface and how easily specific tasks can be completed. **Firewall, VPN, antispam, antivirus, and intrusion**



detection ratings reflect the implementation, quality, usability, and effectiveness of each respective feature. For **ongoing management**, we evaluate how easy it is to perform necessary, recurring maintenance tasks. The **logging and reporting** rating reflects the facilities the appliance provides to inform the administrator of system status, alerts, user activity, and common and hostile traffic patterns. Finally, the **overall** rating is not an average, but an aggregate based on analysis by PC Magazine Labs staff.

	Setup and deployment	Versatility and features	Management interface	Firewall	VPN	Antispam	Antivirus	Intrusion detection	Ongoing management	Logging and reporting	OVERALL
Astaro Security Gateway 220	●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●	●●●●●	●●●●	●●●●●	●●●●●
Fortinet FortiGate 200A	●●●●	●●●●	●●●●	●●●●●	●●●●	●●	●●●●	●●●●●	●●●●	●●●●●	●●●●
ServGate EdgeForce	●●●●	●●●●	●●●●	●●●●●	●●●●	●●●●	●●●●	●●●●●	●●●●	●●●	●●●●
SonicWALL Pro 2040	●●●●	●●●●	●●●	●●●●●	●●●●	●●●	●●●●	●●●●	●●●	●●●	●●●●

RED denotes Editors' Choice.



impressive appliance. The fact that some functions—spam quarantining, logging—require the help of additional equipment may lead some to choose Astaro's appliance instead. Still, the 200A offers an easy setup, integrated help system, and dual WAN ports. It will be a good fit for many small businesses.

ServGate EdgeForce

\$3,300 street. ServGate Technologies Inc., www.servgate.com. ●●●●●

This is a mature, well-organized security appliance, offering high-quality spam and virus protection from McAfee and Web-content filtering from SurfControl.

The EdgeForce offers two operational modes—routed and transparent. When it's in NAT routing mode, your internal network will typically be configured in a private IP address space, and the device's external interface will have a public IP address with access. When the device is in transparent mode, you can just “drop” the unit into any existing network; the EdgeForce acts like a bridge, requiring no routing or IP changes to the internal network.



SERVGATE'S Dashboard provides a good overview and 24-hour statistics of traffic and services.

This is a very useful feature that will tip the scale in favor of the ServGate for some.

Configuration is straightforward for those familiar with networking. We especially like the grouping feature, which allows administrators to group interface addresses. These groups can then be used during the configuration of firewall policies, providing for a less cluttered setup. The Astaro 220 has similar features.

A very nice feature is the schedule function, which allows the administrator to apply a time-based filter on certain firewall policies. It means you can let your employees browse the Web during lunch only, or automatically deny access to your

SUMMARY OF FEATURES

Security Appliances

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	Astaro Security Gateway 220	Fortinet FortiGate 200A	ServGate EdgeForce	SonicWALL Pro 2040
Price for unit, including antispam and antivirus for 50 users	\$4,035 direct	\$3,495 direct	\$3,300 street	\$2,995 direct
GENERAL				
Routable network port count	8	8	3	4
Unit can be configured for failover	■	■	■	■
MANAGEMENT AND INTERFACE				
Management access via HTTPS/SSH/local	■■■	■■■	■■■	■□■
User authentication through local/RADIUS/LDAP	■■■	■■■	■■■	■■■
System configuration can be downloaded/restored	■■	■■	■■	■■
SPAM FILTERING				
SMTP/POP3	■■	■■	■■	■□*
Message format/header analysis	■■	■■	■■	□□
Whitelist for e-mail domain/IP address	■■	■■	■■	□□
RBLs/reverse DNS lookup	■■	■■	■■	■□
SPAM HANDLING				
Message can be quarantined/blocked/marked	■■■	□■■	■■■	□■■
Quarantined messages can be forwarded to recipient	■	N/A	■	N/A
Notification to recipient/daily digest	■■	■□	■□	□□
ANTIVIRUS				
SMTP/POP3	■■	■■	■■	■■
FTP/HTTP	■■	■■	■■	■■
Virus can be cleaned/deleted/quarantined	■■■	■■■	■■■	□■■
Quarantined content can be forwarded to recipient	■	■	■	N/A
Notification to recipient	■	□	■	■
FIREWALL				
NAT route mode/bridge mode	■□	■■	■■	■□
NAT modes: One-to-One/One-to-Many/Many-to-One	■■■	■■■	■■■	■■■
Max throughput (in Mbps)	280	150	150**	200
VPN				
IPSec L2TP/PPTP	■■	■■	□■	■■
Max simultaneous tunnels/throughput (in Mbps)	500/105	200/70	500/30**	50/50
LOGGING AND REPORTING				
Logs activity for AV/Spam/VPN	■■■	■■■	■■■	■■■
Live logs available/Logs are searchable	■■	□■	□■	□□
Executive report summary	■	□	□	□
RED denotes Editors' Choice. N/A—Not applicable: The product does not have this feature. * Provides only RBL blocking. ** With optional performance module.				

FTP server at night.

The McAfee antivirus engine scans Web content (HTTP), mail (SMTP), Web-based e-mail, and FTP files; those files found to contain viruses can be quarantined or deleted. Administrators can also opt to have a file cleaned of the virus and then forwarded to its intended recipient.

The SurfControl Web-filtering module comes with a complete URL database containing billions of Web sites to block, based on dictionaries that group URLs by type, such as violence, gambling, or hate.

The combination of HTTP-virus and content scanning should stop most spyware from reaching internal PCs.

The built-in VPN supports IPsec and PPTP. Key exchange is provided by either IKE or RSA remote-public-key infrastructure.

We were extremely pleased to see that ServGate addressed some of the complaints we voiced in last year's review. It has fixed the most pressing problem, that the spam quarantine could neither be searched nor sorted, which made it virtu-

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ally impossible for administrators to locate a false positive in the queue. But we wish that ServGate would take the extra step and extend searching and sorting to the log engine as well.

All in all, though, the EdgeForce is impressive, with unique features such as its two operational modes and the firewall's time-based filters. It's a solid, well-organized appliance that will satisfy the needs of most SMBs.

SonicWALL Pro 2040

\$2,995 direct. SonicWALL Inc., www.sonicwall.com.



The SonicWALL Pro 2040 and its SonicOS have come a long way. The SonicOS, the 2040's underlying operating system, has been upgraded from dedicated firewall and VPN firmware to a full-featured UTM system.

In addition to its hardware-accelerated VPN, which can handle up to 50 simultaneous tunnels (ten VPN client licenses are bundled with the unit), the Pro 2040 now has built-in support for optional antivirus, antispam, and content filtering. The gateway AV service is provided by McAfee.

Spam protection is unfortunately limited to RBLs (Realtime Blackhole Lists), databases of known spammer IP addresses. Like the Fortinet appliance, the 2040 does not quarantine e-mail; it merely rejects mail from senders that match any

Time/V	Message	Source	Destination	Notes	Rate
05/12/2005 15:23:48.000	TCP connection dropped	62.23.171.1328	64.81.221.176.445	Port 445	0
05/12/2005 15:23:48.340	Web management request allowed	64.81.221.176	192.168.100.142	Web/HTTPS	0
05/12/2005 15:23:55.704	Web management request allowed	64.81.221.176.445	192.168.100.142	HTTP	0
05/12/2005 15:47:40.000	UDP packet dropped	202.85.173.5	64.81.221.176.1028		0
05/12/2005 15:48:17.528	UDP packet dropped	207.87.142.252	64.81.221.176.1028		0
05/12/2005 15:44:28.002	TCP connection dropped	64.81.38.283.4721	64.81.221.176.445	Port 445	0
05/12/2005 15:42:27.544	TCP connection dropped	64.81.88.248.2160	64.81.221.176.445	Port 445	0
05/12/2005 15:38:27.448	TCP connection dropped	64.175.227.151.3858	64.81.221.176.24	File Transfer (FTP)	0
05/12/2005 15:37:03.784	TCP connection dropped	64.229.205.135.4288	64.81.221.176.135	RPC Mapper	0
05/12/2005 15:18:59.768	UDP packet dropped	216.05.194.133.36787	64.81.221.176.1028		0
05/12/2005 15:11:13.000	TCP connection dropped	64.135.162.175.4811	64.81.221.176.445	Port 445	0
05/12/2005 15:08:29.350	TCP connection dropped	64.81.38.283.4095	64.81.221.176.445	Port 445	0
05/12/2005 15:03:20.206	TCP connection dropped	202.75.166.123.4378	64.81.221.176.135	RPC Mapper	0
05/12/2005 15:01:28.720	UDP packet dropped	210.27.234.5.3	64.81.221.176.1	Client/Executable Code 1	0
05/12/2005 14:52:12.240	TCP connection dropped	64.81.88.248.4057	64.81.221.176.445	Port 445	0
05/12/2005 14:51:11.208	UDP packet dropped	207.181.547.45.2513	64.81.221.176.1028		0
05/12/2005 14:49:18.880	UDP packet dropped	210.220.15.155.26984	64.81.221.176.1028		0
05/12/2005 14:42:42.240	TCP connection dropped	67.42.111.3026	64.81.221.176.135	RPC Mapper	0
05/12/2005 14:42:14.076	UDP packet dropped	209.23.175.175.1167	64.81.221.176.1428		0
		64.81.38.283.1715	64.81.221.176.445	Port 445	0
		64.81.221.176.136	64.81.221.176.136	LAN network 65.03.47.23.78.88	0
		64.81.38.283.4095	64.81.221.176.445	Port 445	0

SONICWALL'S log viewer highlights potentially dangerous traffic; it's a great tool for troubleshooting.

IP addresses in the RBL database.

A key design element to the 2040 is its operating system's object-based management approach. Like the Astaro and ServGate devices, the 2040 lets administrators define objects for ranges of network addresses, users, groups, and services. These objects can then be applied as design elements when creating policies, such as NAT policies, which determine how traffic flows between internal and external resources.

Another architectural aspect that makes the 2040 very flexible is its zone structure. Because it has multiple routable network ports, administrators can assign varying levels of privileges for different internal users by fine-tuning their access to any one of the four ports (X0, X1, and so forth) on

the device. Using zones and ports, they can even define a dedicated zone for their wireless network on a specific port and require IPsec via policy. This broadens the 2040's potential from a gateway device to a central security appliance in the network. But it also makes its administration slightly more complex.

The 2040 supports all common forms of NAT and allows administrators to create rules for one-to-

one, many-to-one, and even many-to-many mappings. For example, if you map one public-facing IP address to a private address on your internal network, you effectively keep a Web server accessible to the Internet but residing on your internal LAN. This is especially handy if you want to run more than one Web server using the same port 80 address.

To ease the pain of configuring complex networking tasks such as VPN setup, the 2040 includes a series of configuration wizards, which definitely simplify the process.

Overall, however, the Pro 2040 requires a higher administrative skill set than the Fortinet or ServGate appliances do. We recommend this device to businesses that have experienced IT administrators, need a flexible solution and solid VPN, and aren't concerned about quarantining spam. ■

Contributors // **Oliver Kaven** is a lead analyst at PC Magazine Labs. Executive editor **Stephanie Chang** was in charge of this story.

PERFORMANCE TESTS

HOW WE TESTED

The focus of our testing was the setup, installation, configuration, and ongoing management of the security appliances. In addition, we used Visionael Security Audit (www.visionael.com), a Nessus-based vulnerability-assessment tool, to identify common and critical security vulnerabilities that could afflict a business. (A review of Visionael Security Audit appears on page 62.)

We deployed the auditing tool on the same subnet that we had assigned to the WAN port of the appliances. We then configured the tool to test for standard Linux and Unix operating-system vulnerabilities, Web server and database server vulnerabilities, and the SANS (www.sans.org) Top 20 vulnerabilities.

Our testing did not reveal any security vulnerabilities in any of the products.

To determine how easily each of the units can be set up and integrated into a network environment, we deployed each one in a dedicated test network. We went through the same installation and configuration tasks that would confront any IT administrator in a small or medium-size business.



Our network consisted of two servers and two workstations, including an Apache-based Web server and a Lotus Notes-based SMTP server. We used Lotus Webmail for users' mail access. Our DNS servers were running Bind 9. We configured each appliance firewall to allow all traffic outbound, and to accept connections for the aforementioned services inbound.

FINDINGS

We were surprised that only two of the devices (the Astaro and ServGate) provide a spam-quarantine facility. We believe quarantining is the best solution, because it does not pass spam mail through to your mail server, and it gives granular controls over what e-mails are deleted or kept.

The appliances' firewall and antivirus capabilities worked in a more straightforward manner. Since a virus is a far greater danger to your network than any spam, we believe that flat-out blocking infected content is the safest procedure. The firewalls were all equally capable and freely configurable with regard to ports and services.—*Analysis by Oliver Kaven*

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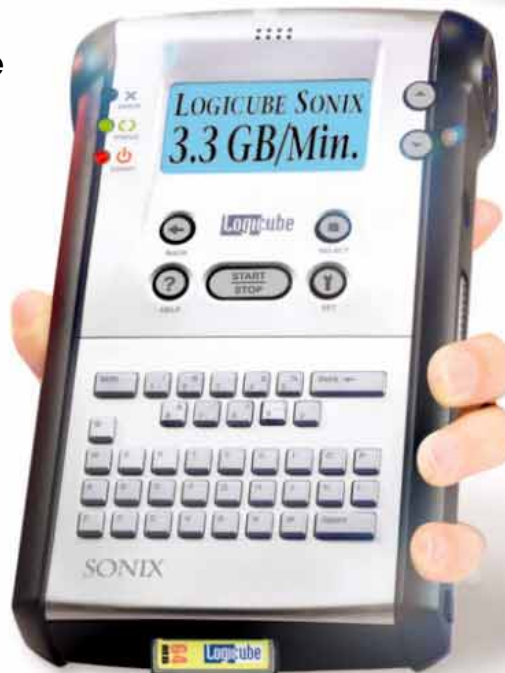
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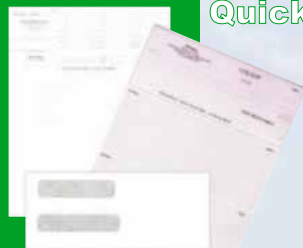
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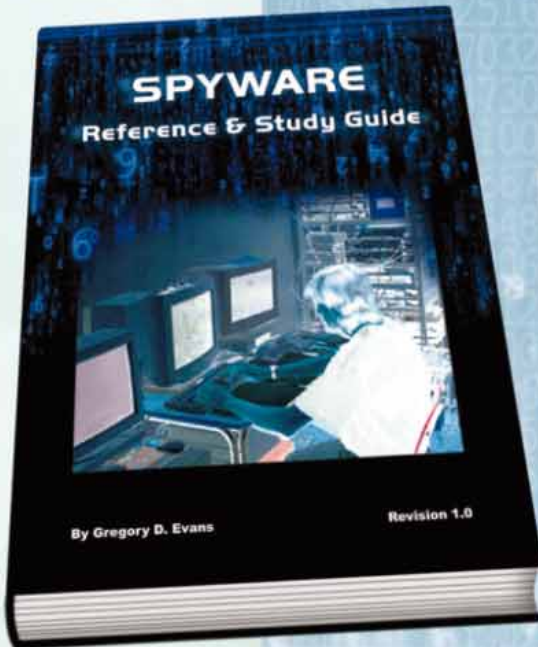
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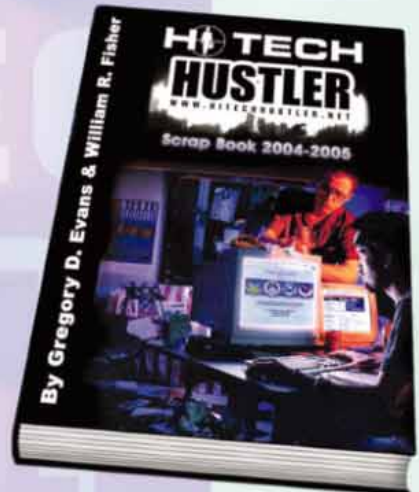
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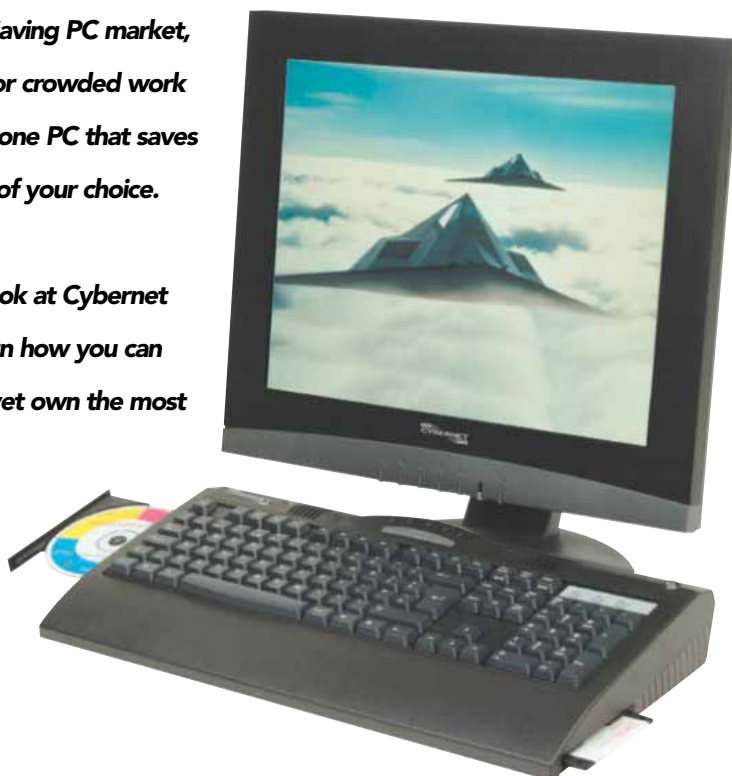
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AFTER HOURS

TECHNOLOGY ON YOUR TIME

C'mon, Kill the Noise!

BY BILL MACHRONE

Listening to music on your portable player in noisy environments can be a frustrating experience. If you turn up the volume to drown out background hubbub, the music will probably be louder than you like, and you also risk damaging your hearing. Noise itself is fatiguing, and the constant filtering that your brain must do to separate noise from music is equally tiring. The most obvious solution is to use earphones that block outside noise—traditional closed-back headphones or earplug-like ear-canal phones. But you can also reduce

unwanted sound with headphones that sample external noise and play an out-of-phase version of it, to cancel a portion of it. In practice, these phones also block noise passively with their closed-back designs.

We tested seven headphones and canal

phones in a controlled-noise environment to see what frequencies they reduced. We also conducted listening tests to see which head-

sets sounded best, using a high-end listening room with audiophile amplifiers and speakers as well as studio headphones to establish a baseline. We prefer listening levels at 80 to 85 dB, and set all of our earphone levels accordingly.

The *quieting* cited in the reviews is the worst-case average. The headphones' effectiveness varies greatly with frequency; they have almost no power to stop the lowest tones and vibrations, but all the units we tested reduce irritating high frequencies by 20 dB or more.

Bose QuietComfort 2

You can't open an in-flight magazine without seeing an ad for the Bose QuietComfort 2 (QC2) headphones. They really do work, and nothing outperforms them for sheer noise reduction. These headphones listen to your environment and subtract what they hear from what you hear. They even block noise well

without music: Turn them on while you're talking and you'll have the eerie experience of hearing the lowest octave of your own voice disappear. Noise isolation is excellent, but frequency response could be a lot smoother. Weakness in the low midrange leaves vocals sounding a little disconnected or hollow. After 6.3 kHz, high frequencies plummet 12 dB and more—a disappointment.

◀ Bose QuietComfort 2

The circumaural (covering the ear) design is very comfortable, and the QC2s are light, for closed-back headphones. The travel case is bulky but protects the headset well. A single triple-A battery slips into one of the ear cups. Bose supplies a quarter-inch adapter and a two-prong airline adapter. Sensitivity is low; you may have to turn your player up all the way. **Quieting:** 20 dB; **Frequency response:** Mid sag, high dive; **Comfort:** Excellent.

\$299 direct. Bose Corp., www.bose.com.

●●●●●

Etymotic ER6i

Etymotic has tuned these ear-canal phones for the iPod generation: The ER6i's have greater sensitivity and more bass than the ER6. They come with three-flange rubber eartips and foam eartips. Since a tight seal is critical to good bass performance, the

▲ Etymotic ER6i

foam tips were more effective and more comfortable. Foam eartips are a minor inconvenience, though, because you have to compress them with your fingers before inserting them, then wait until the warmth of your ear expands them. We prefer the Etymotic foam eartip material to that of the Shure E3c/E4c. Replaceable filters protect the drivers from ear wax and provide damping to smooth out peaks in the drivers' response.

The ER6i's are highly effective at blocking outside noise. We heard brilliant clarity throughout the audio range, but we had hoped for more bass. The ER6i's respond well to EQ, however, and a little bass boost or loudness compensation brings the bottom end into

◀ Sennheiser PXC 250

WHAT THE RATINGS MEAN

●●●●● EXCELLENT
●●●●○ VERY GOOD
●●●○○ GOOD
●●○○○ FAIR
●○○○○ POOR



line. During testing, we heard buzzing in one ear on bass notes; a filter was loose. We pressed it back in, and all was fine. **Quieting:** 12 dB; **Frequency response:** Smooth and bright; **Comfort:** Very good.

\$130 street. Etymotic Research Inc., www.etymotic.com. ●●●●○

Sennheiser HD 280 Pro

The studio-grade Sennheiser HD 2809 Pro headphones block out noise passively. They're heavy and bulky—and they sound terrific. Response is effortless and natural throughout the sound spectrum. Low-frequency response is nothing short of amazing: You can actually feel the lowest notes before you can hear them.

The HD 280 Pros block noise effectively, but they don't work as well as the Bose QC2 headphones. And although the thick circumaural pads are comfortable for long listening sessions, you may find, as we did, that the tightness against your head ultimately becomes oppressive. The long, weighty, coiled cord and screw-on quarter-inch adapter make the HD 280 Pros a rugged choice for home or studio use; you'd have to be highly committed to high fidelity, though,

to take these heavyweights on the road. **Quieting:** 15 dB; **Frequency response:** Professional; **Comfort:** Very good.

\$80 street. Sennheiser electronic GmbH & Co. KG, www.sennheiser.com. ●●●●○

Sennheiser PXC 250

Logic might tell you that the Sennheiser PXC 250 headphones can't possibly work—they're too small to seal out noise. But these compact, supraural (top-of-the-ear) phones with active noise reduction do a respectable job. They don't give you the tomblike isolation of

the Bose phones, but they can do the voice-thinning trick too. In fact, these are the most compact active-noise-reduction phones we've tried that actually do the job.

The headphones are pretty flat up to 6.3 kHz; then they begin to tail off gradually. A glockenspiel concerto might sound thin, but the PXC 250s will deliver lots of good music in noisy places. The active electronics introduce a small amount of hiss, but it's inaudible below the music. The electronics module takes two triple-A batteries and has a belt clip. The zipper case includes both quarter-inch and two-prong airline adapters. **Quieting:** 15 dB; **Frequency response:** Almost great; **Comfort:** Excellent.

\$149 street. Sennheiser electronic GmbH & Co. KG, www.sennheiser.com. ●●●●○

Shure E3c

The Shure E3c canal phones are positioned against the Etymotic ER6i phones, and they include a "fit kit" with eartips of several different sizes and materials. We found that the single-flange gray rubber tips and the foam tips worked best, but the foam material is rough and prone to collecting dirt; also, it was somewhat uncomfortable once it had expanded in our ear canals.

The rubber tips are comfortable, and with three sizes, you can be assured an adequate fit. Bass response is lacking, though, and boosting the EQ doesn't help—the E3c phones have nothing more to give you at low frequencies. High frequencies hit a wall at 8 kHz and drop nearly 20 dB. **Quieting:** 10 dB; **Frequency response:** Midrange; **Comfort:** Good.

\$120 street. Shure Inc., www.shure.com. ●●●●○

Shure E4c

The Shure E4c headset is an upgraded version of the popular E3c, with better bass response and more sensitivity. It also comes with a fit kit that includes a variety of eartips, plus a pair of replaceable eartip tubes. The foam tips have the best seal, but they provide no more

◀ Shure E4c

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isolation than the rubber tips. They get dirty easily, but they can be washed.

As for sound reproduction, the E4c's are flat through the midrange and have a nicely extended high end, as good as that of the Sennheiser HD 280 Pros, but they're unconvincing in the bass. They are, however, more responsive to bass boost than the E3c's and are louder overall. Both sets of phones are available in charcoal as well as white. **Quieting:** 10 dB; **Frequency response:** Slow start, strong finish; **Comfort:** Good.

\$198 street. Shure Inc., www.shure.com. ●●●●○

Sony MDR-EX71

If you like bass, you'll love the Sony MDR-EX71 headphones. Online opinions say that the bass is too thick and muddy and that there are no highs, but they're only half right. Our oscilloscope tests show that the bass is quite clean, not muddy in the least, and also that it extends noticeably deeper than that of other canal phones. The MDR-EX71s are actually a very good companion for players that are weak in the bass. We also found a double bump in the frequency response at 1.25 kHz and 5 kHz; the strong mids can overwhelm the highs, which tail off rapidly after 6.3 kHz.

Despite the sonic imperfections, the MDR-EX71s sound decent for the money—they are inexpensive for this type of headset—and they are very comfortable for extended wear. The headphones don't extend very far into the ear canal, but fortunately, they do stay put. Sony bundles three sizes of eartips, so you're guaranteed a good fit. We're not fans, however, of the short left/long right cords. **Quieting:** 10 dB; **Frequency response:** Bassy and bumpy; **Comfort:** Excellent.

\$49 street. Sony Corp. of America, www.sony.com. ●●●●○

▲ Shure E3c

◀ Sony MDR-EX71

GEAR + GAMES



Protect Your PSP

The virtually indestructible polycarbonate **Logitech PlayGear Pocket** case fits your PSP like a glove. The case has openings for shoulder buttons, a headphone jack, a power jack, and a power switch. When opened all the way (270 degrees) the lid serves as a stand so you can watch movies in comfort. Logitech suggests playing on the PSP without removing it from the 6.4-ounce case, but we found that difficult because of the combined weight of the PSP and the case (16.4 ounces). It's best to keep your PSP in this sturdy and protective case while on the go, then take it out to play.—*Matthew D. Sarrel*

\$20 street. Logitech, www.logitech.com. ●●●●○



Carry Your PSP

The sturdy aluminum **Intec Pro Gamer's Kit** seems like overkill, but it will definitely keep your PSP safe. The case has a lot of room in it and plenty of compartments. It comes with a plastic screen protector, a handy three-UMD carrying case, a car adapter, an awkwardly long lanyard, and headphones. The earbuds' cable retracts around a small spool, making them easy to carry. The screen protector's backing was too difficult to remove; we didn't use it.—*MDS*

\$30 street. Intec Inc., www.inteclink.com. ●●●●○



Entry-Level Remote

For anyone who gives PowerPoint presentations—or even the occasional slide show—the **Interlink Presentation Pilot Pro** wireless remote is well worth its cost. The truncated feature set includes RF communications, a laser pointer, 360-degree mouse control, and dedicated forward/back/blank buttons for Microsoft PowerPoint and Apple Keynote. What's missing is button programmability, which most people don't use anyway. The Pilot Pro worked well within the claimed 50-foot range. It's also capable of navigating Web sites. We think the buttons should be labeled with words as well as icons. Otherwise, we recommend the Pilot Pro highly.—*Bill Howard*

\$60 street. Interlink Electronics Inc., www.interlinkelectronics.com.

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Hub and Reader in One

The iPod-white **IOGear USB 2.0 Hub & Card Reader** packs a lot of functionality into a slim device. Attach it to a USB port on your PC and you gain six more ports, as well as a reader for CompactFlash, Memory Stick, Microdrive, MultiMediaCard (MMC), Secure Digital (SD), and Smart Media memory cards. Data transfer is simple and speedy, up to 480 Mbps. The elegant and handy hub is fine for desktop use and light enough to take on the road.—*Carol A. Mangis*

\$59.95 list. IOGear Inc., www.iogear.com. ●●●●○

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BY PETER SUCIU

With the release of the final Star Wars prequel, Revenge of the Sith, the cycle is complete. But that doesn't mean you have to hang up your lightsaber. A wave of products has arrived that will put your Jedi skills to the test.

Tiger Star Wars Saga Edition Lightsaber Battle Game

Remember the brutal training Yoda put Luke through in *The Empire Strikes Back*? You could train like that—or you could skip it, and test your skills against Darth Maul, Jango Fett, Count Dooku, and Darth Vader himself. This single-player gaming system connects directly to your TV and lets you join forces with Obi-Wan Kenobi, Yoda, and Anakin Skywalker. Though fairly simplistic—it's listed for ages 8 and up—this *Star Wars* game gets you off the couch, so you won't turn into a Hutt.

\$49.99 list. Tiger Games/Hasbro, www.hasbro.com/lightsaber. ●●●●○

Hasbro Star Wars Call Upon Yoda!

"Wars not make one great," Yoda said. But simple robotics and pre-recorded lines not make this toy great, though the detailed sculpture is fun to look at. Yoda tells stories, bestows wisdom, and provides a trivia challenge. The interactivity is limited, however, to squeezing Yoda's hands to access menus and take part in the wisdom and trivia activities. As an interface, this is far from perfect, and the 500-plus phrases, which feature the voice of Frank Oz, get stale. Worst, Yoda's motorized parts are stiffer than Hayden Christensen's acting.

\$34.99 list. Hasbro, www.starwars.hasbro.com. ●●●○○

Jakks Pacific Star Wars: Revenge of the Sith Plug It In & Play

The galaxy needs a hero—and you can be that hero. Although this plug-in controller's graphics hark back to the era of the original films, the game play offers nonstop thrills, and the Darth Vader-shaped controller connects to your TV faster than R2-D2 can interface with a security system. Included are a saber slasher, a space-fighter battle, a side-scrolling bombing game, and two other action games. With simple controls and the ability to save your high scores, the only thing you might miss is being able to



play with a friend. But sometimes a hero must go it alone.

\$19.99 list. Jakks Pacific Inc., <http://jakkstvgames.com>. ●●●●○

Intec Star Wars Jedi Hunter Wireless Controller

Imagine having Sith powers: You could manipulate objects or even individuals from across the room. Although it won't help you conjure up the stolen Death Star plans—or even a snack—this 2.4-GHz wireless controller lets you engage in duels from up to 30 feet away and set combination moves. Designed specifically for the Episode III video game from LucasArts, the Jedi Hunter features a special preprogrammed lightsaber button, along with analog sticks, dual vibration motors, and up to 60 hours of game time (using a pair of double-A batteries). Although you can use this controller for other games, it's clearly meant for hard-core fans. So unless you plan on devoting a lot of time to Episode III, listen to Obi-Wan: This isn't the controller you're looking for.

For Xbox, \$34.99 list; for PlayStation 2, \$29.99. Intec Inc., www.inteclink.com. ●●●●○

Intec Star Wars Sith vs. Jedi Controller 2-Pack

Now, the battle between light and dark can continue with Intec's controller twin pack. This pair of programmable Sith and Jedi gamepads lets players show their true colors: The Jedi controller casts a blue light, and Vader's Sith controller glows red, as players engage in on-screen action. Also compatible with the Episode III game, and featuring programmable buttons, the Intec controllers are *Star Wars*-centric, but the pairing is hard not to like for other games as well. For Xbox and PS2.

\$29.99 list. Intec Inc., www.inteclink.com. ●●●●○



QUICK CLIPS



Star Wars: Episode III—Revenge of the Sith

Did you ever wish you were a Jedi Knight? In this game, your wish comes true, and the experience feels real: You're sucked into the plot the moment you start playing, taking on the role of Anakin Skywalker. Later, you play as Obi-Wan Kenobi, whose attacks are different from Anakin's. That's the kind of attention to detail that makes this such a gripping, immersive game and a must for *Star Wars* addicts. You'll get to experience thrilling lightsaber battles, 12 minutes of movie footage, and terrific sound effects and music. Our only complaint: The ability to strike down enemies effortlessly gets boring after a while.

—Matthew D. Sarrel

\$50 street. LucasArts, www.lucasarts.com. ●●●●○



LEGO Star Wars: The Video Game

If you're a serious *Star Wars* fan—say, for example, your screen name is GrandMoff1—you will probably be spending most of your time with *Star Wars: Episode III*, reviewed above. But those in the mood for a fun, Mario Brothers-style romp through the first three movies of the *Star Wars* odyssey will have a blast with this game. LEGO *Star Wars* recreates the *Star Wars* universe one brick at a time and lets you fight as, and alongside, any of 30 characters from the films. The game includes a fun single-player mode but also multi-player, so kids and parents can use the Force together. —Daniel S. Evans

\$29.99 list. Eidos plc, www.legostarwarsthevideogame.com. ●●●●○



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BACKSPACE

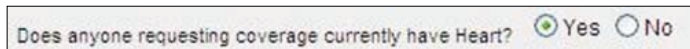
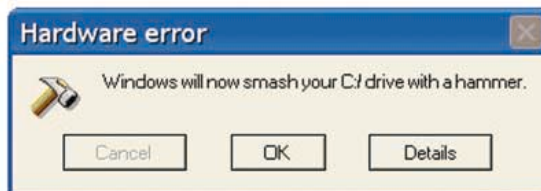
YAHOO! FLICKR: HOW'S THAT FOR A CATCHY BRAND NAME?

Edited by Don Willmott



◀◀ Backspace on the Road: New York, New York

➤➤ Go to <http://atom.smasher.org/> error to create customized comic error messages. Looks like Backspace is going to have to be on the lookout for phony-baloney dialog boxes from now on.



◀◀ Everyone knows you gotta have heart, miles and miles and miles of heart. (www.freeipods.com)

➤➤ We're not sure exactly how loud that is. (CNN.com)

Powered by a high pressure hydrogen fuel cell, the Emissions Neutral Vehicle (ENV) produces the equivalent noise of a personal computer fan belt.



➤➤ Watch out! Lake Michigan is spilling! (online ad for Real-Time and Embedded Computing Conference)



◀◀ Maybe so, but we like 3G GSM, too.



➤➤ For sale at www.humanbeans.net/powerpizza: a notebook case disguised as a pizza box. A tasty idea!

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Winners this issue: Kent Bales, Jayson Chapman, Richard Hunt, Jeremy Kohn, Yuriy Teyf, and Bill Thompson.

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- Bill Machrone, *PC Magazine*

- Marc Spiwak, CRN

- Ira Gold, *Electronic Publishing*



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