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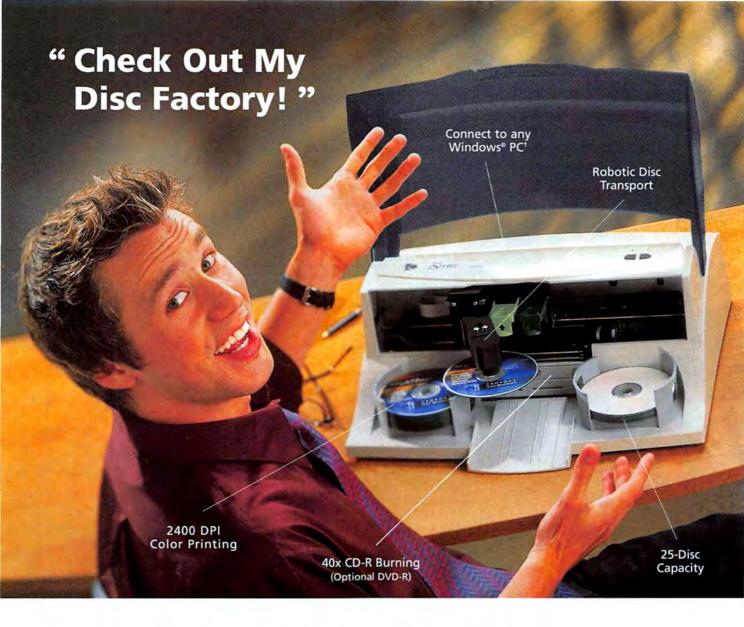
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Multimedia	No	No	No	Yes	No	No	Yes	No
Vacation Switch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cable Management	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
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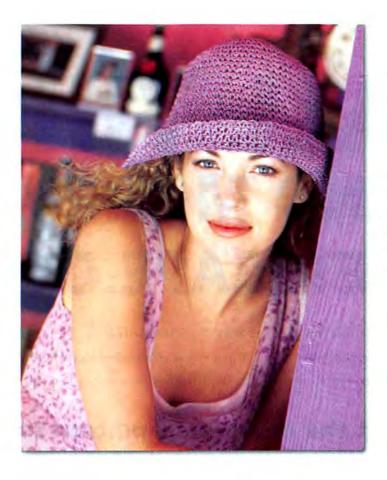
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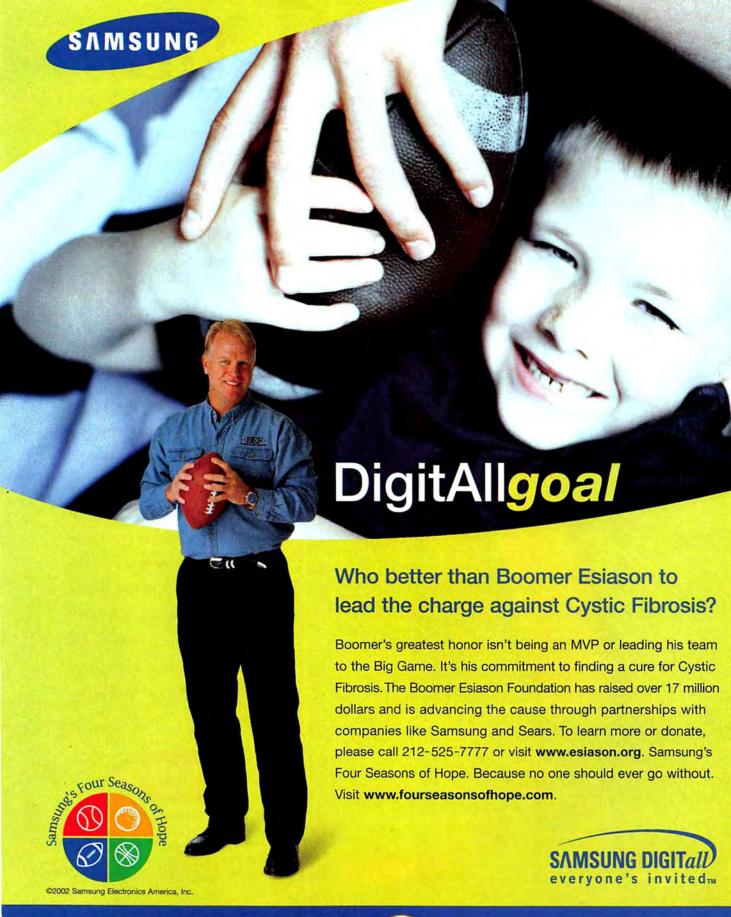
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The Uneasy Reign of Pax Microsoftia

Bill Gates's conquest of PC software brought pain but also gain to most of us.

WHEN OCTAVIAN DEFEATED MARC ANTONY'S and Cleopatra's navy at the battle of Actium in 31 B.C., he ushered in an era often called Pax Romana. For centuries, Rome's military and economic might enforced a relatively prosperous if unwilling peace across much of the world.

Personal computer users today live in an era that, for similar reasons, has been dubbed Pax Microsoftia. Windows' dominance of the operating system market—it's on some 95 percent of PCs—creates a

de facto standard for software developers. And Office enjoys similar hegemony over desktop business software.

To its credit, Pax Microsoftia hastened the spread of PCs into every aspect of corporate and personal life. It made business easier by ensuring that workers in different offices could read each other's files. It even encouraged the growth of the Web, since so many networking and Internet applications are created for Windows. For a reminder of what life is like without widely accepted standards, consider the alphabet soup of formats that has retarded the development of DVD recorders,

covered in our full roundup on page 111.

But Pax Microsoftia hasn't been all fun, any more than Roman rule was a picnic for the subjugated peoples. Competition withered in software categories Bill Gates controls. Once-mighty WordPerfect and Lotus 1-2-3, among others, were mashed by Word and Excel. Before Outlook and Access, many personal information managers and desktop database programs existed. Most are now history.

Microsoft also made a habit of waiting for other firms to identify an opportunity, then swooping in to capture the business. Witness the company's furious assault on Netscape in the mid-1990s, which eventually led to an antitrust judgment against it. And forget about competitors to the Windows operating system. Apple, with its elegant OS X, survives as a software Switzerland—tolerated because it's mostly harmless, despite its recent ad campaign urging people to switch. Linux is still barely a blip on Microsoft's radar; OS/2 and BeOS have long since faded from the screen.

Fortunately, Microsoft doesn't always

win. Quicken continues to lead after years of battle with Microsoft Money. Real Networks' video player is holding its own against Windows Media Player. Microsoft's MSN online service has nearly 9 million subscribers, but I don't see it surpassing America Online's 35 million anytime soon. (Full disclosure: *PC World* supplies content to AOL.) And while Microsoft's Xbox has grabbed a respectable share of the U.S. market, it lags in Europe and Asia—including Japan, where many new games are created.

Today, the firm clearly believes that the classic desktop PC will not remain the epicenter for personal technology. So it is pushing ahead on several new fronts, notably wireless displays, tablet PCs, cell phones, and home entertainment centers, most equipped with special iterations of Windows XP (for our preview and hands-on evaluation, see page 24).

THE ROAD AHEAD?

NO ONE KNOWS how long Pax Microsoftia will last, though my hunch is that we are living in its latter years. But next time you're tempted to bash Microsoft, give it a nod as well for tearing down the Tower of Babel that beset early personal computers. Someday we may look back nostalgically on Pax Microsoftia as a time of uncommon progress in technology, thanks in part to Microsoft's amazing success. ∎

Kevin McKean (kevin_mckean@pcworld.com) is editorial director of PC World.

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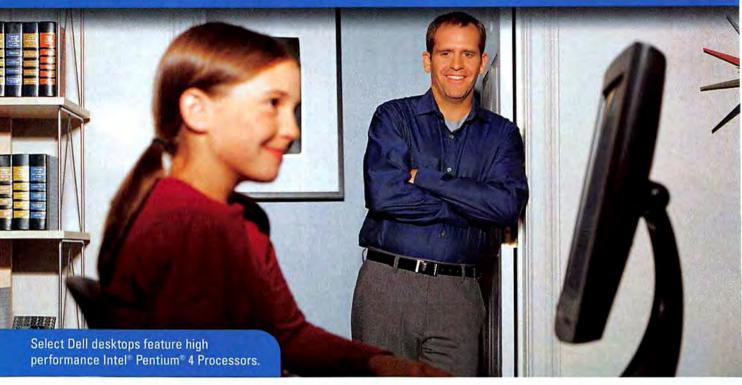
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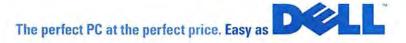
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SPECIAL REPORT

TRIPLE XP PLAY

MICROSOFT IS SPINNING OFF THREE NEW WINDOWS VARIATIONS FOR SPECIALIZED HOME AND BUSINESS USES. SHOULD YOU GIVE THEM A WHIRL? BY SCOTT SPANBAUER

IT'S TAKEN about a decade, but Microsoft has finally managed to move PC makers away from two main operating systems—Windows 9x/Me and NT/2000—to just one, the NT-based Windows XP. Now, the company has time to invent a few embellishments. This fall and winter, three debut: Windows XP Media Center Edition, Windows XP Tablet PC Edition, and Windows Powered Smart Display (the last, though based on Windows CE.net, requires an XP Professional desktop).

Each is a hardware-specific platform—the only way you can get Windows XP Tablet Edition, for example, is by buying it on a tablet-format PC that meets Microsoft's minimum hardware requirements. But should you?

We don't expect any of these new Windows devices to take

WINDOWS HARDWARE OPTIONS

ViewSonic Airpanel V150

Motion Computing M1200

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SMART DISPLAY TABLET PC MEDIA CENTER

PHOTOGRAPH: MARC SIMON

the computing world by storm. But XP Tablet and Media Center PCs especially could well find appreciative niche audiences. We found PCs running Tablet Edition, scheduled to ship in early November, to be promising for certain business users on the go. Media Center PCs, due by the holidays, are an expensive but intriguing option for digital media enthusiasts and for people living in confined spaces who would like to fold their television and PC into a single system. We can't pass judgment on Smart Display until we've spent some time with shipping products (due in early 2003), but we have some concerns about the concept.

MORE WINDOWS

DESPITE superficial similarities—both come with handheld screens that you write on using a stylus—the Tablet PC and the Windows Powered Smart Display (known earlier as Mira) target different audiences. Tablet PCs are ultraportable systems that have high-end digitizer screens and styluses designed to work with the OS's powerful digital-ink and handwriting-recognition engine (see "Putting Pen to Tablet," page 26). They're intended for business users who want to enter handwritten data at meetings and other away-from-desk locations.

In contrast, a Smart Display is basically a specialized monitor upgrade for home users who want to work with their apps on an existing Windows XP Pro desktop as they roam about the house. When docked to its included PC-connected base, a Smart Display functions the way an LCD touchscreen monitor does. But ▶
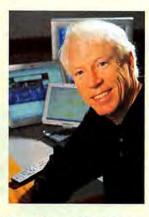
MICROSOFT ON CUSTOM XPs

LAST YEAR, MICROSOFT merged its two Windows lines—9x/Me and NT/2000—into one, Windows XP. Now the company is launching three new XP-based products. To learn why, *PC World* editors Harry McCracken and Yardena Arar interviewed Microsoft's top Windows guy—Jim Allchin, vice president for Microsoft's Platforms Group. Here's a partial transcript of the conversation.

Q. Is there some big strategy here?

A. Yes, absolutely. After 11 years we finally got to the NT code base for basically everyone. And the benefits of that [include] higher reliability, more stability, security, and the like for consumers. It's obviously better for IHVs [independent hardware vendors] because they only have to write one driver and it will work everywhere. And now we have the flexibility to target specific customer needs very quickly without having a splintering of the code base.

Q. Did you consider doing these more as add-on packs, as opposed to distinct editions of XP?

A. Although we have been asked [to make] the Media Center Edition able to run on a regular PC, we wanted our first baby step into the potential living room to be a good experience.... We wanted people to just have a machine that worked out of the box.

Eventually we may decide, okay, if we can define a class of machine that we know is going to have sufficient capability ... then you can just buy the software. We would definitely be open to that....

That's less true for the Tablet because it's a different environment there. It's not one that you can just go say, "Oh, well, load the Tablet Edition on your laptop."

Q. How much has Microsoft been involved in the actual hardware designs?

A. In terms of the Tablet, quite involved, quite involved. We had, as you probably know, some of the people from Xerox PARC here, and they were definitely intimately involved in the work on the Tablet.... Our investment was building prototypes.... And you might see us do more of that. It's not our business, but we're trying to show that you can innovate in the hardware and show off some of the software as we move ahead.

Q. What made you decide to come out with all of these at once, and are you concerned about consumer confusion?

A. The biggest confusion point could be between the Smart Display and the Tablet. But in that case, if you explain it to somebody, it becomes pretty clear. We have a lot of analogies we talk about here—that the Tablet is like a cell phone and the Smart Display is like the cordless phone in the house. You can't go outside the house with it very far, versus the Tablet, which you can take totally with you—it's a full-fledged machine.

Q. How do you see the PC evolving?

A. You will see us continue to push harder and harder into the living room.... You're going to see these nice, slim form factors come up [for Media Center Edition PCs], and you'll see us make progress in the software so that it can be a sort of A/V-type device.... And then you'll see us do distribution of audio and video based on that throughout the home.

Q. If Windows-Powered Smart Displays are intended for home use, why do they require Windows XP Professional on the desktop?

A. Our dream is to move to where these panels are anyplace in the home, a lot of them, and we didn't want to do that work in Home Edition. We wanted to do it in Pro.... That's the long-term vision of what we're trying to get to there. But it's a valid point.

Q. If we come back in a couple of years, will there be ten Windows versions with extensions for special types of PCs, special types of hardware?

A. Probably not. Probably not. Right now we have no plans for additional ones besides what you see right now on the drawing board.

when you detach the screen, it turns into a Windows CE.net–powered terminal that accesses the PC via a wireless Wi-Fi (802.11b) network (see "Smart Displays: Smart Enough?" on page 30). Its handwriting recognition capability is essentially the same as a Pocket PC's.

Microsoft may have an easier sell with XP Media Center Edition, given that users are already accustomed to treating the PC as a media hub. The first Media Center PC, HP's 883n, was due in stores by late October. Overall, we liked the prerelease version that we re-

viewed in last month's issue (find.pcworld.com/31574). To a cutting-edge multimedia PC, HP adds a TV-mode interface that users can control from across the room with an included infrared remote. The result is a computer that lets you watch TV, record your

favorite shows, and—incidentally—do everything else you might want to do on a PC. It's great for students and anyone else who lives and works in cramped quarters. (For more about the HP Media Center 883n, see "PCs With Personality," page 98.) ▶

PUTTING PEN TO TABLET

IF YOUR JOB involves frequent meetings or lots of "management by walking around," you know how useful it would be to take handwritten notes comfortably and unobtrusively–without later having to transfer them to your desktop PC.

Microsoft's answer is a clipboard-shaped ultraportable running Windows XP Tablet PC Edition, with a stylus and a digitizer screen that let you take notes much as you would on paper. I tried out five preproduction tablets–from Acer, Fujitsu, Hewlett-Packard, Motion Computing, and ViewSonic–to see whether those vendors (and Microsoft) had gotten the platform right. The Acer and the Fujitsu ran shipping versions of Windows XP Tablet PC Edition; the others used betas.

I could see myself using a tablet at trade shows. Weighing roughly 3 pounds (or slightly more), a typical unit is light enough to carry all day for notetaking and then to use at a desk for writing and filing stories.

Many of the tablets have Wi-Fi (802.11b) wireless, ethernet, and 56-kbps modems built in; all have an included or optional

TABLET PCs (clockwise from left): Acer TravelMate C102T, Compaq TC1000, Fujitsu Stylistic ST4000, ViewSonic V1100.

keyboard. All use subnotebook processors such as Intel's Ultra Low Voltage Pentium III-M, plus at least 128MB of RAM–plenty of computing power for typical office work, though a bit slow for graphics-intensive tasks.

WRITE THIS WAY

WINDOWS XP Tablet PC Edition lets you write on screen in three ways. The operating system ships with Journal, a utility with an interface that resembles a legal pad; working with Journal comes closest to the experience of writing on paper. The Tablet Input Panel (TIP)–a window a couple of inches high that stretches across the width of the display, something like the

pen-input window on a PDA screen–works with any Windows application. A Write Anywhere option turns almost the entire screen into a TIP.

Finally, pen-enabled applications should be available when (or shortly after) the first Tablet PCs ship in early November. These range from third-party offerings (such as Alias Sketchbook, Zinio Reader, Corel Grafigo, and Franklin Covey TabletPlanner) to Microsoft freebies like Office XP extensions and utilities like Snippet. This last application allows you to circle and annotate sections of Journal notes, a Web page, or an Office document, and drop the snipped section into an e-mail

message or other document.
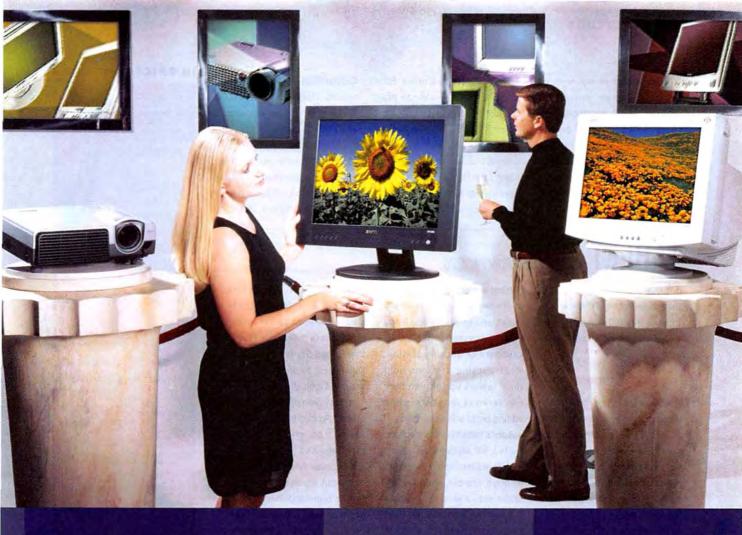
The TIP recognizes and transforms handwriting into editable text that appears in whatever application you're working in. It includes a software keyboard, and lets you switch quickly between writing with the stylus and using it for highlighting, editing, and moving the cursor.

In Journal, "digital ink" records an image of your writing (or drawing). Journal offers few editing functions and doesn't perform handwriting recognition on the fly. You can insert extra space on your page, but I found this tricky to do. You can't select and correct your work on the fly with the stylus, either; you have to switch to an eraser tool to delete your writing, or to a lasso tool to select and then move or delete entire sections.

You can convert the handwritten Journal notes you select into text, and export them to other applications. One cool Journal feature is that your handwritten notes are searchable: I didn't believe it until I successfully searched some notes for unconverted text.

I wrote a long e-mail message fairly comfortably using the stylus, and the handwriting recognition engine in the TIP worked surprisingly well for me; it even recognized some words that I judged illegible. Recognition in

Windows XP Tablet PC Edition
Microsoft
★★★★☆
find.pcworld.com/31679

Our main gripe was with its draconian copy protection scheme, which let users view recorded shows only on the PC that recorded them. But in a last-minute turnabout following customer and vendor complaints, Microsoft withdrew those restrictions. Win-dows XP Media Center Edition PCs will be able to play back video recorded on any other XP MCE PC—as well as all Windows XP PCs equipped with Windows Media Player 9 (due late this year). And by year's end, Microsoft promises, a patch will enable Media Center Edition PC owners to record television shows on DVDs that will be playable in any DVD player.

This flexibility could give Microsoft's new platform an edge over competing products such as TiVo and SonicBlue's ReplayTV. At $2598, HP's ▶

TABLET CONTINUED FROM PAGE 26

Journal was less successful, though, and other *PC World* editors ran into difficulty with the TIP's handwriting recognition.

TOUCHING EXPERIENCE

WHEN THE STYLUS tip is positioned within about an eighth of an inch of the screen, you can move the cursor and objects, but you have to touch the tip directly to the screen to write. Having worked in the past with touch-sensitive pen-input devices, I found it difficult to get used to resting my palm on the screen. All the devices have hardened surfaces, but if the vendor offers a thin screen protector, I recommend buying it.

Tablet PCs come in two basic designs: a "convertible" notebook, with a screen that can be twisted around to lie flat on top of its keyboard for use as a tablet; and a slate, to which you attach accessories like a USB keyboard or docking station. Most docking stations hold their tablets upright—so they can serve as monitors—while adding ports and drive bays.

Acer's tablet is a convertible; Fujitsu, HP, Motion Computing, and ViewSonic opted for slates (though you can latch the HP tablet onto a keyboard and use it much like a notebook). Most slate makers sell keyboards and docking stations as options ranging in price from $40 to $50 for the former and from $200 to $300 for the latter.

Windows XP Tablet PC Edition hardware specs require bezel buttons to handle such functions as Ctrl-Alt-Delete (soft reboot), and switching from portrait to landscape mode. But each tablet implements these differently. I found the Fujitsu Stylistic's buttons the easiest to understand and the most logically placed.

Will my next portable PC be a tablet? Probably—because I like having a computer with me in meetings and on the subway and because Tablet PC Edition's pen input worked for me. The tablets command about a $500 premium over a standard notebook, but for true corridor warriors, the extra productivity may justify the price. And if Microsoft is right, we may eventually have no choice in the matter: The company believes all notebooks will have tablet capabilities within five years.

—Rebecca Freed

TABLETS BY THE NUMBERS

TABLET PC	Price[1]	CPU	RAM/hard drive (basic configuration)	Diagonal screen size/ resolution	Weight (slate or notebook only)
Acer TravelMate C100 find.pcworld.com/31682	$2199	800-MHz Intel ULV Pentium III-M	256MB/ 20GB	10.4 inches/ 1024 by 768	3.2 pounds
Fujitsu Stylistic ST4000 Series find.pcworld.com/31685	$2199	800-MHz Intel ULV Pentium III-M	256MB/ 20GB	10.4 inches/ 1024 by 768	3.2 pounds
HP Compaq Tablet PC TC1000 find.pcworld.com/31694	$1699	1-GHz Transmeta Crusoe TM5800	256MB/ 30GB	10.4 inches/ 1024 by 768	3.4 pounds
Motion Computing M1200 find.pcworld.com/31691	$2199[2]	866-MHz Intel ULV Pentium III-M	128MB/ 20GB	12.1 inches/ 1024 by 768	3.0 pounds
ViewSonic Tablet PC V1100 find.pcworld.com/31688	$1995[2]	866-MHz Intel ULV Pentium III-M	256MB/ 20GB	10.4 inches/ 1024 by 768	3.0 pounds

[1] Price is for basic configuration—no docking station or keyboard included. [2] Includes wireless adapter.

It's so far forward, it's a shame to call it backup.

ARCserve v9 is here

Apparently the word is out everywhere. BrightStor™ ARCserve® Backup is among the most reliable and widely used backup solutions in the world. In fact, hundreds of thousands of people rely on BrightStor ARCserve Backup technology to protect their critical servers. Now we've created BrightStor™ ARCserve® Backup v9, the most advanced version ever. As part of the BrightStor™ line of storage management solutions, BrightStor ARCserve Backup v9 is amazingly powerful yet one of the simplest to use and easiest to install solutions out there. In fact, most users can perform their first backup within 20 minutes of start-up. And that means it's the perfect backup software choice for, well, just about everyone.   ca.com/brightstor/arcserve9

BrightStor™ ARCserve® Backup   **ca** Computer Associates™

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$179 $299

Epson Stylus Photo **825** and **925**

MCE PC is five or more times the price of a basic TiVo or ReplayTV unit, but it offers far more than just time-shifting capability, including the ability to make DVD copies of shows for archiving and for viewing anywhere.

Microsoft notes, however, that your ability to play back a copied show could be limited if the broadcast contains an industry-standard (but at the moment, rarely used) no-copy flag. The approach puts the copy-control ball back in the content providers' court.

Another problem all three platforms face is price. Yankee Group analyst Laura DiDio predicts that only a comparative few upscale buyers will spring for the new Windows XP devices, in light of the fact that conventional computers containing most of the same features are readily available for substantially less.

Gartner vice president and research director Michael Silver gives the new XP-based PCs better odds. "While they aren't going to cure world hunger, they may find successful markets," he predicts.

As in the past, businesses and consumers may wait for the best elements of these new offerings to appear in mainstream PCs. Like some aspects of once-exotic products such as Windows for Workgroups, the multimedia PC, and Windows NT, the best features of tablet PCs, wireless displays, and personal video recording may eventually become elements that no Windows user will dream of living without. For now, the users most likely to buy into the new offerings will be people with specialized needs and some extra cash. ▶

SMART DISPLAYS: SMART ENOUGH?

AT YOUR DESK: The display sits on a stand and serves as an LCD monitor for a desktop PC.

AROUND THE HOUSE: The display becomes a pen-based terminal that talks to the desktop PC via a Wi-Fi connection.

TAKE AN LCD MONITOR. Add pen input, a wireless connection, and a dash of Windows CE. That's the recipe for a Windows Powered Smart Display, an untethered screen usable anywhere within Wi-Fi range of a desktop PC (that's 150 feet maximum, 125 feet or less in the real world).

Based on technology formerly code-named Mira, the first Smart Displays are due in early 2003 from ViewSonic, Philips, and others. Judging from our brief experience with prototypes, Smart Displays are intriguing, but peppered with technological gotchas. Here's what they aren't: stand-alone computers. Running a Windows CE.net-based OS, they provide roaming access to programs, files, and the Net connection on a Windows XP Pro PC. Microsoft envisions their use for such domestic tasks as sofa surfing or recipe-viewing in a kitchen.

But limited hardware muscle and the relatively slow real-world speed of Wi-Fi (about 4 megabits per second) limit Smart Displays' smarts. Microsoft says they will play digital audio but not full-motion video clips. Their pen-based input uses Windows CE's Transcriber, not more powerful Tablet PC technology. And when you're using a Smart Display remotely, the PC it talks to will otherwise be unavailable.

At $500 to $1000, Smart Displays will cost much more than standard LCDs of equivalent size; add another $200 if you need to upgrade Windows XP Home Edition to XP Pro. Stay tuned for our take on shipping products.

–Harry McCracken

They'll love what they see.

You'll love what you save.

The Stylistic® ST4000 Tablet PC Is Here.

Don't expect our Tablet PC to be like all the rest. It's not some OEM clone. Or a PDA on steroids. Or a stripped down notebook. Instead, it's powered by the latest Intel® processor. Runs any Window's application. Thrives with or without a keyboard and slips effortlessly into our optional Tablet Dock for instant desktop duty. It's thin, it's light, it's flat. In other words, it's everything 12 years of industry-defining experience said it could be: The most natural, mobile, productive and thoroughly thought out PC the world has ever seen.
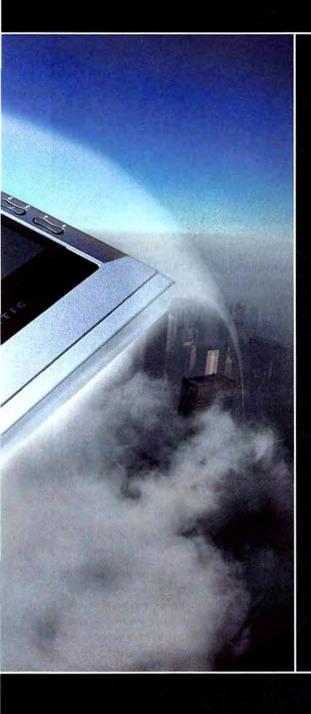
The Stylistic® ST4000 is powered by an ultra low voltage Mobile Intel® Pentium® III Processor 800MHz – M which supports enhanced Intel® SpeedStep® Technology.

intel inside
pentium III

TEST DRIVE
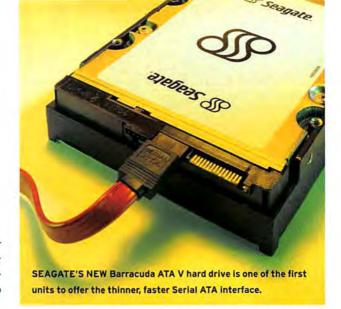
HANDS-ON WITH NEXT-GEN DRIVE

PC WORLD TESTS A NEW SERIAL ATA HARD DRIVE—IS IT WORTH YOUR MONEY?

SERIAL ATA (SATA) drives and controllers have finally hit the scene. Should you upgrade? SATA offers numerous technical advantages, but the 10 to 15 percent premium you have to pay for a drive, on top of the extra bucks for an adapter, probably won't generate a return that will appeal to most users today. But if your power desktop or server has multiple drives, the bandwidth advantages may be worthwhile.

We examined a $79 Promise TX4 controller and a preproduction, $190, 120GB Seagate Barracuda ATA V SATA drive. Our preliminary results show—and vendors admit—that for now, SATA offers little benefit over the fastest parallel ATA100 or ATA133 setup in a single-drive system.

But that's for now. SATA *is* the future of ATA for a variety of reasons. Most obviously, SATA allows an increase in bandwidth to 150 MBps today, growing to at least 600 MBps in 2007. (Parallel ATA has effectively hit the wall at 133 MBps.) Single-drive systems can't use all that bandwidth, but multiple-drive ones can, especially since they're the likeliest to be running disk-intensive applications. Expect even more performance gains with a RAID setup in place.

SATA also offers physical advantages for system builders and upgraders. SATA cable connectors are much smaller than their parallel-design counterparts, have no pins to be bent or broken, and take far less pressure to attach. The cables themselves are about 0.25 inch wide, so they don't restrict airflow within the PC case as 2-inch-wide parallel ATA cables do. SATA cables may run up to 39 inches long, compared with parallel's limit of 18 inches. And SATA's 3-volt architecture costs less than 5-volt parallel ATA.

Serial ATA 1.0 permits ▶

SEAGATE'S NEW Barracuda ATA V hard drive is one of the first units to offer the thinner, faster Serial ATA interface.

SATA Barracuda V ST3120023AS
(Preproduction model, not rated)
Seagate
Estimated street: $190
find.pcworld.com/31634

STORAGE

MAXTOR'S ONETOUCH BACKUP HARD DRIVE

MAXTOR'S EASY-TO-USE 5000DV, with OneTouch backup.

MAXTOR'S 5000DV external hard drive—120GB with a dual FireWire/USB 2.0 interface—is fast, vast, and built to last, but the drive's unique OneTouch backup feature is what intrigued us. Press a button on the front of the 5000DV, and the unit backs up your favorite partition without further bother.

The button sends a command down the interface cable to open a special version of the Retrospect Backup Express program. Retrospect automatically executes an internal script, backing up a partition (or volume, as Retrospect calls it) that you select during the first run; then it quits. The program is easy to set up and convenient to use on the fly, and it lets you schedule backups, too.

Notice that we said "partition," not "system." As configured, OneTouch is limited to backing up one partition to the 5000DV in its volume copy mode—a straight transfer of files without compressing or otherwise altering them. You can fairly easily create a new script to use Retrospect's backup mode, which will back up multiple partitions or your entire system. But if you do, everything will then be compressed into one large file, and you'll have to use Retrospect to restore the individual partitions, which is a bit of a drag.

Priced at $300, the unit performed well in informal tests. Our only complaints are minor: The 5000DV runs a bit warm, and it lacks a power switch.

Maxtor 5000DV
★★★½☆
Street: $300
Maxtor
find.pcworld.com/31628

one drive per port, so you can't use the same cable for multiple drives. Motherboards and cards should offer multiple ports, however, and look for multipliers to increase those options in the future. Version 1.0 supports up to 128 drives.

The aforementioned four-port Promise adapter and pre-production Seagate drive were both stable and reliable in our trials. In comparison to its preproduction ATA100 Barra-cuda V counterpart, the SATA model performed well, besting the other drive in five of seven tests. It did particularly well on the throughput tests, scoring about 13 to 16 percent better than its sibling. The caveat: The SATA unit's 8MB of cache versus the ATA100 model's 2MB clearly helped most of its scores. (Performance may change once hardware and drivers are final.)

For now, SATA seems a bit pricey for the benefits it provides, and most users will be better off waiting until the middle or late part of 2003, when SATA will be widely implemented in PCs. (But you shouldn't expect parallel ATA drives—or connectors—to disappear for a couple of years after that.) In contrast, power users may want to try SATA once shipping drives become available, in about a month.

—*Jon L. Jacobi*

TEST REPORT

SERIAL ATA THROUGHPUT SHINES

HARD DRIVE		File-and-folder copy time (sec)	File-and-folder throughput (KB/sec)	Large-file copy time (sec)	Large-file throughput (KB/sec)	Photoshop 6.0.1 (sec)	File find (sec)	PC WorldBench 4 score Faster
Seagate Barracuda V	Serial ATA	103	13,320	83	14,834	130	246	108
	Parallel ATA	124	11,088	97	12,774	125	251	112

Both Seagate drives are 120GB, 7200-rpm preproduction models, but the SATA drive has 8MB of cache while the parallel ATA has 2MB of cache.

TEST Center **HOW WE TEST:** We copy 1.3GB of data (first as one large file and then as a number of folders and files) from one location on the drive to another, time the opening of a 105MB file in Adobe Photoshop 6.0.1 and a number of other operations, and time a find-file operation in Windows. All tests performed on a Dell Dimension 8200 using a 2-GHz Pentium 4 and running Windows XP.

CONSUMER ALERT

A DSL PROVIDER'S SPOTTY HISTORY

NET CONNECTION CUSTOMERS TELL OF UP-FRONT PAYMENTS, NO SERVICE.

THE STORIES sound remarkably similar. A late-night telemarketing call: "Congratulations, you've qualified for DSL service in your area." A sales pitch, a $304 up-front fee, payable by credit card. Months pass, and no DSL service is ever provided. Promised refunds never materialize.

It happened to Alfred Haymond of Pasadena, California, Steve Zambito of Kennesaw, Georgia, Andy Dennison of Columbus, and Terry Woods and Tim Ghrist of Dayton, Ohio. A year and a half later, they have neither DSL nor their deposits.

All five men are would-be customers of Net Connection Corporation, a small ISP in McLean, Virginia, with a history of complaints from consumers scattered throughout the country.

"I paid $303.99 for installation fees," says Zambito, who ordered service from NCC back in March 2001. "Seventeen months later, I have not received one penny. No one has ever called me, no one has ever been to my house for any kind of installation. I have been ripped off."

The Washington, D.C., arm of the Better Business Bureau lists 45 grievances regarding NCC extending over the past three years; the Virginia Department of Agriculture and Consumer Services collected 7 complaints between May 2001 and September 2002. Most of them were similar to the scenario described above.
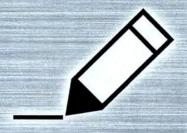
But NCC and its president, Ray Bolouri, are no strangers to consumer dissatisfaction.

HISTORY OF GRIPES

ACCORDING TO a page on the NCC Web site, NCC was "a branch of " USS Net, aka US Surf Net, a Chicago-based ISP. (The page was removed after we interviewed Bolouri, who says NCC and USS Net have always been separate entities.)

The Better Business Bureau of Chicago and Northern Illinois says that it logged 22 complaints against USS Net from 1998 to 2000, most of which it closed as unanswered by the company. USS Net was subsequently dissolved, so the state BBB began forwarding inquiries on the company to the state attorney general's office, which received 7 complaints through 2001. Virginia's Fairfax County Consumer Protection Division received 9 complaints about NCC during the last two fiscal years, all of which were eventually favorably resolved.

But its history of consumer complaints did not prevent NCC from winning a fed- ▶

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eral contract that was worth nearly $39 million.

In December 2000, the U.S. General Services Administration awarded a $380 million DSL1 contract to ten small ISPs, including NCC. The contract was designed to let federal employees connect to the Net at high speeds without putting a strain on department budgets.
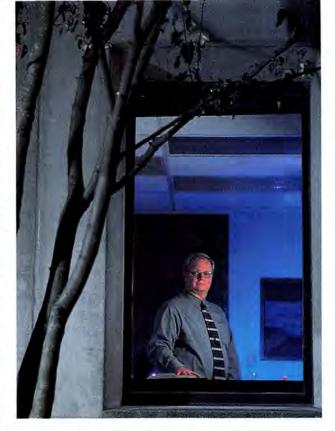
Another DSL1 contract winner, Omega Technologies, says the GSA's approval process was tough. "They put us into the blender, then strained and re-strained us," says company president Pat Williams.

GSA spokesperson Mary Alice Johnson says that the vetting process didn't include checks of Better Business Bureau filings. Rather, the agency checked NCC's Dun and Bradstreet report, made sure the firm was not on a list of companies excluded from future government contracts due to poor performance in the past, and talked to references provided by NCC.

"We asked about their timeliness—do they finish projects completely, do they respond to complaints and inquiries in a timely fashion?" she points out. "They [NCC] were a satisfactory company."

BANKRUPT PROVIDER

NCC CUSTOMER Terry Woods might not agree with that benign assessment. After he languished for months waiting for a refund from NCC, the company told him that it had given his money to Capital Area Internet Services, which provided the Internet access for NCC's customers. NCC told Woods to approach CAIS for a refund. But in November 2001, the D.C.-based CAIS (by

> ## "I gave my money to Net Connection Corp., and all they did was run me around for 16 months."
>
> **Terry Woods, Dayton, Ohio**

then renamed Ardent Communications) filed for Chapter 11 bankruptcy and sold off most of its assets.

"But I gave my money to Net Connection Corp., and all they did was run me around for 16 months," Woods said.

A former CAIS executive says that the firm never saw a penny of the fees NCC collected. "That money went straight to Net Connection Corp.," says Judy Cronin, a former vice president of channel sales.

CAIS, in turn, had partnered with Covad to complete its DSL orders. Covad spokesperson Martha Sessums says that the company received 334 DSL orders from USS Net and NCC, of which only 10 are still active. "The vast majority never qualified for the service

in the first place," she says.

But in a phone interview, Bolouri asserted that virtually all of the potential customers NCC had identified as prequalified had in fact prequalified online by the most common criterion—being located within a specified distance from a central switching office set up for DSL service.

"Our systems were connected directly to CAIS's," says Bolouri. He says "a number" of NCC's orders were filled, but that a "large number"— Bolouri can't remember how many—just sat in the queue at CAIS for "a number" of months. Bolouri says CAIS executives assured him that the orders would move forward, but two months later CAIS filed for bankruptcy.

"To alleviate customer issues, we made an agreement with EarthLink to provide services for all these clients," says Bolouri. "Because of delays involved, we asked they be given two additional free months." As an alternative, he says, he offered customers a partial refund in accordance with their terms-of-service agreement.

But while Alfred Haymond does remember being told during one of his calls to NCC that he would be getting a letter describing an "arrangement" with EarthLink, neither he nor any of the four other customers interviewed for this story recalls receiving the offer Bolouri describes.

And EarthLink spokesperson Carla Shaw says that the company never made any special commitment to provide service for NCC customers. "There was a referral agreement where Mr. Bolouri could receive payment for customers who signed on with EarthLink through him," contends Shaw. "But it was up to the subscribers to initiate contact with us." Shaw says that only a handful of NCC customers signed up with EarthLink.

A BIG DISCONNECT

THE GSA SAYS that the federal DSL1 contract never attracted many takers and is therefore unlikely to be renewed.

Meanwhile, chief executive Ed Johnson of the Washington, D.C., metropolitan BBB says that he urges caution to anyone approaching NCC for service. "If our past complaint experience record is any indication of the future, consumers would be well advised to consider taking their business elsewhere," Johnson says.

—*Daniel Tynan* ▶

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Evo D310v Microtower

Intel® Celeron® processor 1.70GHz
128MB PC2100 DDR SDRAM
20GB¹ Ultra ATA Hard Drive
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Integrated Intel® Extreme 4X AGP graphics
Integrated Intel® Audio with premium internal speaker
Integrated Intel® PRO 10/100 NIC
Microsoft® Windows® XP Professional
1-year (parts, labor and next business day on-site)
   Limited Warranty³

$549 Lease for $16/mo.†

Monitor not included.

D510 e-pc

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128MB PC2100 DDR SDRAM
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8X Slim IDE CD-ROM⁵ Drive
Integrated Intel® Audio with premium internal speaker
Integrated Intel® PRO 10/100 NIC
Microsoft® Windows® XP Professional
1-year (parts, labor and next business day on-site)
   Limited Warranty³

$839 Lease for $24/mo.†

Monitor not included.

Evo D310 Microtower

Intel® Pentium® 4 processor 2.0GHz
256MB PC2100 DDR SDRAM
40GB¹ Ultra ATA Hard Drive
48X Max² CD-ROM Drive
Integrated Intel® Extreme 4X AGP graphics
Integrated Intel® Audio with premium internal speaker
Integrated Intel® PRO/100 NIC
Microsoft® Office® XP Small Business
   with Publisher 2002
Microsoft Windows® XP Professional
1-year (parts, labor and next business day on-site)
   Limited Warranty³

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Notebook Innovations

Evo N1000v Notebook

Intel® Pentium® 4 processor 2.00GHz
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256MB DDR SDRAM
20GB¹ SMART Ultra ATA Hard Drive
DVD-ROM Drive
ATI Mobility Radeon 7500 4X AGP Graphics with
   32MB DDR SDRAM
JBL Pro Speakers
Integrated Mini PCI 56K V.92 Modem⁴
Integrated 10/100 NIC
Microsoft® Windows® XP Professional
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Evo N800v Notebook

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15.0" TFT SXGA+ Display
256MB DDR SDRAM
30GB¹ SMART Ultra ATA Hard Drive
DVD-ROM Drive
ATI Mobility Radeon 7500 Graphics with
   64MB DDR SDRAM
JBL Pro Speakers
Integrated Mini PCI 56K V.92 Modem⁴
Integrated 10/100 NIC
Microsoft® Windows® XP Professional
1-year Worldwide Limited Warranty³

$1968 Lease for $56/mo.†

Evo N610c Notebook

Mobile Intel® Pentium® 4 Processor 2.00GHz - M
14.1" TFT SXGA+ Display
256MB DDR SDRAM
40GB¹ SMART Ultra ATA Hard Drive
DVD/CD-RW Combo Drive
ATI Mobility Radeon 7500 4X AGP Graphics
   with 32MB DDR SDRAM
Compaq Premier •Sound™
Integrated Mini PCI 56K V.92 Modem⁴
Integrated 10/100 NIC
Microsoft® Windows® XP Professional
3-year Worldwide Limited Warranty³

$2449 Lease for $70/mo.†

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40GB¹ Ultra ATA Hard Drive
48X Max² CD-ROM Drive
Embedded Intel® PRO/100 NIC
Integrated Intel® Audio with internal speaker
Microsoft® Windows® XP Professional
3-year (parts, labor and next business day on-site)
   Limited Warranty³
Compaq S7500 17" Monitor

$989 Lease for $29/mo.†

Offer valid from 11/1/02 through 01/31/03.

Evo N1000v Notebook with hp iPAQ Pocket PC*

Intel® Pentium® 4 processor 2.00GHz
14.1" TFT XGA Display
256MB DDR SDRAM
20GB¹ SMART Ultra ATA Hard Drive
DVD-ROM Drive
ATI Mobility Radeon 7500 4X AGP Graphics
   with 32MB DDR SDRAM
JBL Pro Speakers
Integrated Mini PCI 56K V.92 Modem⁴
Integrated 10/100 NIC
Microsoft® Windows® XP Professional
1-year Worldwide Limited Warranty³
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HANDHELDS

NEW PALM OS: A HIGH FIVE

FIRST DEVICES BASED ON THE PALM 5 OS RAISE THE STAKES IN THE PDA WARS.

PALMS EXCEL at simplicity, while Pocket PCs are for power users. That was the conventional wisdom in PDA circles—and mostly, it held up. But the latest Palm operating system addresses some of the weaknesses that had hobbled its predecessors' suitability for high-end applications, and the first devices based on the upgrade—two Sony Cliés and Palm's new Tungsten T—exploit these newfound powers.

Palm OS 5 supports the latest ARM-based CPUs, which promise superior performance with multimedia and wireless apps without excessively compromising battery life. And it allows 320-by-320 displays, up from previous editions' resolution of 160 by 160 (Cliés, however, have had this capability since introduction).

OS 5 also natively supports Bluetooth and Wi-Fi (802.11b) connectivity, which used to be after-market add-ons. It beefs up security, too, offering 128-bit data encryption and Secure Socket Layer (SSL) technology for Internet applications.

Some of your current software may not run on OS 5, however. Palm says 80 percent of old apps should run, but the rest (such as the popular Hackmaster utility) may not.

POWER PALMS

THE FIRST OS 5 Sony Cliés—the $600 PEG-NX70V and $500 PEG-NX60—focus on multimedia functions, while Palm's $500 Tungsten T emphasizes

PALM'S new Tungsten T model features native Bluetooth support.

SONY'S Clié NX PDAs offer Wi-Fi via a CompactFlash card.

business-friendly features.

NX-series Cliés are like current NR models with the 320-by-480 display that covers a thumb keyboard. But the NXs are a bit thicker, thanks to an added type 2 Compact Flash slot that can hold a $150 Sony Wi-Fi card. And their opening menu is more text-heavy than the Palm OS's typical version.

Both NX units have a relatively powerful, 200-MHz Intel PXA250 chip. The extra oomph fuels the NX70V's improved built-in camera: It has 2X digital zoom and captures 640-by-480 stills and MPEG-4 video (the NR70V was limited to 320-by-240 stills and no video). The NX60 lacks a camera.

The $499 Tungsten T, the first in Palm's new line of power-user devices, debuts a new, shorter look. In the T,

the Graffiti area hides in the lower half of the case, which slides down for data input. In addition, its built-in Bluetooth adapter lets you access the Net via a Bluetooth GSM/GPRS cell phone. Also new in Tungsten T: Texas Instruments' OMAP1510 ARM-compatible CPU, a 320-by-320, 65,000-color LCD—the nicest yet on a Palm—and a five-way button for one-handed navigation.

While OS 5 powers a new generation of PDAs, OS 4.1 will persist on entry-level models such as Palm's $99 Zire, and even higher-end devices like the new Tungsten W. But if you want an OS 5 device (you can't install the new OS on an older PDA), first check with your favorite apps' vendors to see if they're compatible.

—Yardena Arar ∎

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- Fifties ★
- Sixties ★
- Seventies
- Eighties
- Nineties ★

COUNTRY
6 channels

- Classic Country ★
- Top Country Hits
- Progressive Country ★
- Traditional Country
- Bluegrass ★
- Folk ★

HITS
11 channels

- Top 20 Hits
- LA Rock
- Pop Mix
- Love Songs
- Beautiful Music
- Rock/Pop
- Rock/Pop
- Movie Soundtracks
- ShowTunes ★
- Euro & Global Chart Hits
- Special Topics ★

CHRISTIAN
2 channels

- Christian Rock ★
- Christian Pop ★

ROCK
11 channels

- Deep Album Rock ★
- Hard Rock
- Heavy Rock
- New Music
- Classic Alternative ★
- Modern/Soft Alternative ★
- Classic Rock Hits ★
- Alternative Hits ★
- Acoustic Rock ★
- Progressive/Fusion ★
- Unsigned Artists

URBAN
8 channels

- Classic Soul
- Neo Soul
- Urban
- Gospel
- Old School R&B
- Classic Rap ★
- Uncut Hip-Hop
- Urban Top 40

JAZZ & BLUES
7 channels

- Traditional Jazz ★
- Contemporary Jazz ★
- Modern Jazz
- Great Vocals/Standards ★
- Blues ★
- Latin Jazz ★
- Cocktail Mix ★

DANCE
4 channels

- Underground Dance ★
- Club Hits
- Electronica
- Disco ★

LATIN
5 channels

- Spanish Top 40
- Spanish Pop Hits
- Rock in Spanish
- Tejano
- Caribbean

WORLD
5 channels

- World
- Reggae ★
- African
- New Age ★
- Eclectic ★

CLASSICAL
3 channels

- Traditional Classical ★
- Opera ★
- Popular Classical ★

KIDS
2 channels

- Children
- Children

NEWS
12 channels

- News
- News
- News
- News & Talk
- 24-Hr. Weather
- Business News
- Financial News
- News & Business
- Tech News
- World Affairs ★
- US Gov. & Public Affairs ★
- News in Spanish

SPORTS
5 channels

- Sports Talk/Play-by-Play
- Sports News
- Sports News/Talk
- Sports Talk
- NASCAR Racing

COMEDY
3 channels

- Comedy
- Family Comedy
- Radio Crazies

TALK & VARIETY
10 channels

- Real Life Stories & News
- Entertainment News
- Books & Drama
- Old Time Radio
- Experts & Advice
- Talk & Opinion
- Young & Sassy Talk
- African American Talk
- Christian Talk
- Truckers' Channel

PREMIUM
1 channel

- Adult (Additional Cost)

★ Commercial-free channels

LETTERS

IDENTITY THEFT: WHOSE BURDEN?

MULTIPURPOSE DEVICES

WAITING FOR 'STAR TREK'

THOSE PC ANNOYANCES

I THOROUGHLY enjoyed Steve Bass's article ["How to Fix the Biggest PC Annoyances," October]. So often I see users (myself included) who deal with these things as a necessary evil and lose productivity rather than fixing them.

Chris Cain, via the Internet

THANK YOU, thank you! You just saved me the cost of a new cooling fan for my expensive graphics card. The fan was making such a racket that I was thinking of purchasing a whole new card. The tip on how to lubricate the fan did the trick! It's now as quiet as when it was new.

Jo Anne Lambert, Mantoloking, New Jersey

THE OCTOBER cover story is a terrible article. In my opinion, a more appropriate title would have been "Steve Bass's Preferred Windows Settings," because much of what was addressed is a matter of personal preference, not "broken" things within Windows.

John King, Waterloo, New York

YOUR SOLUTIONS to common Windows annoyances were terrific; however, in Windows, three or more approaches to a task often exist. Take, for example, the annoyance of automatically created hyperlinks when you type URLs or e-mail addresses in Word or WordPerfect (page 78).

My fix: Sometimes you want to keep the hyperlink and sometimes you want to delete it. Simply press **<Ctrl>-Z** or click *Undo* to reverse the change to a hyperlink, leaving you with the text you typed.

And the online version of the article (find.pcworld.com/31640) asks: "Who decided that Internet Explorer's new browser windows should open to the same small size, even though I always maximize the windows before I close them? You'd think the program would remember and open the new window in the same state as the last one I closed."

My fix: Size the Internet Explorer window as you want it—even at its maximum. Hold down **<Shift>** and close the window (click the X at the far right of the Title bar). Now every time IE opens, the window will be at that size.

Curt Coover, via the Internet

Editor's note: Many readers proposed alternate solutions to the "Dialog-Box Dilemmas" item, which recommended a $20 utility. Steve Bass will discuss these suggestions in his December 18 online newsletter (go to find.pcworld.com/25821 to sign up).

QUICKEN 2003—NO, THANKS

IN HIS REVIEW of Quicken 2003 [*New Products,* October], Mike Hogan states its changes "aren't always for the better." He should have been firmer in warning your readers. Some of my aggravations:
• I do not want Quicken's credit card, brokerage, or bill-paying service, or to be reminded of them every minute by icons or advertising on the interface.
• Quicken 2003 would not upgrade my portfolio. In trying to make it do so, I inadvertently transferred all of my investment information to Quicken.com—not where I wish to see it.

Roland A. Frechette, via the Internet

CAUTIONS ON HOME NETS

I ENJOYED the "Home Net Hassles" article in the October issue [*News and Trends*]. Besides the tips you mention, hard experience has taught me the following:
1. Mixing equipment from different manufacturers in a network is not a good idea because of compatibility issues. ▶

LETTER OF THE MONTH

Biometrics Not Ready for Prime Time

I WAS INTRIGUED by Andrew Brandt's online article on biometrics, which reported on how easily many biometric security systems can be fooled [find.pcworld.com/31589]. As an inventor of a biometric ID system myself, I have also discovered vulnerabilities in these systems. In fact, one doesn't need to melt down gummy bears (as the story suggests) to "lift" a fingerprint. Wal-Mart has a silicon gel kit for $15—used to record baby footprints and fingerprints—that can do the same thing.

Forgeries are not the only problem. As a Department of Defense contractor, I was recently issued a Common Access Card as part of a DOD-wide program that will eventually cost taxpayers untold billions of dollars. Its fingerprint identification system not only failed to recognize my right index finger after several registration attempts, it also recognized three other people as being me after it did work!

Michael Willmore
Lexington Park, Maryland
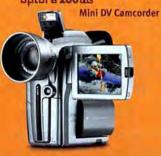
2. There are many ways the signal can be disrupted. Newer cordless telephones, microwave ovens, cell phones, and even faulty light switches throw out RF in the 802.11b-designated spectrum.

3. Don't tarry on returns. If you don't return an item within the designated period, you could be charged a restocking fee, or the store could refuse a return outright.

Warren B. Carah, Brighton, Michigan

PATCHES BEARING GIFTS

FOLLOWING YOUR advice [*Bugs and Fixes*, October], I installed the patches for the "dangerous holes" in Word and Excel (find.pcworld.com/30320) in my Windows XP machine. But I was highly irritated when I used Word and found I had to once again accept a lengthy End User License Agreement or apparently lose all rights to a legally purchased product. And new clauses in this EULA seem to give Microsoft automatic rights to download software to my computer. Maybe I should have taken my chances with the holes.

R. C. Oliver, via the Internet

ACT 6'S MISSING FEATURE

YOUR REVIEW of ACT 6 [*New Products*, October] failed to mention that the mapping feature—where the user can automatically insert a contact's address into the Yahoo Maps Web site to get a map of the location or driving directions—has been deleted from the current version. Until I missed it, I did not know that dropping such a small feature could cause such frustrating disruption to an otherwise excellent program.

Phil Hansen, via the Internet

WHO WANTS A SWISS ARMY KNIFE?

THE DEVICE described in the online article "Cell Phones Wed Digital Cameras" [find.pcworld.com/31583] is another entry in the growing plethora of new electronic gadgets of questionable usefulness. Why not add a can opener, a corkscrew, and even a metal toothpick? Maybe a built-in paper shredder will be next. And what do we have then? An electronic version of the Swiss Army knife!

J. M. Davidson, Glendale, Arizona

TANGLED IN WIRES

I THOROUGHLY enjoyed October's *Full Disclosure* on the wiring needed to set up PCs. Nearly every peripheral requires two cables, one to communicate with the PC and the other to power the device, and I usually need two plug strips.

The communicators on *Star Trek* provide the best example of a wireless environment. Everyone can talk to everyone else—and the computer—by tapping their badges. Until we get to that point, the cable industry will live long and prosper.

Jason McMahon, Dolgeville, New York

IDENTITY THEFT

"DON'T LET THEM Steal Your Good Name" [*Consumer Watch*, October] sounded like verbiage from a bank's PR department. Consider that after the victim, Michelle Brown, issued fraud alerts, *for a year and a half* merchants, banks, and a physician continued to let the criminal make purchases. The banks were clearly negligent here, as was the state DMV that issued the criminal a duplicate driver's license in Brown's name. [Go to www.privacyrights.org/victim.htm for details.]

As long as banks and merchants can put the onus on us, they are free to save money and be careless.

Harry Pottol, Sunnyvale, California

PC World *welcomes your correspondence. We reserve the right to edit for length and clarity. Send e-mail to letters@pcworld.com.* ■

CORRECTIONS

AN ERROR AT the end of the item "Netmask Unmasked" in October's *Internet Tips* was introduced in the editing process and was not the fault of the author. The correct version can be found online at find.pcworld.com/31601.

Contrary to a statement in October's "High-Flying Graphics Cards," NVidia's Personal Cinema is not available as a stand-alone unit.

In October's "Dynamite Downloads," the Pocket Informant utility should have been listed at $20.

PC World regrets the errors.

S200 DIGITAL ELPH

Pictures without film.   **Prints without a computer. What's the world coming to?**

Ditch your computer. The   Canon Card Photo Printer CP-100 connects right to your PowerShot
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colors from dye-sublimation.   For credit card and 4"x 6" print sizes that you can create
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Digital Movies Invade the Living Room

Plus: Starbucks Wi-Fi, spam revolt, CD killers, and online gaming.

1 Movie Downloads to Go

The Buzz: Coming to a couch near you, recent movie releases sent straight to your PC. Leading the pack of video delivery sites is Movielink—backed by the major studios—which debuts this quarter. Broadband users willing to endure the download time (an estimated 2 hours, which sounds wildly optimistic) have 30 days to activate a flick. Once they hit 'Play', they can watch it as often as they want for 24 hours, on a monitor (ugh) or a TV connected to their PC. Video-on-demand sites CinemaNow and Intertainer have struck their own studio deals. And that's just the legal stuff. According to a study by Divine, film buffs bootleg more than 400,000 movies every day.

Bottom line: More Pause than Fast Forward. Movielink's flicks will reportedly be priced "competitively with Pay Per View." Can that compete with the bootleggers' "Steal Per View" pricing plan?

2 Starbucks Goes Wireless

The Buzz: The java giant has a new two-step program: Get wired on caffeine, then hop on a wireless network. A whopping 70 percent of Starbucks shops may eventually sport Wi-Fi Net connectivity, courtesy of T-Mobile. With a Starbucks on every corner, this development creates a de facto nationwide wireless network.

Bottom line: Coffee shop Net access for $30 per month? That's too many beans. Get back to me when it costs less than five decaf nonfat mocha Frappuccinos.

3 Spam Backlash

The Buzz: The rumbling you feel is a groundswell of antispam sentiment. Not unexpected, given that junk e-mail has jumped by more than 65 percent this year, according to Postini, an e-mail security service. Consumer groups are demanding government action.

Bottom line: Direct marketers claim that they can limit spam through self-regulation. If you believe that, I've got some herbal Viagra I'd like to sell you.

4 'CD Killer' Is DOA

The Buzz: DataPlay was supposed to kill off the CD. After all, it boasted rockin' technology (500MB of data on a disc the size of a quarter), recording-industry support (thanks to built-in copy protection)—even a Britney Spears album on the way. But at press time the parent company was scrambling for cash, marketing bucks had dried up, and only a short slate of artists was releasing discs.

Bottom line: Good-bye, DataPlay; hello, Philips SFFO? As DataPlay rummaged through the couch cushions, Philips demonstrated a coin-size rewritable disc that holds 1GB. The wheel just keeps on turning.

5 Game Consoles Get Net

The Buzz: Competing with others in an online community is the Next Big Thing for console games. Sony's PlayStation 2 has the $40 Network Adaptor, which lets you play games such as Madden NFL 2003 online. Microsoft has announced a mid-November launch of Xbox Live, an online broadband-only community with a yearly subscription fee of $50. And Nintendo's GameCube offers a $35 broadband adapter or modem of its own.

Bottom line: Imagine a kind of digital Mister Rogers' neighborhood...but with guns, helmets, swords, and attitude. ∎

Contributing Editor Steve Fox covers buzz-worthy products, ideas, and trends. Contact him at steve_fox@pcworld.com. Visit find.pcworld.com/31643 for more Plugged In.

NAGGING QUESTION

What Does Scroll Lock Do Anyway?

EVERY KEYBOARD has it, somewhere on the upper right-hand side, and frankly, it's pretty useless. It was included on the original IBM PC (where it also had little point). Nowadays, Excel is about the only app that takes advantage of it. When you engage Scroll Lock and press an arrow key, the active cell remains where it was and the entire spreadsheet moves (without Scroll Lock, the active-cell indicator moves to the next cell). But that's hardly an essential tool. The real purpose of Scroll Lock? To make the Scroll Lock indicator glow reassuringly. It makes a lovely night light.

ILLUSTRATION: JACK GALLAGHER

SETTING NEW STANDARDS IN
WEB HOSTING

IT'S NO SECRET that Web hosting services can simplify the challenge and cost of creating and maintaining a Web site or Internet presence. Companies that outsource the hosting of their Web sites can save money and reduce IT headaches by eliminating the time-consuming chores of configuring and managing complex Web servers and networking technologies.

But too often, small-to-mid-sized organizations are faced with a difficult decision when it comes to Web hosting: the tradeoff between reliability and price. For an increased fee, dedicated hosting services can provide high reliability and strong security by isolating a company's Web site on a single, non-shared server.

Alternatively, organizations can reduce costs by using shared Web hosting services, where the Web server is shared among many companies. This considerably reduces costs, but introduces the possibility that problems with one company's Web site could negatively affect another company's Web site. These "traditional" shared Web hosting services make it easy for small and mid-sized companies to get online, but they often lack the reliability, security, and features found on high-end, dedicated hosting solutions.

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Interland Inc.
www.interland.com

But now that's changing. By using a new Web hosting architecture that includes additional security measures and the latest storage and backup technologies, it's possible to create a shared Web hosting environment that rivals the reliability of a dedicated hosting configuration—all without significantly altering the price. This new standard, which delivers higher reliability, increased security, and better performance, is starting to change the face of the Web hosting market.

INTERLAND RAISES THE BAR

Now, businesses with a limited Web presence will no longer need to make price their only criterion. Instead, they should also be looking for strong, multi-level security features, highly reliable hosting architectures, and built-in redundancy, with no single point of failure—as well as a competitive price.

Interland, Inc. (www.interland.com), the leading provider of business-class Web hosting for small and medi-

um-sized businesses, is setting the standard for next-generation shared Web hosting solutions with the introduction of its blueHALO shared hosting services. BlueHALO (for High Availability Load Optimizing architecture) dramatically raises the bar for shared Web hosting. Unlike traditional shared hosting architectures, which tend to rely on single firewalls, stand-alone servers with stand-alone storage, and limited backup and recovery capabilities, blueHALO includes the following important architecture elements:

BlueHalo's Key Elements

> Redundant firewalls that provide added security and isolation
> Load balancers that route traffic and guard against botlenecks while increasing performance
> Multiple Web server arrays that keep the Web site up and running even if one server fails
> Duplicated Network Attached Storage (NAS) units, which deliver data instantly and offer immediate recovery in the event of a problem
> Disk backup systems that include backups of all data to guarantee Web site continuity.

But Interland didn't stop there. They've included two unique components that make the blueHALO architecture even more resilient: code management and process management. BlueHALO's Code Manager component runs on every account and monitors Web site code for common errors, while reporting possible performance improvements. Process Manager isolates resource-intensive server processes, increasing reliability by isolating Web sites from potential damage due to application problems on one of the Web sites running on the shared servers.

These features all add up to a new standard for shared Web hosting. With these fundamental changes to hosting architecture and new management capabilities, even small companies can have enterprise-class reliability, security, and performance in a cost-effective solution. In fact, Interland is backing this new approach by offering a Service Level Agreement of 99.99%, and even providing a money-back guarantee. No longer do organizations looking for cost-effective Web hosting have to make a tradeoff between price and reliability—blueHALO shared Web hosting delivers enterprise-class service at small-business prices. ■

Traditional shared hosting is dead.

Introducing blueHALO℠ shared.

The hosting architecture that redefines an entire industry.

Two years and millions of dollars in research have been spent revolutionizing the face of Web hosting. For the first time ever, small- and mid-sized businesses have a reliable option in shared hosting architecture. It's called blueHALO shared.

Unprecedented security and redundant stability can be yours.

Redundant firewalls provide essential security. Load balancers route traffic and guard against bottlenecks. A server array keeps your site up and running

Traditional hosting		blueHALO shared
✓	Network Firewall	✓
	Primary Firewalls	✓
	Load Balancers	✓
	Server Array	✓
	Network Storage	✓
	Disk Backup	✓

even if one server goes down. Duplicated network-attached storage units deliver data with incredible speed and instant recovery. A disk backup system also

prevents data loss. Regardless of what you've been told, the old, shared technology you're currently using offers none of this. But blueHALO shared does.

All for what you're paying now.

blueHALO shared

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LIMITS IN MIND

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matched with Direct X® 9.0 support for superior video realism in your
3D games. Plus, get incredibly crisp video during DVD and streaming
video playback. Let the performance begin!

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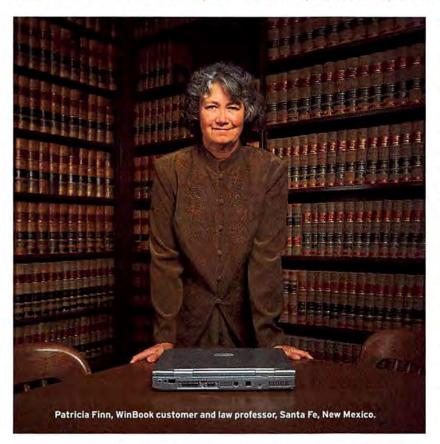
Bulletproof Your PC's Warranty

How to make sure that your warranty will really protect you.

Patricia Finn, WinBook customer and law professor, Santa Fe, New Mexico.

PATRICIA FINN WAS happy with her new WinBook J4 laptop computer—at first. But about two months after she bought it, she noticed that the pin inside the notebook's connection for the AC power converter had broken off, so she could no longer charge the machine's battery. "The dead battery alert beeped even though the computer was plugged in," explains Finn, an attorney and law professor in Santa Fe, New Mexico. "I looked to see if the pin was in the connector, but it was nowhere to be found. I shut down the computer and was dead in the water."

Confident that the extended warranty she had purchased would take care of the problem, Finn called WinBook to arrange for repairs. To her surprise, that's when the real trouble started.

"As soon as I mentioned the AC pin, the tech support representative transferred me to customer service," Finn recalls. "The [customer service representative] told me that—without question—I had damaged the computer and would have to pay a large deposit against the repair cost prior to the repair."

That response left Finn angry. "Since I knew I hadn't done the damage, I asked to speak to a supervisor and was told that I had no recourse—I had to pay the deposit to repair the notebook or they would void both my warranty and my extended warranty."

Finn had no luck contesting the policy with WinBook, and she eventually had to give up. She authorized the repairs and paid the deposit. By the time WinBook fixed her notebook, she had shelled out $144, plus all shipping costs. "By that point it had been a couple of weeks, and I was desperate to have my computer back," she explains. "Honestly, the computer is nice, but I wish I had gone with another company."

After I called WinBook about Finn's experience, the company's marketing manager Ed Lukens investigated and determined that the damage to Finn's computer was less extensive than expected and that the repairs should have been covered by her warranty. As a result of my inquiries, the company reimbursed Finn.

NASTY SURPRISES

NOT ALL WARRANTY disputes have such happy endings, though. The issue may be who is responsible for an equipment failure, whether the company must replace a faulty component with a new one, or who should pay for shipping. But whatever it is, too many users get a nasty surprise when they invoke a PC's built-in insurance policy. (Take a look at this month's *On Your Side*, page XX, for a different tale of warranty confusion.)

How do you ensure that a PC maker will stand behind the promises it made when you bought the machine? A ▶

PHOTOGRAPH: JOHN MacLEAN

Free me.

Power me.

Best of
both worlds
me.

good place to start is by checking our ratings of PC makers' reliability and service on page TK. In addition, I'll give you some tips on how to guard against warranty nightmares.

Finn's experience is a good example of how differently a company and its customer can see the same facts. According to Lukens, WinBook turned down Finn's original claim because the problem she described fit neatly into the category of "user misuse" and consequently, under the written terms of the warranty, was ineligible for coverage.

"Of the thousands of WinBook J4's sold, this is the only one that's shown the problem Ms. Finn described," Lukens explains. "Generally, problems like this are caused when the user moves the system without bothering to unplug it, breaking off the AC adapter pin."

Lukens says that his company maintains photo archives to document the damage incurred by each unit that WinBook rejects for warranty repairs. "That way, we have a record to show damages that simply wouldn't be possible under normal use," he explains.

Finn is positive that she didn't cause the problem herself by forgetting to unplug the system. "Nobody at WinBook was willing to even consider that the computer might have a defective part," she says.

BUSINESS AS USUAL

WINBOOK'S REFUSAL to cover problems caused by users reflects standard policy among computer and other hardware vendors, and it's understandable. After all, you wouldn't expect the maker to cover repairs or replacement if you dropped your notebook into a vat of Jell-O or left it on the roof of your car just before departing on your morning commute.

But as Finn discovered, a reasonable policy can sometimes be enforced in an unreasonable way. If you're lucky—and many PC users are—the company that made your computer will go out of its way to make you happy. But if not, you may find that the company's warranty policies and procedures aren't particularly user-

friendly. How do you avoid such problems or deal with them when they crop up? I have some suggestions.

First, make sure that you know the exact terms and conditions of your warranty from the beginning. Federal law requires manufacturers and resellers to make the details of their warranties available to consumers prior to purchase, so always ask to see a written warranty statement before you close the deal.

If you're buying at a retail store or over the phone, follow the famous advice of former President Ronald Reagan: "Trust, but verify." It's not unheard of for an uninformed salesperson to make verbal assurances that are at odds with what the vendor really covers. In these cases, the

"Nobody at WinBook was willing to even consider that the computer might have a defective part."

–Patricia Finn, WinBook owner

company—not to mention a court—is likely to fall back on what's in writing.

If you're buying online—or just doing some research at home—you can obtain a detailed warranty statement at the PC maker's Web site. If you're deciding between two or more products, compare the details of warranty coverage just as you'd compare features and price.

Consider the length of the standard warranty and the points at which it starts and ends. Although policies are getting stingier all the time, most PC makers still offer at least a one-year limited warranty; be wary of anything less. Find out whether the company will pay for 100 percent of repair costs, and whether the warranty covers both parts and labor.

Get details on exactly what kind of repairs your warranty covers. This is a notoriously gray area, with plenty of potential pitfalls. For example, in addition to refusing to foot the bill in cases of "user misuse," most warranties won't cover accidents like spills or drops, problems with

Unauthorized Dealers and Warranties

I CAME UP against a troubling scenario when purchasing computer and audio equipment on the Internet. I ordered a Sony LCD projector from a supposedly reputable online vendor. But then I called Sony and found out that the vendor was not an authorized dealer. The Sony rep said that if I bought from that vendor, my warranty would be void. So I canceled my order. How can consumers make sure that their purchases are covered by the manufacturer's warranty?

John McCracken, New York

On Your Side responds: I contacted Sony to inquire about its warranty policy. According to company spokesperson Greg Dvorken, Sony provides warranty service on all of its products as long as users have proof of purchase in the form of a bill of sale or invoice certifying that the product is within the warranty period.

If, however, the factory-applied serial number has been altered or removed from the product (which Sony says some unscrupulous unauthorized dealers do), then the warranty is invalid.

Sony recommends purchasing from an authorized dealer because the company requires that such dealers meet certain standards, including informing you of the status of your order by e-mail within 12 hours and offering convenient return policies. Go to find.pcworld.com/31076 for more information and a complete list of Sony's authorized resellers.

–Grace Aquino

user-installed software, or damage ascribable to unauthorized service or parts.

Worse, some warranties seem to ignore the fact that most computers are built to be upgradable. The most draconian policies dictate that the minute you open the PC's case—whether it be to upgrade your sound card or even to try to fix a loose connection—you void your warranty.

Find out what's involved in making a claim under warranty. For example, ask whether you need to report a problem within a specific time limit. Determine whether on-site service is an option and, if so, how long you can expect your hardware to be out of commission.

Will you have to spend hours on the phone with tech support before a service rep is deployed? (Hint: Start clearing your schedule now.) Look for a company that maintains a local repair facility, so you won't have to box up your PC and ship it to another time zone. In case you do have to ship your computer, find out who pays for shipping and handling.
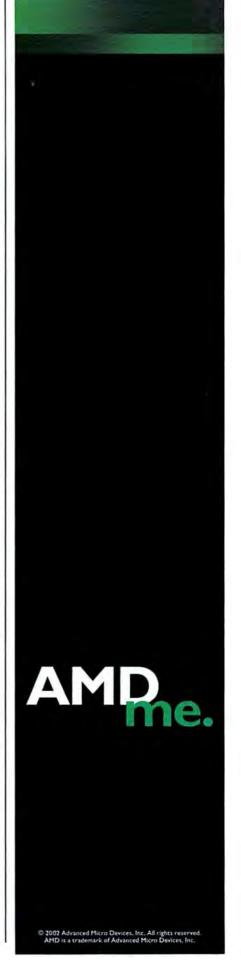
Keep in mind that some warranties aren't transferable, so if you purchase a second-hand computer or buy a machine from an auction site, you may be out of luck. And virtually all warranties state

clearly that the companies standing behind them are not responsible for any lost data or lost profits that result from a system failure, so be sure to back up your PC regularly and have a second system available if your work is time-critical.

EXTENDED WARRANTIES

PURCHASING AN EXTENDED warranty may add hundreds of dollars to a system's price, making it even more crucial to analyze the details of the policy. The investment often isn't worth the extra cost. It may make sense to give more consideration, though, to extended warranties from direct vendors. These warranties tend to be more reasonably priced.

If you're buying a laptop, look for an extended warranty that covers accidents like drops that portable PCs are prone to.

If you purchase a new system using a credit card, check the card issuer's product warranty options. Some cards automatically extend your warranty coverage after your manufacturer's warranty expires or offer extended coverage at a more affordable price. But the terms of credit cards' extended warranties typically mirror the terms of the manufacturer's warranty—check with your card issuer. ▶

A final option: Credit card companies sometimes sell extra protection against accidents and theft not covered by most computer manufacturers' warranties.

What if you've played by all the rules, but your claim is still turned down? Document everything carefully so you won't forget the details. When you call tech support, explain the problem as precisely as possible, including details of how it happened and when you first noticed it. Describe any attempts you made to fix the problem. (But remember what I said earlier: Some warranties become void if you or anyone else performs any unauthorized service on the equipment—even something as minor as opening the tower).

If you still don't get anywhere, ask to speak to a manager and again explain the situation calmly and rationally. Offer to send documentation, including digital photos of the damage if necessary.

BRING IN THE BIG GUNS

AS A LAST RESORT, send a firmly worded letter by certified mail to the highest-level executive you can find by name, and send a copy to your state attorney general and Better Business Bureau.

Before you buy, see what other consumers say about a company's policies. Our reliability and service survey, based on responses from nearly 30,000 *PC World* subscribers, is a good place to start.

Also consult friends and coworkers, and visit consumer Web sites such as PlanetFeedback (www.planetfeedback.com) and the BBB's site (www.bbbonline.org). If you have comments—either positive or negative—pass them on. Sharing your experience online could save other PC buyers a lot of headaches. ∎

Anne Kandra is a contributing editor, Grace Aquino an associate editor, and Andrew Brandt a senior associate editor for PC World. *E-mail them at consumerwatch@pcworld.com. For more* Consumer Watch, Privacy Watch, *or* On Your Side *columns, go to* find.pcworld.com/31703, find.pcworld.com/31706, *or* find.pcworld.com/31709.

PRIVACY WATCH

A Little Bird That Guards Your Online Privacy

IF YOU WANT TO GET detailed information about how Web sites use your personal data–and you want to get it quickly–then you need to listen to a little bird–the Privacy Bird.

A free plug-in from AT&T for Internet Explorer 5 and later versions, Privacy Bird (find.pcworld.com/31022) allows you to specify your privacy preferences regarding how a Web site stores and collects data about you. If a site's policies meet your requirements, a small green bird icon in the browser's title bar emits a happy tweet after you have loaded the page. But if the site does more with your information than you've said you'll accept, the bird icon turns red and chirps a shrill warning when you first load the page. The bird doesn't block the site; it only alerts you that you may not like what the site does with your information.

With a couple of clicks, you can see what a site plans to do with your data. Even at the lowest privacy threshold, I noticed, the bird was alarmed when I visited Yahoo.com, for example. I clicked on the bird's summary of Yahoo's privacy policy and found that, among other things, Yahoo "may use health or medical information for marketing" and "may contact you to interest you in other services or products and does not allow you to remove yourself from marketing/mailing list." (Full disclosure: *PC World* provides some content to Yahoo.)

The idea for the bird hatched at AT&T Research, which got involved when programmers at AT&T and many other companies began crafting the Platform for Privacy Preferences, or P3P.

P3P gives Web sites a standardized, simple way to disclose how they collect, use, and distribute personal information about their visitors. Specialized software can automatically query a site's P3P policy. Internet Explorer 6 uses P3P to give users fine control over which sites may set cookies. But the browser can't give you any information about how sites will use data entered into registration fields, shopping forms, or message boards.

That's where Privacy Bird earns its wings. Since its quiet launch last spring, thousands of people have downloaded the software. According to Lorrie Cranor, the AT&T researcher who headed the Privacy Bird project, about a third of the top 100 most-visited sites on the Web–including Expedia.com, Microsoft.com, and About.com–have in place the P3P policies the plug-in needs to operate. Unfortunately, that leaves another two-thirds of the largest sites (as well as many other sites, including PCWorld.com, for now) at which the Privacy Bird flashes yellow–a signal indicating only that the site has no posted P3P-compatible privacy policy.
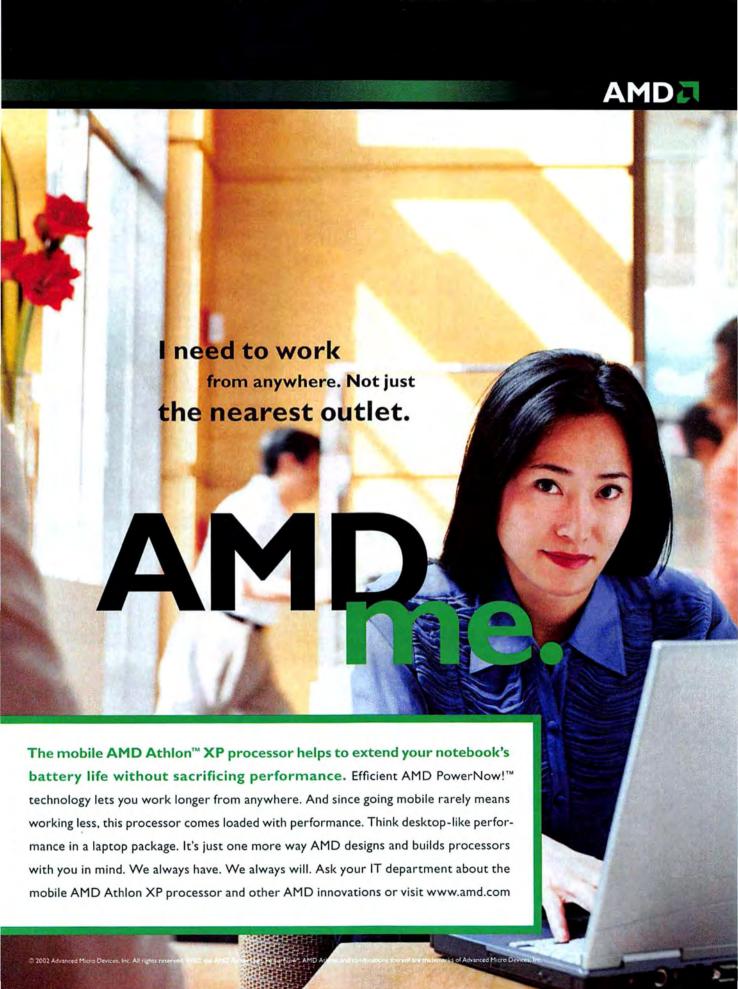
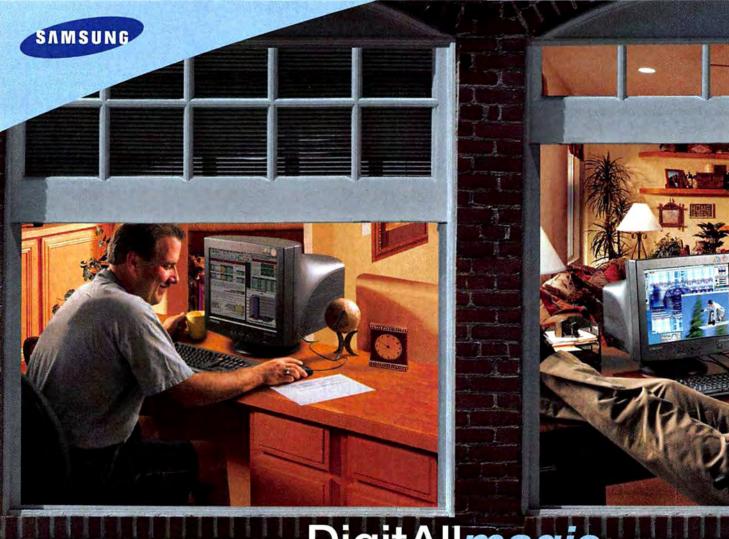Cranor says that completing the forms and creating the P3P files for an average-size site can take an hour or two; but because a posted privacy policy has legal implications, the process can take considerably longer for larger, more complicated sites–especially sites with order forms.

The Privacy Bird is already a useful tool. As more sites create P3P policies, it will become indispensable for cautious surfers.
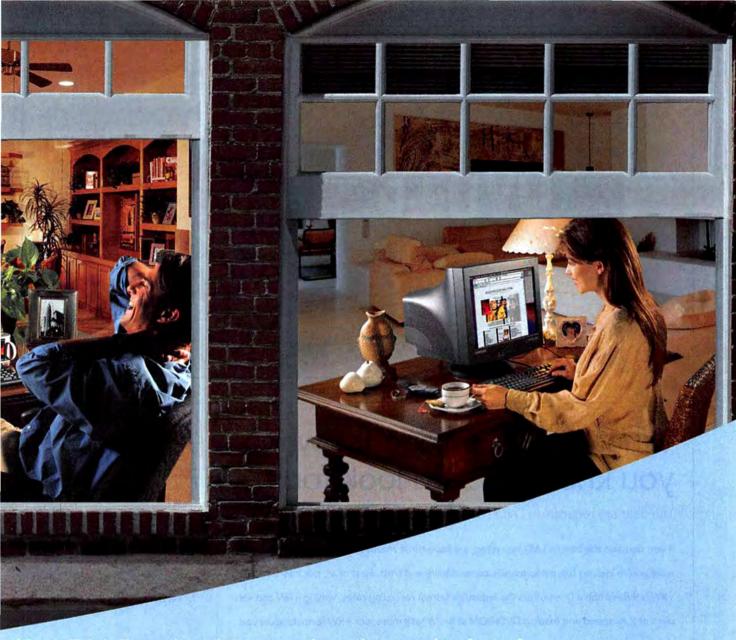
–Andrew Brandt

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If you demand the best in DVD recording, we have three reasons why Memorex is exactly what you're looking for: performance, compatibility and trust. First of all, our internal DVD +RW/+R ReWritable Drive offers the industry's fastest recording rates, writing +RW and +R discs at 2.4x speed and reading DVD-ROM at 8x. What's more, our +RW formats allow you to edit your videos without having to rewrite the entire DVD—an enormous time-saver. Plus, our intuitive software makes the whole formatting process quick and easy. Secondly, our +RW and +R DVDs provide maximum compatibility. So whether you capture video, save photos or just transfer data, your DVDs will be compatible with 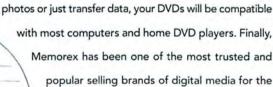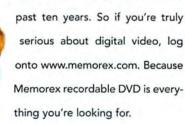most computers and home DVD players. Finally, Memorex has been one of the most trusted and popular selling brands of digital media for the past ten years. So if you're truly serious about digital video, log onto www.memorex.com. Because Memorex recordable DVD is everything you're looking for.

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Will the Web Ever Really Work?

Final lesson: The Net has become invaluable, but it's far from foolproof.

ONE DAY I GREW tired of receiving paper statements from my stockbroker, so I signed up to receive e-statements. Two months later, my physical mailbox was still clogged and I hadn't received a single e-statement. When I called my stockbroker, however, the man who answered said, "Looks like everything is okay." So why was I staring at yet another paper statement instead of reading it online?

There was no ready explanation. Some statements started appearing online shortly after I made that phone call, but another service I signed up for, e-mail notification of online trades, has yet to function. Overall, I'm not surprised—and what does that say about the Web?

ACCEPT MEDIOCRITY?

THE WEB IS essentially one huge software application. When was the last time you used software that was bug-free and never crashed? (Microsoft Word just suggested that I replace the word *does* in the previous paragraph with *doe*.)

Ever since the first time a credit card number was inadvertently revealed online, we've known the Web is prone to errors. And I don't envision a day when the Web works perfectly.

But is near-perfection too much to ask for? If the Web were a one-way medium like cable TV, I could overlook the occasional glitch. But the Web is two-way. I

hand over everything from my address to my credit card number in return for goods and services. The systems behind these exchanges had better work as advertised, or I'm going to stop using them.

People use the Web as a tool in their daily lives. Since the tool isn't perfect, they must use it carefully and learn from their experiences. Here are some of mine:

I've started to pay bills with Yahoo's BillPay, and I've been moving my bills online slowly because I fully expect more occurrences like last month's: My online utility bill never showed up. BillPay was still researching the problem after the due date had passed. Fortunately, the utility company won't stop mailing bills to me, so my credit rating is still intact.

My poor father. All he wanted to do was download McAfee VirusScan to get rid of an infection, but the site kept telling him to enable cookies. We made sure that cookies were enabled, but the file still wouldn't download. That didn't stop the company from charging my dad's credit card three times, however. I told him to go to the CompUSA store up the street.

I signed up for Yahoo Alerts to get news flashes. It was an invaluable service for about five months. Then alerts started mysteriously disappearing for weeks at a time. I had to sign up for alerts from CNN.com to keep my bases covered.

I love Upromise to death (see October

2001's *Web Savvy* at find.pcworld.com/ 31115). I have saved hundreds of bucks for my boys' college education through Upromise's rebate program. But the system doesn't always work. I've occasionally had to e-mail the company and produce receipts showing that I deserved a cash rebate. I'll never give up on this service, but I'm tired of monitoring my account to make sure I get my contributions.

The Web is a terrific invention—one I'll always use. It is also very young and still needs years to develop. Heck, I've got offline companies that continue to bill me for services I paid for months ago. Nothing is perfect, but here's hoping the Web comes closer to fulfilling its promise of being a faster, easier, more convenient, and more private way of doing things. ∎

Brad Grimes is a contributing editor for PC World. *Visit* find.pcworld.com/31508 *for past* Web Savvy *columns.*
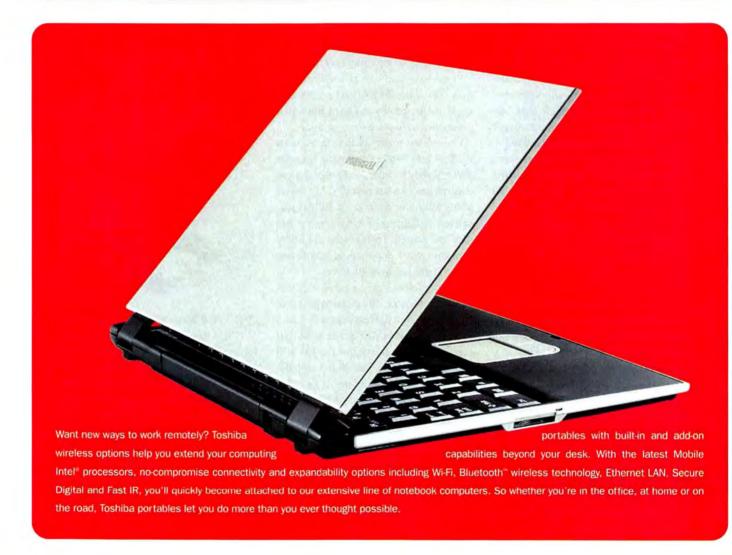
FAREWELL

Gimme a Ticket Home

IT'S TIME TO TAKE a bow and bid so long to *Web Savvy* readers. It's been a pleasure navigating the Web with you, but this is the last time this column will appear in this magazine. Although *Web Savvy* is going away, rest assured that *PC World* will continue covering new, cool, and useful sites throughout its pages. Stay savvy.

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The Toshiba Small Business Series, featuring Microsoft® Office XP, brings desktop-level capabilities in a portable to businesses with up to 400 employees. Offering a wide range of options including connectivity, Mobile Intel® Pentium® 4 computing power and NVIDIA® GeForce 4™ 420 Go graphics.

Great Gadgets Make the PC Livin' Easy

Check out the useful hardware gizmos headed for Bass's holiday stocking.

MY WIFE, JUDY, never has a problem wondering what I want for Christmas. She knows I'm such a gadget freak that I can't get my hands on enough of these technological marvels. But the five devices I've been whiling away the hours with lately aren't just playthings, no matter how much I enjoyed them. They'll make your home-office computing a lot smoother, and maybe a lot more fun, too. (For more cool hardware, see page 129 for our list of this year's "Cheap Champs.")

Sound switcheroo: When I work late, I like to listen to music playing on my PC. I don't want to disturb my wife, but I'm too lazy to crawl under the desk, disconnect my PC's speaker cables, and connect a headset. That's why Plantronics' $20, mouse-size Audio PC Headset Speaker Switch is so handy. With a flick of its button, I'm listening to Brubeck without waking up the household.

Ports to the fore: Imagine never having to hunker down under your desk searching for ports and fussing with cables. With IC Intracom's $39 Multimedia Control Panel, you can bring two USB ports, as well as ports for a FireWire link, a joystick, a microphone, speakers, and other connections, to the front of your PC. The panel fits into any free 5.25-inch bay inside your system's case, and its connectors snake through the back of the PC into the corresponding backward-facing ports.

Power shots: My digital camera is great, except for the dozens of AA batteries I've had to schlep to keep it powered. Now I use DigiCom's $30 Digital Camera Auxiliary Power Pack rechargeable lithium ion battery, which links to the camera via a cable. It's about the size of a small cell phone, and in unscientific tests using my Epson PhotoPC 3100Z, I took 212 pictures before it ran out of juice.

Digital video snipper: After a day of using a mouse to edit the video from my trip to China last spring, my hand and shoulder ached. And no wonder—I was using the wrong tool for the job. Contour A/V Solutions' $90 ShuttlePro Multimedia Controller is a trackball-size device with a knob that rotates 360 degrees, making precise frame-by-frame movements easy. The shuttle control has seven forward and reverse speeds, as well as 13 buttons preprogrammed for popular video editing applications. The ShuttlePro connects via a USB port and works with all current Windows versions.

Take a good look: Pull out your checkbook for the ProScope—a handheld, lightweight digital microscope from Bodelin Distribution. I used the scope to inspect items around my home office—leaves, feathers, and bugs (so I'm a little late on the spring cleaning). Go to find.pcworld.com/31043 to check out some of my images. The ProScope looks like a doctor's otoscope (the thing they use to look in your ear), only a little bigger. Aim the device at anything and see it on your PC's screen; click a button on the scope to take snapshots, time-lapse photos, or videos. The $229 ProScope (no, I didn't say it was cheap) has a 50X lens, which is more than adequate for seeing the individual cells of a leaf, for example. On a Windows XP system (the device also works with 98 SE, Me, NT, and 2000), the ProScope took 10 minutes for me to install and start using.

It broke my heart to return these products after testing them. But no worries— my wife reads the column, and she knows it's almost stocking-stuffer time. ∎

Contributing Editor Steve Bass runs the Pasadena IBM Users Group. Reach him at homeoffice@pcworld.com; visit find.pcworld. com/31610 for more Home Office columns.

Audio PC Headset Speaker Switch	Multimedia Control Panel	Digital Camera Auxiliary Power Pack	ShuttlePro Multimedia Controller	ProScope Digital Microscope
★★★★☆	★★★★☆	★★★★☆	★★★★☆	★★★★★
$20	$39	$30	$90	$229
Plantronics	IC Intracom	DigiCom	Contour A/V Solutions	Bodelin Distribution
www.plantronics.com	www.icintracom.com	find.pcworld.com/31529	www.contouravs.com	www.theproscope.com

ILLUSTRATION: MARC ROSENTHAL

Hark! Harold the angel sings.

card created at www.hp.com/go/7holiday
with hp photo greeting card paper

'tis the season to share

Give generic greeting cards the old heave-ho ho ho! Create and print truly personalized cards using your own photos, or choose a festive cover from a gallery of exclusive designs. It's free at My Card Maker.™ Guaranteed to make everyone's holidays a little jollier!

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SYS, International has been an industry-leader in high performance PCs and workstations since 1988. When reviewed, PC World called the SYS Performance 1400TD a Best Buy! In January 2002, PC World retested the SYS Performance 1400TD using its updated benchmark. Once again, the SYS Performance 1400TD earned a "Best Buy" award.

Equipped with a powerful Intel Pentium® 4 processor, SYS PCs offer brute power and complete reliability when running even the most advanced applications.

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• Customization for today diverse needs
• A great warranty and world-class customer support
• All of the above at a fair price

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FASTER MEMORY ADDS PUNCH TO P4 PC World, October, 2002.
http://www.pcworld.com/news/article/0,oid,104165,pg,2,00.aspf

Just one example of SYS quality. For SYS' latest Pentium 4 processor-based system review by PC World, see the chart below.

SYSTEM	Processor	Memory	PC WorldBench 4	AutoCAD (seconds)	Adobe Photoshop 6.0.1: Lighting effects (seconds)	Adobe Photoshop 6.0.1: Multiple filters (seconds)	Musicmatch Jukebox 7 (seconds)	Windows Media Encoder 7.1: Audio file conversion (seconds)	Windows Media Encoder 7.1: Video file conversion (seconds)	Unreal Tournament (frames per second)
SYS Performance 2800 PC	2.8-GHz Intel Pentium® 4	512MB PC1066 RDRAM	129	262	46	61	16	50	48	86
Alienware Aurora DDR	1.8-GHz Athlon XP 2200+	1GB DDR266 SDRAM	123	286	46	59	21	60	58	111
Dell Dimension 8200	2.8-GHz Intel Pentium® 4	1GB PC800 RDRAM	122	282	49	61	16	51	49	118
Gateway 700XL	2.8-GHz Intel Pentium® 4	1GB PC800 RDRAM	121	277	48	63	16	56	52	122
Average of six systems	2.4-GHz Intel Pentium® 4	512MB	120	n/a	n/a	a	n/a	n/a	n/a	n/a

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1-800-613-9963   www.sys.com

Microsoft Patch: Proceed With Caution

Sure, the Windows XP update fixes some problems, but it may bring new ones.

MICROSOFT recently shipped two important service packs—one for Windows XP, and the other for Internet Explorer version 6. Service Pack 1 for Windows XP includes IE 6 SP-1, so if you're running XP, you'll have to install only the XP update to get both.

Windows XP SP-1 contains a critical patch for a previously unknown security flaw that may be one of the most dangerous holes I've ever written about. The flaw involves the way that XP's Help and Support Center works. Experts say that unlike run-of-the-mill security holes, this one is easy to exploit and can enable a miscreant to delete files from your hard drive remotely.

Microsoft has announced that it won't release a separate security patch for this serious hole. Jump to find.pcworld.com/31034 to get SP-1.

A word of warning: When installing the XP service pack, don't be surprised if you run into some complications. So far, things have gone pretty smoothly for most users. But a number of e-mail messages I've gotten indicate that SP-1 is driving some of you batty.

Several readers reported that programs such as Microsoft Outlook stopped working properly. Others had trouble with their systems' overall stability. To deal with the issue, some users uninstalled SP-1; they said that the problems promptly went away. Though this tactic might work for a little while, it's not a good long-term plan. You will probably need to install SP-1 in order to get future updates.

At press time, Microsoft said it was looking into our readers' complaints. Meanwhile, the company has posted workarounds for acknowledged post–SP-1 problems; these include specific error messages and IntelliMouse glitches. Go to find.pcworld.com/31565 for more details.

Just as the XP service pack rolled out, Microsoft released the first service pack for IE 6. This update contains all previous security fixes for IE 6, including the cumulative patch I wrote about last month (find.pcworld.com/31457). There are no new fixes in this service pack, but read "Java Jive" at right to learn about a patch that isn't covered in SP-1.

IE's SP-1 is available in different versions for Windows XP, 2000, Me, 98, and NT 4. Browse to find.pcworld.com/31358 to get the download. ∎

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

KODAK AND NIKON CAMERAS SHOCK, BURN

KODAK IS RECALLING its DC5000 Digital Zoom cameras because of a manufacturing defect that could cause users to sustain electrical shocks. The recall applies to you if you purchased your DC5000 camera between June 2000 and August 2002. Visit find.pcworld.com/31364 for Kodak's recall procedure.

At the same time, Nikon is recalling about 9000 of its Coolpix 2000 digital cameras because owners of these units may burn themselves. The affected models fall within the following serial number ranges: 3010001 to 3060980 and 3510001 to 3561916. Go to find.pcworld.com/31367 for Nikon's replacement policy info.

IN BRIEF

Word Theft

MICROSOFT Word 97, 2000, and 2002 could permit a clever cracker to steal copies of files on your hard drive by sending you a malicious Word document file and getting you to return it. Microsoft says the apparent hole is simply a Word feature; at find.pcworld.com/31370 the company offers some general ways to protect your files from prying eyes.

Java Jive

MICROSOFT found two "critical" holes in its Java Virtual Machine. The flaws could let a bad guy take over your system. Hop to find.pcworld.com/31373 to get the patch.

King Klez

MANY users haven't updated their antivirus software to block the Klez.H worm. It's now the most widespread virus in history. To stop this insidious worm, go to find.pcworld.com/31376 for McAfee's advisory or to find.pcworld.com/31379 for Symantec's removal steps.

BUGGED?

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

Yak, yak, yak, clobber, clobber, yak, yak, yak.

Games

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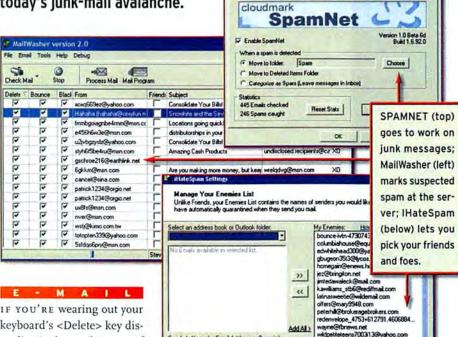
NEW PRODUCTS

New Spam Fighters: Smart and Effective

Latest tools effectively stem today's junk-mail avalanche.

SPAMNET (top) goes to work on junk messages; MailWasher (left) marks suspected spam at the server; IHateSpam (below) lets you pick your friends and foes.

E · M A I L

IF YOU'RE wearing out your keyboard's <Delete> key discarding junk e-mail, try one of the new breed of intelligent spam-fighting tools. I tested four: **IHateSpam**, **MailWasher**, **SpamNet**, and **Spamnix**. The good news: All four performed well. Even better, two cost just $30 each and two are free.

The filters included in most e-mail clients rely on the outdated method of examining addresses and headers to catch unwanted messages. Today's spam fighters are cleverer: They use heuristic testing—learning as they go—to analyze a message's content, looking for both blatant and subtle signs that it's spam.

For instance, an e-mail message with many words entirely in uppercase letters and lots of large fonts may be from your boss, but add a forged address or mismatched header, and bingo—it's tagged as spam.

Errors? Sure. All the programs I tested confused some legitimate e-mail messages for spam (and vice versa), but not enough to worry about. Also, each program let me review blocked messages to ensure that nothing important accidentally got vaporized.

I tested the four programs in two ways: I set up Earth-Link e-mail accounts and then trolled for spam by opting in to obvious spam ploys; and I used the programs for my everyday e-mailing duties.

WASHDAY FOR SPAM

THE SHIPPING version of MailWasher works as a stand-alone tool, so it is compatible with any POP3-based e-mail program, but it won't work with Web-based programs. (I also tried an early beta compatible with Hotmail.)

The free program goes to your mail server, retrieves the header and enough of the message for analysis, and marks suspected spam. Once you double-check the list, it filters, blacklists, bounces, and deletes the spam.

Because MailWasher identifies spam before you download entire messages, it's a real plus for dial-up users.

In my tests, MailWasher caught 93.5 percent of spam.

JUST FOR EUDORA

IF YOU USE Eudora to check e-mail, you need Spamnix. The $30 no-frills plug-in from

RAZOR
Zayo A600.

Spamnix Software is available free for 30 days before you buy. I tested a late beta version and had no problems.

As Eudora retrieves e-mail messages, Spamnix examines each one, scrutinizing the header and contents. If the e-mail isn't spam, a click on the Accept This Sender button grants immunity to future mail from the sender. Click the Reject button, and Spamnix bans the sender's subsequent messages.

Adding or removing e-mail addresses from Spamnix isn't difficult, and the lists can accept wild cards. For example, *@pcworld.com matches any sender that ships a message from PCWorld.com.

While not perfect—Spamnix caught 190 out of 200 spams—it worked better and faster than the hundreds of filters I created to detect spam.

TWO FOR OUTLOOK

I TRIED late-beta versions of two programs that work exclusively with various editions of Outlook. Sunbelt Software's $30 IHateSpam adds itself to Outlook Express versions 5

TEST REPORT

Spam Busters Take Aim

PRODUCT	Effectiveness	Works with	Cost
IHateSpam	95.5 percent effective (191 spams caught, 9 missed)	Outlook 2000 and 2002 (Outlook Express version also available)	$30
MailWasher	93.5 percent effective (187 spams caught, 13 missed)	Any POP3 e-mail program; beta is compatible with Hotmail	Free
SpamNet	87.5 percent effective (175 spams caught, 25 missed)	Outlook 2000 and 2002	Free
Spamnix	95 percent effective (190 spams caught, 10 missed)	Eudora 3 or newer	$30

Informal tests were performed using the same 200 spam messages left on a server. Each program was tested after a clean installation, so no heuristic learning occurred.

and 6 and to Outlook 2000 and 2002 (XP). Cloudmark's free SpamNet works only with Outlook 2000 and 2002 (an Outlook Express version is under development).

IHateSpam—available for a free 30-day trial—has many useful features, including a way to block messages that are in foreign character sets, a fully customizable IHate-Spam toolbar, easily configurable spam folders, and a powerful way to create customized filtering rules.

IHateSpam for Outlook worked flawlessly in checking

my Hotmail account. I simply added the account, and I was off and running.

Unfortunately, the Outlook Express version offered fewer features and detected far less spam. Whereas the Outlook version caught an impressive 96 percent, the Outlook Express version caught a relatively middling 80 percent.

SpamNet keeps things simple: It filters e-mail for spam and adds three buttons to the Outlook client toolbar—Block, Unblock, and the Cloudmark button, which lets you check for updates or run SpamNet

on any folder in Outlook.

If you have a specific domain you consider above suspicion, you can enter it into SpamNet's Whitelist (a list of addresses you trust).

Though it's the simpler of the two products, SpamNet removes spam effectively. I tested an early beta version that caught 87.5 percent of my incoming junk messages.

Both IHateSpam and Spam-Net add another wrinkle to the ongoing spam war: They record details about your spam and then send that data to the vendors, who add the information to a database they use to further fight spam.

The upshot: All four programs do a fine job of ferreting out, examining, and dispensing with spam. Anyone can use the stand-alone Mail-Washer program. If you are a Eudora user, Spamnix is an excellent choice. And if you use Outlook, you can try SpamNet—a free, no-frills tool—or IHateSpam, a fast and efficient application that also works with Outlook Express and Hotmail.

—*Steve Bass* ▶

IHateSpam

Sunbelt Software
★★★★☆
Program eradicates spam from Outlook and Outlook Express.
Street: $30
find.pcworld.com/31556

MailWasher

MailWasher
★★★★⯪
Powerful tool works with any POP3 e-mail client to filter spam.
Free download
find.pcworld.com/31559

SpamNet

Cloudmark
(Beta product, not rated)
Gives Microsoft Outlook users a free, no-frills tool to fight spam.
Free download
find.pcworld.com/31553
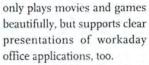
Spamnix

Spamnix Software
★★★★☆
Smart, uncluttered plug-in for Eudora ferrets out spam.
Street: $30
find.pcworld.com/31562

A Monitor for Multimedia

L C D

SONY HAS combined a brilliant LCD panel with connections to a panoply of media devices to create the **SDM-V72W**, billed by the company as its first "personal entertainment display." The resulting 17-inch flat-panel monitor not

only plays movies and games beautifully, but supports clear presentations of workaday office applications, too.

This model has a 16-by-9 aspect-ratio screen that is 14.66 inches wide and 8.79 inches tall (most 17-inch LCDs are 13.5 by 10.5 inches), so it can comfortably display about 15 percent more spreadsheet columns than a comparable standard LCD. Another advantage is that you can use the extra screen real estate to arrange two portrait-mode windows side by side—which is useful for viewing two documents or two

Web pages at the same time.

At a native resolution of 1280 by 768 pixels, the display showed graphics with good color fidelity and detail. Text looked clean and sharp down to about 8 points; below that size, letters became blocky.

The screen displayed images from the game Carmageddon 2 with good detail and fast response times. I saw no artifacts or blurriness while viewing the movie *Titus*, and colors looked saturated but not too dark. One caveat: The SDM-V72W doesn't include a TV tuner, so you must route your video signal through another device such as your computer, DVD player, or VCR.

Unlike most LCD monitors, the SDM-V72W comes with a backlight level control. Besides saving energy and backlight life, this control lets you adjust the display for different situations. I found that the

highest setting looked great for DVDs, but I lowered the level for computing.

Finally, the unit's integrated speakers are easily the best I've heard, and the included headphone jack is so well hidden in the design that I had to consult the manual to find it.

The big drawback of this slick unit—and you just knew there had to be one—is its racy price of $1000. Still, that's comparable to the cost of other hybrid displays, and well-heeled AV aficionados and design fanatics may well prefer the SDM-V72W.

—*Rebecca Freed*

SONY'S 17-inch, 16-by-9-aspect ratio SDM-V72W.

SDM-V72W

Sony

★★★★☆

If you think good design is worth paying for, this sleek beauty may be the LCD for you.

List: $1000

find.pcworld.com/31226

ATI's 3D Speed Champ

G R A P H I C S

TEST Center ATI'S RADEON 9700 graphics chip runs faster than anything the company's main competitor, NVidia, currently offers. With 3D applications and games finally catching up to the hardware, that actually matters again.

Our first tests of a graphics card incorporating the new chip—ATI's $399 **Radeon 9700 Pro**—netted some impressive

results. At standard resolutions, such as 1024 by 768 pixels and 32-bit color, the Radeon performed on a par with boards using NVidia's GeForce4 Ti 4600 chip. In higher-resolution tests, the 9700 Pro took a commanding lead.

In our Unreal Tournament 2003 tests, for example, the Radeon delivered 139 and 102 frames per second, respectively, at resolutions of 1200 by 1024 and 1600 by 1200. Its nearest competitor, EVGA's E-GeForce4 Ti 4600, scored 100 and 70 frames per second in the same tests. The Radeon was also faster in our antialiasing tests and earned high marks for image quality.

The 9700 Pro's impressive performance derives from the 9700 graphics chip, a 325-MHz processor with DirectX 9 capabilities that requires so much juice, you have to connect it to your PC's internal power supply. The board also sports 128MB of 620-MHz DDR memory. Other features: dual monitor connectors (one analog, one DVI), a TV-out port, and AGP 8X support.

Currently, the Radeon 9700 Pro is the graphics card to

own if you want the best 3D speed in stunningly detailed DirectX 8 games like Unreal Tournament 2003.

The folks at NVidia aren't standing still, of course. The graphics giant is currently readying its forthcoming NV-30 chip. Expected to launch in late November, the new graphics processor is sure to challenge the Radeon 9700 for the performance lead.

—*Eric Dahl* ▶

Radeon 9700 Pro

ATI

★★★★☆

Expensive, but it's the fastest graphics chip out there.

List: $399

find.pcworld.com/31505

ATI'S RADEON 9700 Pro graphics card.

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Boardwatch (ISPworld.com)
June 2002

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Communications Convergence
May 2002

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Logitech's Upscale Mouse

INPUT DEVICE

THOUGH MX700 may sound like the name of some exotic testosterone-driven sports car, it's not: It belongs to Logitech's Lamborghini of a cordless optical mouse—a precision instrument that's the first

LOGITECH'S wireless MX700 recharges in its base station.

to offer rechargeable batteries.

The only thing missing from the shipping unit I tested was that new car smell—and a left-handed grip. The right-handed mouse is loaded with hot-rod features. Aside from one minor glitch (more on that later), it provided an exceptionally smooth ride.

The MX700 comes with a rapid-charge base station in which you dock the mouse when you're not using it. Logitech says a 10-minute charge keeps the mouse going all day, and 6 to 7 hours of recharging gets you 10 days of service. But that's optimistic—in my experience, a night's charge netted 5 days of run time.

The base station eliminates the need to replace standard batteries every three months; however, the MX700's true strength lies in its performance. The fast RF wireless control worked well at up to 30 feet away from the base station (no line-of-sight positioning required). Besides the regular two left/right buttons and a scroll wheel on top, Logitech provides three sets of user-customizable buttons. Two buttons offer a unique system for continuous scrolling; two thumb-control buttons let you move forward or back through Web pages; and finally, the Quick Switch Program Selector lets you cycle through active programs and documents.

All these functions make

MX700 Cordless Optical Mouse
Logitech
List: $80
★★★★☆

Top-of-the-line wireless optical mouse offers great performance and features; unfortunately it's for right-handed users only.
find.pcworld.com/31598

on-screen navigation quick and easy. The optical engine tracks at 4.7 megapixels per second—about three times as fast as most optical mice—affording smooth and precise cursor control, which can be particularly useful for graphics creation and game play.

The one glitch I experienced arose when I installed the Logitech MouseWare software on a PC that had an earlier version of the program. A conflict caused my PC to crash severely (Logitech is looking into the problem). To be safe, remove previous software before installing this new version.

Like most luxury items, the MX700 doesn't come cheap. At $80, it may be the most expensive mouse on the market. But as with a fine Italian sports car, you get what you pay for; if you require an exceptionally precise input device, this mouse is for you.
—*Michael S. Lasky*

Nikon's Cool 8X Zoom

CAMERA

TEST Center DIGITAL CAMERAS with zoom lenses that go beyond 3X are rare, which makes Nikon's latest addition to its Coolpix line—the 5-megapixel, 8X-zoom Coolpix 5700—worthy of note.

Descended from Nikon's highly regarded Coolpix 5000, the 5700—priced at $1200—

Coolpix 5700
Nikon
★★★☆☆
Street: $1200
Powerful, flexible, complex, and expensive, the 5700 will best suit experienced photographers.
find.pcworld.com/31571

shares its predecessor's all-black, professional styling, but ups the zoom range from 3X to 8X. That's the film equivalent of a 35mm-to-280mm lens. I wish the 5700, like the 5000, started at 28mm or even wider, but I can't fault its lens quality. In our tests, the 5700 offered sharp and accurately exposed shots, and its overall quality was among the best we've recently seen.

Nikon endowed the 5700 with a through-the-lens electronic viewfinder—a standard feature with long-zoom digital cameras. This allows you to see your aperture and shutter speed during composition,

but it's not as bright and sharp as a true optical viewfinder. Also new is a pop-up flash that's designed to reduce red eye, though it offered little improvement in our tests.

Like the 5000, the 5700 carries an extensive array of imaging controls, including three User Set modes. Unfortunately, the 5700 also continues the 5000's tradition of offering nonintuitive controls. Plus, the unit's autofocus seemed erratic.

With its 8X zoom, I might pick up the 5700 for sport or nature photography,

NIKON's CoolPix 5700 offers an 8X zoom lens.

and—for those who don't mind the hefty price—it does offer image quality superior to that of competitors such as Olympus's 8X C-720 Ultra Zoom and Minolta's 7X Dimage 7i. Overall, though, the product impressed me less than I'd hoped it would.
—*Tracey Capen* ▶

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Multimedia in Your Hand

MP3 PLAYER

WHEN ARCHOS announced that the next version of its popular Jukebox MP3 player would play videos and display photos, I expected some great things. However, while the Archos Jukebox Multimedia 20 delivers the promised functionality, repeated problems with two shipping units I tested gave me pause.

The $420 Multimedia 20 is 4.5 by 3.1 by 1.2 inches and weighs a little over 10 ounces. Its 20GB hard drive is big enough to store multiple movies or about 330 hours of MP3s encoded at 128 kbps. A USB 1.1 port makes the device truly plug and play—no special PC drivers required.

The full-color 237-by-234 pixel LCD measures about 1 inch high by 1.25 inches wide (roughly the size of a large postage stamp). Watching video—encoded in either AVI or DivX standards—requires eagle eyes, as does viewing JPEG photos. MP3 playback sounded good.

The unit's interface isn't particularly intuitive: It's a far cry from the slick Apple IPod, arguably its competition in terms of MP3 storage and playback. If you're looking to entertain a crowd of more than one, you can display the

video on a television using an included cable. The device also includes adapters for uploading the contents of Compact-

ARCHOS Jukebox.

Flash or SmartMedia cards.

Unfortunately, both of my test units exhibited a pixel flutter that made text shimmer. And I disliked some design elements: A poorly placed headphone jack, for example, makes the unit unnecessarily wide, and the rubber corner bumpers give it a more rugged appearance but actually offer little true protection from damage.

Archos gets credit for offering a unique, first-of-its-kind device, and gadget gurus may overlook its flaws to be the first on the block to own one. The unit's design problems, however, make it difficult to recommend to everyone else.

—Andrew Brandt

Archos Jukebox Multimedia 20

Archos

★★⯪☆☆

Portable device plays MP3s and displays video and still images, but it's limited by its small screen.

List: $420

find.pcworld.com/31715

Office in Your Pocket

PDA SOFTWARE

MOST PALM OS applications that let you edit Microsoft Office documents share a nasty habit: They strip out any formatting they don't understand. DataViz's Documents To Go 5 Premium Edition does not, and that alone makes this microsuite worthy of handling vital business documents.

For instance, move a Word document with animated text effects into Documents' word processor, and they won't be visible. When you shuttle the edited file back into Word, however, the formatting extras are still there.

What's more, Documents' roundup of apps is the broadest of any Palm suite: It does word processing, spreadsheets, presentations, image and PDF viewing, and e-mail.

Most of the time, it handles

them readily, though the features in my shipping version were a tad erratic. On the plus side, the word processor supports tables well, the spreadsheet does charts, and the e-mail program neatly hands off e-mailed photos to the image viewer. But it's less of a full-blown writing tool than Blue Nomad's WordSmith (there's no spell checker, and the font display is spartan). Finally, while Documents' presentation module lets you do some rudimentary editing, wran-

Documents To Go 5 Premium Edition
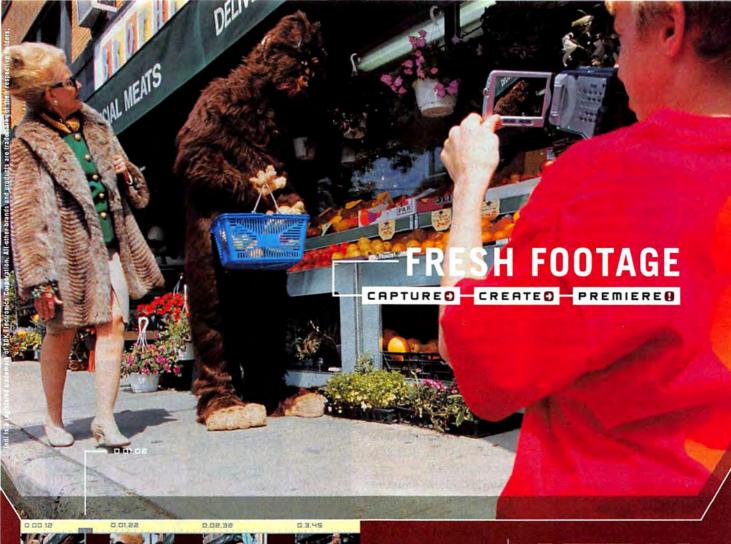
DataViz

★★★⯪☆

Pricey, well-rounded Palm office suite permits slick and effective file synchronization.

Street: $70

find.pcworld.com/31520

Big Little Printer

TEST Center ONCE reserved for big-budget offices, color laser printers are now affordable, and Minolta-QMS's $799 Magicolor 2300 DL takes prices to a new low. Selling for much less than the $2800 average in our August color laser roundup, the compact 2300 DL averaged 11.2 pages per minute printing text (the August average was 9.6 ppm); 2.2 ppm creating color graphics (versus 2 ppm); and 2.3 ppm printing text and graphics (versus 3.3 ppm). Its middling color photo reproduction was offset by sharp text and graphics. Minolta-QMS, find.pcworld.com/31550.

—Tom Mainelli

gling a PowerPoint slide show on a palmtop screen is just as ungainly as it sounds.

At 2MB, Documents To Go is portly for a Palm software app, and its $70 street price is almost double that of $40 competitors Iambic Office and Cutting Edge Software's Quickoffice (the $50 Documents To Go Standard offers just the word processing and spreadsheet modules). Then again, Documents To Go Premium does more than the other guys do—and you can try out the full version for 30 days before you buy.

—Harry McCracken ▶

Budget DVD Movie Tools

DVD SOFTWARE

CAMPED OUT AT the end of one of your local computer store's aisles—where it's likely to snare impulse buyers—a simple all-in-one video editing/DVD application such as Pinnacle Systems' $49 **Pinnacle Expression** or Roxio's $80 **VideoWave Movie Creator** may catch your eye. If it does, my advice is to keep on walking: In trying to make things easier, the vendors have eviscerated these products.

TAKE ONE

I TESTED A shipping version of Movie Creator—and found its interface likely to confuse both experienced and novice users. It consists of five separate but related tools: one for capturing video, three for generating a movie, and one for exporting to DVD or videotape. To jump between these tools, however, you must first save your project and back out to the main screen.

Movie Creator's CineMagic, one of the movie-generation apps, is straightforward. You point to a video file and an audio file, and select a style;

the program then generates a finished video. But the application inexplicably requires that the video be twice the length of the audio, or it will refuse to work—a requirement that I've never encountered. Worse, it won't allow you to trim the video to fit; for that, you must use StoryLine Editor (discussed below).

In addition, CineMagic won't let you preview a style before you choose it, so you must process the entire clip, then abandon it if you don't like it. Finally, if you remove a file from the library, the program will ask if you want to delete it from your hard drive as well—and the default is Yes. Goodbye, file.

Movie Creator's StoryLine Editor—the best of its movie applications—worked more like a traditional low-end video editor with a storyboard interface. It let me trim audio and video, as well as add transitions, text, and effects. Although it offered a good selection of transitions, it lacked fade-ins and fade-outs, and overall was too limited.

TAKE TWO

THE SHIPPING version of Pinnacle Expression I tested was a bit more intuitive than Movie Creator—you click on one of three icons (clearly labeled 1, 2, and 3) at the top of the screen to capture, edit, or export. In the editing section, though, if you customize one of the templates and then decide to scroll through the options again, your previous template disappears.

Expression has even fewer editing tools than Movie Creator—to keep things simple, according to Pinnacle. Nevertheless, the program makes you take multiple steps to accomplish some basic tasks. For example, to trim a video clip, you must play it to the desired starting or end point, split it into two clips, and then delete one. And the buttons offered to perform these tasks are unlabeled icons, so sometimes it takes a second for you to remember what they do.
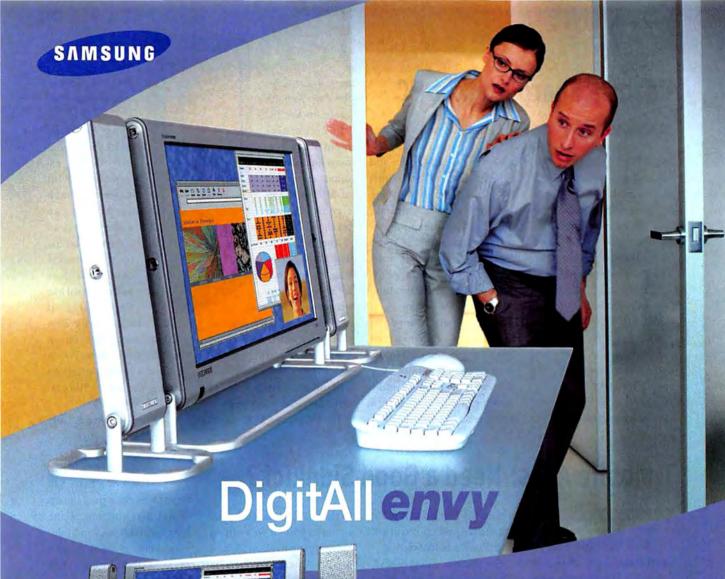
One nice feature: You can set the application to adjust its video export settings automatically to the highest quality that fits your recording media.

PINNACLE Expression is designed for people who find operating a VCR challenging—that's why the on-screen remote has so few buttons.

ROXIO MOVIE Creator's StoryLine Editor section provides only minimal editing tools. But its CineMagic section has almost none.

IT'S A WRAP

ABOUT ALL either of these applications can do well is a slide show. Drop in a bunch of still images, and each program quickly makes a high-quality slide show with simple but effective transitions.

Beyond that, this kiosk-level software will rapidly bore even novice video auteurs. For a little more money, you can buy a true video editor (such as Pinnacle's $100 Studio 8) that does a far better job and is much less frustrating to users of all skill levels.

—Alan Stafford ▶

Pinnacle Expression

Pinnacle Systems

★★⯪☆☆

Reasonably integrated tools, but too few of them.

List: $49

VideoWave Movie Creator

Roxio

★★☆☆☆

Okay for slide shows, but video tools are much too awkward.

List: $80

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Razor's Sharp Pocket PC

P D A

RAZOR TOUTS its **Zayo A600 Pocket PC** as the fastest, smallest, and lightest Pocket PC device available—and for once a product lives up to the hype. This beauty is the first of its breed to challenge Palm-based PDAs for size and weight. And it's speedy indeed.

Zayo A600 Pocket PC
Razor
★★★★☆
www.zayotech.com
A small, well-engineered, powerful Pocket PC.
List: $550
find.pcworld.com/31484

I tested a preproduction version of the sub-5-ounce, 4.9-by-2.9-by-0.5-inch device and found that its 400-MHz Intel PXA-250 processor provided noticeably zippy performance. The CPU features four settings, from full-throttle Turbo for games and video to quarter-speed for basic applications and optimum run time when using the battery.

No matter which speed you select, the bright, crisp screen is a joy to use. The classy-looking, high-tech aluminum-alloy case contains five app-specific buttons, a mono speaker, a stereo headset port, and an IR port. Razor ships the Zayo with the basic Pocket PC 2002 complement of applications, including a miniature version of Microsoft Office programs, and little else.

Another bonus: The lithium-polymer battery ran for up to 12 hours between charges, easily the longest battery life that I've experienced with any Pocket PC. And the versatile AC adapter works with or without the Zayo's included syncing cradle, a nice perk.

The list price of $550 is a bit

RAZOR'S slick Zayo A600 Pocket PC.

steep, especially since the unit has no external expansion slot for CompactFlash cards (you can add a slot via an optional $160 cradle with a second battery); it does accommodate Secure Digital cards. Still, the Zayo A600 isn't much more expensive than today's other Pocket PCs, and it has the distinction of being the first to fit comfortably in your pocket.

—*Michael S. Lasky*

T-Mobile Asks: Need a Good Sidekick?

COMMUNICATIONS

THERE'S A HOT new contender in the push toward comfortable-size, all-in-one wireless PDAs that let you efficiently store contact and calendar information, make phone calls, and access Internet services. T-Mobile's fairly priced new **Sidekick** is geared toward the young and hip, but I found it equally suited to getting down to business.

The Sidekick's easy-to-read, 2.25-by-1.5-inch display offers 16 shades of gray and is embedded in the unit's cover, which cleverly rotates open to reveal a small but usable QWERTY keyboard. Three command buttons—Jump, Menu, and Back—on the Sidekick's face, plus a dial, made for easy navigation within the unique interface after just a bit of practice. The rechargeable battery lasted through two days of testing; it's rated at 3.5 hours of phone use and 20 hours of data use.

T-Mobile's service package includes an e-mail address to which you can forward messages from up to three POP3-based e-mail accounts. I found Web surfing speeds comparable to 56-kbps dial-up. America Online's Instant Messenger service was easy to use, and Web pages were quite readable—thanks to a proxy server that reformats pages for the device. Personal information such as your address book and calendar is cached on the always-connected Sidekick—but it's also stored on a server, so your data is safe if anything happens to the unit.

The biggest weakness of the Sidekick was its performance as a T-Mobile GSM/GPRS cell phone. Sound quality was far from perfect, and speaking into the device felt awkward (especially when the screen was in the open position).

The Sidekick's pricing, however, is attractive: $200 for the hardware (after a $50 rebate—

offered until at least January). The first year of a basic $40 monthly service package includes 200 anytime phone minutes, 1000 weekend minutes, 1000 short text messages, and unlimited data transfer. After one year the data allowance drops to 15MB per month and T-Mobile charges $3.50 for each additional megabyte you transfer.

If you already live and die by your use of AIM, e-mail, and Web access, this device is one great little Sidekick. By the same token, however, I would advise serious cell phone users to look elsewhere.

—*Anne B. McDonald* ▶

T-Mobile Sidekick
T-Mobile
★★★★☆
Multiuse device will appeal to many, though phone addicts should keep shopping.
List: $250 (before rebate and not counting service package)
find.pcworld.com/31499

THE T-Mobile Sidekick.

Pioneer *sound.vision.soul*

pioneerelectronics.com

VIDEO/R/RW

A recordable DVD format that is already accepted by millions.

The time has come for recordable DVD. Now that you're ready to archive your home movies on DVD and toss those old VHS tapes, you want to make sure that you're choosing the best technology for the job.

Pioneer DVR-A04

Join the millions of people who have already chosen DVD-R and DVD-RW to record and archive their own videos with crystal-clear DVD quality.

DVD-R is THE most compatible format. Let's face it, recorded DVDs are most valuable when you can play them back on other DVD players or computer drives. A recent test conducted by *Digital Video Magazine* indicates that DVD-R discs are more likely to play back on other DVD players than any other format of recordable disc tested. And with the price of blank DVD-R media typically being much lower than other formats, recording is also affordable. So if you

Pioneer DVR-7000

want to burn a disc and then be able to share it with friends and family, this is the technology you'll want to use.

DVD-R and DVD-RW are the gold standard. DVD-R and DVD-RW have become the de facto standard for DVD recording with millions of products already in use. DVD-R has been used throughout the professional video and entertainment industries for years and computer manufacturers like Sony® and Compaq® are currently offering DVD-R/RW drives in their latest line of products. Apple® also made the move to install DVD-R drives in many of their new machines.

Why is the DVD Forum important? The DVD Forum was originally formed to create the DVD Video standard. Now, the group that made DVD possible has taken it to the next level, bringing together consumer electronics and computer manufacturers with blank

media companies to set the standard for recordable DVD. The DVD Forum approved DVD-R and DVD-RW as official DVD recording standards. Don't settle for imitations. If you want genuine DVD recording, look for the official DVD-R/RW logo.

What are you waiting for? Whether you want to create a DVD of your wedding, a recent family vacation or your child's first piano recital, DVD-R/RWs offer just what you need to burn a disc that can be shared with friends and family. Now is the time to get started. For more information, go to www.pioneerelectronics.com.

DVD Format Comparison	DVD-R/RW	+R/+RW
DVD Forum-approved Format	YES	NO
Original Equipment Drive Manufacturers	Pioneer Panasonic Hitachi LG Toshiba	RICOH
Drives shipped to Market (projected Q4 2002)[1]	3,284,000	1,490,000
Formally supported by DVD Player and ROM Drive Manufacturers[2]	68%	<5%
Compatibility with Existing Players[3]	DVD-R 88% DVD-RW 65%	+R – NA +RW –59%

1. Source: Techno Systems Research
2. Source: Pioneer Electronics Inc.
3. Source: *Digital Video Magazine*, July 2002

A Tubular Motherboard

MOTHERBOARD

AOPEN GOES RETRO with its high-tech AX4B-533 Tube motherboard, complete with Intel's 845E chip set, a speedy 533-MHz frontside bus, USB 2.0 support, and an on-board vacuum tube for audio. That's the tube worth the extra effort. It offered exceptional Dolby Digital reproduction for spirited playback of DVD movie audio. And with music CDs the tube offered warm, full-bodied sound comparable to a good home audio setup.

AOPEN'S hi-fi AX4B-533 Tube motherboard.

right—a vacuum tube that looks like it was yanked out of some hi-fi audio equipment from yesteryear.

Old-school audiophiles claim that tubes provide richer tonality than today's solid-state amplification—and after building a PC around the AX4B-533 board, I'm inclined to agree. Music played back on the machine sounded as smooth as butter.

I did encounter one problem during installation of the daughter card (which houses all of the sound output connectors, including the optical out). I couldn't get the daughter card lined up correctly, even though I used AOpen's own $50 QF50A chassis. Because of the tight space, I had to force the card into the only slot where it would fit.

After completing assembly of my 2.2-GHz Pentium 4 system, I plugged in my Cambridge SoundWorks DeskTop Theater 5.1 DTT3500 Digital speaker set and quickly found

I didn't hear any of the noise that can be a by-product of vacuum tube audio (AOpen says its Frequency Isolation Wall technology takes care of that). One possible drawback to using a tube, however, is replacing it when it fails in a year or two—tubes run about $10 to $15 each.

Like most things worth having, the AX4B-533 doesn't come cheap. At $240 it is about double the price of a comparable tubeless motherboard. All the same, if good sound is a priority and you are interested in having the newest—or is it the oldest?—audio technology in your PC, then this motherboard is likely to be worth the money.

—*Joel Strauch*

AX4B-533 Tube

AOpen

★★★★☆

Clean, crisp sound, plus top-notch chip set technologies.
Street: $240
find.pcworld.com/31493

Fast Wireless for Home

WI-FI (802.11b) wireless networks are proliferating, but their high-speed Wi-Fi5 (802.11a) cousins have made few inroads into homes and small offices. One reason is price; the other is that, until now, you needed both a Wi-Fi5 access point and an ethernet router to connect your network to the Internet.

Netgear's **HR314 802.11a Cable/DSL High-Speed Wireless Router** addresses one of these

problems: It's the first router we've seen with a Wi-Fi5 access point. But at a $450 street price—four times that of its 802.11b counterparts—it's not for everyone.

I installed a shipping unit and saw an immediate performance benefit in doing large file transfers: Transferring a 128MB file between

NETGEAR'S HR314.

PCs 30 feet apart took 3 minutes using the HR314, versus more than 8 minutes using standard Wi-Fi gear.

Don't expect Internet activity to speed up with a Wi-Fi5 network, because broadband connections typically top out at about 1 megabit per second, far slower than Wi-Fi's 11-mbps and Wi-Fi5's 54-mbps.

Also, if you plan to add a desktop to your wireless network, be prepared to install a PCI-based Wi-Fi5 adapter. Though USB 1.1–based adapters are readily available for Wi-Fi, a Wi-Fi5 version makes no sense because the 11-mbps top speed of USB 1.1 would quash any performance improvement. (Wi-Fi5 adapters that are based on the faster USB 2.0 have yet to appear.)

Wi-Fi5 suffers from the

same highly publicized security vulnerabilities as Wi-Fi, so plan on adopting other security measures for sensitive data. Plus, since Wi-Fi5 is incompatible with the older standard, you'll have to replace all your current Wi-Fi adapters.

The HR314 performs as advertised, but for what it costs, you'd better really need the extra bandwidth. If not, hang on until competition pushes prices downward.

—*Yardena Arar* ∎

Netgear HR314

Netgear

★★★★☆

Wi-Fi5 router simplifies faster wireless home networks, but most buyers should wait for sky-high prices to come down first.

Street: $450

find.pcworld.com/31490

PRESIDENT/OWNER

Makes the presentations.

Writes the checks.

Makes the calls.

Hires the staff.

Makes the coffee.

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Prints the reports at up to 15 ppm.

Copies all documents or bound reports.

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Makes the president/owner look good.

MFC-9700
LASER FLATBED MFC
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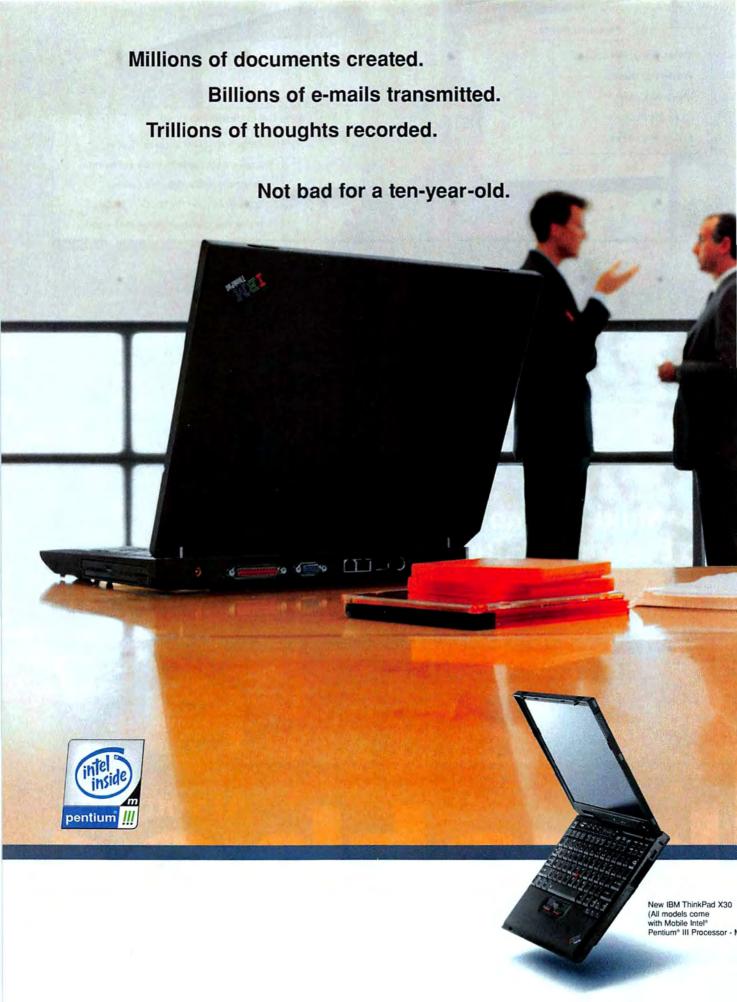
Some even have the ability to print from a digital camera without a PC. You don't need five separate machines. All you need is the right one.

COLOR
FLATBED MFC
From $279

LASER FLATBED MFC
From $399

LASER MFC
From $299

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From $169

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intel inside™
pentium 4

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Meet your new head of PC security. It's loaded with features
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combination of an integrated security chip and downloadable
software from IBM, and it's designed to make encryption keys,
passwords and fingerprint templates even more secure. For added
protection, downloadable software like IBM Rapid Restore™ PC
can back up, rescue and restore files and data. And helping to
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select models), which provides exceptional high-speed performance.
So hackers and thieves beware. There's a new sheriff in town.

(Monitor sold separately)

intel inside
pentium 4

IBM NetVista M42
(shown with optional
flat panel monitor)

PCs with

PCs

Personality

LOOK INSIDE:
Cyberpower's
Titanium Gamer Force
Pro has a clear
panel.

From do-everything workhorses to entertainment specialists, the best new home PCs pack performance and pizzazz to spare.

THE BLAND BEIGE PC sitting on your home office desk is so 1989. These days, home computers are dressed in black, silver, and even bright blue, and their snazziness goes beyond appearance. Many of the latest PCs—with big LCD monitors, recordable DVD drives, and thundering speakers—can stand in as a one-stop entertainment system.

Today's turbo-charged home PCs make games and DVDs come alive, while less-powerful machines deliver good value and plenty of oomph for garden-variety productivity tasks.

We looked at ten systems ideal for the home user, divided into three categories: gaming, entertainment, and general-purpose productivity. PCs in each catego-

**BY DAN LITTMAN
PHOTOGRAPHS BY MARC SIMON**

ry have to meet baseline requirements—for example, you can't edit tape from your camcorder on a system that lacks the proper ports, and playing action games is no fun if the machine can't redraw the screen as fast as you can shoot. To test system performance, we ran our PC WorldBench 4 benchmark; we also blasted game sound tracks and music on their speakers, studied their screens for signs of stuttering while playing videos, and ferreted out useful ports.
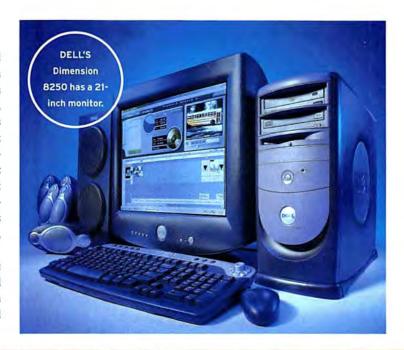
We learned that you won't have to buy a separate system for each different use—all the PCs here have enough power to double or triple up on tasks, and they all have some capacity to receive upgrades. ▶

Entertainment

AS DIGITAL VIDEO, photography, and music proliferate, more people want a PC that acts as an editing station and a mixing board. You need a massive, high-throughput hard drive to access and store huge video and image files; plenty of memory to use in manipulating them; a wealth of ports to import data from cameras and music devices; and ports and drives to use in exporting your finished work to such devices and storage media as your TV screen, videotape, and writable DVD.

We looked at three media-savvy PCs: the Dell Dimension 8250, the Gateway 700X, and the HP Media Center 883n—the first system to run Microsoft's new XP Media Center. We also looked at a midrange, 17-inch, wide-screen IMac.

DELL'S Dimension 8250 has a 21-inch monitor.

FEATURES COMPARISON

Hardworking Home PCs in Three Popular Flavors

ENTERTAINMENT SYSTEM	Street price (9/20/02)	PC WorldBench 4 performance score Faster	Comments
Apple IMac find.pcworld.com/31310	$1999	n/a [1]	A beautiful 17-inch LCD and easy-to-use video- and image-editing software set this model apart from others; but unlike other systems here, it's not upgradable. (★★★★)
Dell Dimension 8250 find.pcworld.com/31313	$2988	Windows XP Home 121	A big CRT monitor and plenty of storage make this system ideal for both editing video and watching DVD movies. (★★★★☆)
Gateway 700X find.pcworld.com/31316	$2999	Windows XP Home 113	With loads of RAM, a big hard drive, and separate recordable DVD and CD-RW drives, this PC is extravagantly equipped for both video editing and music ripping. (★★★★)
HP Media Center 883n find.pcworld.com/31319	$2749	Windows XP Media Center 120	A built-in TV-tuner card highlights HP's latest competitor in the home PC arena. Toggling between music and video controls is easy, thanks to the remote. (★★★☆☆)
GAMING SYSTEM			
Cyberpower Titanium Gamer Force Pro find.pcworld.com/31304	$1299	Windows XP Professional 118	A bright blue finish—marred in some spots by an uneven paint job—helps this machine stand out from the crowd. A plastic see-through panel lets you see inside. (★★★✦)
Voodoo Computers Egad V28400 find.pcworld.com/31307	$3499	Windows XP Home 124	This pricey, stealth-black system comes with a big monitor and plenty of processing power. Has lots of open slots and bays for tinkerers. (★★★✦☆)
GENERAL-PURPOSE SYSTEM			
Compaq Presario 6000 find.pcworld.com/31322	$1266	Windows XP Home 116	Included video-editing and antivirus software make this PC a good deal for both basic and higher-end home tasks. (★★★)
Dell Dimension 4550 find.pcworld.com/31325	$1229	Windows XP Home 110	This is a fairly well-rounded PC, suitable for basic home-office tasks, but it lacks a DVD-ROM drive. (★★★✦☆)
Emachines T2200 find.pcworld.com/31328	$968	Windows XP Home 101	Lots of RAM and a big hard drive make this very affordable system a great deal, but consider choosing another monitor. (★★★)
Gateway 300XS find.pcworld.com/31331	$959	Windows XP Home 94	With its smallish hard drive, low-end sound, and integrated graphics, this PC may suit a family looking for a starter system. (★★★☆☆)

[1] Total capacity in gigabytes.   [2] Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches).

The three Windows systems have one major trait in common: They're quite expensive. (Apple's IMac, at $1999, costs about a grand less.) The three Windows machines each carry two optical drives, including a rewritable DVD drive. And each has a 120GB hard drive for storing your digital library. When that fills up, you can add a second hard drive to the Gateway or the Dell. For its part, HP's system is better equipped to talk to external devices than the others: Though all three systems have several USB 2.0 ports and at least one FireWire port, the HP adds card readers for all common flash media formats; and instead of offering one TV/VCR composite port, it has two.

But the HP system enables you to do more than merely create digital content: It also gives you new ways to luxuriate in it. You can hook up your television cable to the PC and use an included remote control to download television schedules from the Web, channel-surf, and record shows using a TV-tuner video card in TiVo fashion. Or wield the remote to launch My TV, My Music, My Pictures, and other HP programs from the Windows XP Media Center shell: Simple, hierarchical menus allow you to operate all these programs with one busy (and tired) thumb.

Though they can't process a TV signal or certain features of Windows XP Media Center, the Gateway and Dell computers pack some video-savvy software. Gateway totes a full copy of Pinnacle Systems' feature-laden Studio 7 movie creation software and a great 300-page primer on digital video; Dell brings the less-powerful but still-capable MGI VideoWave 4.

The Dell and the HP delivered comparable performance, earning PC WorldBench 4 scores of 121 and 120, respectively. Equipped with the same CPU as the Dell and twice the memory, the Gateway finished 8 points (over 6 percent) behind the Dell.

SOUND AND VISION

WHEN YOU'RE CORRECTING COLORS in photos or testing transitions between video clips, you need a display that you can look at for hours on end. Among the four PCs in our entertainment category, the 700X's monitor takes the prize: Gateway's ▶

Visit find.pcworld.com/31007 for reviews of all products listed in this chart.

CPU	RAM (MB/type)	Hard drive [1]	Monitor (inches)	Graphics	Case type [2]	Extra features	Graphics/ sound quality	Tech support (hours/ days)	Setup and ease of use	Vendor's reliability/ service
800-MHz PowerPC G4	256MB/ SDRAM	80	17 (LCD)	32MB NVidia GeForce4 MX 420	All-in-one	DVD-R and 8X/4X/24X CD-RW SuperDrive; IMovie, IMusic and ITunes software, Quicken 2002	Very good/ Good	12/7	Very good	Good/Good
2.8-GHz Pentium 4	512/ PC1066 RDRAM	120	21	128MB ATI Radeon 9700 Pro	Midsize tower	DVD+RW/+R drive, 16X DVD-ROM drive; Microsoft Office XP SBE, Roxio Easy CD Creator 5.2, Jasc Paint Shop Pro 7, MGI VideoWare 4	Outstanding/ Outstanding	24/7	Very good	Good/Fair
2.8-GHz Pentium 4	1024/ PC800 RDRAM	120	18 (LCD)	128MB ATI Radeon 9700 Pro	Midsize tower	DVD-RAM/-R drive, 48X/24X/48X CD-RW drive; Microsoft Works Suite 2002, Pinnacle Studio 7, Age of Empires 2, Zoo Tycoon, Combat Flight Simulator, Midtown Madness	Very good/ Very good	24/7	Very good	Fair/Fair
2.67-GHz Pentium 4	512/ DDR266 SDRAM	120	17 (LCD)	64MB NVidia GeForce4 MX 420	Minitower	DVD+RW/+R drive, 24X-48X CD-ROM drive; TV Tuner card, remote control, front-mounted CompactFlash, SmartMedia, Memory Stick, and Secure Digital slots	Good/ Fair	24/7	Fair	Fair/Poor
1.8-GHz Athlon XP 2200+	512/ DDR SDRAM	120	19	128MB ATI Radeon 9700 Pro	Tower	16X DVD-ROM drive, 40X/12X/40X CD-RW drive; Corel WordPerfect Office 2002, Norton AntiVirus 2002	Outstanding/ Outstanding	10/5	Good	[4]/[4]
2.8-GHz Pentium 4	512/ PC1066 RDRAM	80	19	128MB ATI Radeon 9700 Pro	Tower	20X/10X/40X CD-RW/12X DVD-ROM drive; front-mounted CompactFlash, SmartMedia and Secure Digital slots	Outstanding/ Very good	12/5 [3]	Good	[4]/[4]
1.8-GHz Athlon XP 2200+	256/ DDR266 SDRAM	40	17	64MB MSI G4 MX 420-T	Minitower	16X DVD-ROM drive, 40X/12X/40X CD-RW drive; Microsoft Works 6.0, Norton Internet Security 2002, Roxio Easy CD Creator 5.0, Pinnacle Studio 7	Fair/ Fair	24/7	Good	Fair/Poor
2.4-GHz Pentium 4	256/ DDR333 SDRAM	40	17	64MB NVidia GeForce4 MX 420-T	Midsize tower	40X/10X/40X CD-RW drive; Microsoft Works Suite 2002, Roxio Easy CD Creator 5.2, MGI VideoWare 4	Fair/ Fair	24/7	Very good	Good/Fair
1.8-GHz Athlon XP 2200+	512/ DDR266 SDRAM	100	17	Integrated S3 ProSavage8 [5]	Minitower	16X DVD-ROM drive, 40X/12X/40X CD-RW drive; Microsoft Works 7.0, Encarta 2002	Poor/ Poor	16/7	Very good	Good/Fair
1.8-GHz Pentium 4	256/ DDR266 SDRAM	20	17	Integrated Intel 845GL [5]	Midsize tower	16X DVD-ROM drive, 40X/12X/48X CD-RW drive; Microsoft Works Suite 2002, Quicken 2002, Norton AntiVirus 2002, The Sims	Fair/ Fair	24/7	Good	Fair/Fair

[1] Not applicable; PC WorldBench 4 does not run on the Mac platform.
[4] Insufficient data to give a rating.
[3] 8 hours on Saturday.
[5] Uses main memory.

FPD1810, an 18-inch LCD equipped with a digital video interface, rendered near-perfect text, even at small type sizes. It also played movies at full screen with no flicker or shimmer.

The Dimension 8250 we looked at came with Dell's P1130 21-inch CRT. The monitor produced rich, warm colors, along with subtle shading and detail on games and digital video. At default settings, however, the contrast was somewhat weak, which made text appear slightly out of focus.

The HP's 17-inch Pavilion F70 LCD screen has both analog and DVI inputs, but its 64MB NVidia GeForce4 MX 420–based graphics board offers only analog out. The F70's text looked somewhat grayish and broken up compared with that of the other monitors. The HP stumbles a bit on digital video, too: Even at half-screen size it flattens colors to preserve detail, and it produced somewhat blocky fast-motion video.

The Gateway and HP LCDs are certainly more space-efficient than Dell's CRT, which is 20 inches wide by 20 inches deep. On the other hand, Dell's monitor supplies so much real estate that you can work comfortably at 1600 by 1200 resolution, which the graphics card supports at 85 Hz.

Another important question is, how loud do you like your audio? Built in to the base of HP's LCD are tiny Polk Audio speakers that distort when turned up past conversational volume. In contrast, the Gateway's Boston Acoustic BA7800 4.1 speaker system sounds beautiful at medium volume, and it can really crank out the sound. Dell's 5.1 Altec Lansing ADA995 speaker set includes a huge subwoofer with its own volume control; in concert with the five surround-sound speakers, both treble and bass sounded clear and lively.

Since all three are similarly pricey, it's difficult to pick a winner. The HP's XP Media Center interface shows off the integration of PC and TV, but as a PC or video-editing station it's unremarkable. The Dell offers the greatest raw power but the weakest digital-media–specific capabilities. So overall, despite its somewhat lagging performance, we would put our money on Gateway's 700X, which excels with its beautiful display and helpful video-editing guide.

GO WIDE:
Apple's IMac features a roomy 17-inch LCD.

THE GATEWAY 700X includes an editing guide.

IMAC INTERLUDE

FOR PEOPLE WHO LOVE the Mac platform and the loads of software that Apple always includes, the IMac could be the right choice. Its bowl-shaped base supports a permanently attached 17-inch, 1440-by-900-pixel LCD on an articulated stalk that can tilt and rise independently. The base sports Apple's SuperDrive in the front (DVD-R/CD-RW); and in the back, FireWire and USB 1.1 ports. It has only one optical drive, and it supplies no bays for adding another. Our test unit had just 256MB of memory; a model with 512MB costs $150 extra.

The two small, spherical speakers rest unstably on rubber rings, and their audio managed to sound both tinny and muddy. The IMac's screen operates in landscape mode by default. It displays bright color and clean, crisp text. The NVidia GeForce4 MX 420 graphics controller, which has only 32MB of memory, makes full-screen movies look unimpressive and jumpy, but at the default size of 8.5 by 3.75 inches, movies played well.

Of course, Apple always devotes as much attention to software as it does to hardware, and this IMac comes with several Apple programs. IMovie, a timeline-based video-editing program, is so easy to use that a kid could figure it out, yet it's sophisticated enough to produce a competent digital movie. The IPhoto application archives digital photos and lets you share them on the Web. And in case you decide to use your computer for something practical, Apple throws in a copy of AppleWorks—a productivity package along the lines of Microsoft Works—and some kid-friendly games. ▶

Pioneer *sound.vision.soul*
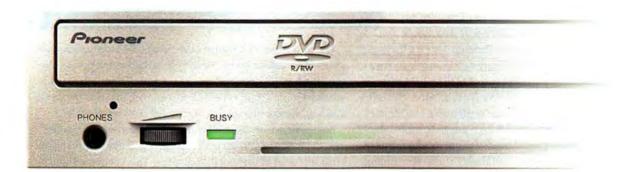
IN 1998, WE WERE THE FIRST TO LAUNCH. TODAY, WE'RE THE FIRST TO FLY.

Introducing the DVR-A05, Pioneer's new DVD Recorder with 4x speed. The company that introduced the first recordable DVD drive presents the next generation of DVD recorders. The DVR-A05 can record a full 4.7GB disc in about 15 minutes. In fact, it takes the kind of flawless performance that *PC World* magazine voted *"World-Class for 2002"* to a whole new level. So if you'd like to fly through video or data recordings, log onto pioneerelectronics.com/dvdr.htm to find a reseller near you.

© 2002 Pioneer Electronics (USA) Inc. Business Solutions Division *2002 *"PC World* World-Class Award" was given to the DVR-A04 DVD recorder.

VOODOO'S
Egad V28400
also sports
media slots.

SERIOUS GAMERS seek total immersion in the action. Most gaming PCs include a graphics subsystem to blast frames on the screen and a sound system to shake the walls. We tested two gaming machines from opposite ends of the price spectrum: Voodoo's $3499 Egad V28400 and Cyberpower's $1299 Titanium Gamer Force Pro.

Our Cyberpower Titanium's blue case has a clear plastic window on one side that allows you to view its interior, which is lit up by a neon tube. Voodoo's Egad V28400 doesn't bother with flashy decoration, though its burnished black all-steel case looks sleek and confident.

Both test systems came with 512MB of memory and an ATI Radeon 9700 Pro graphics board loaded with 128MB of video memory. The Cyberpower Titanium ran on a 1.8-GHz AMD Athlon XP 2200+ processor, while the Voodoo relied on a 2.8-GHz Intel Pentium 4 to earn the highest PC WorldBench 4 score (124) of any system in this review.

We ran our game tests at a resolution of 1280 by 1024 with 32-bit color depth; and at those levels, the Voodoo's muscle really paid off. It displayed Return to Castle Wolfenstein at 93 frames per second—compared with the 63 fps managed by the Cyberpower Titanium. (Frame rates above 60 fps are considered flicker-free; both systems performed admirably at this demanding setting.) We marveled at the subtle shading and uncanny depth maintained on both systems, even during firefight scenes.

The Cyberpower's Creative Labs Inspire 5.1 surround-sound speakers rocked the house. Meanwhile, a dead sound port on our test Voodoo PC sidelined two of the four Klipsch ProMedia speakers in its sound system. But even with just two speakers and a subwoofer functioning, it sounded rich and powerful.

Both systems are also well equipped for everyday computing. The Cyberpower's 19-inch ViewSonic E90F monitor displays crisp text even at very small font sizes. The Voodoo's 19-inch NEC MultiSync FE991SB rendered readable—albeit slightly blotchy—text. The Cyberpower's monitor, in contrast, displayed all of its blotchiness on the outside: The monitor and some other components were messily spray-painted to match the navy blue case, giving the system a shoddy look. Cyberpower says that it couldn't have kept to a $1299 price while putting all the components in special dyed, injection-molded cases with custom-made faceplates.

So is the Voodoo Egad V28400 worth $2200 more than the Cyberpower Titanium Gamer Force Pro? The Voodoo's processing muscle will keep it current longer with the next wave of games. But the Cyberpower has plenty of power too, and it's definitely a better deal—if you don't mind the sloppy paint job. ▶

MOBILE HOME PC

Should Your Next Home PC Be a Notebook?

MY CURRENT HOME COMPUTER is a notebook, and I'll never go back to using a desktop. Partly I'm attracted by the aesthetics of mini-PCs, but mostly I love the freedom to work wherever I please.

Five days a week, I use a desktop PC in my *PC World* office. When I'm at home, the last thing I want to do is sit isolated in my home office, just so I can Web-surf and return e-mail. I'd much rather slouch in my big living room chair, where I can take part in conversations. And because I've installed a home network with a Wi-Fi (802.11b) wireless access point, I can do just that.

Using a notebook at home has other charms. It's no longer an inconvenience to clear out of my office so that it can serve its other purpose as a guest room. And when I travel, my notebook comes with me, along with all the applications and files I've been using at home. Hauling my 7-pound notebook through airports is no picnic, but I don't mind doing it occasionally. (If I traveled often, I'd probably buy one of the new, tiny ultraportables.)

Using a notebook at home has its compromises. My desktop-replacement–size notebook has all the computing power I need for now, and its screen is big enough for comfortable use over long stretches. But some components are getting outdated, and upgrading them is an expensive proposition.

Sure, I might be able to ship my system back to its maker, wait a couple of weeks, and pay through the nose for those upgrades, but instead I'll live with the 20GB hard drive and use an external CD-RW drive for backups. When it's time to replace my notebook, I'm willing to pay the $200 to $300 difference between a power notebook and a power desktop in return for the freedom to set up wherever I like. You have to make a few sacrifices in any relationship, and I'm committed to this one.

–Rebecca Freed

General-Purpose

MAYBE YOU NEED A COMPUTER just for sending e-mail and doing research on the Internet, or for those nights when you bring your spreadsheets home. If so, you can skip the custom-painted, neon-illuminated box and the big LCD screen and save a lot of money without sacrificing computing capability. We looked at efficient productivity PCs from Compaq, Dell, Emachines, and Gateway that range in price from $959 to $1266 with monitor.

Your first concern about a basic system is probably how fast it is. Rest assured, they're fast enough to run a spreadsheet, or even a photo editor. The $1266 Compaq Presario 6000 (with a 1.8-GHz Athlon XP 2200+ processor and 256MB of memory) and the $1229 Dell Dimension 4550 (with a 2.4-GHz Pentium 4 and 256MB of memory) both earned PC World-Bench 4 scores only several points behind the fastest systems tested in this review. The $968 Emachines T2200 has the same processor as the Presario 6000 and carries twice the memory, but came in about 15 percent slower; meanwhile, the $959 Gateway 300S ran approximately 23 percent slower.

But that 23 percent spread in benchmark scores looks bigger on paper than it feels when you're using productivity applications. The few instances when you might notice the low-cost systems' performance lag are while playing games or watching DVDs. The Emachines T2200 and the Gateway 300X, which use integrated graphics chips, lack dedicated graphics memory; unfortunately, however, even the Dell's and Compaq's stand-alone graphics boards deliver choppy motion and jaggy textures.

WHAT'S INSIDE?
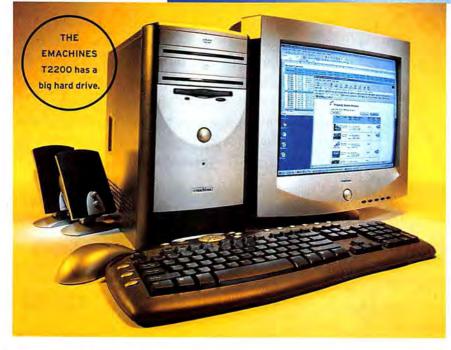
WE COULD EVALUATE the Dell's graphics capability only on games—not DVD movies—because it has no DVD player, just a CD-RW drive. (Springing for a DVD-ROM drive adds $20 to the price.) The Compaq, Emachines, and Gateway units all have separate DVD-ROM and CD-RW drives. For downloading video from your digital camcorder, Emachines gives you three FireWire ports, and Compaq provides one. Emachines also supplies a 100GB hard drive, which is big enough to hold some digitized video. The Compaq and Dell PCs have 40GB hard drives, and the Gateway hard drive is only 20GB; you may want to supplement their storage capacity with another hard drive. Fortunately, all four systems leave an internal drive bay open—though getting at the Compaq's bay is a chore—and several USB 2.0 ports that you could use to connect an external drive.
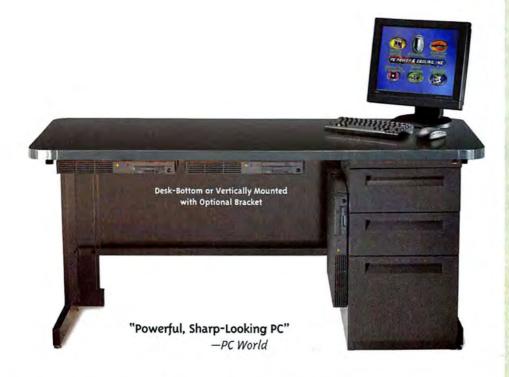
Because the monitor is a PC's most expensive component, that's where makers of low-cost systems usually try to economize. All four of our test machines came with 17-inch, house-brand CRT monitors. Compaq's FS 7550 screen looked grayish and somewhat out-of-focus; Emachines' 17S display delivered a decidedly muddy picture at its default settings, and appeared overexposed with the brightness turned up; Gateway's EV700 rendered particularly weak and blurry text. Dell's M782 came through with the best image quality of the lot, especially for e-mail, ▶

COMPAQ'S Presario 6000 is a strong performer.

THE EMACHINES T2200 has a big hard drive.

Maximum Power! Minimum Space!

"Powerful, Sharp-Looking PC"
—PC World

Desk-Bottom or Vertically Mounted
with Optional Bracket

SleekLine® Pentium®4 Computers start at only $999.

That's right! A SleekLine 2000 with a 2GHz Pentium4 processor, 256MB DDR memory, and a 40GB 7200RPM drive is only $999. Need more power? SleekLine is available with a 2.8GHz P4, 2GB DDR, and *two* 120GB drives. Based on your configuration, the space-saving SleekLine (15.5"W x 17"D x 1.75"H) gives you 3x-5x more power-per-cubic-inch than *PC World's* Top 15 PCs!

SleekLine® Systems

The *only* PCs you can mount, rack or stack.™

Unmatched Versatility

INDUSTRIAL APPLICATIONS

SleekLine® Systems are available with mounting brackets for installation in a 1U 19" rack. With dual Ethernet, SCSI, and 1GB/2GB memory options, SleekLine makes a great workstation or file server.

MOBILE COMPUTING

A 12VDC input power supply option gets SleekLine out of the office. You'll have performance and mass storage (that far exceed a laptop) in your car, RV, or boat.

HOME ENTERTAINMENT

SleekLine's stylish looks and compact size make it ideal for a home entertainment cabinet. Features Intel® Extreme Graphics 845G chipset, front-panel USB 2.0 ports, built-in 10/100 Ethernet, and is available with a DVD/CD-RW combination drive.

OFFICE SPACE

SleekLine computers offer a centralized solution for crowded office cubicles. Reclaim valuable working space by replacing up to 12 mid-towers with a 2 sq. ft. stack of space-saving SleekLines.

spreadsheets, and other eyeball-intensive work: Text looked fairly sharp, but colors were somewhat muted.

All four of these systems offer a fair deal for the price, but the Compaq Presario 6000 really delivers on performance. We just wish it had a better monitor. If you decide to buy the 6000, you'll probably want to pair it with another display.

So which activity is it going to be—gaming, filmmaking, Web surfing, or all three? By picking an appropriately configured PC, you can make it easier to pursue whichever pastime you choose. Our advice: Give strong consideration to types of tasks you'll be performing, and shop accordingly. Often, a gaming system can serve as a competent video-editing system as well, and many video-editing machines—and even basic, mainstream PCs—can also deliver great images and sound for your favorite games. By choosing the right PC carefully, you can ensure that your system won't be a one-trick pony. After all, even the most devoted video editor enjoys relaxing with a game once in a while.

Dan Littman is a contributing editor and Rebecca Freed is a senior editor for PC World. ∎

Configuration Checklist: Pick the Right PC

DOUBTLESS, YOU ALREADY know what you want to be able to do with you next home PC. But what configuration will do the best job for you—both today and a year or two down the road?

Here's a checklist of recommended specifications for four common types of home PC: gaming, video and image editing, music and movies, and basic productivity. Treat these specs as reference guidelines when you shop for your next PC. And don't forget to take future uses into account—you might live for gaming today, but in a couple of years, additions to the family may turn you into a budding videographer.

Depending on how generous your budget is, you may have to make some compromises between your lust for the latest and greatest technology and the cold reality of how much money you can afford to spend.

FINDING CORNERS TO CUT

WHERE SHOULD YOU LOOK for places to cut? The monitor makes a good starting point: Picking a smaller screen can save you substantial money, as can sticking with a CRT rather than upgrading to an oh-so-desirable LCD flat-panel. Downgrading your processor to a model that's a step or two lower than the fastest CPU available is another relatively painless way to save a couple of hundred dollars.

Also, do you really need 5.1 surround-sound speakers with a subwoofer the size of a big dog? And how large a hard drive do you require? You won't want to undertake even general-purpose computing (surfing the Web and using office productivity applications) with less than 20GB, but anything over 80GB is probably overkill.

Where you shouldn't compromise is on service (see our story on page 143). If your PC has a one-year warranty and the vendor offers a three-year upgrade, paying the difference is almost always worthwhile. (That piece of advice doesn't necessarily hold for the separate warranty upgrades offered by retail stores, however.)

COMPONENT	PRIMARY USE OF PC			
	Gaming	Video and image editing	Music and movies	Basic productivity
CPU and hard drive	• Top-of-the-line processor, such as a 2.8-GHz Pentium 4 or 2.13-GHz Athlon XP 2600+ • 80GB hard drive	• Top-of-the-line processor, such as a 2.8-GHz Pentium 4 or 2.13-GHz Athlon XP 2600+ • At least 80GB hard drive for big video and image files	• Midrange processor, such as a 2-GHz Pentium 4 or 1.8-GHz Athlon XP 2200+ • At least 80GB hard drive for massive, high-bit-rate MP3 files	• Lower-end processor such as a 1.8-GHz Pentium 4 or 1.67-GHz Athlon XP 2000+ • 20GB hard drive
Graphics system	• 19-inch or 21-inch CRT monitor • High-end graphics board, such as the ATI Radeon 9700 Pro	• 19-inch or 21-inch CRT, or 15-inch or 17-inch LCD monitor • High-end graphics board, such as the ATI Radeon 9700 Pro	• 15-inch or 17-inch LCD monitor • Midrange graphics card, such as an NVidia GeForce4 MX 420 chip	• 17-inch CRT monitor or 15-inch LCD monitor • Integrated graphics
Sound system	• Sound card that supports surround sound, such as the Creative Labs SoundBlaster Audigy 5.1 • Dolby 5.1 surround-sound speakers and subwoofer	• Midrange sound card, such as the Creative Labs SoundBlaster Audigy • Basic speaker set	• Sound card that supports surround sound, such as the Creative Labs SoundBlaster Audigy 5.1 • Dolby 5.1 surround-sound speakers and subwoofer	• Integrated sound • Integrated speakers or basic speaker set
Other features	• Gaming accessories, such as joysticks, and preloaded games	• At least one IEEE 1394 port • Video- or image-editing software package • DVD-Recordable drive	• At least 40X/12X/40X CD-RW drive • At least 12X DVD-ROM drive	• 40X/12X/40X CD-RW drive and/or 12X DVD-ROM drive • Productivity package such as Microsoft Office XP Small Business Edition or Corel WordPerfect Office 2002

Wireless Wizard.

Wireless networking simplified.

You want all of your PCs, whether wired or wireless, to work seamlessly together using one Internet connection – as if by magic. NETGEAR® makes it happen with its latest Platinum family member, the 802.11b Cable/DSL Wireless Router (MR814). The included Install Assistant guides you through each step while the award-winning Smart Wizard automatically detects your ISP connection and gets you up and surfing in minutes. It's all done easily and effortlessly.

And NETGEAR's wireless router doesn't stop there. Your communications and network are secure from hackers thanks to the integrated firewall. With content and URL filtering, Internet activities are always safe, including parental controls to manage objectionable web sites and content. As a bonus, you'll also receive a free, full-year subscription of Freedom® Personal Firewall and Privacy Software for up to eight connected PCs.

Take advantage of wireless networking that conforms to industry standards, backed by 24x7 toll-free support, and NETGEAR's user-recognized excellence in service and reliability in home networking. NETGEAR's 2.4 GHz 802.11b solutions can turn magic into reality. To learn more, visit **www.netgear.com**.

PC Magazine (August 2002)
NETGEAR Home Networking

I.D.
ID Magazine (August 2002)
2002 Design Review
Consumer Products

PRISM
On Board
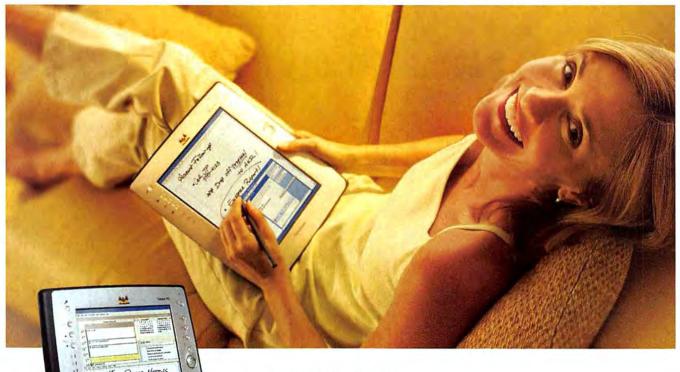
Everybody's connecting.™

NETGEAR®

PCs have changed the shape of life. Now, life is changing the shape of PCs.

COMPUTE. SURF.
COLLABORATE. DOODLE.
DOODLE?

The new ViewSonic® Tablet PC V1100. Put both sides of your brain to work. The ViewSonic Tablet PC is where your business and creative brains can finally work together. It's pen, paper and all the power of your PC rolled into tablet form. If you're on the go or in meetings, you'll achieve new levels of productivity with the robust write-on display, advanced handwriting recognition and wireless networking capability. Capture meeting notes. Sketch flowcharts on the fly. Doodle images to remember great ideas. Share critical information instantly. ViewSonic Tablet PCs are already award winning. *Laptop Magazine* chose the ViewPad™ 1000 as its Ultimate Choice Award winner in the September 2002 Ultimate Mobility special issue. That's because ViewSonic has pushed the envelope of visual display technology since 1987. Change the way you see work and play. Visit **ViewSonic.com** and See The Difference.®

All the power of a PC in compact, lightweight Tablet form. It's a desktop without the desk.

Freedom

ViewSonic®
See the difference.

DVD Burners Hit PRIME TIME

BestHardwareBuys

Though the format wars continue, rewritable DVD finally has mass appeal. We test 13 drives, starting at $250.

By Jon L. Jacobi

GOOD-BYE, CD-RW. Hello, rewritable DVD. The latest DVD burners are faster and can hold more data than your CD-RW drive. And as sure as someone getting whacked on *The Sopranos*, the prices of these drives will keep falling. For as little as $250, you can now own a rewritable DVD drive that will turn your movies, ▶

BEST BUY

THE SONY DRU-500A supports several formats, offers fast burn speeds, has an excellent software bundle, and can write to the new 4X DVD-R media—and it doesn't cost much more than slower, less flexible drives.

photos, and TV recordings into high-quality DVD video playable in most living-room DVD players.

But there are other good reasons—besides being able to burn movies—for you to plunk down your money on a new DVD burner. One of the most compelling is the ability to create reliable backups painlessly. A rewritable DVD drive lets you store gigabytes of data on a single disc, so backups will take only a handful of DVDs. Forget the swap-a-disc-every-5-minutes routine of CD-RW drives; the speed and convenience of

rewritable DVD will transform your backup habits for the better.

If homemade DVD movies and easy backups aren't enough to sway you, how about the one-drive-writes-all factor? Most rewritable DVD drives also burn and read all types of CD media, though not as quickly as a late-model CD-RW drive can.

THE POLITICS OF BURNING

REWRITABLE DVD might have reached a wider audience already if it weren't for the logjam of competing standards and the conflicting claims of compatibility with

FEATURES COMPARISON

TEST Center: BURN IT RIGHT: CHOOSE THE BEST DRIVE FOR YOU

REWRITABLE DVD DRIVE	Street price (9/30/02)	Write speed for movie (min:sec) [1]		Format disc & write 1.18GB (min:sec) [2]			CD-R write time [3]	Features
		DVD-R	DVD+R	DVD-RW	DVD+RW	DVD-RAM		
DVD-RW drive								
CenDyne CD000176 find.pcworld.com/31436	$469	10:06	n/a	122:02	n/a	n/a	10:42	2X DVD-R, 1X DVD-RW, 8X CD-R, 4X CD-RW;‡ FireWire and USB 2.0 interface, external drive, 2MB buffer
LaCie D2 DVD-RW U&I find.pcworld.com/31433	$429	10:07	n/a	101:14	n/a	n/a	10:54	2X DVD-R, 1X DVD-RW, 8X CD-R, 4X CD-RW;‡ FireWire and USB 2.0 interface, external drive, 2MB buffer
Pioneer DVR-A04 find.pcworld.com/31430	$289	10:09	n/a	106:17	n/a	n/a	10:43	2X DVD-R, 1X DVD-RW, 8X CD-R, 4X CD-RW;‡ IDE interface, internal drive, 2MB buffer
DVD+RW drive								
HP DVD Writer Dvd200i find.pcworld.com/31424	$349	n/a	9:16	n/a	13:27	n/a	7:25	2.4X DVD+R, 2.4X DVD+RW, 12X CD-R, 10X CD-RW;‡ IDE interface, internal drive, 2MB buffer
Ikebana DVD+RW/+R find.pcworld.com/31427	$399	n/a	n/a ‡	n/a	7:46	n/a	7:14	2.4X DVD+R, 2.4X DVD+RW, 12X CD-R, 10X CD-RW;‡ USB 2.0 interface, external drive, 2MB buffer
Memorex DVD+RW+R Internal ReWriteable Drive find.pcworld.com/31421	$250	n/a	9:06	n/a	7:33	n/a	7:16	2.4X DVD+R, 2.4X DVD+RW, 12X CD-R, 10X CD-RW;‡ IDE interface, internal drive, 2MB buffer
Pacific Digital DVD BurnerPlus U-31034 find.pcworld.com/31412	$320	n/a	9:01	n/a	7:29	n/a	7:12	2.4X DVD+R, 2.4X DVD+RW, 12X CD-R, 10X CD-RW;‡ IDE interface, internal drive, 2MB buffer
Philips DVDRW228 find.pcworld.com/31418	$390	n/a	9:05	n/a	7:30	n/a	7:14	2.4X DVD+R, 2.4X DVD+RW, 12X CD-R, 10X CD-RW;‡ IDE interface, internal drive, 2MB buffer
Multiformat drive								
LG Electronics Super-Multi DVD-Writer GMA-4020B find.pcworld.com/31067	$399	10:57	n/a	89:12	n/a	n/a	7:08	2X DVD-R, 1X DVD-RW, 2X DVD-RAM, 12X CD-R, 8X CD-RW;‡ IDE interface, internal drive, 2MB buffer
Panasonic LF-D521 find.pcworld.com/31415	$350	10:47	n/a	117:13	n/a	n/a	7:07	2X DVD-R, 1X DVD-RW, 2X DVD-RAM, 12X CD-R, 8X CD-RW;‡ IDE interface, internal drive, 2MB buffer
Best BUY Sony DRU-500A find.pcworld.com/31409	$349	11:56	8:38	23:39	7:48	n/a	4:42	4X DVD-R, 2X DVD-RW, 2.4X DVD+R, 2.4X DVD+RW, 24X CD-R, 10X CD-RW;‡ IDE interface, internal drive, 8MB buffer
DVD-RAM drive								
Pacific Digital DVD Burner U-30116 find.pcworld.com/31442	$299	21:28	n/a	n/a	n/a	17:18	n/a	1X DVD-R, 2X DVD-RAM;‡ IDE interface, internal drive, 1MB buffer
Vivastar RS-111 find.pcworld.com/31439	$350	14:53	n/a	n/a	n/a	17:24	n/a	1X DVD-R, 2X DVD-RAM;‡ IDE interface, internal drive, 1MB buffer

HOW WE TEST: We tested rewritable DVD drives under Windows XP Professional on PCs with 1.67-GHz Athlon XP 2000+ processors and 512MB of DDR SDRAM. To test each drive, we used the DVD video authoring, mastering, and packet writing software supplied by the vendor. We used either media supplied by the vendor or media supplied by Verbatim. See find.pcworld.com/10860 for details on *PC World*'s Star Ratings. n/a=Not applicable.

[1] Time to write two 10-minute video files to DVD. Does not include rendering, transcoding, or other preparation time.

the huge installed base of set-top DVD players. Many prospective buyers have kept their wallets in their pockets rather than face a confusing choice between the competing formats: DVD-RW and DVD-RAM (both from the DVD Forum, www. dvdfoum.org), and DVD+RW (from the DVD+RW Alliance, www.dvdrw.com).

Adding to the confusion, both DVD-RW and DVD+RW have their own corresponding write-once formats: DVD-R and DVD+R, respectively. (The -R and +R media offer greater compatibility, particularly with DVD set-top players.) Fortunately,

new drives like our Best Buy, the Sony DRU-500A, support both DVD-RW and DVD+RW. These bet-hedging wonders let buyers migrate to DVD without worrying over which format is more compatible or which one will eventually win out. DVD-RAM adherents can also cover more bases with Panasonic's new LF-D521 or LG's Super-Multi DVD-Writer GMA-4020B, which support DVD-RW as well.

Each format has its strengths, and no single format is best for everything: While DVD-R and +R are good for video, DVD-RW and +RW are good for storing data

because they let you reuse the discs. DVD-RAM still has a niche in data storage as well, because the discs are protected in cartridges and can be rewritten a huge number of times.

But as welcome as multiformat drives may be, the DVD format battle has never been the problem that the VHS-versus-Betamax contest was. Whereas the two videotape formats were physically incompatible, all five consumer-level DVD recordable/rewritable formats use discs that are physically similar and will work in some—but not all—devices; see "Plus ▶

Software (DVD authoring, DVD mastering, packet writing, and other)	Warranty and support	Comments
Sonic MyDVD 3.1, Ahead Nero Express 5.5, Ahead InCD 3.3, Intervideo WinDVD	One-year warranty; 12-hour weekday and 4-hour Saturday phone support[5]	FireWire and USB 2.0 interfaces make this external drive flexible, but it is the most expensive in this roundup. (★★★☆☆)
Sonic MyDVD 3.5, Roxio EasyCD Creator Basic, Roxio DirectCD, Intervideo WinDVD, MusicMatch Jukebox	One-year warranty; 12-hour weekday phone support[1]	A tough but attractive case and both FireWire and USB 2.0 interfaces make this drive ideal for sharing among several PCs. (★★★½☆)
Sonic MyDVD 3.1, Veritas RecordNow DX 4, Veritas DLA, Cyberlink PowerDVD 4	One-year warranty; 10.5-hour weekday toll-free support	Though it writes slowly to -RW media (typical for such drives) and has lengthy formatting times, it's the least-expensive drive here. (★★★★½☆)
HP (Sonic) MyDVD 3.5, HP (Veritas) RecordNow 3.5, HP (Veritas) DLA, HP (Veritas) Simple Backup, ArcSoft ShowBiz 1.1, Cyberlink PowerDVD 4, Music-Match Jukebox	One-year warranty; 12-hour weekday phone support[5]	Terrific software bundle includes backup and video-editing utilities. Good for both video and data DVDs. (★★★★☆)
Ulead Video Studio 5 SE DVD, BHA B's Recorder Gold, BHA B's Clip 3.3, Cyberlink PowerDVD 4	One-year warranty; 8-hour weekday toll-free support	Well priced for an external drive, but it comes with older software. (★★★★☆)
Sonic MyDVD 3.5, Ahead Nero Express 5.5, Ahead InCD 3.3, ArcSoft ShowBiz 1.1, Cyberlink PowerDVD 4	One-year warranty; 9-hour weekday phone support[5]	A good, no-frills internal drive with an adequate software bundle and an attractive price. (★★★★½☆)
MedioStream NeoDVD Standard 4, Ahead Nero Express 5.5, Ahead InCD 3.3, Intervideo WinDVD, ArcSoft ShowBiz 1.1, Dantz Retrospect	One-year warranty; 12-hour weekday toll-free support	This DVD+RW drive is fast, reasonably priced, and comes with backup software. (★★★★☆)
Sonic MyDVD 3.5, Ahead Nero Express 5.5, Ahead InCD 3.3	One-year warranty; 9-hour weekday toll-free support	This drive performs adequately, but it costs a bit more than similar drives and its software bundle is basic. (★★★★½☆)
BHA B's DVD, BHA B's Recorder Gold, BHA B's Clip 5, Intervideo WinDVD	One-year warranty; 13-hour weekday toll-free support	Supports DVD-R, DVD-RW, and DVD-RAM, but it's expensive compared to other multiformat drives. (★★★★☆)
Sonic MyDVD 3.5, BHA B's Recorder Gold Basic 5, BHA B's Clip 5, Panasonic DVD-MovieAlbum SE 3, Panasonic FileSafe	One-year warranty; 8-hour weekday toll-free support	One of the new breed of multiformat drives. Offers plenty of flexibility for both video and data use. (★★★★☆)
Sonic MyDVD 4, Veritas RecordNow DX 4.5, Veritas DLA, Veritas Simple Backup, ArcSoft ShowBiz 1.1, CyberLink PowerDVD 4, MusicMatch Jukebox	One-year warranty; 12-hour weekday toll-free support	The first drive to support both -RW and +RW formats, as well as quick-formatting of -RW discs. Fast, and comes with a good software bundle. (★★★★★½)
MedioStream NeoDVD Standard 4, Ahead Nero Express 5.5, Ahead InCD, Diamond Cutter, Acid Music, SoundForge, MusicMatch Jukebox	One-year warranty; 12-hour weekday toll-free support	A reasonably priced DVD-RAM and DVD-R drive with a comprehensive software bundle. (★★★★½☆)
Cyberlink Power Director 2 Pro VE, Vivastar Recording, Vivastar DVDForm	One-year warranty; 11-hour weekday toll-free support	This DVD-RAM drive is good for data backup, but it can't write to CD-R or CD-RW discs. The software bundle is very limited. (★★★☆☆)

[2] Time to format space on a blank rewritable DVD disc combined with time to copy 1.18GB of data to the disc.
[3] Time to write 700MB of data to a blank CD-R disc of the appropriate speed rating.
[4] Vendor speed ratings.
[5] Calls are not toll-free.
[6] The Ikebana drive will complete writing DVD video to disc only with the use of an undocumented download; as a result, we did not test this function.

vs. Dash vs. RAM: Battle of the Formats," below, for additional details. For more on compatibility, see "DVD Players and Discs: Press Play and Pray?" on page 120.

Compatibility is certainly a concern, but write speed is another important factor in deciding on one format over another: If you will be writing to a particular type of disc often, choose the drive with the highest speed rating for that type. If you are burning a large number of discs (such as multiple copies of a promotional video for your business), a faster drive can save you a significant amount of time. In our tests, we found that all of the DVD-R drives that supported the 2X write speed could burn a 20-minute movie to disc in just over 10 minutes. But the DVD+R drives we ▶

FORMAT DETAILS

Plus vs. Dash vs. RAM: Battle of the Formats

TALK ABOUT rewritable DVD, you'll sound as if you're choking on an acronym salad. Two of the three competing DVD writing specifications—DVD-RW and DVD+RW—are currently engaged in a heated battle to become the industry's de facto standard.

WRITING ONCE, WRITING TWICE

DVD-RAM IS THE only rewritable format that lacks a write-once variant—though most recent DVD-RAM drives can write to DVD-R or DVD-RW discs, too. Both the DVD-RW and DVD+RW formats use highly reflective write-once media and rewritable phase-change media for their RW variant.

Each type of drive, however, formats rewritable discs for packet writing in a different way. A DVD+RW drive's firmware handles the physical formatting of a disc. When you insert a blank disc into the drive, the formatting occurs in the background.

During use, it seems as if the drive takes scarcely more than a minute to complete the formatting before it allows you to start copying data to the disc.

The DVD-RW spec leaves disc formatting up to the software that you use with the drive. All first- and second-generation DVD-RW drives came bundled with packet-writing software that must perform a full disc format—which can take an hour—before you can start writing to the disc. In contrast, some of the third-generation units supporting DVD-RW, such as Sony's DRU-500A, include software that can format DVD-RW discs in the background.

Manufacturers claim that both -RW and +RW media will hold data for approximately 30 years under optimal storage conditions. DVD-RW and +RW media can be rewritten up to 1000 times; in contrast, DVD-RAM media in a cartridge can be rewritten up to 100,000 times—a big bonus if you use the discs for regular backups.

Only one drive (Sony's DRU-500A) currently ships with Mt. Rainier support built in, and its primary benefits—the ability to read discs without the aid of third-party software installed, and the ability to use defect management—won't be available until Microsoft integrates Mt. Rainier into the next full revision of Windows. See find.pcworld.com/31496 for details.

DVD-RAM was created with data applications in mind. The discs are preformatted with sector marks when they're made, and manufacturers claim this gives DVD-RAM drives random-access capability (like that of hard disks), enabling them to find data on the disc more quickly than other rewritable DVD drives can. DVD-RAM media and drives also contain extensive defect-management and error-correction technologies, to ensure correct data storage.

—Melissa J. Perenson

FORMAT COMPARISON

COST AND COMPATIBILITY COUNT

	DISC TYPE	Can be written to by drives of type...					Disc capacity	Cost of disc[1]	Disc comes in a cartridge?	Quick format?	Data verification?	Defect management?	Maximum rewrites rating	Sequential/ random read/write?	Best for data or video?
		DVD-RW	DVD +RW	DVD -RW/+RW	DVD-RAM/ -R/-RW	DVD -RAM/-R									
Write-once	DVD-R	Yes	No	Yes	Yes	Yes	4.7GB	$4	No	n/a	No	No	n/a	Sequential	Video
	DVD+R	No	Yes	Yes	No	No	4.7GB	$5	No	n/a	No	No	n/a	Sequential	Video
	CD-R	Yes	Yes	Yes	Yes	No	700MB	> $1	No	n/a	No	No	n/a	Sequential	Video and data
Rewritable	DVD-RW	Yes	No	Yes	Yes	No	4.7GB	$6	No	Optional	No	No	1000	Sequential	Data
	DVD+RW	No	Yes	Yes	No	No	4.7GB	$7	No	Yes	No	Yes[2]	1000	Sequential	Data
	DVD-RAM	No	No	No	Yes	Yes	4.7GB[3]	$15	Yes[4]	n/a[5]	Yes	Yes	100,000	Random	Data
	CD-RW	Yes	Yes	Yes	Yes	No	700MB	$1	No	No	No	No	1000	Sequential	Data

n/a = Not applicable. [1] Price based on single Verbatim discs on 10/3/02. Bulk discs are cheaper. [2] Only on Mt. Ranier writes, which are not supported by most drives. [3] Double-sided discs hold 9.4GB. [4] Discs are also available without cartridges, on a spindle. [5] DVD-RAM discs are preformatted.

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Empowering People

DVD-RW has a small advantage in cost per gigabyte.

Pictured (clockwise, from left): Vivastar RS-111, Pioneer DVR-A04, Panasonic LF-D521, LG Electronics Super-Multi DVD-Writer GMA-4020B, Pacific Digital DVD Burner U-30116, Pacific Digital DVD BurnerPlus U-31034.

the formats becomes more popular (see "Burning Cash: The Cost of Media," below).

MANY FORMATS, SINGLE DRIVE

THE SONY DRU-500A reduces your odds of getting format remorse: It writes to DVD-RW, DVD-R, DVD+RW, and DVD+R; and it's the only rewritable DVD drive in our review that can use 4X DVD-R media. It's also a speedy CD-RW drive (at 24X CD-R and 10X CD-RW), and it retails for only

tested (which can write at 2.4X speed) had a slight edge: They all took just over 9 minutes. Sony says that its DRU-500A can write DVD-R at the recently announced 4X speed, but we couldn't evaluate this claim because no production-level 4X-compatible media was available when we conducted our tests. Our informal trials

with preproduction 4X media indicate that 4X recording is likely to be about 70 percent faster than 2X.

Consider media cost and availability as well when choosing a format. At this writing, DVD-RW has a small cost advantage in cost per gigabyte and is more widely available, but this may change as one of

$349—less than a number of the single-format drives. As a result, it won our Best Buy award without a serious challenge.

The LG Electronics Super-Multi DVD-Writer GMA-4020B and the Panasonic LF-D521 get honorable mentions—both of them can write to DVD-RAM as well as to DVD-R and DVD-RW discs. Be- ▶

Burning Cash: The Cost of Media

THE PRICE OF MEDIA is a huge factor in choosing a drive: Since RW discs, for example, currently go for $6 apiece and DVD-RAM discs are $15, you can quickly spend as much on media as you did on the drive.

Write-once DVD-R discs (carrying 1X and 2X speed ratings) are widely available on store shelves and in quantity, but DVD+R media is a little harder to find. You'll pay about $4 for a single DVD-R disc, while DVD+R discs cost just under $5 apiece. Rewritable DVD-RW and DVD+RW discs are both currently priced at about $6 apiece.

In the short term, you can expect DVD-R prices to fall—several factories in Taiwan are switching their lines to produce DVD-R discs to meet increased demand. Long term, however, industry experts expect market forces to push prices down for media in both formats as more drives are sold.

DVD-RW and DVD+RW discs are physical-

ly the same. However, the two media have their own lead-in codes on the disc that a DVD device uses to identify the format and speed rating.

BUILT FOR SPEED

MEDIA WITH different speed ratings use different dyes and alloys. That's something to keep in mind if you're considering buying a drive rated at one of the higher speeds (such as 4X for DVD-R or 2X for DVD-RW), because these drives won't work at their top speed without the right media. In other words, a 4X DVD-R drive won't be able to write at 4X if you use a less expensive 1X or 2X DVD-R disc, so make certain that you buy the right-speed media to get the most out of your drive.
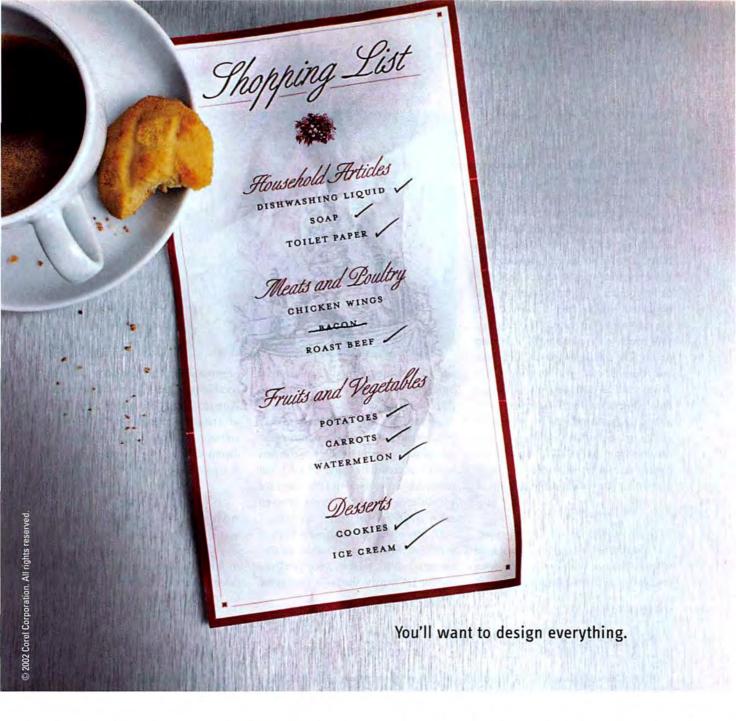
It is also worth checking the drive manufacturer's site for updates: A glitch in the firmware on Pioneer's DVR-A03 and DVR-

Pictured (from left): DVD-R, DVD-RAM, and DVD+R discs. DVD-RAM discs can be removed from the protective cartridge.

A04 models (and on drives from companies such as CenDyne, LaCie, and QPS, all of which use the same mechanism) may cause problems if you try to use an affected drive with certain types of 4X media. Pioneer has released a patch that fixes this; go to find.pcworld.com/31460 for more details and to download the patch.

—Melissa J. Perenson

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cause DVD-RAM has advantages for purposes such as data backup (thanks to its built-in data verification and rated rewrite capability of 100,000 times or more per disc), these drives will appeal to people who want to burn both data and video DVDs.

The emergence of multiformat drives also means that older rewritable DVD technology is likely to get cheaper in a hurry. If you're not worried about state-of-the-art performance, wider compatibility, or leveraging lower media prices, you might find an older drive on sale at a price you can't resist. One caveat: Try to confine your search to so-called second-generation drives (like the single-format models in our review). First-generation DVD+RW drives such as HP's Dvd100i (which we didn't review but which is currently available at bargain-basement prices) lack the ability to burn to DVD+R media—they can only write to DVD+RW discs. We recommend a newer model unless you want one strictly to handle making backups.

INNIE OR OUTTIE?

AFTER WEIGHING THE format, speed, and cost of media, you still have to decide whether you need an internal drive or an external model like the Ikebana, CenDyne,

The drives capable of burning DVD+R media were a little quicker.

Pictured (clockwise from bottom): HP DVD Writer Dvd200i, Philips DVDRW228, Memorex DVD+RW+R Internal ReWriteable Drive.

and LaCie units. Although an external model usually costs about $100 more than an internal drive, an external drive is easier to install. (If you lack the necessary port, however, you'll need to add an interface card. You might be able to write data to DVD successfully using USB 1.1, but no vendor recommends it.) We didn't see any difference in performance between external and internal units in our tests.

All three of the external drives we looked at offered friendly setup and decent documentation. We preferred the CenDyne and the LaCie (with the LaCie getting the

edge overall thanks to its price), however, because they have both USB 2.0 and FireWire interfaces. This makes them usable with more systems than the USB 2.0–only Ikebana can support. (Thus, for example, dual-interface drives would be great for sharing among several PCs in an office.)

BURNING YOUR VIDEOS

MOST OF THE AUTHORING and data-mastering programs that came with the drives performed without a serious hitch, making it relatively easy to burn digital video and back up data to DVD. The ▶

DVD Players and Discs: Press Play and Pray?

ONCE YOU'VE BURNED YOUR video to DVD, you'll want to play it back on your TV, but will it work? In much the same way that some CD players have problems playing CD-R discs, some DVD players refuse to play discs created in rewritable DVD drives.

We tried six write-once DVD discs (three DVD-Rs and three DVD+Rs) in a selection of 11 DVD players, all of which were released over the last couple of years. The results of our tests were promising: 10 of the units played all of the recorded video without problems. Only one (a Yamaha DVD-S520) refused to play the DVD-R discs, which were supplied by Verbatim. Note, however, that our tests covered only

a small number of players, all of which were fairly new models. A recent study by Intellikey Labs says that DVD+R discs worked in 90 percent of the players in its tests, while DVD-R worked in 77 percent. For rewritable discs, Intellikey found that +RW worked in 72 percent of players, while -RW worked in 66 percent. Though results vary and the data isn't exhaustive, DVD+R discs seem to work in more players than DVD-R discs do.

COMMITMENT ISSUES

THOUGH MOST MANUFACTURERS seem unwilling to commit to saying that recordable DVD discs will or will not play in their products, some manufacturers have start-

ed listing their players' compatibility with DVD media: Sony lists its recently released NS-D315/B DVD player as being compatible with DVD-R, DVD-RW, and DVD+RW video discs, but not with DVD+R. Interestingly, Pioneer (which makes the DVR-A04 rewritable DVD drive) doesn't mention rewritable DVD in the manuals for two of its recent DVD players, except to say specifically that DVD-RAM discs won't play.

Many manufacturers offer firmware updates for DVD players. Always check the manufacturer's Web site, since such updates may make the player more amenable to playing back rewritable DVD discs.

—Richard Baguley

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drives generally had similar software bundles, though some included older versions of applications. A few of the drives came with Sonic's MyDVD 4 or Medio-Stream's NeoDVD Standard 4 for video authoring (writing video to DVD), both of which offer more features than the older versions bundled with many drives. Although none of the DVD authoring programs can do much more than perform basic editing tasks (such as trimming the video you want to put onto a disc), several of the drives we looked at also included ArcSoft's ShowBiz video editor, which lets you do more-advanced editing, such as adding transitions, special effects, and titles.

The only major problem we encountered was with Ulead VideoStudio 5 SE DVD, which was bundled with the Ikebana DVD+RW/+R drive. The software it uses to burn video to DVD seems to be something of an afterthought; it's on the CD that comes with the drive, but it isn't covered in the manual. The audio on the DVD+R disc we created with VideoStudio 5 didn't play on several DVD players, and Shecom (which makes the Ikebana drive) was unable to offer a fix. Shecom says that it's replacing Video Studio 5 with CyberLink Power Director in the Ikebana's software bundle, however.

For video, some drives can take advantage of yet another format variation, DVD+VR and DVD-VR. Vendors claim that these formats make +RW and -RW discs more compatible with the set-top DVD recorders that many manufacturers are now beginning to offer: It allows both a computer and a DVD recorder to add and remove video from the disc. (Previously, you could only edit video on a PC and play it on a set-top DVD recorder.) DVD+VR and -VR are available only if the drive's DVD authoring package supports

it, however, and MedioStream's NeoDVD 4 is at present the only such program that supports television.

We liked Ahead's Nero Express 5.5 data-mastering program best for writing data to DVD: It provided the widest range of features and the greatest control over the burning process. When it came to packet-writing software, Ahead's InCD and BHA's B's Clip proved far abler performers than the HP and Veritas DLA (Drive Letter Access) software. In particular, the DLA software data took noticeably longer to write data to rewritable discs.

SPEEDS 'R' PLUS

THE DRIVES displayed relatively little variation in burning video to DVD-R and +R discs in our tests, though the drives capable of burning DVD+R media were a little quicker, due to their slightly faster 2.4X writing speed (versus 2X for DVD-R). The Sony DRU-500A led the pack in writing MPEG video to DVD+R discs, while the CenDyne CD000176 did best for DVD-R. We also tested the time each took to write a large amount of data to both types of write-once discs (these results are not listed), and once again we found only slight variations between drives, although

the +R drives were a little faster overall.
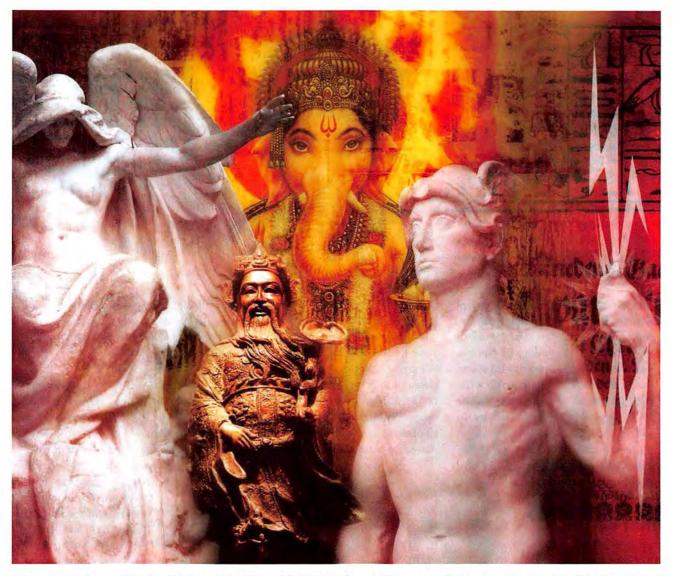
Drives capable of writing to DVD-RW discs can do so only at 1X—less than half the speed rating of DVD+RW drives writing to +RW media. (The Sony supports 2X DVD+RW, but media isn't yet available.) But the much faster times of the DVD+RW drives compared to the DVD-RW units are also partly due to a function built into DVD+RW drives that lets them format rewritable discs in the background. This allows you to start writing data to a DVD+RW disc much quicker—generally within a minute of inserting the blank, unformatted disc. DVD-RW drives can perform this trick too, but generally only with the aid of extra-cost software, which wasn't included with most of the drives that we tested (the Sony DRU-500A was the exception). The software accompanying DVD-RW drives lets you copy the files you want to a temporary folder while the formatting continues, and then write the files to disc with a single mouse click. The slowest drive we tested was CenDyne's CD000176, which took over 2 hours to format a DVD-RW disc and then write the data in our tests. The LG Super-Multi DVD-Writer was relatively fast, taking just under 90 minutes to perform the two tasks. The Sony DRU-500A was fastest (due to the formatting capability mentioned above).

We tested LG Electronics' Super-Multi DVD-Writer GMA-4020B and Panasonic's LF-D521 as DVD-RW/-R drives, but both of them can also write to DVD-RAM discs. We tested DVD-RAM on the single-format Vivastar RS-111 and Pacific Digital DVD Burner U-30116, using the DVD-RAM format's unique verify cycle in its default, enabled state. This means that as data is written out to the disc, the drive reads it back to make sure it's written ▶

External and internal drives produced similar test results.

Pictured (from left): LaCie D2 DVD-RW U&I, CenDyne CD000176, Ikebana DVD+RW/+R.

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Easy Install

TO MAKE THE installation process simple, all internal rewritable DVD drives should come with a kit that includes an IDE drive cable, mounting screws, and an audio cable (such as the kit from the HP DVD Writer Dvd200i shown here). Most of the models in our roundup did, although the Pioneer DVR-A04 failed to include an IDE cable. (The DVR-A04 was otherwise very easy to install, however.)

The best of the lot, in our opinion, was the HP Dvd200i. The drive came bundled with a comprehensive mounting kit and a setup poster that explained the installation process in helpful detail.

IDE cable

Internal drive

Audio cable

Software

Manuals

correctly. While this process does ensure accuracy, it effectively halves performance, which explains the slow write speeds we saw with these drives: Although both the Pacific Digital DVD Burner U-30116 and the Vivastar RS-111 are rated to write DVD-RAM at 2X, they appeared to write at only 1X with the verify cycle enabled. In addition, both drives support writing to -R media at just 1X, and they produced relatively lackluster results in our tests of writing a movie to DVD-R.

Neither of the single-format DVD-RAM drives can write to CD-R or CD-RW discs, which means that you can't use them for burning audio CDs, writing Video CDs, or storing data that can be read on standard CD-ROM drives. That limits their suitability for general use, but these drives are less expensive than most of their more-flexible cousins.

BURNING TO CD-R

ALL OF THE DRIVES we tested (with the exceptions noted above) can write to CD-R discs, and all did a reasonable job in our tests. Once again, though, the Sony DRU-500A stood out from the crowd: Thanks to its support for 24X CD-R media, it was

significantly faster than the other drives, burning the 700MB of data we used in our tests in under 5 minutes. All of the other DVD+RW drives supported CD-R burning at 12X, and all managed to complete our tests in under 8 minutes. The DVD-RW drives were a little slower. They support writing to CD-R media at 8X, and all of them took just under 11 minutes. Across the board, the drives produced the

> **A rewritable DVD drive can do most of the things a CD-RW drive can do (and plenty more things it can't).**

kinds of results we have seen from similarly rated CD-RW drives.

We didn't test CD-RW performance, but again all the drives (except the Pacific Digital DVD Burner U-30116 and the Vivastar RS-111 DVD-RAM drives) permit writing to CD-RW discs. The speeds they support vary, with the lowest rated being the DVD-RW drives at 4X, and the fastest being DVD+RW drives at 10X.

Although a dedicated CD-RW drive may be faster (models that can burn CD-Rs at 48X and CD-RWs at 24X are now

available), a DVD-Rewritable drive can still do most of the things a CD-RW drive can do (and plenty more things it can't).

THE FUTURE IS FASTER

GREATER PERFORMANCE is in store for rewritable DVD drives. Pioneer recently announced its DVR-A05, which matches the Sony DRU-500A's 4X DVD-R speed rating, but it wasn't available in time for this feature. The DVD+R/+RW Alliance has countered with the announcement of a 4X specification for writing to both +R and +RW discs, but don't expect to see models that support it until at least early 2003. Mitsubishi has announced a laser that will allow writing to both formats at 8X, but drives that use this laser won't appear until late 2003.
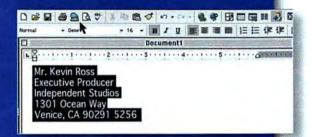
Even though faster drives are on the horizon, now is a good time to consider buying a rewritable DVD drive, and the Sony DRU-500A is the clear winner as the fastest and most flexible drive. ∎

Jon L. Jacobi is a freelance writer who regularly covers rewritable DVD. Melissa J. Perenson is an associate editor, and Richard Baguley is a senior associate editor for PC World.

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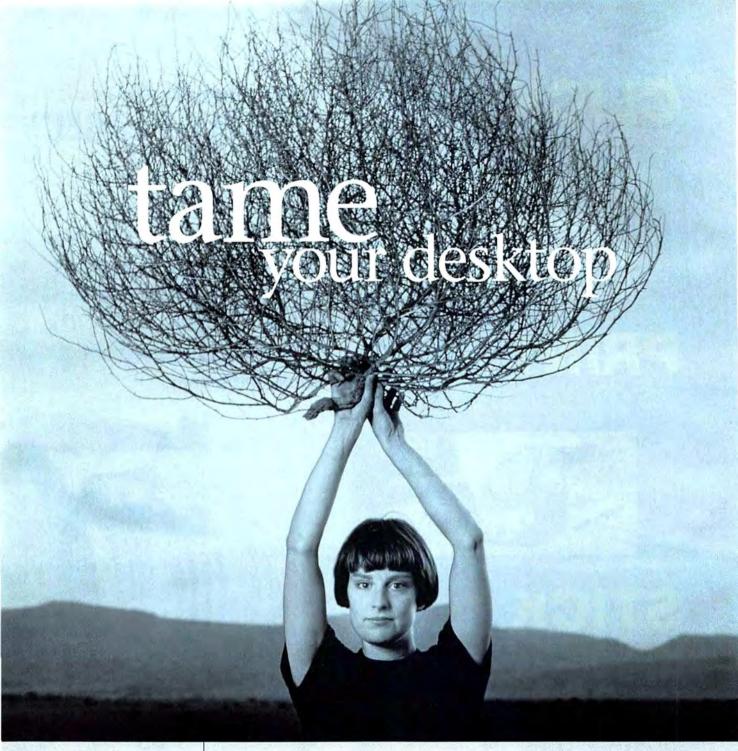
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CHEAP

CHAMPS

BY MICHAEL S. LASKY AND DENNIS O'REILLY
•
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F

rom the loads of inexpensive accessories for desktop PCs, notebooks, and PDAs on the market, we selected 14 favorites that make computing easier and more productive. Our criteria: They had to be under $100 (street) and incredibly useful.

Notebook Movie Maker

Veo Mobile Connect, $65, find.pcworld.com/31283, ★★★★☆

BROADCAST YOUR MUG from anywhere you can tote a laptop. The $65 Mobile Connect camera can capture still and video images at three different resolutions: 640 by 480, 320 by 240, or 160 by 120. You can send video e-mail with three clicks, and videoconferencing via Windows Messenger is almost as easy (but setting up a NetMeeting requires coordination between participants beforehand). Video e-mail is compressed automatically and sent as an .exe file, but other captured video is saved as an .avi file to facilitate editing with the bundled ArcSoft VideoImpression software. The camera comes with ArcSoft's PhotoImpression and Panorama Maker for editing still images.

One Clever Mouse

Kensington StudioMouse, $49
find.pcworld.com/31277, ★★★★☆

MOST OF the time, mice don't get much respect. Plug 'em in, click left, click right, scroll—that's about it. The tricks the StudioMouse performs will make you think otherwise, however. The StudioMouse uses a three-mode sensor instead of a scroll wheel for free, continuous, and single-step scrolling. A middle button below the scroll sensor can be programmed via the included MouseWorks software to pop up a custom menu or provide two-click access to any open application. All three buttons can be set to launch applications or files, paste boilerplate text, or enter keystrokes, among other functions.

Point and Light

Belkin PenLight, $9, find.pcworld.com/31229, ★★★★☆
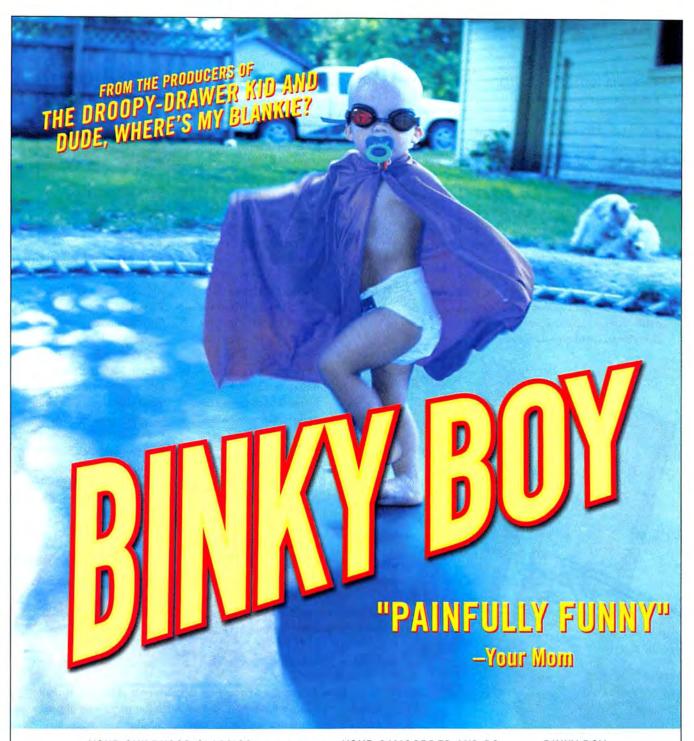
BELKIN ADDS A TINY but surprisingly bright LED tip to its PenLight PDA stylus. Spring action in the twist-on power switch at the top of the device permits either short bursts of light or a longer, sustained stream. The PenLight fits most Palm devices and many PDA models from Handspring, HP, Samsung, Sony, and Toshiba. You can use the high-intensity beam as a flashlight, but it's intended to illuminate a PDA screen, reducing your PDA's battery consumption. An easy-to-replace battery is included.

Stuff Your Stuff

RoadWired Pod, $40, find.pcworld.com/31247, ★★★★☆

IT'S CALLED The Pod, and with more than 20 pockets and compartments, this 7-by-6.5-inch bag has space that belies its size. The fully padded, durable ballistic nylon case sports a removable hammocklike insert to protect your primary device from jostles. On the outside are zippered compartments and netted pockets, many with their own subpockets and compartments. Clever use of Velcro makes many compartments resizable. For anyone who carries a digital camera, PDA, and cell phone—along with paraphernalia (such as memory cards, batteries, and cables) for each—The Pod all but screams "the more the merrier." ▶

Thin Is In for Speakers, Too

Monsoon Audio PlanarMedia 9, $84

find.pcworld.com/31265, ★★★★☆

THE PERFECT DESKTOP complement to your sleek new LCD monitor is a pair of Monsoon Audio's 0.75-inch-thick PlanarMedia 9 ribbon speakers. Of course, the millions of us still using CRTs need all the desktop space we can recover, too. Problem is, we'll need the space we save—and then some—to accommodate the system's sub-woofer, which measures 11 by 8.5 by 8 inches. The two 4-by-7-inch speakers project audio both backward and forward (a process called dipole radiation) to create surprisingly warm sound.

No More Floppies

SanDisk Cruzer, $48 (128MB)

find.pcworld.com/31256, ★★★★☆

FLOPPY DRIVES are almost history. Even Zip drives can hardly compete with the latest in high-capacity flash memory. But until recently, people had no convenient way to read and write to flash memory cards on a computer. Enter the new pocket-size USB flash drives. One of the most convenient and practical of these is San-Disk's Cruzer. About the size of a small cigarette lighter, the unit can handle Secure Digital (SD) cards of any capacity—unlike many other USB memory drives, which come with preset, built-in memory. The Cruzer's single switch on top cleverly releases the SD card or reveals the otherwise-hidden USB connector. Plug it into your PC's USB port for instant access to your data. No software installation is needed (except for drivers for Windows 98 systems).

Easy Networking

Siemens SpeedStream 2105

$36, find.pcworld.com/31286

★★★★☆

IT'S NOT difficult to find an Ethernet hub that supports both 10Base-T and 100Base-TX networks, or one with five autosensing ports, each independently switched and fully duplexed. But all that for only $36? The Siemens/ Efficient Networks Speed-Stream also features a built-in uplink port that will let you expand the network via a hub or a switch without requiring a special crossover cable. The device's LEDs let you know at a glance the status of each connection.

Any Port Replicator in a Storm

Keyspan Mini Port Replicator, $49

find.pcworld.com/31238, ★★★★☆

SOMETHING'S missing from most notebooks—and many desktop computers—made in the past year: serial and parallel ports. Maybe that's the price of progress, but you now might wonder how to attach your old printer or Palm syncing cradle. Keyspan's USB-powered Mini Port Replicator packs a serial port, a parallel port, and two USB ports in a box the size of an Altoids tin.

A Second Listen to External Audio

Xitel HiFi-Link, $50, find.pcworld.com/30338, ★★★★☆

AFTER IT RECEIVED a poor review in our October issue (find. pcworld.com/31289), Xitel engineers convinced us to give their HiFi-Link PC-to-stereo connector another try, citing driver issues as a possible culprit. Armed with updated system drivers and a new list of setup tips, we reinstalled the USB-based product—and experienced better audio. In our tests with MP3s and audio CDs, the HiFi-Link produced higher-quality sound than did our test computer's existing sound card; if your PC's current sound is poor, the improvement should be even more noticeable. The 30 feet of shielded audio cable that Xitel includes seals the deal. ▶

One Plug, Four Drives

Addonics Mini DigiDrive, $40, find.pcworld.com/31241, ★★★★☆

RAISE YOUR HAND if your desktop PC lacks a drive to read and write small memory cards for cameras, MP3 players, laptops, and PDAs. No matter what type of card you have, the Addonics Mini DigiDrive can handle it. This 3-ounce USB flash media drive is about the size of an audiocassette and handles seven different formats with aplomb. Plug the 3-foot cable into a USB port on your PC or notebook, and the device adds up to four different drive letters to your computer to handle various memory cards simultaneously.

Got Juice?

Mobility Electronics Juice, $99, find.pcworld.com/31232, ★★★★⯪

UNIVERSAL POWER chargers are indispensable on the road. Their interchangeable tips let a single power brick work with multiple devices—say a laptop, a PDA, and a cell phone—obviating the need for separate chargers. The 1.5-pound Juice, a shiny silver cell-phone look-alike, works no matter where you are—in a car, plane, hotel, or office, or at home. And with its optional $20 Peripheral Power system, you can simultaneously charge a laptop and a second device.

Video in Your Pocket

Sharper Image Digi Pen II, $99, find.pcworld.com/31274, ★★★★☆

THINK OF IT as the Swiss Army knife of digital cameras. The Sharper Image's $99 Digi Pen II is a 1.3-megapixel digital still camera; a digital video camera that can store up to 120 seconds of video at 30 frames per second; and a security camera for detecting and recording motion with two successive snapshots. The camera connects to a computer or notebook via USB 1.1 and fits comfortably in a shirt pocket. Its lens swivels 90 degrees—it can serve as a Webcam atop your monitor—and a clip lets you attach the camera to the top of a notebook PC. The Digi Pen II's low price and versatility compensate for the camera's limit of 8MB of built-in flash memory and its funky plastic flip-out viewfinder.

Straighten Up and FlyLight

Kensington FlyLight and FlyFan, $14 each
find.pcworld.com/11982, ★★★★⯪

WITH THEIR FLEXIBLE, 15-inch extensions, the ingenious Kensington FlyLight and FlyFan are highly practical—and simple—notebook add-ons. They have no switches or software: Plug them into a USB port, and on they go. The bulb-free FlyLight expends less than 90 seconds per hour of battery charge while its LED glow illuminates the keyboard and other areas near your PC. The FlyFan's safe nylon blades offer an instant cool breeze in any direction. Use either device for a few seconds, and you'll wonder how you ever got along without them.

Tabletop Surge Suppression

Kensington SmartSockets, $40
find.pcworld.com/31271, ★★★★⯪

IT'S ABOUT TIME someone developed a surge suppressor to accommodate the oversize power plugs on so many PC devices. All six outlets on the tabletop model of Kensington's Smart-Sockets Advanced Multi-Stage Surge Protector accept such bulky plugs. A green/red indicator light lets you know if your devices are protected. The suppressor's conveniently color-coded outlets and matching adhesive tags make it easy to identify which plug goes with which device. Also nice: the audible alarm that sounds when a power surge damages the suppressor. ■

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Microsoft .NET and Sun™ ONE

Made up of equal parts vision, architecture and products, the Microsoft .NET and Sun ONE initiatives permeate the companies' respective messages to you. What do you need to know about their plans in order to make the right choices for your company when selecting products, undertaking new initiatives and setting a course for the future?

It used to be simple. Microsoft was all about Windows and Sun was about Java. The funny thing is, not much has changed in that regard. So why did the two companies create all this confusion with the introduction of Microsoft .NET and Sun Open Net Environment (ONE)? We'll answer that question, show what really has changed and what has not, and provide some solid information that will help you weigh the implications for your daily decision-making.

You might be wondering whether these terms—.NET and ONE—refer to: a) a vision; b) some kind of architecture; or c) some new products. The answer is, of course, d), all of the above. What good would an all-encompassing term be if it didn't mean everything and anything? To make matters more interesting, the companies and the press are often loose and free when discussing the present and the future. Sometimes in their presentations and press releases, they look forward to how they would like things to be and then talk about that future as if it were here today.

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Microsoft and Sun need some glue to hold their initiatives together, a way to communicate their current and future plans to companies that might buy their products. Microsoft .NET and Sun ONE are that glue for each of the companies—the super glue that tries to hold together a lot of information around vision, architecture and products.

Do you need to make a binary decision between Microsoft .NET and Sun ONE? If you listen to the two companies closely, the answer should be an unequivocal no. Due to a set of common standards such as XML and HTTP, it will be easier to connect an application written on one platform to an application written on the other using Web services. The hope is that you can choose the platform that best fits the application, and connect new and old applications together almost as an afterthought. Although there are still some serious design implications, there is no doubt that lightweight (lightweight implies easier, less powerful and a bit slower), application-to-application integration has never been easier than when using XML Web services. Some might say that this integration is really possible for the first time.

Of course there are many other considerations besides application integration when choosing a strategic platform for your company. Indeed, you need to look at the vision, architecture and products coming out of each initiative. Both companies are vying hard to become your predominant platform, with a full plate of new initiatives and offerings.

Microsoft .NET

Microsoft defines .NET as "software to connect information, people, systems and devices," reaching into many aspects of software and services. The bottom line is that .NET will impact almost every one of Microsoft's products.

Here are some key points about the Microsoft .NET initiative:
- Where possible, applications can connect to other applications using XML Web services.
- All products—.NET Enterprise servers, Office, Windows, and so forth—will move toward a fundamental reliance on XML.
- The .NET Framework and its Common Language Runtime (CLR) will serve as the common foundation for all development work done on .NET. A

number of third-party companies have ported or are porting languages (such as PERL, COBOL and Delphi) to the .NET CLR that can be used to write .NET applications.
- Three programming languages from Microsoft (Visual Basic .NET, C# .NET and J# .NET) can be used to build traditional applications and XML Web services. C++ .NET still will be the choice for high-performance, lower-level development.
- Microsoft has expanded its line of software servers, with many new line-of-business servers—tagged .NET Enterprise servers—with .NET connectivity expected in new versions.

Vision and Architecture

It's important to remember that .NET is not a product or a product line in itself. Instead, it will be a set of ingredients in all Microsoft product lines and services. The amount and type of .NET support will depend on the product.

Microsoft has opened up its environment through what it calls the .NET Framework, an intermediate layer between programming languages and Windows that allows third-party language vendors to share a common framework with classes to build Web applications, Windows applications and XML Web services.

As mentioned, Microsoft will count on XML Web services for application-to-application integration. Examples include integrating a partner's travel service, weather forecasts or financial services application into your own Web site.

Table 1: Microsoft .NET Overview

Company Definition	"Software to connect information, people, systems and devices."
Vision	Microsoft wants to extend its reach beyond just Windows by providing support for XML Web services, mobile endpoints, and third-party programming languages.
Architecture	• Windows • XML • XML Web services • .NET framework and Common Language Runtime (CLR)
Products	• Visual Studio .NET (Visual Basic NET, C# .NET, C++ .NET) • J# .NET • .NET Enterprise Servers (includes Windows operating systems)

Windows

From an architectural perspective, Microsoft Windows is the foundation for all of Microsoft's products. Although there are a few exceptions, such as its Office and Internet Explorer products for the Macintosh, when Microsoft develops an application, it develops it for Windows. With the release of Windows XP last year, Microsoft unified the underlying code base for its server and desktop operating systems so it's much easier for applications—either from Microsoft or third parties—to run on both platforms. Windows XP is Microsoft's desktop platform, and Windows 2000 is Microsoft's server platform until Windows .NET Server is released. Due to release cycles, neither Windows XP nor Windows 2000 has the .NET Framework installed, but you can expect all future versions of Windows to include it.

XML Web Services: XML, SOAP, WSDL, UDDI

The term XML Web services often is used synonymously with .NET. To be sure, XML Web services are a big part of .NET, but these services are a part, rather than just another term for the same thing. .NET also includes a new fundamental reliance on XML itself, a new architecture for building applications on Windows, and a set of new products.

So what is an XML Web service? First, it's not a Microsoft standard. Although Microsoft played a big part in its creation, XML Web services are defined by standards managed by the World Wide Web Consortium (W3C, www.w3c.org). Many other vendors including Borland, IBM, Oracle and Sun have announced support for and products containing XML Web services.
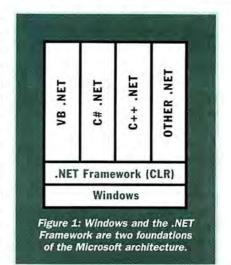
An XML Web service is a programable application logic, or part of an application, written to allow for its easy consumption by other applications. It conforms to a set of specifications called the Simple Object Access Protocol (SOAP) and the Web Services Description Language (WSDL). These protocols rely on XML for data formats and HTTP for data transport. Although HTTP is not required by the standard, it's by far the most common way to implement XML Web services.

Using these standards, an application can be written so that its methods are easily exposed to remote applications. For example, a financial application written as an XML Web service could include a method for accessing a real-time stock quote (perhaps called "GetQuote") and returning a result containing the latest price, its percentage change, and volume traded on the day. Another company, perhaps an insurance company wanting to offer a stock service, could consume this Web service on its own Web site very easily to provide its customers with the same robust functionality.

From a programmer's perspective, XML Web services provide a standard and far easier path to create and consume applications. Complex methods such as CORBA (Common Object Request Broker Architecture), DCE (Distributed Computing Environment), or RMI (Remote Method Invocation) have never worked well for inter-company application integration, as their protocols did not work well over the Internet and their development was a job for experts. XML Web services offer an excellent path for creating new services and service-to-service communication on the Internet. As simplicity often far outweighs power, XML Web services also make a good choice for internal application integration, even though they are less powerful and slower than traditional methods. These services are easy to develop and certainly attainable for developers who might have created only standalone applications before.

The .NET Framework

A good example of .NET at work is

Figure 1: Windows and the .NET Framework are two foundations of the Microsoft architecture.

Microsoft's release of Visual Studio .NET in February 2002. This development tool shows the significant architectural gains made by Microsoft in the application development arena. Visual Studio .NET introduced us to a new layered architecture commonly known as the .NET Framework and Common Language Runtime (CLR), a language-neutral, object-oriented, virtual machine. The basic idea is that any language can be used to create .NET applications in the Windows environment, so long as they support the .NET Framework. The .NET Framework can be used to create traditional applications and—perhaps more importantly—can be used to create or consume XML Web services.

The .NET Framework includes a full set of classes, controls and connectors, including ASP .NET for building Web applications, Windows forms for creating Windows applications, and ActiveX Data Objects .NET for connecting to relational databases, such as Microsoft SQL Server or the Oracle9i database.

Of course, the first products to support the .NET Framework were Microsoft's own VB .NET, C# .NET and C++ .NET. Other vendors such as Borland and ActiveState have released or will release languages supporting .NET. In the past, languages would be written directly to Windows and its Win32 API, and the different languages

would include their own controls, widgets, and so forth. Now Microsoft will provide a common set of controls in the .NET Framework. There will be more consistency between applications written in, let's say, VB .NET and applications written in Borland Delphi on .NET. Also, applications written in one language can use components written in a different language. This is historically very difficult, and developers cringe at the thought of wrapping components written in one language into code that will be used by another language.

Other Non-Windows Endpoints

Market share numbers will tell you that Windows dominates as both a consumer and corporate desktop platform. So the question remains, where doesn't Windows dominate? The answer is server operating systems. Although Windows has a big presence in the server sector, the Linux and Solaris operating systems are prevalent as well. Solaris has continued to be the popular choice for high-end systems, and Linux has shown promise as a workgroup, department and even an enterprise-class server operating system.

The answer from Microsoft is XML Web services. If you have applications on the Linux and Solaris platforms, you can use XML Web services to connect them to applications in the Windows environment. Microsoft also understands that companies will not throw away their existing applications and hardware, and so communicates the message that XML Web services is a part of a seamless migration approach to Windows. In short, Linux and Solaris have their place, and now their applications can integrate better with those written on Windows. This is a big win for companies.

Products

The culmination of a company's vision and architectural musings are its products.

For Microsoft, there is no shortage of products and a good number of products that have the .NET ingredient built in.

Out of the more than 250 products listed on the Microsoft Web site, only games and computer peripherals might escape any .NET makeovers. All the other Microsoft products have been or will be affected by .NET. That's more than 50 products, including Visual Studio .NET, all of the Windows variants, the .NET Enterprise Servers and Microsoft Office.

Let's look at some of the more important products and how they are or will be affected by .NET.

Visual Studio .NET

Visual Studio .NET is Microsoft's integrated development environment (IDE). While typical IDEs support a single language, Visual Studio .NET integrates the Visual Basic .NET, C# .NET and C++ .NET languages into one product. Conventional IDEs integrate a development and debugging environment, but Microsoft goes one step further by integrating three languages on top of a common set of libraries and components, called the Common Language Runtime (CLR). This means that a developer can access any of the underlying classes and components of .NET from any of the languages in Visual Studio .NET or any other language written to the .NET Framework.

Taking the integration theme to the extreme, Microsoft has integrated other key aspects of the development, test and deployment process. From within Visual Studio .NET, developers can use many .NET-connected third-party tools such as testing tools from Rational and Mercury
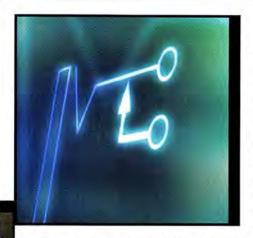
Interactive and components from companies such as SoftArtisans and VisualSoft Technologies. Also, you can sign up and deploy applications to a set of .NET hosting providers. There is no part of the development cycle left to chance.

The product name, Visual Studio .NET, is the source of some confusion. Its name suggests that it might be the development environment for a new breed of distributed applications built using Web services. It is that, but it also is the development tool for building traditional Web applications, Windows desktop applications, or server applications. While Visual Studio .NET allows developers to create XML Web services in Visual Basic .NET and C#, it also lets developers create conventional client and server applications in any of the three included languages.

Visual Studio .NET includes an update to the popular Active Server Pages (ASP) called ASP.NET for building Web sites, and a new flavor of Active Data Objects (ADO) called ADO.NET. ASP.NET allows developers to use compiled code for the dynamic elements in their Web pages— a faster, more manageable approach to dynamic Web sites. ADO.NET is similar to the old ADO, but a new data class called a dataset is much more powerful for applications requiring complex data manipulation or intelligent intermittent database connectivity.

Microsoft released Visual J# .NET in July

2002 for those comfortable with the Java language and for those who built applications with the Microsoft Visual J++ development tool. Visual J# .NET integrates tightly with the Visual Studio .NET environment. The difference between Microsoft's Java-syntax language and Java itself is that the Microsoft flavor is deployed on the .NET Framework, while traditional Java programs run in a Java Virtual Machine (JVM). It's the JVMs that provide cross-platform capabilities, so J# is really for those that have Java expertise but want to deploy on Windows platforms and the .NET Framework.

.NET Enterprise Servers

Microsoft has re-classified most of its server line as .NET Enterprise Servers. The Windows 2000 Server and Advanced Server products are included in this line along with many other servers:

• SQL Server
• Exchange Server
• SharePoint Portal Server
• BizTalk Server
• Commerce Server
• Content Management Server
• Host Integration Server
• Internet Security and Acceleration Server
• Microsoft Operations Manager
• Microsoft Project Server
• Mobile Information Server
• Applications Center

The current Microsoft 2000 server product line does not have the .NET

Framework built in. You can download the framework from Microsoft's Web site (http://msdn.microsoft.com/netframework/downloads/howtoget.asp). It's installed by default with Visual Studio .NET. Microsoft's next-generation server is called Windows .NET Server 2003, and will include the .NET Framework along with some new management features. It will be Microsoft's platform for all kinds of services including file and print, directory, applications, mail and terminal services. The product will be available in four flavors:
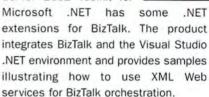
• Windows .NET Server 2003, Standard Edition: standard server
• Windows .NET Server 2003, Enterprise Edition
• Windows .NET Server 2003, Datacenter Edition
• Windows .NET Server 2003, Web Edition

The other .NET Enterprise Servers include .NET to a greater or lesser degree. Some of the early .NET inclusions are in SQL Server and the BizTalk Server.

The first hints of .NET are found in the SQLXML 3.0 extensions to SQL Server, the latest version of SQL Server's XML support. This product adds XML Web

services support to SQL Server 2000. Specifically, stored procedures and XML templates can be exposed as Web services using the toolkit.

The Microsoft BizTalk Server 2002 Toolkit for Microsoft .NET has some .NET extensions for BizTalk. The product integrates BizTalk and the Visual Studio .NET environment and provides samples illustrating how to use XML Web services for BizTalk orchestration.

Microsoft will continue to ship toolkit add-ons for its server products until the next release ships with built-in .NET capabilities including XML Web services.

Related Products and Services

Microsoft claims that more than 20 languages have been "ported" to .NET. On the company's partner page (http://msdn.microsoft.com/vstudio/partners), a number of partners are listed by language. Key languages include COBOL, Eiffel, FORTRAN, Perl and Python. It's important to distinguish between Visual Studio .NET integration

Table 2: Sun ONE Overview

Company Definition	"Open Net Environment is Sun's standards-based software vision, architecture, platform, and expertise for building and deploying Services on Demand."
Vision	To create a set of standards-based products and technologies for building enterprise and Internet applications including Web services.
Architecture	• Open standards such as XML, HTTP, SMTP, IMAP, etc. • De facto Java language standard • Standards integration with other standards-based products on both Windows, Linux, and Solaris platforms.
Products	• Sun ONE Studio (formerly Forte) • Sun ONE Infrastructure Software (formerly iPlanet) • Solaris Operating Environment

and .NET integration. The former means that developers can use the Visual Studio .NET environment with its Intellisense code completion and debugging to create traditional applications in the given language. True .NET integration goes deeper and means that you can create .NET applications using the .NET controls in the respective development language. Here are two examples of products with full .NET integration:

• Fujitsu COBOL. For porting old COBOL projects to the .NET environment. It allows companies with COBOL expertise to deploy on a modern platform.
• ActiveState PERL. Using the ActiveState Perl development kit, Perl developers can build Perl applications within Visual Studio .NET on the .NET Framework.

Another interesting and related product is the Covalent Technologies (www.covalent.com) Enterprise Ready Server. This product allows .NET applications to be deployed in the Apache Web server environment. Covalent has developed the glue for this. This option might be interesting to those companies standardizing on the Apache Web server (it runs on multiple platforms such as Windows, Solaris and Linux) and the .NET development environment.

Sun ONE

With some striking similarities to Microsoft .NET, Sun ONE clearly shows that the entire industry is concerned now with distributed application development. Like Microsoft, Sun is fully behind XML Web services, but makes more of a point to stress its traditional application roots. Although Web services are significant to Sun, so are conventional client and server software development. This makes sense, as Sun and its flagship products—Solaris and Java—are used extensively for mission-critical applications. Companies are loath to replace components that work with new technologies where issues are still being resolved.

Here are the key points about the Sun

ONE initiative:
• Support for XML Web services can be found in both Sun and its partners' products.
• Java has continued to improve and forms the basis of Sun ONE application development.
• Sun has clarified its server software line. The confusion about the AOL/Netscape merger and Sun's ownership of the servers is gone. Sun owns them now.
• Sun has stayed true to the standards.

Figure 2: Sun relies on Java as the glue to tie together multiple platforms.

Vision & Architecture

Sun wants to sell software, based on open standards, to connect all of your company's endpoints. Whether these endpoints happen to be huge SunFire servers running Solaris, Windows-based Web servers, Windows desktops, Linux machines, or portable devices, Sun can help. With its acquisition of the iPlanet servers, Sun has a full line of server software for Web, mail and line-of-business applications.

Open standards permeate everything Sun does, from the de facto standard Java to the myriad of data and connectivity standards. You cannot talk about Sun ONE without mentioning Java first. Although not a true standard, Java has become a de facto standard language for server-side application

development. Java's portability to all popular operating systems has made it a wise choice for companies needing a popular and approachable language that can provide very high-performance applications.

Java 2 Standard Edition (J2SE) provides a robust set of Java classes for implementing client and server applications. Many companies will use the Java 2 Enterprise Edition (J2EE) with its classes for JavaServer Pages, the Java Servlet API and Enterprise Java Beans, to build robust Web applications and Web services. The Java Web Services toolkit adds support for Web services and is updated frequently to match the new XML Web services standards as they are approved.

Java has a lot of support for XML—accessing XML documents, parsing XML, creating objects from XML documents, formatting XML, and so forth. Indeed, XML is an important part of the Sun ONE initiative.

All the Other Standards

Suffice to say that every Sun product includes support for the obligatory and new standards coming out of the W3C and other standards committees. Many of its infrastructure products have their roots in the days of Netscape, when servers were built up from standards. The Web server came from HTTP; the mail server used IMAP, POP3 and SMTP; the news server handled NNTP, etc.

Let's look at some of the products offered under Sun ONE.

Products

Sun has moved most of its products under the Sun ONE umbrella and renamed many of the products to include the term Sun ONE. Sun categorizes its products as follows:

- Solaris
- Sun ONE Infrastructure Products
- Sun ONE Studio

Solaris

The latest version, Solaris 9, builds on the tradition of a stable, high-end operating system most appropriate for databases, mission-critical applications and Internet infrastructure servers such as Web, e-mail or directory.

Sun takes a different approach to operating systems than does Microsoft. Whereas Microsoft is Windows-centric, Sun supports its own Solaris operating system with a full set of applications, but also builds its applications for other operating systems such as Windows and Linux. Although Solaris remains the top choice for high-end applications, Sun

does not require that companies using its Sun ONE products deploy them on Solaris.

Sun ONE Infrastructure Products

As did Microsoft with its .NET Enterprise servers, Sun attached the prefix Sun ONE to the previous iPlanet products. But, just as with the Microsoft enterprise server products, nothing magical actually changed in the products. Sun will add new XML Web services to these products as appropriate and will continue to evolve the products as the standards develop. Sun has a wide variety of servers for both infrastructure and line-of-business applications:

- Portal Server
- Web Server
- Messaging Server

- Calendar Server
- Application Server
- Directory Server
- Identity Server
- Meta-Directory
- Directory Proxy Server
- Web Proxy Server
- BillerXpert
- Market Maker
- BuyerXpert
- Trustbase Transaction Manager
- Integration Server, EAI Edition
- Integration Server, B2B Edition
- Message Queue
- Unified Development Server
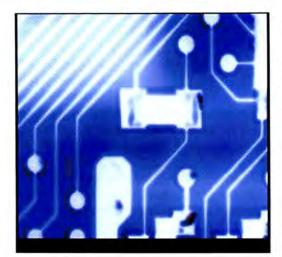
Sun ONE Studio

The product formerly known as Forte, acquired a couple of years back, is now known as Sun ONE Studio. Three languages (Java, C++ and Fortran) are included, but most serious developers will use Java for Web development and

Table 3: Microsoft .NET and Sun ONE Compared

The following table illustrates some of the differences and advantages of the two initiatives.

	Microsoft .NET	Sun ONE	Reasons
Programming Languages	☆		Java is great but Microsoft offers great languages also and more choice
Server Platforms		☆	Sun ONE supports multiple platforms (Windows, Linux, and Solaris); .NET supports Windows only.
SMB Application Development	☆		You can't beat Microsoft and its ease of use in the small business
Enterprise Application Development		☆	Sun and Solaris have proven themselves for large applications
Web Site Development	☆		Building Web sites using JSP and Servlets is good but Microsoft provides better tools for most kinds of sites
Web Services Development	☆	☆	Both camps have great support and tools available
Windows Client Development	☆		Microsoft does this much better
Mobile Endpoints (PDAs & cell phones)	☆	☆	Both companies have good solutions
Non-Windows Clients (Macintosh, Linux, Solaris)		☆	Microsoft focuses on Windows
Directory	☆	☆	Microsoft has Active Directory, Sun has its directory server based on LDAP

C++ where high performance is paramount.

Sun ONE Studio competes against some of Sun's Java partners, specifically the Borland JBuilder IDE and the IBM VisualAge IDE. This competition illustrates one of the big challenges for Sun: supporting and competing against its partners in an area such as Java IDEs.

Related Products and Services

A large part of the Sun ONE offering comes from its direct and implied partners that use Java and other standards-based products. Sun developed the Java language, but other partners like Borland have products, such as JBuilder, that are more popular than Sun's own Sun ONE Studio product. Sun's list of partners is quite long, and includes all of the companies that play in the Java space.

Comparing Microsoft .NET to Sun ONE

There are a few major differences between the two initiatives that might profoundly affect your buying decisions.

Microsoft .NET

If you are going to use Microsoft .NET, plan on Windows as your foundation. You have a little more flexibility in

choosing your language, although VB .NET, C# .NET and C++ are the mainstream choices. Microsoft also has Visual J# .NET for those with Java language expertise, and third-party products for other languages such as Perl, Python and COBOL will interest some.

Many Microsoft solutions use Microsoft products alone. Microsoft has a complete product line including operating systems, development tools, servers and the SQL Server database. Microsoft Solution Providers (MSPs) can be found for any region and for any vertical market area. In short, Microsoft and its MSP partners provide a full solution.

Because Microsoft products are generally easier to use, and synergies and commonalities are found across its

products, its solutions are particularly useful for small and medium businesses. It's not to say that this same ease of use can't be leveraged in larger companies, it's just that smaller companies often can't handle some of the power and complexity that comes with high-end UNIX-based solutions.

Sun ONE

If you're thinking about Sun ONE, make sure Java is in your plans. Although Sun ONE Studio also has Fortran and C++ available, no self-respecting application developer is going to use Fortran going forward. C++ is still a great choice for projects where very high performance is required.

Sun ONE seems much more viable for medium and large businesses where experts abound on the various language, platform and server technologies. When you build a higher-end solution on Sun ONE, as a rule, it will require more expertise.

TOM CHIMNER,
engineer,
Eaton Corporation,
Southfield, Michigan

You Call This Service?

30,000 readers speak out:

PC support remains shaky, and reliability is slipping.
And the best-backed computer may not be a PC.

BY BRAD GRIMES

TOM CHIMNER IS AN ENGINEER at Eaton Corporation in Southfield, Michigan. He uses Dell PCs at work and at home, but admits he's had problems getting good service. "When my home PC's CD/DVD-ROM drive stopped working," Chimner explains, "I called tech support and waited on hold for 30 minutes." A technician read Dell's knowledge base and suggested installing an antivirus program (which his PC already had) and cleaning the drive's optical reader. Chimner followed the tech's suggestions, but the drive still failed to work. "At one point the rep told me to reformat my hard ▶

drive, which I didn't want to do," recalls Chimner.

After weeks of back and forth, Dell finally sent a tech to his house to install a new drive—that fixed the problem. "Getting a replacement may not have happened if I hadn't been persistent," he says.

Chimner is not the only customer at odds with a PC maker. Our most recent survey of 29,593 subscribers reveals growing frustration with computer service. Last year, *PC World* readers told us they were unhappy with technical support (see "Service Takes a Dive," find.pcworld.com/31361). This year's survey shows little—if any—improvement. Dell, for example, tumbled in service overall—especially in hold times. The other big news: Apple rated higher than any other computer maker.

Overall, just half the people reported hold times of 5 minutes or less; fewer people said their problems were resolved within five days; and in a new measure, only 53 percent said their problem was resolved the first time they called tech support.

Survey respondents also indicated that PC reliability may be slipping, which could prompt more calls to tech support. Customers of several companies, including Dell, Gateway, MicronPC, and the now-merged Hewlett-Packard/Compaq, gave their vendors lower reliability marks than in last year's results. The most notable worsening is in the percentage of PCs with a problem. For example, in our last survey, Dell received a Good overall score in the notebook category; this year it dropped to Fair. Meanwhile, 43 percent of MicronPC desktop users reported a problem in the past; this time it was 56 percent. Last year 40 percent of IBM notebook users reported a problem; this year 47 percent did.

What's going on? To find out, we visited call centers and interviewed support technicians from various companies. The quality of these centers affects customer satisfaction, but some factors are out of technicians' hands. Cutthroat competition and a sluggish economy have forced companies to watch what they spend. Though PC makers insist they're investing heavily in service and support, they may not be investing as much as they did in years past. "In a market driven by prices, it's not surprising that companies are getting low marks for service," says Rob Enderle, research fellow at Giga Information Group. "PC makers are under severe cost constraints. They may be spending on service, but they can't overspend."

Nearly every vendor we spoke to has shifted its support emphasis from short hold times to resolving problems on the first call. Companies have dis-

REPORT CARD

The Best and the Rest

NOT A SINGLE PC company earned an Outstanding score in this year's survey, but Big Blue received high marks for both its desktop and its notebook computers. Apple took the top spot in the desktop category, while ABS and Dell were both rated Good overall. Dell did decline on several reliability and service measures, especially in the notebook category (see scores on pages 150 and 151), even though the company retained its Good bottom-line rating. HP and Sony desktops slipped from Good to Fair. On the bright side, discount PC maker Emachines improved its rating to Fair—up from from last year's Poor rating.

CATEGORY	Outstanding	Good	Fair	Poor
Desktops	None	Apple, IBM, ABS Dell, local retailers	Emachines, MicronPC, Gateway, Sony, Compaq, Hewlett-Packard	Systemax
Notebooks	None	IBM, Toshiba	Gateway, Dell, Hewlett-Packard, Sony, Compaq	None

SOURCE: *PC World* Reliability and Service survey, based on 29,593 online participants' responses recorded from March 1 through August 1, 2002. Companies are ranked from best to worst within each category.

57%

of PC users surveyed who accessed online tech support said it did not solve their problems.

SOURCE:
PC WORLD SURVEY
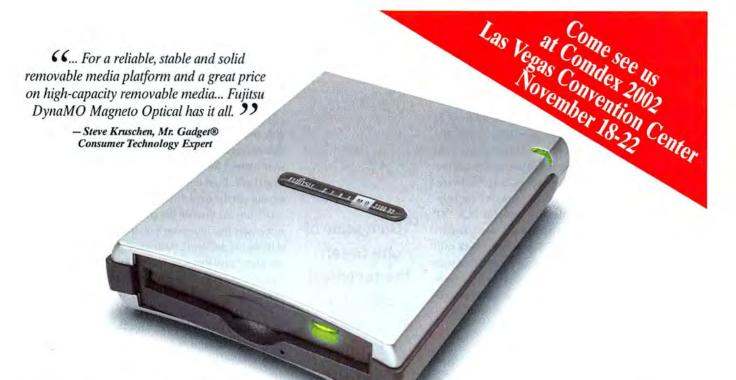
covered that it costs more to field follow-up calls from customers than it does to take the time to solve their problems on the first try. Technicians like the change because they are not under as much pressure to push people off the phone. Getting problems solved on the first call also means fewer hassles for PC users. But callers may wait on hold a few more minutes before they get through.

FAULTY TOWERS?

THE TECHNICIANS we spoke to blamed some of today's PC problems on Windows Me, which has developed a reputation for being an unstable operating system. They say that many users trying to upgrade from Me to Windows XP encountered compatibility issues. Support reps also said that buying PCs with extra hardware features raises the incidence of problems. Digital video and wireless networking issues have increased in every call center we approached. High-speed and analog modems were other common sources of PC angst.

"People are using their PCs for everything," says Valerie (most technicians are identified by their first names to protect their privacy), a three-year veteran at Dell's Nashville call center. "Problems are getting as complex as the products."

More features mean more parts that can fail. Overall, 31 percent of survey respondents indi- ▶

cated they'd had a component failure, up from 25 percent last year. Motherboards, hard drives, and modems are common problem components, but CD-RW drives and other new components fail, too.

Still, the majority of service calls are software-related. Techs recommend Windows XP for helping stabilize and troubleshoot complex PCs. "XP has great tools for fixing problems," says Valerie.

Before upgrading your OS, however, check with your PC maker: Doing it yourself could affect your warranty. You're not on your own—bad components should still be covered—but many technicians won't help you troubleshoot OS conflicts.
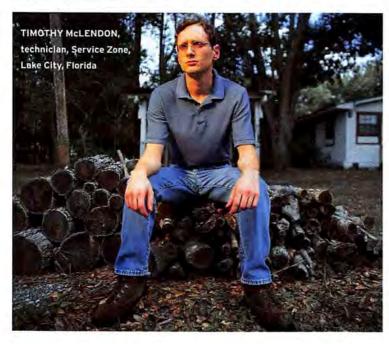
DELL'S FALL FROM GRACE

IN YEARS PAST, Dell consistently led the pack in reliability and service ratings. But this time around, Dell users didn't give the company top marks. Most notably, owners of Dell desktops and notebooks are likely to wait on hold longer than they used to. Just 42 percent of Dell desktop PC owners report a hold time of 5 minutes or less—one of the worst scores earned by any PC vendor.

Arthur Corbin, a salesman in San Rafael, California, has used Dell PCs since the days of the Intel 486 processor. In the past, he says, Dell's phone lines were answered by "trained, knowledgeable, techie types who knew PCs." But recently, he says, things have changed. When he had problems with his Dell, "support was about 50 percent helpful," and getting prompt service was difficult.

> "On a scale of one to ten, the technical skills [at Service Zone, a support facility used by Dell] are about a 5."
>
> –TIMOTHY McLENDON

"One support rep wanted to wipe out my hard disk and reinstall Windows 98," says Corbin. "The tech realized it wasn't the solution, but by then we were halfway through the process, so it was too late to go back. Even though it corrected the problem, wiping out the hard drive was unnecessary."

Dell doesn't dispute the criticism. The company recognizes that its service has struggled, and says it is fixing the problems. "Our sales grew well beyond our plan," says Rick Chase, Dell's vice president of technical support. "We got caught with inadequate resources, and it affected things like hold times."

Timothy McLendon, a veteran technician at Service Zone, a facility in Lake City, Florida, that handles calls for Dell, says one problem is rapid turnover of staff: The average tenure there is three months. Many reps are males between 18 and 25 who view this as their first job on the way to some other technical career, says McLendon. In the first two months, he says, many reps raise their hands, on average, once every three calls to ask for help.

"On a scale of one to ten, the technical skills here are about a five," says McLendon. "In many cases they're lower than that. Reps get two weeks of training, but there's no way they can learn everything about all of Dell's systems in that time. Adequate training may require two months."
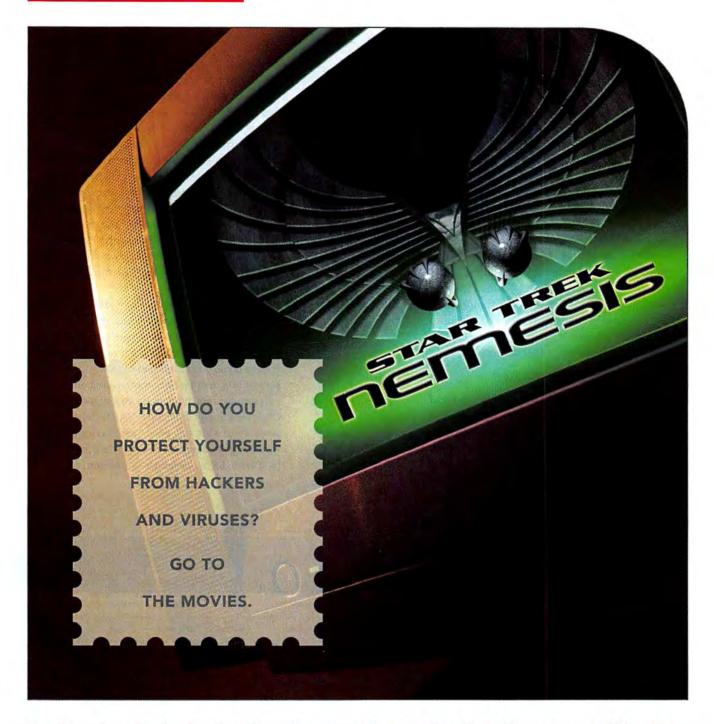
John Bray, executive vice president of administration at Service Zone, would not comment on McLendon's statement or confirm whether the company supplies support for Dell, owing to confidentiality clauses in Service Zone's contracts.

In April 2001, Dell opened a call center in Bangalore, India, to field the volume of calls. Depending on the number of calls coming in and the availability of technicians, calls may be routed from North America to one of several distant facilities, including the Bangalore center. Though some survey respondents complained about difficulty comprehending technicians with strong accents, Dell says the level of technical expertise is outstanding.

Giga Information Group's Enderle understands the move. "You can probably find better English speakers in India who are more competent with computers," he says. "If Dell makes a move like this, other companies will consider doing it."

MERGER MANIA

COUNT HEWLETT-PACKARD among the companies exploring overseas centers. But the company must first focus on merging its operations with those of Compaq, which it acquired last year. ▶

TIMOTHY McLENDON, technician, Service Zone, Lake City, Florida

"We're consolidating support centers and cross-training staff on the Pavilion and Presario lines," says Kenny Stephens, HP's marketing manager for services and support. "Going forward, HP will be committed to both lines and we'll offer the best of both service policies, including 24/7 phone support and a one-year warranty." Compaq Presario PCs previously came with 90 days of phone support.

We list HP and Compaq separately in our ratings because they were still distinct brands when our subscribers took the survey. But no matter how we slice the new HP, readers gave the company poor marks for service. Less than half of Compaq and HP users encountered short hold times; almost half said their problems took more than five days to resolve. HP's Stephens says the company has taken measures to ensure service doesn't suffer during the merger, but Giga's Enderle expects things to get worse before they get better.

THE DEBUTANTES

BECAUSE THEY RECEIVED a sufficient number of survey responses, three companies that weren't in our ratings in the last few years have now made it on our desktop chart. Apple topped every system maker in the desktop arena. The company's cus-

45%
of problems were not resolved the first time customers contacted tech support.

SOURCE:
PC WORLD SURVEY

tomers said they received especially good service.

ABS also received good service scores, but its customers said they encountered problems when they first started using their PCs. A whopping 15 percent of ABS users said their systems had a problem at arrival—by far the worst number.

ABS, which sells made-to-order systems, has its own tech-support staff and offers toll-free support. "Because we're a small company, we can focus on building the best products with the best components and back them with attentive service," says Howard Tong, ABS Computers' vice president of marketing. He says the company is working on shipping issues to ensure that systems work when customers receive them.

Systemax, which became successful by supplying generic PCs to resellers (like its own subsidiary Tiger Direct), received poor service scores. Just 33 percent of Systemax users in our survey reported waiting on hold for 5 minutes or less, and only 40 percent said their problem was resolved quickly.

Systemax, which owns its own call center in Ohio, sees things differently. "Our technical support numbers are very good," says Systemax CEO Richard Leeds. Service and support improvements have led to higher customer satisfaction, adds ▶

SURVEY RESULTS

Readers Rate Desktop PCs: The Mac Leads the Pack

COMPANY	BOTTOM-LINE SCORE	OVERALL RELIABILITY SCORE	OVERALL SERVICE SCORE	RELIABILITY SCORE BREAKDOWN					
				Percent of PCs with problems	Problems per year	Problems on arrival	Dead on arrival	Component failure	Satisfaction with reliability
Apple	Good	Good	Good	Outstanding	Fair	Good	Outstanding	Good	Fair
IBM	Good	Good	Fair	Outstanding	Good	Good	Outstanding	Good	Fair
ABS	Good	Fair	Good	Outstanding	Outstanding	Unacceptable	Poor	Good	Fair
Dell	Good	Good	Fair	Good	Good	Fair	Outstanding	Good	Good
Independent shops	Good	Fair	Good	Fair	Fair	Poor	Good	Fair	Fair
Emachines	Fair	Good	Fair	Good	Good	Good	Outstanding	Good	Fair
MicronPC	Fair	Fair	Fair	Fair	Outstanding	Fair	Good	Fair	Fair
Gateway	Fair	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair
Sony	Fair	Good	Fair	Outstanding	Poor	Good	Good	Outstanding	Fair
Hewlett-Packard	Fair	Fair	Poor	Fair	Fair	Fair	Good	Good	Fair
Compaq	Fair	Fair	Poor	Fair	Fair	Fair	Good	Good	Poor
Systemax	Poor	Fair	Unacceptable	Fair	Fair	Poor	Fair	Good	Fair

What's Behind the Ratings and the Survey Methodology

WORD SCORES awarded reflect the companies' relative rankings. Each measure listed here and in the charts relates to a particular question (or set of questions) we asked *PC World* subscribers in our survey. For the numbers underlying each word score, visit our Web site at find.pcworld.com/31718. We provide the detailed breakdown of the scores for the computer companies on our charts.

RELIABILITY MEASURES

♦ **Percent of PCs with problems:** Percentage of PCs that have had at least one problem needing repair.

♦ **Problems per year:** Average number of problems per PC per year of age.

♦ **Problems on arrival:** Percentage of PCs that did not work properly when they were first turned on.

♦ **Dead on arrival:** Percentage of PCs that were nonfunctional when first turned on.

♦ **Component failure:** Percentage of PCs that have had at least one faulty component replaced.

♦ **Satisfaction with reliability:** Percentage of respondents who said they were satisfied or neutral with their PC's reliability.

SERVICE MEASURES

♦ **Short hold time:** Percentage of service recipients who waited for 5 minutes or less.

♦ **Quick resolution:** Percentage of service recipients whose most recent problem was resolved in 5 days or less.

♦ **No resolution:** Percentage of service recipients whose problem was never resolved.

♦ **Knowledgeable tech support:** Percentage of service recipients who rated the technician's knowledge as Excellent or Good.

♦ **Sincere effort by tech support:** Percentage of service recipients who rated the tech's sincere effort as Excellent or Good.

♦ **Satisfaction with service:** Percentage of service recipients who said they were satisfied or neutral with the service they received.

SURVEY METHODOLOGY

OUR SURVEY WAS conducted in conjunction with Research Results of Fitchburg, Massachusetts. We invited subscribers to take the Web-based survey from March 1 through August 1, 2002. We received 29,593 responses. Survey respondents described their PCs' reliability and their experiences (if any) in getting service. We limited reports to PCs that were three years old or newer. *PC World* editors and research experts analyzed the reliability and service performance of each vendor's desktop and notebook PCs. We rated each company's performance on 12 weighted measures and then used those results to determine the company's overall ranking.

SERVICE SCORE BREAKDOWN						
Short hold time	Quick resolution	No resolution	Knowledgeable tech support	Sincere effort by tech support	Satisfaction with service	Comments
Good	Good	Outstanding	Outstanding	Outstanding	Good	Customers are very impressed with Apple's technicians.
Fair	Fair	Good	Good	Good	Fair	PCs are solid, but Big Blue gets only lukewarm satisfaction ratings.
Good	Fair	Good	Good	Good	Good	Reliability all over the map; troubling number of initial problems and DOAs.
Poor	Fair	Fair	Good	Good	Fair	Service tumbles; expect to wait on hold a while.
Outstanding	Fair	Good	Outstanding	Good	Fair	Reliability is unpredictable, but techs pick up quickly and know their stuff.
Poor	Poor	Fair	Fair	Fair	Fair	Company builds very sturdy computers; service is dismal in spots, however.
Fair	Fair	Fair	Good	Fair	Fair	Reliability is up and down; support is generally mediocre.
Fair	Fair	Fair	Good	Good	Fair	Middle-of-the-road ratings, but customers said techs try to do their best.
Fair	Fair	Poor	Fair	Fair	Poor	Several high scores in reliability, but some customers were left in the lurch.
Poor	Poor	Poor	Fair	Fair	Poor	Customers reported so-so reliability, and service that's even worse.
Poor	Poor	Poor	Fair	Fair	Poor	Customers give a thumbs-down on satisfaction.
Unacceptable	Unacceptable	Poor	Fair	Poor	Unacceptable	Service ratings way at the back of the pack.

Leeds. According to Systemax's own research, the company's technicians answer calls within 30 seconds on average, and resolve more than 85 percent of problems on the first call.

Enderle says, however, that "Systemax PCs have been designed with OEMs [original equipment manufacturers] in mind, not consumers. When you buy a Systemax, you're sacrificing something to get a great price."

SILVER LINING

WHILE SATISFACTION is down overall, there are glimmers of hope. For example, Apple's desktops and IBM's notebooks were rated Good in both computer reliability and service. Richard Violette, a field-support technician for Cigna Systems in Hooksett, New Hampshire, says "[IBM systems] are very reliable. When I need to call with a problem, 99 percent of the time I reach a technician in less than 5 minutes." In one incident, "we had a ThinkPad laptop with bad Hitachi hard drives. IBM sent its own drives within a day and paid for shipping back and forth."

Emachines seems to be turning things around, too. In last year's survey, people had few good things to say about the company. This year it has moved into the middle of the pack in our service ratings; its reliability scores put it ahead of more-established companies such as Gateway and HP.

"Emachines used to employ a VCR strategy in selling PCs," says Michael Zimmerman, Emachines' senior vice president of customer care. "The company thought that if $399 PCs broke, people would throw them away and buy new ones.

> " When I need to call [IBM] with a problem,
> # 99%
> of the time I reach a technician in less than 5 minutes. "
>
> –RICHARD VIOLETTE

So we didn't put effort into service and support."

Emachines recently hired a new management team and support staff, invested $20 million in customer care, extended its standard warranty from 15 days to one year, more than doubled its staff of call center technicians, rolled out new troubleshooting tools, and introduced a new component replacement program. "If we didn't do this," says Zimmerman, "we'd go out of business."

Gateway seems to be improving as well. The company's desktop users expressed growing satisfaction with Gateway's service. Its customers said that they're waiting on hold less, that their problems are being resolved more frequently, and that they're more satisfied with the knowledge and sincerity of the technicians.

BEHIND THE CURTAIN

WE VISITED CALL centers and talked to technicians from several PC companies to get the scoop on what goes on behind the scenes. The techs we spoke to clearly wanted to do a good job. But their backgrounds and range of skill varied widely.

Call centers that are owned and operated by the manufacturer tend to have more-experienced reps. At Dell's Nashville call center, for example, the three techs we interviewed came into their jobs with significant technical and/or customer-service backgrounds. The support reps we talked to at IBM's center in Raleigh, North Carolina, had been with the company for more than three years.

In contrast, third-party facilities (which most PC makers—including Dell and Emachines—use) tend to have less-experienced reps. Dell customer

SURVEY RESULTS

Readers Rate Notebook PCs: IBM Comes Through

COMPANY	BOTTOM-LINE SCORE	OVERALL RELIABILITY SCORE	OVERALL SERVICE SCORE	RELIABILITY SCORE BREAKDOWN						
				Percent of PCs with problems	Problems per year	Problems on arrival	Dead on arrival	Component failure	Satisfaction with reliability	
IBM	Good	Good	Good	Fair	Outstanding	Good	Good	Fair	Good	
Toshiba	Good	Good	Fair	Good	Outstanding	Good	Outstanding	Good	Good	
Gateway	Fair	Good	Fair	Fair	Outstanding	Fair	Outstanding	Fair	Fair	
Dell	Fair	Fair	Fair	Poor	Good	Good	Outstanding	Fair	Good	
Hewlett-Packard	Fair	Good	Poor	Good	Good	Good	Outstanding	Outstanding	Fair	
Sony	Fair	Good	Poor	Good	Good	Good	Outstanding	Outstanding	Fair	
Compaq	Fair	Fair	Poor	Poor	Good	Good	Good	Fair	Fair	
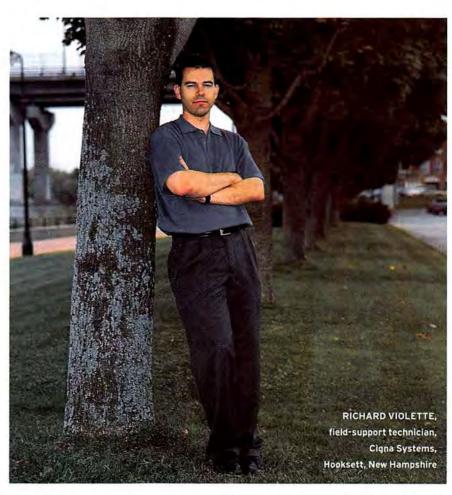
Tom Chimner says that the unhelpful technicians he talked to worked for a third-party call center under contract to Dell.

Todd Penner, Dell's U.S. director of customer support, says his company screens third-party centers for the quality of the people they hire. "We train everyone [the trainers and the support reps] and give them the same tools and knowledge bases that Dell technicians use," explains Penner. "They must meet the same performance goals that we must meet."

What if you want to speak to a technician who actually works for the company that sold you your computer? Usually, it's out of your control. Calls are routed to technicians based on availability. But if your PC maker uses its own support reps plus third-party technicians, your chances of reaching a company representative are best during the middle of the day.

At Emachines' third-party support facility in suburban Salt Lake City, technician Daniel admits that when he was hired, he didn't know anything about PCs beyond how to turn them on. He says it took him 90 days before he felt comfortable offering technical assistance. Is this a problem? If you had drawn Daniel during his first 90 days on the job, it might have been.

RICHARD VIOLETTE,
field-support technician,
Cigna Systems,
Hooksett, New Hampshire

"When we hire reps, we look for people with good customer-service skills first," says James Sherin, an account manager at Alorica, the company that operates the Emachines call center. ▶

SERVICE SCORE BREAKDOWN						Comments
Short hold time	Quick resolution	No resolution	Knowledgeable tech support	Sincere effort by tech support	Satisfaction with service	
Fair	Fair	Good	Good	Good	Good	Machines are pretty darn solid; customers are content, too.
Good	Poor	Fair	Fair	Fair	Fair	You can count on these systems; fixing problems might take some time.
Fair	Poor	Fair	Fair	Good	Good	You're less likely to end up with a DOA, but service is inconsistent.
Poor	Fair	Fair	Good	Good	Good	Some troubling scores for the former leader of the pack, notably in hold times.
Fair	Unacceptable	Poor	Fair	Fair	Poor	Very reliable machines, though getting problems sorted might take ages.
Poor	Unacceptable	Poor	Fair	Fair	Poor	Solid PC hardware, pity about the service.
Poor	Poor	Poor	Fair	Fair	Fair	Spotty reliability; support is even worse.

"We can teach them technology," he adds. As we stroll past rows of cubicles where support reps in headphones stare at computer screens and knock back junk food, Sherin explains, "Everyone goes through four to five weeks of training and incubation before we put them on the phones." He also says that the techs must take a set of tests to identify gaps in their knowledge. Then they go through more training and, if needed, retake the tests. Experience breeds competence. Less than a year after his hire, Daniel is now a senior technician and handles the most challenging calls.

LEARNING FROM THE FLIP SIDE

SUPPORT TECHNICIANS face their own battles. Understanding what happens on the other end of the phone can help PC users get the support they need. Reps told us that callers often are unprepared to work out their problems. Many aren't in front of their computers, and those who are may not have enough time to help the tech diagnose the problem. As a result, callers get frustrated and problems go unresolved. "I've had people say 'I'm call-

ing from the highway. I don't have my PC with me, but I was hoping you can tell me what's wrong with it,'" says Dell technician Valerie.

We listened in on some calls at Emachines, and not one customer was prepared to identify the model and serial number of the problem machine. This information helps the technician identify you, your system, and any case history you might have.

Technicians use knowledge bases to help diagnose problems, but they also use a tool that anyone can access to help solve their technical issues: the Internet. Every tech we spoke to swore by Google as a resource for seeking solutions. "Google is great for researching error messages," says Tim, one of Dell's Nashville-based technicians.

NEXT STEP

PC MAKERS RECOGNIZE that they must do better. So they continue to create new tools to improve support. Emachines, for example, provides a program called BigFix (a utility that downloads new drivers, software patches, and BIOS upgrades as they become available) on all its PCs. IBM has an Access Support feature on its Web site that performs diagnostics, such as a hard-drive fitness test, at the push of a button. "Nine of ten problems are now handled electronically," says Andrew Flanagan, manager of IBM's global service and support strategy. "Call volume is flat to declining." However, 57 percent of survey respondents who used online support said it did not solve their problem.

Future PC Reliability and Service surveys may show improvement, but in the short-term, a couple of forces could affect the results. The first is the vendors' shift in emphasis from reducing hold time to resolving problems on the first call. There has been a definite change in recent months at Dell's third-party call center in Lake City, Florida, says technician Timothy McLendon. "It's taking more than 15 minutes to resolve problems, but more problems are being solved."

The other factor is problems getting more complex. "Questions coming into call centers are difficult to answer and require more time on the phone," says IBM's Flanagan.

Perhaps the best solution is to produce a better PC. "As we look out to the horizon, we see a point where machines can diagnose and repair themselves," says Enderle. In the meantime, PC makers must handle the job—and handle it better. ∎

> Every **tech** we spoke to swore by Google as a resource for finding solutions.

DESKTOP RESULTS

Office vs. Home PCs

OUR PC RELIABILITY AND SERVICE survey invites subscribers to specify where they use their systems—at home or at work. In previous reports, we separated scores for work PCs and for home PCs. This year, the chart on page 148 combines the ratings from office and home machines. This allowed us to report on more companies—including Apple and ABS—in our ratings.

According to our survey, home PC owners have a higher likelihood than work PC users of running into trouble. Respondents with office PCs generally had more dependable machines and better luck with tech support. Of course, this won't always be the case. Here's what our survey revealed:

♦ **57 percent** of home computers had at least one problem, compared with 45 percent of systems used at work.

♦ **33 percent** of home PCs had defective components, versus 27 percent of work machines.

♦ **51 percent** of problems with home PCs were resolved the first time around, compared to 60 percent of problems with work PCs.

♦ **8 percent** of our readers with home PCs rated their technician's computer knowledge as Poor or Unacceptable, versus 4 percent of work PC users.

During the manufacturing process, some vendors (including Dell) make a distinction between office- and home-bound PCs. On the tech-support front, some companies have one service operation that handles support calls from all customers. Others, like HP, have separate call centers: One pool of techs specializes in the company's corporate PC lines, and another deals with its home PCs.

–Aoife McEvoy

Brad Grimes is a contributing editor for PC World.

BY ANDREW BRANDT

Info in Your In-Box

These 15 mailing lists and online newsletters deliver tech news and tips right to you—for free.

TO GET A NEWSPAPER, you can schlep to the corner and pop a coin into a metal box every day, or you can have the daily fishwrap delivered to your door. Online, you have a similar choice: Either you spend time using search engines, news sites, and Web-based help tools to find information, or you simply subscribe to newsletters that send what you need to your in-box.

We subscribed to a slew of newsletters and mailing lists—valuable and sometimes provocative online sources of timely technology news, useful tips, and links to shareware, services, and helpful (as well as ▶

entertaining) Web sites. From this pool of information providers, we selected the 15 newsletters and mailing lists that can help you get the most out of your PC.

WHAT'S IN A NEWSLETTER?

A GOOD NEWSLETTER gives you a regular dose of the information you need, in a small, easily digestible package. A great one is like a candy bar: You want another as soon as you've finished the first.

Among our favorites is "Lockergnome," in which Chris Pirillo divulges tips and shareware recommendations, and explains tech concepts like digital rights management in language Mickey Mouse could understand. Pirillo publishes eight newsletters on different computer topics. (*PC World* and Lockergnome share links on one another's newsletters.)

Personality drives many a newsletter. For example, Woody Leonhard, author of seven different e-mail publications, amusingly bashes Microsoft (he calls himself a "Certified Office Victim") in his "Woody's Office for Mere Mortals" newsletter, while in the same breath providing useful downloads and tips to Office users.

The kookier "Internet Tourbus" is as likely to provide tips about spam as it is to have links to sites like Moviepoopers.com, where you can get one-sentence summaries to ruin hundreds of films you haven't seen. One issue promised, "you'll finish this tour smarter and better looking than the average Internet user." Don't

FEATURES COMPARISON

THE BEST NEWSLETTERS AND MAILING LISTS

ONLINE NEWSLETTER	Delivery frequency	What you get	The high and low points
About Windows/About Computers ★★★☆☆ www.about.com	Weekly	About.com's specialist "guides" point you to Windows tips and PC hardware tips, respectively.	The Windows tips tend to focus on Windows XP, while About Computers covers a broader range of topics (including some Windows settings). You have to read the tips on About's site.
Langa List Standard Edition ★★★★☆ www.langa.com	Twice weekly	Former *Byte* magazine editor Fred Langa provides Windows tips, hardware help, and shareware links aimed at the intermediate or advanced Windows user.	Great advice and shareware links; subjects vary from broadly useful tips to solutions for obscure problems. The Plus Edition, with more content than the Standard list, costs $1 a month.
Naked PC ★★★½☆ www.thenakedpc.com	Twice monthly	Four guys you wouldn't want to see naked produce an average of three long, technical articles (such as a comparison of new motherboards), interspersed with long ads.	Good technical information that unfortunately sometimes suffers from buzzword-itis. It's not always clear if you're reading an ad or a tip until you get to the very end.
TechGuy ★★★★☆ www.helponthe.net/list	Daily	Mailing list features the advice of a contingent of technically savvy readers who help others with their PC problems.	A great place to go if you're looking for the solution to a tricky problem. It's an open mailing list, with highly variable mail volume and subject matter.
Woody's Office Watch/Windows Watch ★★★☆☆ www.woodyswatch.com	Weekly	These two newsletters from Woody Leonhard (he writes seven) provide opinionated tips for Microsoft Office and Windows.	Entertaining, light reading for users with almost any level of technical skill. The "Certified Office Victim" author tends to gripe more than he provides concrete solutions.
CNet News.com Daily Dispatch ★★★½☆ find.pcworld.com/31184	Daily	Links to current tech news headlines from the News.com wire. Other newsletters, such as "Digital Dispatch," provide links to reviews and features.	Contains news you're unlikely to find anywhere else. Ads clutter the HTML newsletter, however, and for you to register CNet wants your job title, zip code, and details about where you work.
Computer Privacy Digest ★★★½☆ find.pcworld.com/31190	Daily	A weekly summary of news reports and opinions, plus practical links about online privacy, which have been posted to a moderated Usenet newsgroup.	One of the last truly useful e-mail digests that doesn't display a lick of advertising. Some posts can be too technical or cover topics too obscure for the average PC user.
Kuro5hin Email Digest ★★★☆☆ www.kuro5hin.org	Daily, weekly, or monthly	Community-posted and reader-rated news headlines about technology and culture, with topics ranging from brownie recipes to Internet crime.	Topics hit the front page if they get enough votes from registered users. The technology coverage tends to focus more on the esoteric than on everyday matters of PC use.
New York Times Newsletters ★★★★☆ find.pcworld.com/31196	Daily or weekly	Technology news coverage from the newspaper's *Circuits* section (weekly) and *Technology* section (daily).	The newspaper of record covers a wide range of technology products and issues. Not every story provides useful tips or take-away.
SiliconValley.com Dispatches ★★★★☆ find.pcworld.com/31199	Daily	Reporting and commentary from the *San Jose Mercury News*, a newspaper in the heart of Silicon Valley.	Excellent technology coverage with a West Coast spin. Emphasis on the "tech economy" seems out of date.
Wired Newsdrop ★★★½☆ www.wired.com	Daily	Quick-hit links to the day's top technology news stories from Wired.com and other Lycos network sites.	Wired covers many interesting stories you're not likely to read anywhere else. But many of those stories focus on the people who create technology or on business topics.
ZDNet's AnchorDesk/Tech Update ★★★½☆ find.pcworld.com/31208	3 weekly/ daily	Links to stories from ZDNet's tech news pundits. "Anchordesk" links to a few in-depth stories, while "Tech Update" provides links to the day's headlines.	Good, deep reporting from the heart of the technology business. Unfortunately, none of it gets into the newsletter: It's all links back to the Web site, and almost no content.
DealNews ★★★★☆ www.dealnews.com	Daily	A daily list of links to the best discounts on technology products sold on the Web, from printer ink cartridges to new computers or peripherals.	Manages to find all kinds of bargains you may not have found otherwise. But you may not be in the market for many of the products listed for sale on any given day.
The Internet Tourbus ★★★½☆ www.tourbus.com	Weekly	Written in an offhand, jocular tone, this newsletter links to a couple of sometimes-humorous, sometimes-useful Web sites.	Can contain a wealth of helpful and entertaining links, but the newsletter's length and quality varies a lot from week to week.
Lockergnome ★★★½☆ www.lockergnome.com	Daily or weekly	Chris Pirillo's links to the best shareware for Windows users, with Windows and hardware tips, plus cool Web links, all written in his very distinctive style.	Pirillo covers a wide range of topics well, in daily and weekly versions, in plain text or HTML. Brevity is the soul of a newsletter, however, and the write-ups could be a little more concise.

hold your breath for that one, but "Tourbus" does offer a lot of choice tips.

At the other end of the spectrum, few newsletters are as dry as the About.com offerings—though their tips are great. The "editor and guide" for each particular topic provides remarkably little personality. If *Dragnet's* Joe Friday weren't a fictional character, this would have been his favorite newsletter: Just the tips, ma'am.

We also covered mailing lists because they can provide quick tips, and they work like newsletters, with one exception: A mailing list is a conversation among the list members. Depending on the traffic level, a busy mailing list could quickly bury you in e-mail. Digests—collections of posts from mailing lists, message boards, or Usenet newsgroups—make these subscriptions more manageable, providing in a single e-mail the many messages that may come to a list or get posted on a board in a day.

Each message might be only a few kilobytes in size, but it adds up fast. Depending on the service you subscribe to, and whether you choose to receive plain-text or HTML versions, you might end up with a mountain of e-mail help in no time.

Staunching the flow of e-mail is easy. Most newsletters include an unsubscribe link in each e-mail message. The *New York Times*, however, does not offer such a link in its newsletters; you must click on the Subscriber Services link at www.nytimes.com to unsubscribe.

Keenly sensitive to the issue of spam, most of the organizations and individuals who run the lists, newsletters, and digests we evaluated promise never to send you anything other than what you sign up for.

With so many newsletters out there, we didn't have the space to cover them all.

Many of the newsletter publishers we evaluated in the chart also produce other mailings about narrower topics, such as help with specific applications or tips for PDA users. Likewise, some solo newsletters cover very specific technology topics. For instance, surfers who are politically minded probably will want to follow Declan McCullagh's popular Politech list (politechbot.com) to keep abreast of legal issues pertaining to technology, like copy protection or online wiretap laws. If you're worried about (or fascinated with) online crime, the scambusters.org list provides details about the latest Internet fraud schemes, viruses, and urban legends. No matter your field of interest, there's probably a newsletter for you.

We didn't review our own nine terrific (in our unbiased opinion, of course) newsletters. We deliver computer news and product reviews daily. Every week we dispatch a summary of the latest stories on our site in "Weekly Brief," links to the best downloads in "Hot Shareware," Steve Bass's quirky *Home Office* column, plus tips for photo editing, mobile computing, and more. You can sign up on our subscription page (find.pcworld.com/31214) or on the left side of our home page. ■

Andrew Brandt is a senior associate editor for PC World.

Bottom line	How to subscribe
With topics ranging from how to change your browser's start page to how to build your own PC, About's tips cover a lot of ground.	Enter your e-mail address in the Subscribe form on windows.about.com (for the Windows newsletter) or on about.com/compute (for the Computers newsletter).
The topics may go over some users' heads, but Langa provides high-quality information for hard-core PC users.	Head to www.langa.com/newsletter.htm and fill in the e-mail form.
Solid information on a wide range of slightly-ahead-of-the-curve topics, including new and developing technologies.	Fill in the form on the front page of thenakedpc.com.
Helpful in the short term, but you might not want to subscribe for long periods (unless you like helping others).	E-mail majordomo@helponthe.net with the words SUBSCRIBE TECHGUY in the body of the message.
Usually an entertaining read, but the newsletters sometimes fall short on advice and end up heavy on opinion.	Plug your e-mail address into the form on the front page of woodyswatch.com to get all of Woody's newsletters.
Great for tech investors (all 12 of you) or anyone who wants technology news fast.	Head to find.pcworld.com/31187 to register with your e-mail address, then check the boxes next to newsletters you want.
Helpful and informative, whether you're just curious about online privacy or have a keen interest in protecting your personal information.	E-mail the moderator at comp-privacy-request@uwm.edu and ask to subscribe.
Cool news from cutting-edge readers; not limited to the matters or problems of daily computing.	Register at Kuro5hin, then click the *My Account* link at the bottom of the page to choose the frequency of the e-mail digests.
Reliably competent reporting on new high-tech products and services, and how they may improve (or complicate) your daily life.	Register on nytimes.com, then head to find.pcworld.com/31193, check the *Technology* box, and choose the number of headlines per e-mail you wish to receive.
Strong reporting on technology issues with a greater focus on practical advice than the *New York Times*.	Click the *Email Dispatches* link in the upper-right corner of the home page, register as a user, and then choose the newsletters you want to read.
Compelling forward-looking journalism that, sometimes to its detriment, keeps its head in the sky and its feet off the ground.	To subscribe, sign up as a Lycos network member (find.pcworld.com/31202), and choose the Wired Newsdrop newsletter.
Even though it's packaged as a unique item, "Tech Update" seems like a rehash of CNet's News.com e-mail. "Anchor-Desk" provides strong opinions.	Enter your e-mail address in the Newsletters sign-up box at the bottom-right side of the ZDNet home page.
Great for finding low-price computer parts and peripherals—if you don't mind waiting for the product you want.	Sign up under the subscribe link on the dealnews.com home page.
A sometimes-valuable resource that's worth reading in the long run.	Enter your e-mail address in the form on tourbus.com.
A must-read for almost any Windows user or Internet fanatic.	Sign up on the front page of lockergnome.com.

Lab-tested rankings of the best in PCs, peripherals, and upgrade components

TOP 100

EDITED BY THE REVIEWS STAFF

175

Color Laser Printers

The Toshiba E-Studio 6CP, ranked fourth on our *Top 10 Printers* chart, is the first Toshiba color laser we've tested—but Lexmark manufactures the printer.

164

Desktop PCs

Short of space? IBM's NetVista A30p features a relatively small midsize tower case, so it fits in spots other systems won't.

The New Beige

Fading to black: Fashion designers say black is practical because everything goes with it. Compaq, Dell, Gateway, and IBM have applied that principle to their latest desktops, having entirely forsaken bland beige boxes for sleek black ones across their lines. The new IBM NetVista A30p, which seizes second place on our power chart, comes totally dressed in black, from its case to its monitor to its Monsoon flat-panel speakers.

Big Black—er, Big Blue—also makes a good showing on the power side of this month's *Top 15 Notebooks* chart, with the ThinkPad T30 moving into the top spot and the new ThinkPad R32 earning second place.

Freelance writers Dan Littman, Mick Lockey, and Carla Thornton, and PC World reviews editors Richard Baguley, Tracey Capen, Seán Captain, Rebecca Freed, Alexandra Krasne, Kalpana Narayanamurthi, Melissa J. Perenson, and Alan Stafford contributed to the Top 100 *section this month. Ulrike Diehlmann, Julio Giannobile, Elliott Kirschling, Jeff Kuta, Tony K. Leung, and Thomas Luong of the PC World Test Center performed testing on the products reviewed in this section, with logistical support provided by Julian Weatherby.*

Notebook PCs

Sony's VAIO PCG-SRX99 weighs just 2.8 pounds, yet it has a built-in DVD player. You may have to squint to watch movies on its 10.4-inch screen, but most purchasers will buy it for its portability and its integrated wireless capability.

183

Digital Cameras

The Pentax Optio 430RS is one of a slew of 4-megapixel digital cameras that now cost less than $500–and one of two on our *Top 10 Digital Cameras* chart. Its tiny stainless-steel case makes it pocketable, and our tests showed that it takes good pictures.

179

Scanners

You may never have to lift the lid: HP's Scanjet 5500c has an integrated photo feeder that accepts prints the way a change machine accepts bills, and spits them out after the scan.

YOUR GUIDE TO THE TOP 100

EACH MONTH WE TEST a large number of PCs, printers, monitors, and other products. Only the best products land on the charts, which are refreshed monthly.

System configurations are shown as tested. The overall rating for each product is calculated on a 100-point scale and reflects results from our hands-on evaluations and performance tests. A 90-point score is exceptional, while one in the 70s is above average.

The PC WorldBench 4 score is a measure of how fast a PC can run a mix of common business applications as compared with our baseline machine, a Gateway Select 1200 with a 1.2-GHz Athlon processor, 128MB of PC133 SDRAM, and a 20GB hard drive. For example, a PC that scores 120 is 20 percent faster than the baseline system. The policies score is based on vendor support policies (not shown on charts). Please see find.pcworld.com/15720 for additional details on how we compile charts for the *Top 100*.

TOP 15 DESKTOP PCs

POWER SYSTEM		Overall rating	Street price (9/13/02)	PC WorldBench 4 performance score [1] ▸Faster▸		Comments
1	**Best BUY** MicronPC Millennia XP+ Xtreme find.pcworld.com/25103	90	Inexpensive $2199	Windows XP Home	Very good 123	Fast system handles games with aplomb. Has a top-notch monitor and an extensive system manual. (★★★★✦ June 02)
2	IBM NetVista A30p **NEW** find.pcworld.com/31262	89	Expensive $2713	Windows XP Professional	Good 119	Pricey model offers a high-quality CRT monitor. Cramped interior with limited expansion room is not friendly to upgraders. (★★★✦☆)
3	ABS Conquest SP find.pcworld.com/30734	87	Inexpensive $2069	Windows XP Professional	Good 121	Basic-looking unit combines strong performance and many high-end features. Already-low price drops $230 this month. (★★★★☆ Nov 02)
4	Gateway 500XL find.pcworld.com/30770	86	Inexpensive $1999	Windows XP Home	Good 117	Silver-and-black system has the speed and storage for movie-making. LCD monitor showed good colors but smudgy text. (★★★✦☆ Nov 02)
5	Sys Technology Performance 2800 find.pcworld.com/30758	85	Expensive $2815	Windows XP Professional	Outstanding 129	The fastest Windows XP system we've tested comes with a sharp-looking LCD monitor and drops $180 this month. (★★★★☆ Nov 02)
6	NuTrend Giga Color Special **NEW** find.pcworld.com/31295	82	Very inexpensive $1849	Windows XP Home	Good 119	Spacey-green tower PC comes with a high-end speaker set; but performance was only so-so, given its top-of-the-line processor. (★★★✦☆)
7	Polywell Poly 883VR-2200 find.pcworld.com/29939	82	Inexpensive $2150	Windows XP Professional	Very good 124	We got excellent performance scores from this well-equipped system, which comes $100 cheaper this month. (★★★★☆ Sept 02)
	Percent of overall rating ▸		10 percent	25 percent		

VALUE SYSTEM		Overall rating	Street price (9/13/02)	PC WorldBench 4 performance score [1] ▸Faster▸		Comments
1	**Best BUY** ABS Bravado 2300 find.pcworld.com/30275	92	Very inexpensive $999	Windows XP Home	Good 115	Two-time Best Buy offers a great sound setup. Price drops by $200 this month. (★★★✦☆ Oct 02)
2	Micro Express MicroFlex 1800B find.pcworld.com/26981	86	Very inexpensive $999	Windows XP Professional	Very good 122	System achieves its speed in part by using a motherboard with an overclocked CPU as a default setting. (★★★☆☆ July 02)
3	Polywell Poly 883VF-2000 find.pcworld.com/30287	84	Inexpensive $1199	Windows XP Home	Good 117	Offers zippy performance and a hefty hard drive at an affordable price. Monitor is unexceptional, however. (★★★☆☆ Oct 02)
4	Gateway 300S find.pcworld.com/30281	84	Very inexpensive $899	Windows XP Home	Poor 84	Bargain, compact system is fine for basics. Now comes with a 15-inch LCD monitor. (★★★☆☆ Oct 02)
5	NuTrend Centra 2 find.pcworld.com/30749	83	Inexpensive $1145	Windows XP Home	Good 117	Low-cost, bare-bones machine wrings impressive performance from a 2.26-GHz processor. (★★★✦☆ Nov 02)
6	Sys Technology Performance 2000+ **NEW** find.pcworld.com/31280	82	Inexpensive $1250	Windows XP Home	Good 119	Fast basic model offers plenty of room for upgrades. Monitor and sound quality were mediocre. (★★★✦☆)
7	FreewayTech Velocity I35 find.pcworld.com/30782	82	Inexpensive $1099	Windows XP Home	Good 112	Inexpensive unit provides plentiful ports, including S/PDIF for attaching digital audio components. (★★★✦☆ Nov 02)
8	Tangent Valera DDR 2000+ find.pcworld.com/25281	81	Average $1499	Windows XP Professional	Good 117	A strong performer with video capture and editing software—but no FireWire ports. (★★★✦☆ June 02)
	Percent of overall rating ▸		20 percent	20 percent		

Go to find.pcworld.com/10860 for details on *PC World's* Star Ratings.

[1] Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" on page 163.

[2] In gigabytes.

[3] Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches). All-in-one PCs integrate a system and a monitor.

OH, BIG BLUE, where have you been? The first IBM desktop PC we've seen in several months, the all-black NetVista A30p, is well designed for small or medium-size offices. This power system's best feature is its IBM P77 CRT monitor. Though a modest 17 inches, this screen offers big performance, with razor-sharp text on our test documents and lifelike colors on photographs. It also supplies useful advanced controls, such as horizontal and vertical convergence (which lets you refine images further by corralling errant electrons onto the right pixels). Despite the display's high quality, however, we would have preferred to see a larger mon-

PHOTOGRAPH: RICK RIZNER

BASE CONFIGURATION						Extra features	Graphics quality	Setup and ease of use	Vendor's reliability/service
CPU	RAM (MB/type)	Hard drive²	Monitor (inches)	Graphics	Case type³				
1.67-GHz Athlon XP 2000+	512/ DDR266 SDRAM	120	19	128MB GeForce4 Ti 4600	Midsize tower	**Fair:** DVD-RW drive, V.92 modem, network adapter, Pinnacle Studio 7	⁴	Outstanding	Fair/ Fair
2.8-GHz Pentium 4	512/ DDR266 SDRAM	120	17	128MB GeForce4 Ti 4200	Midsize tower	**Fair:** 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, V.90 modem, network adapter, Microsoft Works Suite 2003, Lotus SmartSuite Millennium Edition	Very good	Fair	Good/ Fair
2.53-GHz Pentium 4	512/ DDR266 SDRAM	120	15 (LCD)	128MB EVGA E-GeForce4 Ti 4400	Midsize tower	**Very good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Microsoft Office XP Small Business, CyberLink Power Director	Fair	Outstanding	Fair/ Good
2.53-GHz Pentium 4	512/ DDR266 SDRAM	120	17 (LCD)	128MB GeForce4 Ti 4200	Midsize tower	**Outstanding:** DVD-RAM/-R drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Microsoft Works 2002, Pinnacle Studio 7, Quicken 2002	Good	Fair	Fair/ Fair
2.8-GHz Pentium 4	512/ PC1066 RDRAM	80	18 (LCD)	64MB Leadtek WinFast A170 DDR T	Midsize tower	**Fair:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, memory card reader, IDE RAID, Corel WordPerfect Office 2002	Fair	Fair	⁵/⁵
1.8-GHz Athlon XP 2200+	512/ DDR333 SDRAM	120	19	128MB Asus AGP V8460Ultra	Tower	**Good:** 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, V.90 modem, network adapter, IDE RAID, Corel WordPerfect Office 2002, three games	Outstanding	Outstanding	⁵/⁵
1.8-GHz Athlon XP 2200+	512/ DDR333 SDRAM	80	18 (LCD)	128MB Asus AGP V8460Ultra	Midsize tower	**Fair:** 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.92 modem, network adapter, Lotus SmartSuite Millennium Edition	⁴	Good	⁵/⁵
10 percent						10 percent	15 percent	5 percent	25 percent

BASE CONFIGURATION						Extra features	Graphics quality	Setup and ease of use	Vendor's reliability/service
CPU	RAM (MB/type)	Hard drive²	Monitor (inches)	Graphics	Case type³				
1.6-GHz Athlon XP 1900+	256/ DDR333 SDRAM	60	17	64MB GeForce4 MX 460	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Corel WordPerfect Office 2002	⁴	Very good	Fair/ Good
1.53-GHz Athlon XP 1800+	256/ DDR266 SDRAM	60	17	64MB Leadtek WinFast GeForce2 Ultra	Midsize tower	**Fair:** 16X DVD-ROM drive, 24X/10X/40X CD-RW drive, V.92 modem, network adapter	⁴	Fair	⁵/⁵
1.67-GHz Athlon XP 2000+	256/ DDR333 SDRAM	120	19	64MB GeForce4 MX 420	Midsize tower	**Fair:** 16X DVD-ROM drive, 32X/12X/40X CD-RW drive, V.90 modem, network adapter, Lotus SmartSuite Millennium Edition	⁴	Good	⁵/⁵
1.8-GHz Celeron	256/ DDR266 SDRAM	40	15 (LCD)	Integrated Intel 845GL using main memory	Desktop	**Good:** 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Microsoft Works Suite 2002, The Sims game	⁴	Good	Fair/ Fair
2.26-GHz Pentium 4	256/ PC1066 RDRAM	80	17	64MB Leadtek WinFast A170 DDR T	Midsize tower	**Fair:** 16X DVD-ROM drive, V.92 modem, network adapter, Corel WordPerfect Office 2002	Fair	Very good	⁵/⁵
1.67-GHz Athlon XP 2000+	256/ DDR333 SDRAM	60	19	64MB Leadtek WinFast A170 DDR T	Midsize tower	**Good:** 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Corel WordPerfect Office 2002, two games	Fair	Good	⁵/⁵
2A-GHz Pentium 4	512/ DDR266 SDRAM	60	17	64MB MSI G4MX440-T	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, network adapter, three games	Fair	Fair	⁵/⁵
1.67-GHz Athlon 2000+	256/ DDR266 SDRAM	80	19	64MB MSI G3Ti200 Pro-VTG	Midsize tower	**Fair:** 16X DVD-ROM drive, 32X/12X/48X CD-RW drive, network adapter, toolless drive-bay carriers	⁴	Fair	⁵/⁵
10 percent						10 percent	10 percent	5 percent	25 percent

⁴ Based on new testing starting in the November 2002 issue. Insufficient data for systems tested in previous months.

⁵ Insufficient data to give a rating.

itor bundled with a system costing $2713.

The A30p's 16-inch-tall case makes the PC a handy space-saver for cramped cubicles or home offices, but its interior is a bit too cozy—upgrading could be a difficult chore. Even the features designed with upgrading in mind aren't always

helpful; for example, the power supply swings away from the motherboard, but not far enough to improve access much. Our test configuration had no open memory slots or hard-drive bays, but it did have three free PCI slots and a spare 3.5-inch bay for a removable-media drive. ▶

FAST AND CHEAP: The MicronPC Millennia XP+ Xtreme stays on top this month.

COMPUTER SCREEN GRAPHICS: JOHN GODDARD

RELIABILITY AND SERVICE STAGNATE

THE NETVISTA A30P ranks high on the chart in part because of IBM's ratings in our latest reader survey of reliability and service. IBM held on to its Good score for reliability, while the other vendors on this month's chart mustered only a Fair rating. (Dell, Emachines, and Sony—the first two are featured in our home PCs roundup on page 98—also received a reliability score of Good in the survey.)

As usual, smaller system vendors such as Polywell Computers, Sys Technology, and Tangent Computer did not generate enough reader responses to get a ranking in our survey. But this year, for the first time, we collected enough data to rank the reliability and service of ABS, whose Bravado 2300 holds on to the number one spot on the value side of the chart and whose Conquest SP moves up to number three on the power list, thanks partly to its new ratings. ABS was the only national vendor, aside from Apple, to earn a rating of Good for service. However—and par for the course on this month's Top 15—ABS managed only a Fair reliability rating. For more about our survey, see "You Call This Service?" on page 143.

OTHER NEWCOMERS

ELSEWHERE ON the chart, NuTrend grabs the number six spot on the power side with the curious-looking Giga Color Special. Taking a cue or two from colorful gaming systems by vendors like Alienware and Voodoo Computers, this Nu-Trend PC comes in a towering server-style case painted metallic green. (Yellow, blue, and silver are other options.) Also, the side panel features a window into the fluorescent-lit interior. Yet despite the flashy looks, it didn't provide exceptional performance. With a 1.8-GHz AMD Athlon XP 2200+ processor and 512MB of 333-MHz DDR RAM, it turned in a PC WorldBench 4 score of 119—fast, but relatively modest for that configuration. Text on the bundled 19-inch NEC MultiSync FE991SB monitor appeared light, and it blurred at font sizes below 9 points; detail in photographs was good, however.

The Giga Color Special does shine as an

TECH TREND

The Ubiquity of USB 2.0

USB 2.0 (aka Hi-Speed USB) has zoomed past its predecessor, USB 1.1, in *PC World*'s performance tests—providing nearly a 13-fold increase on some peripherals that support the interface (see find.pcworld.com/31445). And thanks to its integration in most new motherboard chip sets over the past year (Intel's 845E and 845G, for example), USB 2.0 is quickly becoming a standard feature on desktop systems.

The one major holdout is Intel's 850 chip set for PCs using RDRAM memory. But many PC vendors, such as Dell and Gateway, are getting around that limitation by integrating USB 2.0 controller chips into their motherboards. And nearly all system vendors offer USB 2.0 expansion cards. According to Brian O'Rourke, a senior analyst at high-tech market research firm In-Stat MDR, "By the end of 2002, all new [desktop] PCs from major vendors will be USB 2.0-enabled." Further greasing the rails of adoption, Microsoft's recently issued Service Pack 1 for Windows XP includes sup-

port for PCs equipped with USB 2.0 ports.

In contrast to its proliferation on desktops, USB 2.0 is still rarely found on notebooks, and it will probably remain that way until notebook chip sets integrating the standard start appearing sometime next year. In the meantime, you can add the ports by installing a PC Card adapter.

FIGHTING FIREWIRE

BEFORE USB 2.0, video and external storage devices had only one practical method for quickly transferring large amounts of data: FireWire (also known as IEEE 1394). The new USB standard, however, is proving to be an appealing alternative to FireWire because its interface works with both the new crop of high-bandwidth devices and the plethora of older USB 1.1 peripherals (which it supports at the slower 1.1 transfer speed).

The number of USB 2.0 peripherals is growing rapidly, especially devices that demand high transfer rates, such as exter-

nal hard drives, CD-RW drives, rewritable DVD drives, and a few high-capacity MP3 players. Digital camcorders remain the exception—in that market, FireWire is still firmly entrenched. "[FireWire] has been in the digital camcorder space from the beginning," says In-Stat MDR's O'Rourke. "For that reason, anyone who's interested in home video editing buys a PC with [FireWire]." So far, only Hitachi's DZ MV270A digital camcorder forgoes FireWire for a USB 2.0 interface.

A DEAD HEAT—FOR NOW

FOR PRODUCTS LIKE external hard drives that come with either interface (and occasionally both), the speed difference is negligible. USB 2.0 has a slightly higher advertised speed than FireWire (480 versus 400 megabits per second), but our tests have shown that devices using one or the other interface perform nearly identically (see find.pcworld.com/31448 for details). However, FireWire is set to pull ahead soon. A new version, currently called IEEE 1394b, promises speeds up to 3200 mbps. According to Dick Davies, a spokesperson for the 1394 Trade Association, adapter cards and peripherals with the new FireWire interface will begin appearing early next year.

CineMagic ▶ transforms your favorite song and raw video into an edited movie!

Finally, a fast and easy way to make
HOME VIDEOS
WORTH WATCHING!

▼ StoryLine Editor lets you take control of your editing.

Family get-togethers, the first solo bicycle ride, shared moments with good friends—all are memories worth preserving. The problem, however, is that preserving those moments has always been so complicated and expensive that only pros could do it well. Until now, that is.

Roxio's VideoWave Movie Creator (www.roxio.com) transforms movie-making into a fast and easy three-step process. First, capture the scenes with your digital camcorder and upload them to your PC. Next, select one of Movie Creator's three editing modes. Finally, burn the movie to CD or DVD, and share the memories with family and friends.

Only four clicks separate you from your first professional-quality movie. CineMagic, Movie Creator's automated editing mode, will have you making movies in minutes—without cracking a manual. Simply import your raw video footage from your camcorder into your PC, add your favorite music track, and let CineMagic do the rest. CineMagic features an advanced algorithm that automatically selects the best scenes from your footage and cuts the video to your music. CineMagic then adds transitions and special effects like emboss, 3D shapes, slow/fast motion, and more.

ONE PRODUCT—THREE WAYS TO EDIT

With three editing modes to choose from, your movies can become more sophisticated as you learn new tech-

niques. While CineMagic is fully automatic, Story-Builder offers a series of interactive wizard-like guides. As it leads you through the process of creating your movie, StoryBuilder enables you to exercise more creative control over the process. For instance, you can select pre-designed opening and closing templates, personalized titles, and fast storyline building by dragging and dropping your imported video clips. (For digital video capture, an IEEE 1394 card is required.) If you want the highest level of creative control, Movie Creator's StoryLine Editor allows you to do precision editing with a full set of easy-to-use features.

BURN YOUR MOVIE TO DVD OR VCD

After you assemble your movie, use your CD or DVD burner to burn it to disc. Not only will your family and friends enjoy watching your movie on TV or their computer, but by preserving your video on optical storage, you ensure that your memories will last a lifetime.

HEADS UP

But Wait, There's More!

ARE YOU READY for a new home computer but not sure what kind of system to buy? Check out our survey of ten unique models (including both PCs and a Mac) in our home-system roundup, "PCs With Personality," starting on page 98.

affordable entertainment system. Its Asus AGP V8460Ultra graphics card (based on the NVidia GeForce4 Ti 4600 chip set) produced fast frame rates in our graphics tests—68 frames per second in the game Return to Castle Wolfenstein and 113 fps in Unreal Tournament 2003 at 32-bit color and a resolution of 1280 by 1024 pixels. With those scores, the Giga Color Special beats most of our Top 15 PCs and compares respectably with the dedicated entertainment systems we recently reviewed. (See the chart at the bottom of this page.) The five-piece Klipsch ProMedia 4.1 speaker system sounds great for both games and music.

Another tricked-out model, the $2495 Amax MicroPlex 8000I, missed the power chart but is nonetheless worth a mention. Coming in a black tower case similar to the Giga Color Special's, the 8000I also has a side window. In this PC, it affords a view of a mechanism that pumps a green cooling fluid from a tank at the front of the case to the processor, via clear hoses. The case also features a temperature gauge that shows the status of the coolant,

but the PC's manual doesn't specify what an acceptable temperature range is.

While the 8000I looks like a setup for game enthusiasts who favor overclocking, the company says it's primarily meant to be a high-end workstation for businesses. In fact, unlike the liquid-cooled systems we've seen in the past, the 8000I's 2.8-GHz Pentium 4 CPU isn't overclocked at all, so we struggled to see the benefit. Amax claims the cooling system reduces the processor's chances of overheating in a PC packed full of components such as additional hard drives. (Ours wasn't that crowded, however.) And though Amax also says that the feature makes the PC quieter, it uses six noisy fans (more than most competing PCs use) to cool other system components. In the end, we recognize that the 8000I's appeal lies mainly in its exotic looks—it got more dropped-jaw stares in our Test Center than a Ferrari gets in a Wal-Mart parking lot.

New to our value list, the sixth-ranked Sys Performance 2000+ is an update of the company's Performance 1800+, which was our number eight value system last month. With a PC WorldBench 4 score of 119, the new Sys is right on target for a machine with a 1.67-GHz Athlon XP 2000+ processor and 256MB of 333-MHz DDR SDRAM. The price of $1250 is reasonable, but it doesn't buy you a compelling multimedia experience. Graphics performance in our gaming tests rated just Fair, with 36 frames per second in Return to Castle Wolfenstein and 34 fps in Unreal Tournament 2003 (at 1280 by 1024 and 32-bit color). The sound system was also weak: The bundled Altec Lansing AVS300W two-speaker and subwoofer set had limited treble range and dull-sounding bass. ▶

TOP 5 ENTERTAINMENT PCs

find.pcworld.com/31025

1	**Best BUY**	Gateway 700XL find.pcworld.com/30746
2	**Best BUY**	Xi Computer 4286 MTower find.pcworld.com/30779
3		Alienware Aurora DDR find.pcworld.com/30278
4		Falcon Northwest Mach V find.pcworld.com/30764
5		Voodoo Computers Egad Obsidian Black find.pcworld.com/30776

From the November 2002 issue

TOP 15 NOTEBOOK PCs

POWER NOTEBOOK		Overall rating	Street price (9/20/02)	PC WorldBench 4 performance score[1] ▶Faster	Comments
1	**Best BUY** IBM ThinkPad T30 find.pcworld.com/29898	86	**Expensive** $2949	Windows XP Professional — Good 95	Two-spindle machine has dual pointing devices and integrates Bluetooth and Wi-Fi (802.11b) networking. Price sheds $150. (★★★✫✫ Sept 02)
2	IBM ThinkPad R32 (NEW) find.pcworld.com/31145	85	**Inexpensive** $2114	Windows XP Professional — Good 94	This lightweight model has a convenient modular bay, as well as a spacious screen and a comfortable keyboard. (★★★✫✫)
3	Gateway 600XL find.pcworld.com/30254	84	**Average** $2678	Windows XP Professional — Very good 100	A generous screen distinguishes this wireless-ready model. Holds two optical drives, three batteries, or three hard drives. (★★★✫✫ Oct 02)
4	MicronPC TransPort GX3 find.pcworld.com/29897	84	**Average** $2299	Windows XP Professional — Good 94	A fingerprint reader and an impressive keyboard highlight this stylish laptop; but battery life is only 2.6 hours. Price drops $320. (★★★✫✫ Sept 02)
5	Toshiba Satellite 1955-S801 find.pcworld.com/30803	83	**Average** $2399	Windows XP Home — Outstanding 109	Unit has a detachable wireless keyboard, a huge 16-inch notebook screen, and a wireless mouse. Price falls by $100. (★★★★✫ Nov 02)
6	Gateway 200 find.pcworld.com/31349	83	**Inexpensive** $2020	Windows XP Home — Good 92	Reasonably priced, lightweight model has average battery life and weighs just 6.5 pounds with only its docking station. (★★★✫✫ Nov 02)
7	Sony VAIO SRX99 (NEW) find.pcworld.com/31352	79	**Inexpensive** $2049	Windows XP Home — Average 82	Ultraportable unit weighs a mere 2.8 pounds (with a travel weight of 4.7 pounds); it features built-in Wi-Fi and a Memory Stick slot. (★★★✫✫)
	Percent of overall rating ▶		15 percent	20 percent	

VALUE NOTEBOOK		Overall rating	Street price (9/20/02)	PC WorldBench 4 performance score[1] ▶Faster	Comments
1	**Best BUY** Dell Inspiron 4150 (NEW) find.pcworld.com/31142	82	**Average** $1777	Windows XP Home — Very good 98	An average performer; for an extra $10, it ships with M-Systems' DiskOnKey, an 8MB USB storage drive, in lieu of a floppy drive (a $20 value). (★★★✫✫)
2	Toshiba Satellite 1905-S301 (NEW) find.pcworld.com/31154	81	**Average** $1799	Windows XP Home — Very good 98	Battery lasted a whopping 4 hours, 11 minutes. Snazzy design includes such amenities as integrated Wi-Fi and front-mounted audio controls. (★★★★✫)
3	Compaq Presario 2801CL find.pcworld.com/30806	78	**Average** $1699	Windows XP Home — Good 94	Stylish, neat-as-a-pin case features specialized USB 1.1 connection on the lid for adding a Wi-Fi wireless module. (★★★✫✫ Nov 02)
4	Gateway 450X find.pcworld.com/30251	78	**Average** $1828	Windows XP Professional — Good 91	Called the 450XL last month, this notebook features a single-bay design and a great keyboard. Price sinks by $209. (★★✫✫✫ Oct 02)
5	Fujitsu LifeBook S Series find.pcworld.com/30263	78	**Average** $1899	Windows XP Professional — Good 94	Wireless-ready lightweight model includes a DVD-ROM/CD-RW combo drive. But battery life is only average, at 2 hours, 43 minutes. (★★★★✫ Oct 02)
6	Dell Inspiron 2650 find.pcworld.com/28201	77	**Average** $1746	Windows XP Home — Very good 98	A basic all-in-one notebook with a DVD-ROM/CD-RW combo drive, but only average battery life and price. (★★✫✫✫ Aug 02)
7	Sony VAIO VX88 find.pcworld.com/31139	76	**Average** $1700	Windows XP Home — Average 81	This lightweight portable has no internal bays to accommodate additional peripherals, but does include a roomy 14.1-inch screen. (★★★✫✫ Nov 02)
8	Compaq Presario 1510 (NEW) find.pcworld.com/31148	76	**Expensive** $1999	Windows XP Home — Very good 101	Equipped with a desktop CPU, this is the top performer on the chart, but its battery lasted only 2 hours, 20 minutes. (★★✫✫✫)
	Percent of overall rating ▶		20 percent	15 percent	

Go to find.pcworld.com/10860 for details on *PC World*'s Star Ratings.

[1] Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" on page 163.

[2] Except where noted, all Intel CPUs are SpeedStep chips, which run at a slower speed on battery power.
[3] In gigabytes.

MANY OBSERVERS PREDICTED THAT CD-RW would replace the floppy drive, but keychain-size USB flash-memory devices—which don't need drivers with Windows Me or later—are becoming a popular substitute.

For instance, our new value Best Buy notebook this month, Dell's Inspiron 4150, offers users the opportunity to spend $10 more and upgrade from the included modular floppy disk drive to M-Systems' 8MB DiskOnKey, which conveniently plugs into any USB port. Still, since the floppy drive is worth $20 and you can find 16MB USB flash memory devices for about $30, the deal Dell offers isn't an extraordinary value.

BASE CONFIGURATION						Extra features [4]	Overall design	Battery life (hours:min) [5]	Average weight (pounds) [6]	Vendor's reliability/ service
CPU [2]	Screen (inches)	RAM (MB)	Hard drive [3]	Pointing device	Multi-purpose bays					
1.8-GHz Pentium 4-M	14.1	256	40	Touchpad, eraserhead	1	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, SmartSuite Millennium	Outstanding	Average/ 2:30	Light/ 6.7	Good/ Good
1.8-GHz Pentium 4-M	14.1	256	30	Eraserhead	1	**Good:** 8X DVD-ROM drive, built-in modem and network adapter, Lotus SmartSuite Millennium	Outstanding	Average/ 2:58	Light/ 6.7	Good/ Good
2-GHz Pentium 4-M	15.7	512	40	Touchpad	2	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Outstanding	Average/ 2:33	Very heavy/ 9.9	Good/ Fair
1.8-GHz Pentium 4-M	15	256	40	Touchpad	1	**Very good:** 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Office XP Small Business Edition 2002	Outstanding	Average/ 2:36	Average/ 8.0	[7]/[7]
2.2-GHz Pentium 4 [8]	16	512	40	Touchpad	0	**Good:** 8X DVD-ROM and 16X/10X/24X CD-RW drive combo, built-in modem and network adapter, SmartSuite Millennium	Average	Average/ 2:14	Very heavy/ 11.3	Good/ Fair
933-MHz Pentium III-M	12.1	256	20	Touchpad	0	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Average	Average/ 2:49	Light/ 6.5	Good/ Fair
850-MHz Pentium III-M	10.4	256	20	Touchpad	0	**Average:** 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Word 2002	Average	Very good/ 4:13	Very light/ 4.7	Good/ Poor
5 percent						10 percent	10 percent	5 percent	10 percent	25 percent

BASE CONFIGURATION						Extra features [4]	Overall design	Battery life (hours:min) [5]	Average weight (pounds) [6]	Vendor's reliability/ service
CPU [2]	Screen (inches)	RAM (MB)	Hard drive [3]	Pointing device	Multi-purpose bays					
1.8-GHz Pentium 4-M	14.1	256	30	Touchpad, eraserhead	1	**Very good:** 8X DVD-ROM and 20X/10X/24X CD-RW combo drive, built-in modem and network adapter, Works 2002	Outstanding	Average/ 2:57	Average/ 7.2	Fair/ Fair
2A-GHz Pentium 4 [8]	15	256	40	Touchpad	0	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, SmartSuite Millennium	Average	Very good/ 4:11	Very heavy/ 9.8	Good/ Fair
1.4-GHz Pentium 4-M	15	384	30	Touchpad	1	**Good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter	Average	Average/ 2:54	Average/ 7.4	Fair/ Poor
1.8-GHz Pentium 4-M	15	256	20	Touchpad	1	**Good:** 8X DVD-ROM and 8X/8X/24X combo CD-RW drive, built-in modem and network adapter, Microsoft Works 2002	Very good	Average/ 2:40	Average/ 7.5	Good/ Fair
1-GHz Pentium III-M	13.3	256	40	Touchpad	1	**Good:** 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, built-in modem and network adapter	Average	Average/ 2:43	Very light/ 5.7	Good [9]/[7]
1.6-GHz Pentium 4-M	14.1	256	30	Touchpad	0	**Good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Average	Average/ 2:18	Heavy/ 8.3	Fair/ Fair
850-MHz Pentium III-M	14.1	256	30	Touchpad	0	**Good:** 8X DVD-ROM and 8X/4X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Word 2002	Average	Average/ 2:54	Light/ 6.5	Good/ Poor
2.2-GHz Pentium 4 [8]	15	512	40	Touchpad	0	**Good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter	Average	Average/ 2:20	Heavy/ 8.9	Fair/ Poor
5 percent						10 percent	10 percent	5 percent	10 percent	25 percent

[4] Word score reflects both listed and unlisted features.
[5] Unless otherwise noted, all notebooks come with a lithium ion battery.
[6] Includes computer, AC adapter, power cord, floppy drive, and optical drive.
[7] Insufficient data to give a rating.
[8] Single-speed desktop CPU.
[9] Based on limited data.

Among power portables, IBM's ThinkPad R32 finishes second; its PC World-Bench 4 score fell just one point behind that of the far more expensive ThinkPad T30, and it had better battery life. Meanwhile, Sony's ultraportable VAIO SRX99, in seventh, comes with built-in Wi-Fi (802.11b) wireless networking capability.

In addition to the Dell Inspiron 4150, notebooks from Toshiba and Compaq debut on the chart's value side this month. The Toshiba Satellite 1905-S301 set a new battery-life record for Pentium 4–based notebooks: 4 hours, 11 minutes. ▶

IBM'S ThinkPad R32 has a small LED to illuminate the keyboard.

TOP 10 PRINTERS

Visit find.pcworld.com/31544 for reviews of all products tested this month and ranked in this chart.

TWO NEW MODELS land on our Top 10 chart this month: Toshiba's new E-Studio 6CP at number four and HP's Color Laserjet 4600dn in seventh place. Both offer extremely clear and attractive text printing, fine gray-scale reproduction, and pleasing color prints. The HP model produced better-looking text, while the Toshiba created superior graphics. Moderately priced, either model should easily fit most office budgets.
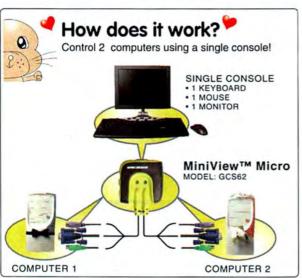
We also reviewed Toshiba's higher-priced E-Studio 20CP and Xerox's Phaser 8200 N, but neither scored high enough to earn a ranking. Look for reviews of these models online. ▶

	COLOR LASER PRINTER	Street price¹ (9/30/02)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/ graphics	Comments
1	**Best BUY** Oki Data Oki C7200n find.pcworld.com/14942	$2164	88	11.9/2.3	Outstanding/ Good	**FEATURES:** Rated 20 ppm monochrome/12 ppm color. Standard 64MB of RAM, 1200-by-600-dpi maximum resolution, 530 sheets input, 500 output. **SUMMARY:** This LED model ranks as the fourth-fastest printer on the chart for both text and graphics. Text quality was impressive too, with thick, dark letters. Colors appeared too bright, though.
2	**Best BUY** Lexmark C720N find.pcworld.com/14941	$2069	87	12/2	Outstanding/ Outstanding	**FEATURES:** Rated 24 ppm monochrome/6 ppm color. Standard 64MB of RAM, 2400-by-1200-dpi maximum resolution, 250 sheets input and output. **SUMMARY:** Lexmark's speedy color laser created beautiful images. Text appeared sharp and fine, and color graphics showed rich colors, shading, and detail. Limited paper-handling features.
3	Brother HL-4000CN find.pcworld.com/29201	$2250	86	9.4/2.1	Outstanding/ Very good	**FEATURES:** Rated 16 ppm monochrome/16 ppm color. Standard 64MB of RAM, 1200-by-1200-dpi maximum resolution, 600 sheets input, 250 output. **SUMMARY:** The HL-4000CN printed clean text, and color images—though slightly garish—had good detail. No printed manual, but online documentation is superior. Includes an automatic duplexer. Price sheds $950. (★★★✦☆ Aug 02)
4	Toshiba E-Studio 6CP **NEW** find.pcworld.com/31541	$2269	84	11.1/1.9	Very good/ Very good	**FEATURES:** Rated 20 ppm monochrome/20 ppm color. Standard 64MB of RAM, 2400-by-2400-dpi maximum resolution, 500 sheets input, 500 output. **SUMMARY:** The unit performed well across the board with crisp text, excellent lines, detailed gray-scale graphics, and fine-looking color prints. Minor feathering in text and color prints. (★★★✦☆)
5	Minolta-QMS Magicolor 3100 DN find.pcworld.com/29202	$2199	83	9/2.1	Very good/ Good	**FEATURES:** Rated 16 ppm monochrome/16 ppm color. Standard 256MB of RAM, 1200-by-1200-dpi maximum resolution, 600 sheets input, 250 output. **SUMMARY:** Based on the same engine as the Brother HL-4000CN's, this printer delivered comparable performance. But text looked slightly jagged, and gray-scale and color images had pronounced cross-hatching. (★★★✦☆ Aug 02)
6	Xerox Phaser 6200 find.pcworld.com/29203	$2399	83	9.4/2.8	Outstanding/ Good	**FEATURES:** Rated 16 ppm monochrome/16 ppm color. Standard 128MB of RAM, 2400-by-600-dpi maximum resolution, 600 sheets input, 250 output. **SUMMARY:** Second-fastest printer on the chart for graphics, the Phaser 6200 produced crisp text and perfectly straight narrow lines. Color graphics looked somewhat dark and fuzzy, however. (★★★☆☆ Aug 02)
7	HP Color Laserjet 4600dn **NEW** find.pcworld.com/31538	$1999	82	10.8/3.1	Outstanding/ Good	**FEATURES:** Rated 17 ppm monochrome/17 ppm color. Standard 96MB of RAM, 2400-by-2400-dpi maximum resolution, 600 sheets input, 250 output. **SUMMARY:** This HP printed exceptionally clear, sharp black text and perfectly detailed gray-scale images. Fastest graphics printing scores this month. Color prints looked a bit faded, but showed good detail. (★★★✦☆)
8	Minolta-QMS Magicolor 2200 DeskLaser find.pcworld.com/21661	$999	81	6.4/0.7	Outstanding/ Good	**FEATURES:** Rated 20 ppm monochrome/5 ppm color. Standard 32MB of RAM, 1200-by-600-dpi maximum resolution, 650 sheets input, 500 output. **SUMMARY:** The Magicolor 2200 DeskLaser is the lowest-cost color laser printer we've seen. Its print speeds were the slowest among our current batch, but black text was perfectly crisp.
9	Brother HL-2600CN find.pcworld.com/20542	$1500	81	12.1/1.8	Very good/ Fair	**FEATURES:** Rated 24 ppm monochrome/6 ppm color. Standard 64MB of RAM, 2400-by-600-dpi maximum resolution, 250 sheets input and output. **SUMMARY:** The HL-2600CN is easy to install and quite affordable for a color laser, but add-on options will cost you. Speedy text printing counterbalances merely adequate graphics quality. Nearly $500 price drop. (★★★☆☆ Apr 02)
10	Oki Data Oki C9200n find.pcworld.com/14947	$4650	81	12.8/2.5	Outstanding/ Very good	**FEATURES:** Rated 26 ppm monochrome/21 ppm color. Standard 128MB of RAM, 1200-by-600-dpi maximum resolution, 650 sheets input, 600 output. **SUMMARY:** Most expensive unit here (even after a $536 price cut this month) prints text and graphics quickly, on sheets as large as 12 by 18 inches. Text looked sharp; color images, though detailed, appeared too orange.

HOW WE TEST: The overall rating for color laser printers is based on print quality (25 percent), price (25 percent), features (15 percent), ease of use (15 percent), speed (10 percent), and service and support (10 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on PC World's Star Ratings. ¹ All street prices include a network card.

IOGEAR®

Live Happily Ever After...

TOP 10 MONITORS

Visit find.pcworld.com/31568 for reviews of all products tested this month and ranked in this chart.

LCD MONITORS ARE GETTING cheaper and better looking all the time—so why not turn in your clunky CRT screen for a sleek 17-inch LCD? The average price of those we tested last March was nearly $900. This month the average is down to about $700, with one new model here selling for under $600.

Three of the four newcomers on this month's chart ditch traditional dull beige bezels in favor of stylish silver or black (or both). What's more, many of the new LCDs come loaded with microphone ports, speakers, and other desirable features that previous-generation LCD screens often lacked. ▶

	17-INCH LCD	Street price (9/19/02)	Overall rating	Quality of text/ graphics	Comments
1	**Best BUY** Samsung SyncMaster 172T **NEW** find.pcworld.com/31385	$680	91	Outstanding/ Outstanding	FEATURES: 17-inch viewable area, 15.2 by 8.5 by 15.6 inches,¹ 10.3 pounds, dual video inputs,² three-year warranty, 24-hour daily toll-free tech support, color-adjustment software. SUMMARY: This slim and stylish silver-bezeled display is the best-looking model we tested this month. It edges out our previous number one, ViewSonic's VG171, in both text and graphics image quality. (★★★★⯨)
2	**Best BUY** ViewSonic VG171 find.pcworld.com/19942	$739	88	Outstanding/ Outstanding	FEATURES: 17-inch viewable area, 16.1 by 6.6 by 16.1 inches,¹ 14.3 pounds, dual video inputs,² three-year warranty, 24-hour daily toll-free tech support, ColorMatch software. SUMMARY: The VG171 displayed bright text, and photos had saturated, natural-looking colors; however, this model offers no frills except color calibration software, and it does not pivot for portrait orientation. (★★★★⯨ Mar 02)
3	ViewSonic VG700 **NEW** find.pcworld.com/31388	$660	87	Outstanding/ Very good	FEATURES: 17-inch viewable area, 16.1 by 7.5 by 16.6 inches,¹ 11.4 pounds, analog video input, three-year warranty, 24-hour daily toll-free tech support, image-adjustment software. SUMMARY: This silver-framed monitor displayed bright text and stunning graphics in our tests. A stubborn plastic panel on the back gets in the way of cable adjustments and monitor setup. (★★★★⯨)
4	Planar PV174 find.pcworld.com/19948	$749	84	Very good/ Outstanding	FEATURES: 17-inch viewable area, 17.6 by 8.1 by 17.7 inches,¹ 19.4 pounds, dual video inputs,² three-year warranty, 11-hour weekday toll-free tech support. SUMMARY: Unit has built-in speakers plus headphone jack; on-screen controls offer lots of image-adjustment options. Strong Word and Excel screens supported razor-sharp text at small sizes. Monitor bezel comes in five colors. (★★★⯨⯨ Mar 02)
5	Dell 1702FP find.pcworld.com/19922	$800	80	Very good/ Very good	FEATURES: 17-inch viewable area, 17.3 by 8.7 by 18.1 inches,¹ 18.5 pounds, dual video inputs,² three-year warranty, 24-hour daily toll-free tech support. SUMMARY: This Dell LCD places on the chart thanks to high-quality support and extensive, easy-to-use controls with many options for fine tuning. The unit lacks ergonomic features such as height adjustment. (★★★⯨⯨ Mar 02)
6	Hyundai ImageQuest L70A **NEW** find.pcworld.com/31397	$579	80	Very good/ Very good	FEATURES: 17-inch viewable area, 16.6 by 17.2 by 8.7 inches,¹ 14.8 pounds, dual video inputs,² three-year warranty, 8-hour weekday toll-free tech support. SUMMARY: This bargain-priced beige unit cannot pivot or change height. It performed well on our tests of graphics and text. Excellent documentation includes walk-throughs for using the controls. (★★★★⯨)
7	Samsung SyncMaster 171MP find.pcworld.com/19947	$910	79	Good/ Average	FEATURES: 17-inch viewable area, 16.2 by 8 by 16.3 inches,¹ 10.7 pounds, analog input, three-year warranty, 24-hour daily toll-free support, Natural Color software. SUMMARY: HDTV-ready display includes S-Video and component video inputs. Colors in test photos looked dark; text appeared slightly fuzzy on sample Word documents and Web pages. (★★★⯨⯨ Mar 02)
8	BenQ FP751 find.pcworld.com/19941	$779	78	Very good/ Good	FEATURES: 17-inch viewable area, 16.6 by 8.2 by 17.8 inches,¹ 15 pounds, analog video input; three-year warranty; 12-hour weekday toll-free tech support. SUMMARY: Thumbwheel under front of bezel adjusts controls up or down; iKey allows one-touch automatic image adjustment; speakers are built into case. Black screens and dark backgrounds looked cloudy. (★★⯨⯨⯨ Mar 02)
9	CTX PV720A find.pcworld.com/19952	$640	77	Very good/ Good	FEATURES: 17-inch viewable area, 17.2 by 6.5 by 17.6 inches,¹ 16.5 pounds, analog video input, three-year warranty, 24-hour daily toll-free tech support. SUMMARY: Low-priced monitor is short on features and has fewer on-screen controls than competing models, but it earned respectable scores in our text and screen brightness tests. Speaker module clips to bottom of display. (★★⯨⯨⯨ Mar 02)
10	BenQ FP781 **NEW** find.pcworld.com/31391	$660	75	Good/ Average	FEATURES: 17-inch viewable area, 15.9 by 8 by 17.7 inches,¹ 10.3 pounds, dual video inputs,² three-year warranty, 12-hour weekday toll-free tech support. SUMMARY: Classy-looking silver display with black accents and microphone input has easy-to-use controls. When you release the hinge on the back, the base becomes a handle for easy transport. (★★★⯨⯨)

HOW WE TEST: Twelve judges rate a monitor's text and graphics quality at the native resolution of 1280 by 1024. We evaluate each unit on how well it displays 13 images, including business letters, spreadsheets, Web pages, and scanned photos. Color and gray-scale screens are taken from the DisplayMate for Windows video utility. The overall rating is based on text and graphics quality (25 percent each), price (20 percent), features and ease of use (20 percent), and service and support (10 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on *PC World*'s Star Ratings. All monitors TCO '99-compliant unless otherwise stated. ¹ Includes base (width by depth by height). ² Includes both digital (DVI) and analog inputs. The digital input must be used with a graphics card that has a digital output.

TOP 10 SCANNERS

Visit find.pcworld.com/31646 for reviews of all products tested this month and ranked in this chart.
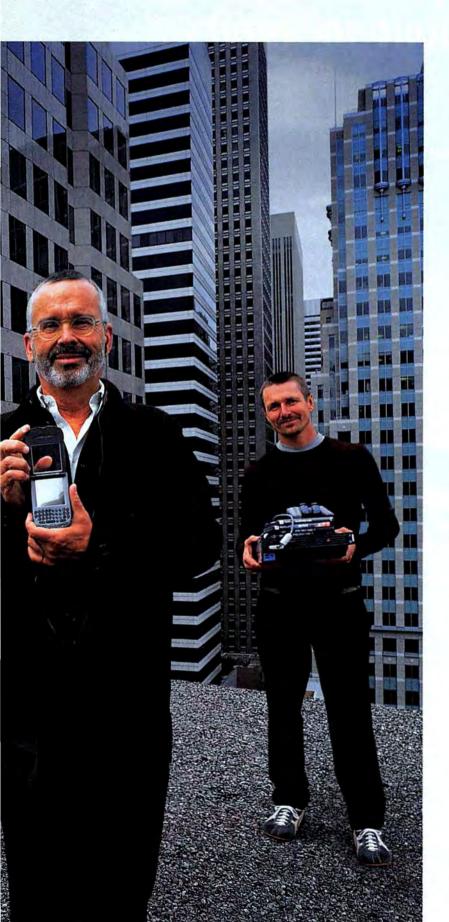
THREE NEW SCANNERS EARN SPOTS on the small-office side of our chart; all have USB 2.0 interfaces and transparency adapters. Epson's Perfection 1660 Photo produced attractive, natural-looking prints, while HP's Scanjet 5500c put up impressive speed numbers and sports a feeder that lets you scan a stack of snapshots quickly. September's small-office Best Buy, the Microtek ScanMaker 4900, slips due to driver problems and superior performance by newer models. ▶

	SMALL-OFFICE SCANNER	Street price (9/23/02)	Overall rating	Scan quality (color/ monochrome)	Scan speed (color [1]/ monochrome,[2] in seconds)	Comments
1	**Best BUY** Epson Perfection 1660 Photo NEW find.pcworld.com/31166	$179	83	Very good/ Very good	41/14	FEATURES: USB 2.0, USB 1.1,[3] 1600 by 3200 dpi, 10.9-by-4.6-by-17.7-inch case,[4] 6.8 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no automatic document feeder. SUMMARY: USB 2.0-equipped successor to long-time favorite Perfection 1650 Photo jumps to the top of the chart with great all-around image quality; high-resolution color stands out. (★★★★⯪)
2	Visioneer OneTouch 9000 USB find.pcworld.com/29882	$99	80	Fair/ Fair	36/25	FEATURES: USB 2.0, USB 1.1,[3] 1200 by 4800 dpi, 11.9-by-2.6-by-17-inch case,[4] 5.1 pounds, 8.5-by-11.7-inch scanning area; no transparency adapter or ADF. SUMMARY: Speedy scanner's $30 price drop and full-fledged optical character recognition application help make it a good value, but its image quality lagged behind the competition's. (★★★⯪⯪ Sept 02)
3	HP Scanjet 5500c NEW find.pcworld.com/31163	$299	80	Good/ Outstanding	21/17	FEATURES: USB 2.0, USB 1.1,[3] 2400 by 2400 dpi, 12.2-by-6.7-by-21.6-inch case,[4] 11.6 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter and automatic photo feeder. SUMMARY: Pricey new model with snapshot feeder takes over as speed champ; like other HP scanners we've tested, it produces gray-scale images that look terrific. (★★★★⯪)
4	Microtek ScanMaker 4900 find.pcworld.com/29124	$150	78	Very good/ Good	39/42	FEATURES: USB 1.1, 2400 by 4800 dpi, 11.8-by-2.4-by-19.3-inch case,[4] 5.7 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no ADF. SUMMARY: Solidly constructed scanner provides great-looking color photos in a hurry, but its quick-start buttons can be tricky to configure, and the driver may need special treatment at installation. (★★★★⯪ Aug 02)
5	Canon CanoScan Lide 30 find.pcworld.com/29883	$99	77	Outstanding/ Very good	109/43	FEATURES: USB 1.1, 1200 by 2400 dpi, 10-by-1.3-by-15.1-inch case,[4] 3.3 pounds, 8.5-by-11.7-inch scanning area; no transparency adapter or ADF. SUMMARY: Like other CanoScans we've seen, the Lide 30 has a slim profile due to the CIS in its scan head, and it produces vivid, accurate color. But this model ranks among the slowest we've tested. (★★★⯪⯪ Sept 02)
6	Microtek ScanMaker 6700 find.pcworld.com/29123	$350[5]	76	Very good/ Very good	36/39	FEATURES: USB 1.1, FireWire,[6] 2400 by 4800 dpi, 11.5-by-4.5-by-19.7-inch case,[4] 8.1 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no ADF. SUMMARY: Color photo prints brought out the best in this former corporate Best Buy, now on small-office chart thanks to a $50 price drop. Includes a 4-by-5-inch transparency template. (★★★★⯪ Aug 02)
7	HP Scanjet 3570c NEW find.pcworld.com/31169	$150	75	Good/ Very good	99/25	FEATURES: USB 2.0, USB 1.1,[3] 1200 by 1200 dpi, 19.7-by-3.4-by-11.8-inch case,[4] 7 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no ADF. SUMMARY: Speed of this USB 2.0 model is underwhelming and the tech support is skimpy; the included transparency adapter accounts for its $50 price premium over the similar 3500c. (★★★⯪⯪)

	CORPORATE SCANNER	Street price (9/23/02)	Overall rating	Scan quality (color/ monochrome)	Scan speed (color [1]/ monochrome,[2] in seconds)	Comments
1	**Best BUY** Epson Perfection 2450 Photo find.pcworld.com/16181	$399	83	Very good/ Very good	78/17	FEATURES: USB 2.0, FireWire,[6] 2400 by 4800 dpi, 11.9-by-4.9-by-18.7-inch case,[4] 12.8 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; no ADF. SUMMARY: Tested using FireWire, this USB 2.0-compatible model showed average speed but provided standout gray-scale and color image quality; software includes Adobe's Photoshop Elements. (★★★★⯪⯪ Aug 02)
2	HP Scanjet 5490c find.pcworld.com/29121	$399	79	Good/ Very good	95/25	FEATURES: Parallel, USB 1.1,[7] 2400 by 2400 dpi, 13-by-4.1-by-22.5-inch case,[4] 8.8 pounds, 8.5-by-11.7-inch scanning area; includes transparency adapter; includes ADF. SUMMARY: This unit showed outstanding detail on maximum-resolution line art but was the slowest corporate model we tested. ADF is built into the lid; transparency adapter attaches separately. (★★★★⯪ Aug 02)
3	Microtek ScanMaker 8700 Pro Design find.pcworld.com/15843	$900[5]	77	Very good/ Good	31/24	FEATURES: USB 1.1, FireWire,[6] 1200 by 2400 dpi, 15.25-by-6.3-by-22.3-inch case,[4] 25.5 pounds, 8.5-by-14-inch scanning area; includes transparency adapter; no ADF. SUMMARY: Despite its age, this FireWire model is still third fastest overall in our test set and best at high-resolution color; comes with great software and a large set of transparency adapters. (★★★★⯪ Aug 02)

HOW WE TEST: Visit find.pcworld.com/31646 for our test methodology; see find.pcworld.com/10860 for details on *PC World*'s Star Ratings. [1] 2-by-2-inch color photo, 1200 dpi. [2] Black-and-white line art, 300 dpi. [3] Tested using USB 2.0. [4] In order: width, depth, height. [5] Priced with FireWire card. [6] Tested using FireWire. [7] Tested using USB 1.1.

The word plasma excites you

The phrase surround sound makes your heart flutter
DVD, HDTV, MP3 and PDA are your new alphabet
You're always the first one to get your hands on the new toy
And when it comes to finding the right price,
The smaller it is, the bigger your eyes become

**Things to know
when you do it eBay**

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computer chat to answer any
questions you may have.

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TOP 10 DIGITAL CAMERAS

Visit find.pcworld.com/31547 for reviews of all products tested this month and ranked in this chart.

THERE'S NO BETTER TIME than the holidays to have a digital camera, and this Top 10 of models under $500 offers a panoply to choose from. Our Best Buy, the $499 Olympus C-4000 Zoom, has advanced (if somewhat complex) controls and takes superior shots. If your camera budget is more modest, Canon's $199 PowerShot A200 is a bargain for a simple point-and-shoot model—suitable for catching life's memorable events. New to the chart, Pentax's Optio 430RS packs 4-megapixel imaging into a pocketable, stainless-steel case; it's worth considering if you're inclined to travel light. ▶

	CAMERA: UNDER $500	Street price (10/1/02)	Overall rating	Image quality	Ease of use	Battery life/ shots	Comments [1]
1	**Best BUY** Olympus C-4000 Zoom find.pcworld.com/30476	$499	82	Outstanding	Good	Outstanding/ 700	**FEATURES:** 4-megapixel resolution, 16MB SmartMedia card, 32mm-96mm focal range, USB and video output, 14 ounces. **SUMMARY:** Relatively inexpensive for an advanced camera, the C-4000 blends great image quality, manual exposure settings, and a long battery life. Menus can be confusing. (★★★★☆ Nov 02)
2	**Best BUY** Fujifilm FinePix 2800 Zoom find.pcworld.com/30473	$329	81	Good	Good	Very good/ 492	**FEATURES:** 2-megapixel resolution, 16MB SmartMedia card, 38mm-228mm focal range, USB and video output, 13.2 ounces. **SUMMARY:** The 2800 has a powerful optical zoom and long battery life; it takes pleasing shots, too. But its menus could be easier to navigate, and it's a bit bulky. Costs $50 less this month. (★★★★☆ Nov 02)
3	Nikon Coolpix 2000 find.pcworld.com/30479	$249	80	Fair	Very good	Good/ 349	**FEATURES:** 2-megapixel resolution, 16MB CompactFlash media, 38mm-114mm focal range, USB and video output. **SUMMARY:** This inexpensive, pared-down camera lacks an optical viewfinder, but intuitive buttons and menus make it easy for beginners to use. (★★★☆☆ Nov 02)
4	Olympus D-550 Zoom find.pcworld.com/30839	$349	78	Outstanding	Fair	Very good/ 398	**FEATURES:** 3-megapixel resolution, 16MB SmartMedia card, 36mm-100mm focal range, USB and video output, 11.6 ounces. **SUMMARY:** This bulky camera takes sharp, evenly exposed photos and adds a few extra features, such as the ability to take panorama shots. Price falls $50 this month. (★★★★☆ Oct 02)
5	HP Photosmart 720 find.pcworld.com/30494	$329	77	Very good	Fair	Good/ 306	**FEATURES:** 3.18-megapixel resolution, 16MB internal memory and Secure Digital media slot, 34mm-102mm focal range, USB and video output, 12.1 ounces. **SUMMARY:** Large, relatively heavy model lacks a macro mode, and the controls feel slow, but it takes nice-looking photos. (★★★☆☆ Nov 02)
6	Olympus C-720 Ultra Zoom find.pcworld.com/30899	$499	73	Fair	Fair	Outstanding/ 1100	**FEATURES:** 3-megapixel resolution, 16MB SmartMedia card, 38mm-320mm focal range, USB and video output, 14.7 ounces. **SUMMARY:** The longest battery life we've seen and an 8X optical zoom are offset by the lack of a manual focus. Image quality could be better. A $100 price drop this month. (★★★☆☆ Nov 02)
7	Canon PowerShot A200 find.pcworld.com/30488	$199	71	Fair	Fair	Limited/ 61	**FEATURES:** 2-megapixel resolution, 8MB CompactFlash media, 39mm focal length, USB and video output, 8.2 ounces. **SUMMARY:** Light, compact, and inexpensive, the A200 is also light on features. There's no optical zoom, just a 4X digital zoom, and its image quality rated only Fair. (★★☆☆☆ Nov 02)
8	Pentax Optio 430RS **NEW** find.pcworld.com/31532	$490	71	Good	Good	Limited/ 106	**FEATURES:** 4-megapixel resolution, 11MB internal memory and CompactFlash media slot, 37mm-112.5mm focal range, USB output, 8 ounces. **SUMMARY:** Exceptionally compact and inexpensive for a 4-megapixel camera, the 430RS has full manual exposure control and creates pleasing images. (★★★☆☆)
9	Kodak EasyShare LS420 find.pcworld.com/30491	$279	71	Fair	Fair	Good/ 360	**FEATURES:** 2.1-megapixel resolution, 8MB internal media, 38mm focal length, USB and video output, 5.5 ounces. **SUMMARY:** This light, stylish camera includes audio and video recording, but little beyond that; it has no optical zoom or exposure override controls, and our test images looked lackluster. (★★☆☆☆ Nov 02)
10	Toshiba PDR-3310 find.pcworld.com/30851	$499	69	Fair	Fair	Fair/ 130	**FEATURES:** 3.2-megapixel resolution, 16MB Secure Digital media, 35mm-105mm focal range, USB and video output, 7.3 ounces. **SUMMARY:** Pocket-size travel camera has a rugged aluminum body and takes soundless video. Image quality did not impress us, however. (★★☆☆☆ Nov 02)

HOW WE TEST: Each camera's overall rating is based on price (25 percent), picture quality (20 percent), ease of use (15 percent), features (20 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better. To gauge picture quality, we take a series of shots, with and without flash, at 640 by 480 resolution and at the camera's highest resolution. We photograph a complex still life and a mannequin to see how well each camera captures details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores; we then average those scores. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on *PC World*'s Star Ratings. [1] Resolutions are expressed in effective pixels, focal range is identified as 35mm equivalent, and camera weights include batteries.

MORE REVIEWS

MISSED AN ISSUE OF *PC World* or passed your copy along to a friend? Here's a recap of other *Top 100* topics from previous issues. To read reviews of the products ranked on these *Top 10* charts, go online and type in the *PC World* Find-It URL at the top of each chart (for example, go to find.pcworld.com/31112 to find products listed on the *Top 10 Hard Drives* chart). Next month's *Top 100* section will include coverage of scanners, 19-inch monitors, and digital cameras over $500. ∎

HP'S DESKJET 5550 looks more like a spaceship than an ink jet, and it prints gorgeous photographs.

MAXTOR'S UNIMAGINATIVELY named Retail Drive 250GB is the largest hard drive we've ever tested.

	19-INCH MONITORS		HARD DRIVES		INK JET PRINTERS			DIGITAL CAMERAS
	find.pcworld.com/30935		find.pcworld.com/31112		find.pcworld.com/30995			find.pcworld.com/31151
1	**Best BUY** Samsung SyncMaster 957mb find.pcworld.com/30926	1	**Best BUY** Maxtor Retail Drive 200GB find.pcworld.com/30980	1	**Best BUY** HP Deskjet 5550 find.pcworld.com/30818		1	**Best BUY** Fujifilm FinePix 2800 Zoom find.pcworld.com/30473
2	**Best BUY** ViewSonic GS790 find.pcworld.com/10573	2	**Best BUY** Western Digital WD800JB find.pcworld.com/29796	2	**Best BUY** HP Deskjet 3820 find.pcworld.com/30821	POINT-AND-SHOOT	2	Nikon Coolpix 2000 find.pcworld.com/30479
3	Dell M992 find.pcworld.com/30914	3	Western Digital WD1200JB find.pcworld.com/29795	3	Epson Stylus Photo 820 find.pcworld.com/29816		3	Olympus D-550 Zoom find.pcworld.com/30839
4	Optiquest Q95 find.pcworld.com/10800	4	Maxtor DiamondMax D540X find.pcworld.com/19521	4	Epson Stylus C82 find.pcworld.com/30824		4	HP Photosmart 720 find.pcworld.com/30494
5	IBM P97 find.pcworld.com/18803	5	IBM Deskstar 120GXP find.pcworld.com/29783	5	HP Deskjet 920c find.pcworld.com/19264		5	Sony Cyber-shot DSC-P9 find.pcworld.com/28122
6	Sony CPD-G420S find.pcworld.com/10577	6	Maxtor DiamondMax D540X find.pcworld.com/29785	6	Lexmark Z55se Color Jetprinter find.pcworld.com/30830		1	**Best BUY** Olympus C-4000 Zoom find.pcworld.com/30476
7	NEC MultiSync FP955 find.pcworld.com/27824	7	Maxtor DiamondMax D540X find.pcworld.com/29789	7	Canon S820 Photo Printer find.pcworld.com/27461		2	Canon PowerShot G2 find.pcworld.com/14800
8	CTX PR960FL find.pcworld.com/27822	8	Maxtor DiamondMax D740X find.pcworld.com/29787	8	HP Color Inkjet Cp1160 find.pcworld.com/30833	ADVANCED	3	Nikon CoolPix 4500 find.pcworld.com/30845
9	Compaq MV9500 find.pcworld.com/27823	9	Maxtor Retail Drive 250GB find.pcworld.com/30986	9	Lexmark Z65 Color Jetprinter find.pcworld.com/27441		4	Fujifilm FinePix S602 Zoom find.pcworld.com/30470
10	Eizo Nanao FlexScan T766 find.pcworld.com/30917	10	Seagate Barracuda ATA IV find.pcworld.com/29804	10	Epson Stylus C62 find.pcworld.com/30827		5	Olympus C-720 Ultra Zoom find.pcworld.com/30899
	From the November 2002 issue		From the November 2002 issue		From the November 2002 issue			From the November 2002 issue

KINGSTON TECHNOLOGY:
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INCREASING RAM GIVES YOU THE BEST BANG FOR YOUR UPGRADE BUCK.

"Think of it this way," said my Introduction to Computers professor (whose name is lost to antiquity): "The CPU controls how big a bite your computer takes of a data sandwich, and the RAM determines how fast it can chew it."

That was true 15 years ago, and it's still true today. With the right amount of tailored RAM installed, your system will chew its way through the streams of text, music, video, and graphic data as fast as the CPU can deliver it. Use too little or the wrong kind of RAM, and your system bogs down with digital indigestion. Fortunately, finding RAM modules that are perfectly tailored to your system requires no more effort than a quick visit to Kingston's Web site (www.shop.kingston.com). There you'll find the configuration tools that will ensure you have the optimum amount of RAM to achieve the best combination of performance, affordability, and reliability.

MEMORY ALPHABET SOUP

Kingston's memory line is encyclopedic. It includes SIMMs, DIMMs, Rambus, DDR, CompactFlash, PC Card, MultiMedia, SmartMedia, and SecureDigital. Confused by this alphabet soup of acronyms and brands? You're not alone, and help's available. The intuitive tools on Kingston's redesigned Web site enable you to select the correct amount and type of RAM that is specifically designed and tested to assure it will work with popular motherboards as well as digital cameras, PDAs, printers, and any other devices whose performance you want to juice up.

Kingston's configurator, prominently located on the site's home page, enables you to select your hardware from hundreds of products in just two clicks. First, you select

your hardware's manufacturer. Next, you pick the specific model. In an instant you'll see the available upgrade modules, as well as simple installation illustrations to further assist you in selecting the correct component. You can further refine your search by memory type, manufacturer model or, if you know it, the part number. If you're still stuck, click on "Live Sales Support," and a Kingston rep will promptly contact you. Sound simple? It is.

MEMORY IS MADE OF THIS

At a minimum, purchasing the proper memory for your system means that when you slip the module into an open slot and hit the ON button, your machine will boot. But there's more to getting the best value for your money. Assuring that Kingston's RAM modules deliver all of the reliability and longevity that you expect is the job of Advanced Validation Labs (AVL). This research group exhaustively analyzes every Kingston memory module before it's released for sale.

AVL certifies that every module Kingston designs meets or exceeds the highest standards for temperature tolerance, impedance, propagation, delay, cross-talk, and attenuation. So, in addition to getting premium RAM components, a lifetime warranty, and 24 x 7 free technical support, when you buy Kingston's products you get the assurance that every module comes with the AVL seal.

CRUCIAL MEMORY:
PICK A CARD—BUT NOT JUST ANY CARD

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CRUCIAL'S WILD CARD

More is often better when you need to transform streams of one and zeros into images. Whether it's an image of a new family member, a house for sale, or Tomb Raider's Lara Croft, you need RAM to make it happen.

Achieving a higher level of performance and extending the life of your system are the two primary reasons why you should look at increasing the amount and speed of your system's RAM. A RAM upgrade is cost-effective and convenient, and best of all, it delivers immediate results.

Savvy users also know they can get improved performance by increasing video-specific RAM. While a video card's components must smoothly integrate to deliver top-shelf 3D performance, the amount and type of RAM is most important. For people who work with digital photos, PC games, and other intense graphic-processing applications, Crucial Technology has just released the Crucial® Radeon™ 8500LE video card.

crucial
TECHNOLOGY
A Division of Micron

128MB of six-nanosecond precision DDR SDRAM doubles the amount of RAM most other cards offer, and gives this card its performance. The card's RAM is manufactured by Micron, Crucial's parent company, and that means you're getting some of the world's highest-quality RAM. And because you're buying from Crucial, you're also getting superior customer service and support and a limited lifetime guarantee.

Also onboard the card is ATi's Graphics Processor Unit to provide you with advanced 2D, 3D, and multimedia graphics performance designed to accelerate Microsoft's DirectX API

and OpenGL graphics. Regular retail price of the card is $149.99. It is currently available online, at www.crucial.com, for $134.99, including free second-day shipping within the contiguous U.S.

While that's an attractive price for a high-performing video card, Crucial wants to do more than save you money. They want to assure you that you have received the best value in video cards. Try your new video card for 30 days. If you aren't happy with it, return it to Crucial for a refund. It's that easy.

THE NEED FOR SPEED

Exactly how do you know if you would benefit from a video card upgrade? Well, it's a good bet that if you run multimedia, especially graphics, you're a candidate. Graphics place the biggest processing demands on your system. Whether you work with images from a digital camera, video images from a camcorder, or custom graphics created with Adobe PhotoShop or AutoCAD, you need a video card that can handle the demand.

One telltale sign that it's time for an upgrade is reduced performance—for example, hesitation in animated scenes. Other examples occur when you're forced to use a lower resolution, reduce desired background effects, limit the number of colors, or scale back details. Avoid all of these performance-inhibitors with the Crucial Radeon 8500LE video card.

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PC AMERICA:
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The home page for PC America speeds you to the point-of-sale products you need.

While many motorists in Dimondale, Mich. say the family-owned Windmill Truck Stop is a home away from home, its controller, Kevin Edelmann, says it's been more like a house of accounting horrors. Besides monitoring retail fuel sales in the truck stop's "truckers only" area, he also has to keep an eye on commuters' and travelers' purchases in the king-sized complex's convenience store, family restaurant, motel, and auto service center. "Keeping track of all of that inventory has been a nightmare," Edelmann says.

The Point of Sale (POS) system that the Windmill had been using since 1982 did a fine job of ringing up sales, but it couldn't tell store managers anything about what was on the shelf. "The system only broke sales down by department," Edelmann says. "So it couldn't tell the difference between a tube of toothpaste and a bottle of shampoo."

Edelmann found only a few POS solutions that were easy to use, Microsoft Windows-based, and able to support multiple input devices. And none of them could manage the 20,000-plus items in the Windmill's convenience store and restaurant. "We desperately needed a solution that could bring all of these components of our business together," he says.

🏆 PC AMERICA

Things finally turned around at the Windmill once Edelmann deployed PC America's Cash Register Express (CRE 2000), a Windows-based POS program that works with ordinary PCs and peripherals, as well as barcode scanners, receipt printers, and pole displays (which show charges at the checkout counter). Now all of the Windmill's cashiers can use touch screens and barcode scanners to enter orders and update inventory. And setting up CRE 2000 could not be easier, says Edelmann. "PC America did

an excellent job pulling all of the hardware together initially. But the great thing about their software is that I can grab any component I want off the shelf and throw it together in no time. This is one slick program."

The Windmill has processed more than half a million transactions with CRE 2000 and PC America's Restaurant Pro Express (RPE 2000) since October 1999. And Edelmann predicts that PC America will continue to develop the software he needs to keep things running smoothly. "PC America is constantly improving upon their products," he says.

Now PC America is helping retailers like the Windmill to move beyond the sale itself to increase revenues. A new feature in CRE 2000 gives businesses the ability to print coupons on the bottom of sales receipts on an Epson TM-T88II receipt printer. They can use the coupons to advertise specials on slow business days (e.g., "10 Percent Off All Purchases Every Tuesday"), or to give their customers discounts on overstock items (e.g., "Get a Free Six-Pack of Pepsi on Your Next Visit").

CRE 2000's couponing feature promises retailers an excellent route to a crucial dimension in retail sales. "Repeat business is the most important aspect of any business," says PC America's president, Howard Gosman. "With this addition to our POS package, we are giving our customers a quick and easy-to-use method for creating it."

HAVE YOUR PC YOUR WAY
WHEN YOU BUILD YOUR OWN PC, YOU'RE IN CONTROL!

www.antec-inc.com

Most consumers know that "one size fits all" doesn't really fit anyone just right. That's true of computers, too. For people who are willing to settle for someone else's idea of what their system's appearance, performance, and configuration should be, then any off-the-shelf PC will do. But if you want to control your computing environment, and you don't want to settle for run-of-the-mill components, then you should be building, upgrading, and modding your own system.

Why build a custom computer instead of buying a preconfigured unit? Actually, there are several good reasons. Aside from the sense of pride and accomplishment and the knowledge you (or your children) will gain, you'll end up with a system that's matched to your needs, you will be able to lower the cost of the system over its life, and you'll even get the chance to express your own personality.

MAKE IT YOUR WAY!

First off, when building your own PC you can select the highest-quality components available for your needs and budget. You can include features like a FireWire port or the hottest AGP video cards without paying for features you will not use. And if you're into modding, you can design a theme and a color scheme for maximum expression. Then, after identifying your components, you can shop around for the best deal.

Antec
The Power of You

One of the first components you'll need is a computer case. After all, the case and power supply are the unifying element that holds everything together. Fortunately, with the variety of case sizes, finishes, and configurations available today, you can now evaluate enclosures with the same insight you'd use picking a CPU or a video card swap.

The days of "any color as long as it's beige" are long gone. For example, the leading case manufacturer, Antec (www.antec-inc.com), which started the black-case move-

ment in 1992, offers a variety of cases in metallic colors at major retailers near you. Their Performance Plus cases in glossy metallic gray are especially attractive, and come equipped with their innovative TruePower line of power supplies.

POWER UP!

You'll want to pay special attention to your power supply, because they certainly don't all perform—or sound—the same. Consistent power for your carefully chosen components is key, and TruePower's dedicated output circuits for the main load lines, voltage feedback control, and tighter performance tolerances will provide that reliably for years. Further, TruePower's Low Noise Technology controls its fans as well as the fans for the case, ensuring the quietest system operation possible.
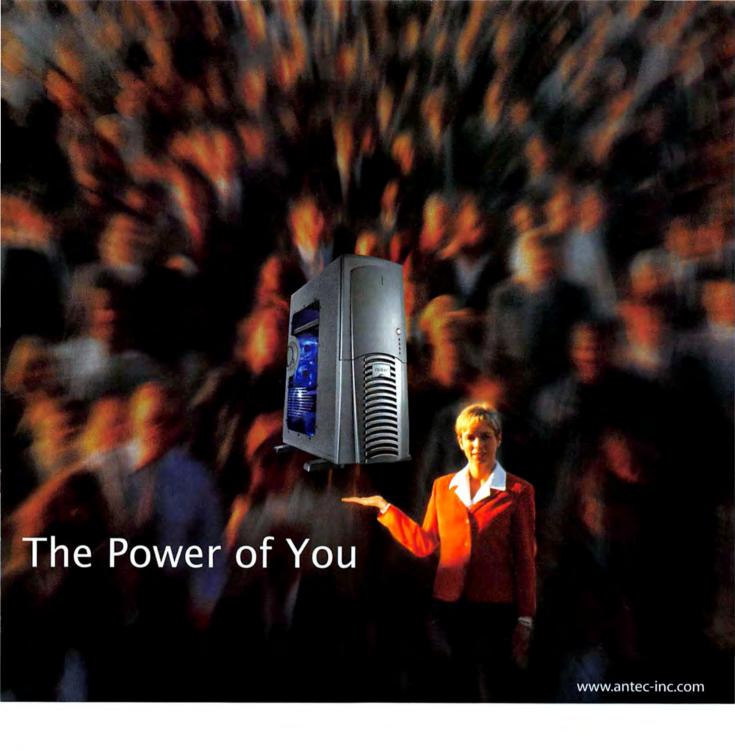
For those who love eye candy, Antec offers power supplies and fans with LEDs in a variety of colors that illuminate your case interior. Put a window panel on your case and enjoy the show. Or check the Internet for modding ideas—the possibilities are limited only by your imagination.

Another reason to build your own PC is the ease of future upgrades. Most off-the-shelf name-brand systems keep their costs down by integrating components in a proprietary way. While that strategy works well on the assembly line, when you want to upgrade those integrated systems, you'll have to deal with extra complexity and cost.

Building or upgrading your PC is a lot simpler than you might think. High-quality components are available at many retail outlets and on the Web. And it's an ideal task to make into an entertaining and educational family project. So go ahead: Have it your way.

The Power of You

www.antec-inc.com

Antec
The Power of You

HERE'S HOW

EDITED BY MICHAEL S. LASKY AND DENNIS O'REILLY

WINDOWS TIPS

SCOTT DUNN

Simplify Your Windows Desktop Cleanup Chores

ALL Versions

BRAND-NEW in Windows XP is a much-needed tool for clearing the junk off your virtual desktop. Unfortunately, it takes more time and energy to use XP's Desktop Cleanup Wizard than it does to clean the desktop manually. If you find this wizard as useless as I do, or if you use another version of Windows, try a different way to keep your desktop shiny and bright.

The Windows way: If you have Windows XP, you might as well give Desktop Cleanup a try: Right-click the desktop and choose *Properties•Desktop•Customize Desktop*. Under 'Desktop cleanup', make sure *Run Desktop Cleanup Wizard every 60 days* is checked. With this feature on, Windows displays a pop-up balloon every 60 days if it finds shortcuts on your desktop that haven't been used in that period (see **FIGURE 1**). To activate the wizard, click *Clean Desktop Now*. If you have any little-used desktop shortcuts, the wizard will give you the option of unchecking them if you want to keep them. Desktop Cleanup puts the shortcuts you leave checked into a folder on your desktop called Unused Desktop Shortcuts (which Windows creates automatically, if necessary).

You may have noticed some shortcomings of this scheme. For starters, the wizard works only on shortcuts, not on files, folders, or other desktop flotsam and jetsam. You can't change the cleanup interval: It's 60 days or nothing. Rather than deleting anything, the wizard simply moves items to a desktop folder—the Windows equivalent of sweeping them under the rug. And if you have only one unused shortcut, creating a folder for it leaves the same number of items on your desktop. This type of tidying wouldn't pass inspection in anybody's army.

A better way: Windows includes all the tools you need to create an automatic reminder for cleaning your desktop, as well as an easy way to see which shortcuts, files, and folders you haven't used lately. You can set it to work at any time interval you choose. This approach works best in Windows Me, 2000, and XP, but it also works in Windows 9x; unfortunately, in 9x you won't receive any clear indication of when you last accessed the items.

In Windows 9x, double-click *My Computer, Scheduled Tasks*, and *Add Scheduled Task* to activate the Scheduled Task Wizard. In other Windows versions, choose *Start•Settings•Control Panel* or *Start•Control Panel*. If you're using XP's Categories view, click *Performance and Maintenance*, and click or double-click (as needed) *Scheduled Tasks* and *Add Scheduled Task* to start the Scheduled Task Wizard.

Click *Next*; in the following panel, click *Browse*. When the 'Select Program to Schedule' dialog box opens, type the path

ILLUSTRATION: JAMES YANG

to explorer.exe in the 'File name' box—on most machines, it's **c:\windows\explorer.exe** or **c:\winnt\explorer.exe**. Press **<Enter>** to return to the wizard. The task name will be 'Explorer' by default, but you can change this to something more descriptive if you wish. Select the interval of your choice—for example, *monthly* (you can change it later)—and then click *Next*.

FIGURE 1: DESKTOP CLEANUP POPS up an annoying balloon reminder for its cleanup wizard every 60 days.

Unless you chose *When my computer starts* or *When I log on*, the next panel will ask you to be more specific about when the software should remind you to clean up your desktop. Make your choices and click *Next*. In Windows 2000 and XP, you must next enter your password twice (or your account name and password, if you want the task to be run by a specific user such as the administrator). When you're done, click *Next*. In all versions of Windows, check the box labeled *Open advanced properties for this task when I click Finish*. Then click *Finish*.

You should now see a tabbed dialog box named 'Explorer' (or whatever you named the task). Click in the Run box at the end of the existing command line after 'explorer.exe'. Type a space followed by the path to your Desktop folder. In Windows 9*x* and Me, the path is usually **c:\windows\ desktop** (if your computer has no other users) or **c:\windows\profiles***profile name*\ **desktop** (where *profile name* is the name of your user account). In Windows 2000 and

XP, the Desktop folder path is usually **C:\Documents and Settings***profile name*\ **Desktop**. Adjust these examples as needed to match your own system (see **FIGURE 2**).

Use other controls and tabs in this dialog box to adjust the schedule if you change your mind or find that you made a mistake. When you're finished, click *OK*. In Windows 2000 and XP, you have to re-enter your password twice, and then click *OK* once more.

Right-click the task you just created in the Scheduled Tasks window, and choose *Run*. An Explorer window should open, displaying the contents of your desktop. To increase its usefulness, you need to fine-tune this window. Start by choosing *View•Folder Options* or *Tools•Folder Options*, depending on your version of Windows. Click the *View* tab. Under Advanced Settings, make sure *Remember each folder's view settings* is checked; then click *OK*.

Now you're ready to customize the window: Choose *View•Details* (if necessary) to see information about your desktop contents. In Windows 2000, Me, and XP, select *View•Choose Columns* or *View•Choose Details*. In the dialog box, check the box labeled *Accessed* or *Date Accessed*. Uncheck any checked items you don't think you'll need, and click *OK*.

In Explorer, click the *Accessed* or *Date Accessed* column heading twice to sort the desktop shortcuts by the date you last used them. The next time the task scheduler launches this window, it will appear exactly as it does now. (If it doesn't, repeat the necessary steps.) Now you can quickly see which items you haven't used for a long time and when you last used them. If you're unlikely to use them soon, select

them in this window and either press **<Delete>** or move them to another folder to make your desktop that much cleaner.

Unfortunately for Windows 9*x* users, there is no way to see the last-accessed date for desktop items. But you can click the *Modified* heading to sort items by when they were last changed. And having the window periodically pop up prompts you to browse through the list and decide what to keep and what to discard.

WALLPAPER FOLDER WINDOWS

ALL Versions ADDING WALLPAPER background to your folders' file panes is a simple way to give the folders some pizzazz. But beyond aesthetics, custom backgrounds let you easily recognize and differentiate folder windows—particularly if you have backup folders on a removable or network drive with names identical to the originals on your own hard drive. Though Microsoft appears to have removed folder wallpaper from Windows XP, you can change ▶
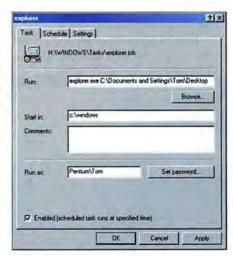
FIGURE 2: SET WHEN YOUR Desktop folder opens via Scheduled Tasks' command line.

your folders' backgrounds in that OS, too.

If the custom folder background that you want will include text, choose *Start• Programs•Accessories•Paint* (or in XP, *Start•All Programs•Accessories•Paint*). Create or load an image that's about the size of your typical file pane; then uncheck *Image•Draw Opaque*, and use Paint's text tool to compose your message on the image. Be sure to use muted colors and large margins so your text doesn't interfere visually with the file pane's icons and icon labels. When you're done, save the picture as a bitmap (.bmp), GIF (.gif), or JPEG (.jpg) file in an appropriate folder (such as My Pictures), and close Paint.

Now you're ready to apply your background to a folder. In Windows 9*x*, 2000, and Me, open the folder whose background you want to wallpaper, and select *View•Customize This Folder*. In Windows 9*x*, select *Choose a background picture*. In Windows 2000 and Me, click *Next*, select *Modify background picture and filename appearance*, and uncheck the remaining check boxes. In all versions, click *Next* and then *Browse* to select your image file from your hard drive (thereafter, your file will be included in the list on the right).

Under 'Icon caption colors' or 'Filename Appearance', click the colored button next to 'Text' to select a color for the folder's icon labels. Choose a color that contrasts with your background picture, and then click *OK•Next•Finish*. To get rid of the wallpaper, select *Remove customization* in the Customize This Folder Wizard, and then click *Next•Next•Finish*.

To add wallpaper to a folder in XP, open the folder, choose *Tools•Folder Options*,

and click the *View* tab. Under 'Advanced settings', select *Show hidden files and folders* (you may need to double-click *Hidden files and folders* first). Uncheck *Hide protected operating system files (Recommended)* and click *Yes* when you see the warning. Click *OK*, and double-click the file named desktop.ini to open it in your text editor (you may not see the .ini extension). If you can't find a desktop.ini file, launch Notepad or your preferred text editor.

In your text editor, type the following on the first line: **[{BE098140-A513-11D0-A3A4-00C04FD706EC}]** (this line contains no capital letter Os, only zeroes) and press **<Enter>**. Type **IconArea_Image=** and the path to your .bmp, .gif, or .jpg image file—for example, 'IconArea_Image= C:\My Documents\My Pictures\Blue Hills.bmp.' Then press **<Enter>**.

Changing the color of the folder's icon labels is a little tricky. To leave the icon text black, do nothing. For white, type **IconArea_Text=0x00FFFFFF** (make sure that the *x* is lowercase) and press **<Enter>**. For red text, replace the code that follows the equal sign with **0x000000FF**; to make the text yellow, type **0x0000FFFF**; for blue text, use **0x00FF0000**; and to show gray text, enter **0x00808080**. These codes identify values in a 24-bit color scheme that specifies how much blue, green, and red to mix together: 0x00*bbggrr* (with values ranging from 0 in decimal or 00 in hexadecimal to 255 in decimal or FF in hexadecimal). If you're editing the folder's existing desktop.ini file, save the file and close your text editor. If you created the file from scratch, save it with the name "desktop.ini" in the folder that will house the background picture; use quotation marks to keep Notepad from adding its default .txt extension.

Now give the folder the System attribute. Put the folder window destined for the background picture in front. Press **<Backspace>** to move up a level, click *Start•Run*, type **attrib +s** followed by a space, and drag the icon for your desired folder to the text box of the Run dialog box. It should now read some-

thing like 'attrib +s C:\Documents and Settings\...\My Documents\My Folder' (your path and folder name may differ, of course). Click *OK*. The next time you open the folder, you'll see your new wallpaper inside (see **FIGURE 3**). If you don't want to see the desktop.ini file, right-click it and choose *Properties*. Under the General tab, check *Hidden* and click *OK*. Then click *Tools•Folder Options•View*, and deselect the option to show hidden files and folders. While the Folder Options box is open, recheck *Hide protected operating system files* if you unchecked it earlier. ∎

FIGURE 3: REMIND YOURSELF OF a folder's purpose by adding a custom picture and message to the background.

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the standard | fall 2002
today's best business technology at a glance

Vol. I Issue 1

a publication for *PC World* readers

Reliability rules

**sponsored by
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The end to "Hurry up and wait." When it comes to printers, people generally want three things: reasonable prices, ease of use, and, most of all, equipment they can count on. There's nothing more frustrating than print jobs piling up or not being able to get a critical job printed because the entire office is waiting for the service tech yet again. Waiting on hold for tech support doesn't make anyone's day, either.
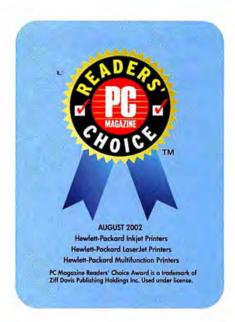
Welcome to the world of no surprises

If you're convinced that your printer somehow senses the worst possible moment to break down, and then does, it's time to switch to the industry's standard for reliability: Hewlett-Packard. "Hewlett-Packard stands first among both inkjet printers and laser printers in satisfaction with reliability – no surprise," wrote Contributing Editor Bill Howard in *PC Magazine's* 2001 "Service and Reliability" survey of its readers. That was HP's 10th consecutive win. In 2002, *PC Magazine's* readers again chose HP's printers as the most reliable printers on the planet. "In earning the top grade for the 11th straight year," Howard wrote in the August 2002 issue, "and receiving one of our first-ever A+'s, HP scores better than average on all four key measures that determine the Reader's Report Card grade."

Less pain means more gain (and more value)

Trouble-free performance at high volumes is one HP hallmark. "The duty cycle is best interpreted as the number of pages per month at which you can expect trouble-free operation," writes Bruce Fraser in the September 2002 *Macworld* ("The Big Players Bring Quick Prints Within Reach"), in a review of the next-generation color laser printers. "The [HP Color]

READERS' PC MAGAZINE CHOICE ™

AUGUST 2002
Hewlett-Packard Inkjet Printers
Hewlett-Packard LaserJet Printers
Hewlett-Packard Multifunction Printers

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inside this issue

Reliability rules, cont.

LaserJet 4600 has the heaviest duty cycle — 85,000 pages per month." The other printers in the review were rated at 60,000 pages per month.

When considering reliability, it helps to think about usability and the total cost of ownership (TCO). This measure goes beyond purchase price and supplies expenses to consider the real cost of owning a printer. And much of the real cost simply comes down to usability. HP's trouble-free performance and fast print speeds reduce the number of trips to the machine your employees have to make. Time spent waiting at the printer for a document to appear is decreased, as are the unproductive and frustrating actions of changing cartridges, refilling paper trays, and pulling out wadded-up sheets of paper from the rollers.

Workhorse reliability, thoroughbred performance

"Reliability" doesn't just mean that you'll no longer be on a first-name basis with the repairman. Reliability also means that HP printers will give you the same star-quality performance day in and day out. Black and white text will always look crisp. Colors will not change hues from one cartridge to the next. The cost per page will not drift upward. The blazing page-per-minute rates HP printers are known for will not vary.

"Hewlett-Packard is a name that almost certainly leaps to mind when you think about printers," the editors write in the September 3, 2002 *PC Magazine*, in which the hp color LaserJet 4600 received an "Editors' Choice" award. We believe the reason for that leap is reliability, and the results of that reliability: lower costs and more efficient workplaces while delivering top-notch quality.

Color LaserJets in the fast lane

"The speed, ease of installation, and network-management prowess make the HP LaserJet 4600 a top contender."

PC Magazine, September 3, 2002

Color printing was once considered a luxury. Businesses have learned that color in their communications packs a punch that black and white lacks. But many people still perceive color as too expensive and color printers as too cumbersome and slow.

Time to join the 21st century! Laser printers, the workhorses of color printing, have evolved into affordable, speedier, and simpler devices. "We were pleasantly surprised by the overall quaity of this crop of printers," writes Bruce Fraser in the September 2002 *Macworld*, "but the clear winner was the HP LaserJet 4600." Fraser singled out the 4600 for its speed, reliability, color stability, and print quality.

Over at *PC Magazine* (September 3, 2002), the 4600 captured the Editors' Choice award and was lauded for its swiftness. Not only was it

"impressively quick" in producing large-format graphic test files, the 4600 ran through a 100-page Word document at a blazing 16ppm — in color and monochrome. Reviewer M. David Stone was also impressed by how easy it was to get the 4600 up and running. "Setting up the 4600 involves taking off the packing tape, inserting the paper, turning on the printer, and inserting the four toner cartridges," he wrote.

Businesses need color to inform, persuade, and promote. These goals are undermined if the cost of color includes sky-high prices for supplies and long waits at the printer for the pages to appear. HP reliability makes unattended printing of large color print jobs the norm; HP innovation is creating color printers with an optimal balance of speed, print quality and costs; and HP's emphasis on ease of use means that everyone in the organization can now make effective use of color. For color in the office, it's truly a new century.

color in the office

The case for color

Printing in color is the most effective way to increase the clarity of a document and help you stand out in a crowd. And yet the rap on color in a business setting has always been that color printers are too expensive. This couldn't be farther from the truth. Printing color in house can actually reduce your color printing costs and increase your productivity — and HP is leading the charge with a suite of new color printers designed specifically to meet the needs of business customers.
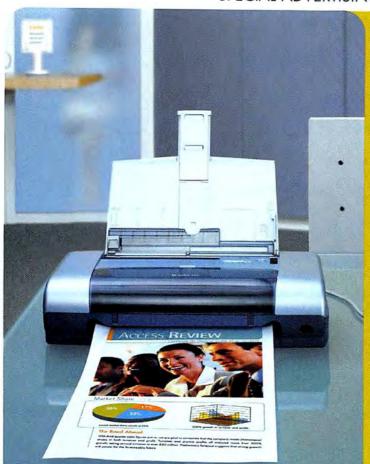
Consider your company's marketing materials. Adding color could make them an expensive proposition — if you have to outsource them. You can't make any changes without incurring extra costs. You have to closely estimate how many copies you'll need, or you'll end up scrapping the excess or paying the printer to make up the shortfall.

HP color solutions let you print short-run color print jobs in-house, quickly and affordably. You can turn on a dime, customize documents at a moment's notice, print the exact number you need, and virtually eliminate waste and storage costs. Thanks to HP's legendary reliability and emphasis on ease of use, you won't have to cope with excessive downtimes or devices only experts can operate.

HP color solutions let you print short-run color print jobs in-house, quickly and affordably.

HP offers a complete line of affordable color solutions designed to meet the needs of any business — from small to enterprise. Color in the office is here to stay, and HP is here to deliver it.

Visit www.hp.com/go/colorprinting to learn more.

color inkjet printers

new

hp deskjet 450cbi

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- 4.6 lbs. with attached battery
- 9ppm (black), 8ppm (color)
- longer lasting ink cartridges — up to 450-page capacity (color) and 400-page (black)
- parallel, USB and Fast Infrared connections

$349 C8112A

hp deskjet 5550

The personal color inkjet printer for home and moderate office use.

- up to 17ppm (color)
- 3000 pages per month duty cycle
- Up to 4800 dpi (color)
- Optional two-sided printing
- PC and Mac compatible

$149 C6487C

hp deskjet 6127

Color printer for the office with Ethernet connectivity.

- up to 20 ppm (black), 13ppm (color)
- Up to 4800 dpi (color)
- Two-sided printing

$249 C8959B

hp color inkjet printer cp1700ps

High-performance, wide format, and cost-savings ideal for growing businesses.

- Up to 13 x 19-inch printing
- Up to 14.5 ppm (color)
- 5000 pages per month duty cycle
- Modular ink delivery system

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Lease Price **$19**/mo.

hp business inkjet 2280tn

Upgradeable, high-performance inkjet printer for power users and small workgroups.

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- 500 sheet input
- Internal EIO networking
- Modular ink delivery system

new low price

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Lease Price **$28**/mo.

multifunction printers

MFPs: More productivity in less space

The HP multifunction printer (MFP), which is designed for workgroup and departmental use, is the result of new technologies, digital convergence, and some out-of-the-box thinking that incorporates digital sending capabilities with new copier-like functionality.

That out-of-the-box thinking was based on these points and the picture they paint:

Paper documents can be digitized — they can be scanned and then emailed. Digitized documents are frequently printed, and, when distributed to people who don't have the source file, are copied, scanned, faxed, and even retyped.

It makes sense then to consolidate printing, copying, and scanning functions in one unit with strong network capabilities. By choosing a balance between single-function and multifunction devices, companies can lower costs and increase productivity while upgrading to fewer, more efficient devices. HP MFPs have shorter paper paths and fewer moving parts than most copiers, resulting in increased uptime and fewer repair costs.

On the productivity front, "scan-once, print-many" HP MFPs maintain copy quality and image alignment through large print runs. "Transmit-once, print-many" HP MFPs can dramatically reduce network traffic. Network printers and many single-function printers send a job multiple times from the PC to the print server to the printer. But HP MFPs, as well as HP single-function printers, eliminate these multiple transmissions, thus freeing up valuable network space.

HP's breakthrough MFPs include the hp LaserJet 3300mfp and the hp 9000mfp, which received the

Better Buys for Business' 2002 Editor's Choice Award. "In true Hewlett-Packard fashion, the company has merged faster printing and reasonable prices into one machine," the editors write. "HP's Digital Sending technology makes it exceptionally easy for senders to select a target email address right from the LaserJet 9000mfp's control panel and send scanned documents" (*Better Buys for Business*, 2002).

Are HP MFPs difficult to use? There wouldn't be much point to combining several machines in one if they were.

"HP took great pains to make a touch-screen control panel that is easy to use for all functions, including copying," say the *Better Buys* editors. "Even the most casual user will have
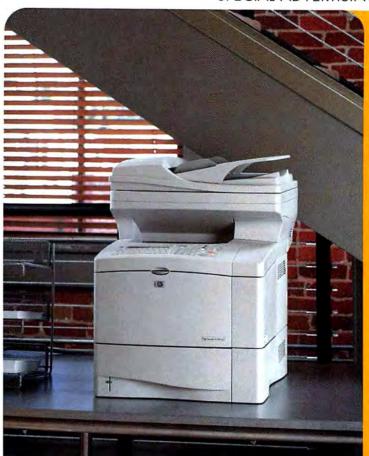
> "We believe the hp LaserJet 9000mfp is one of the best printer-based multifunctionals on the market, and it receives our Editors' Choice Award."
>
> -Better Buys for Business, 2002

no problem navigating through the various menus." And on models without a touch-screen control, an intuitive control panel makes operation equally easy.

"We believe the hp LaserJet 9000mfp is one of the best printer-based multifunctionals on the market, and it receives our Editor's Choice Award."

HP offers a broad line of both MFPs and all-in-one printers that address virtually any business need. To learn more about HP's MFPs visit www.hp.com/go/mfp84.

multifunction printers

hp LaserJet 4100mfp

Multifunction printer and walk-up copier that offers the versatility of printing, walk-up copying, scan-to-email and color scanning for workgroups.

- 25ppm
- 150,000 pages per month duty cycle
- Optional two-sided printing
- 30-page ADF
- HP Jetdirect 615n internal print server

Free analog fax accessory available for a limited time. Visit www.hp.com/go/mfp1 for more information.

new low price

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Print, fax, copy and scan — a four-function premium performance product with upgradeable features.

- up to 16ppm (color),
- 5,000 pages per month duty cycle
- USB, 1 open LIO slot
- up to 2400x1200 dpi (color)

$499 C8375A

Lease Price $16/mo.

hp officejet d155xi

Print, fax, copy and scan — all from one compact, integrated product. Network-ready with Jetdirect 200m print server included.

- up to16ppm (color)
- 5,000 pages per month duty cycle
- additonal 250 sheet paper tray

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hp LaserJet 3330mfp

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hp LaserJet 9000mfp

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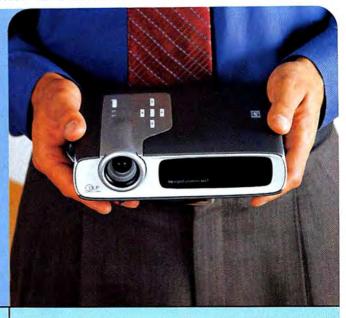
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INTERNET TIPS

SCOTT SPANBAUER

Take Control of Your In-Box and Address Book

"I CAN'T FIND my e-mail in-box. Where are the messages stored?" If you work with multiple computers (one at home and one in the office, for example)—or if you buy a new PC or upgrade an old one's hard disk or operating system—you'll eventually ask the same question.

E-mail programs rarely make it easy to

FIGURE 1: FIND THE PATH to your OE address book by looking under *Help•About Address Book.*

find stored messages or to locate your (even more valuable) address book. Even if you know where the files are, getting your e-mail program to open them can be tough. Here's how to back up or move your e-mail messages and address book contacts in Outlook, Outlook Express, and Netscape Mail/Messenger.

Outlook: By default, Outlook stores your e-mail, contacts, appointments, notes, and tasks in a single file called outlook.pst. In Windows 9x, this file is usually located in the C:\Windows\Application Data\Microsoft\Outlook folder. In Windows 2000 and XP, Outlook stores the file in the folder C:\Documents and Settings*username*\Local Settings\Application Data\Microsoft\Outlook, where 'username' is your Windows XP user account (logon) name. You can also find the file by choosing *Start•Search* in Windows XP or *Start•Find*

in earlier Windows versions, and then searching for **outlook.pst**. Be careful—if more than one user logs on to the PC, it may contain multiple outlook.pst files.

Once you've located the file, use Windows Explorer or your favorite backup program to copy it, move it, or back it up.

Outlook Express: On the other hand, Outlook Express 6 stores the contents of your in-box in a file that's called inbox.dbx. To find it and navigate to it quickly, open Outlook Express, select *Inbox* in the Folders pane, and choose *File• Properties.* Your file's location will appear in the resulting dialog box. Alternatively, you can find this folder path by opening your address book and clicking *Help•About Address Book* (see **FIGURE 1**). Simply select the entire file path (including the part that scrolls out of sight) up to, but not including, 'inbox.dbx'. Press **<Ctrl>-<C>**, choose *Start• Run*, and press **<Ctrl>-<V>** to paste the file path into the Open field. Press **<Enter>**, and boom—you'll be staring at an Explorer window with the folder's contents.

You'll see that inbox.dbx isn't the only .dbx file in this folder. Any folders you create, along with the default Sent Items, Outbox, Drafts, newsgroup, and other folders, are stored as separate .dbx files in this folder. To ensure that you don't lose any messages, simply copy, move, or back up the entire contents of this folder.

One thing you won't see in this folder, however, is your address book. Searching for .wab files on your hard disk won't do—several may be languishing in multiple locations. To cut (and paste) to the chase, choose *Tools•Address Book* and then

select *Help•About Address Book* to display the location of the address book file.

Netscape or Mozilla Mail: These two sibling programs store data files in accordance with similar logic. To navigate to your mail folders in either program, select *Local Folders* in the left panel and then click the *View settings for this account* link. At the bottom of the resulting dialog box, you'll find a field that displays the path to these folders. As described in the Outlook Express tip above, copy and paste this text into the Start menu's Run dialog box to open the folder in Explorer. Both Mozilla and Netscape store every mail folder's contents in a separate file, each with a simple and clear name—such as Inbox, Drafts, or Sent—without a file name extension.

Mozilla's multifile address book resides a few folder levels higher than your local mail folders do; just navigate up using Explorer's Up button until you find the file abook.mab. Any other address books you've imported into Mozilla's will be stored in a file named impab.mab; additional address books that you create within the program will be named abook-1.mab, abook-2.mab, and so on. Play it safe: Back up or copy everything in this folder that ends with .mab. ∎

Send your questions and tips to nettips@ spanbauer.com. We pay $50 for published items. Go to find.pcworld.com/31523 for more Internet Tips. Scott Spanbauer is a contributing editor for PC World.

PRINT YOUR ADDRESS BOOK

THINK HANDHELD PCs are overkill? If you use Outlook Express, you can take all of your contact information with you and access it instantly, anywhere, with—dare we say it—paper. OE's address book prints out a nifty little report with some or all of your contacts. Press **<Ctrl>-<Shift>-B** to open the address book; select the identity, group, or individual contact you want to carry around in your pocket; and click the *Print* button. To include all contact information in your report, choose *Business Card* under Print Styles; or choose *Phone List* to print just names and phone numbers. Then click *Print*.

STEP BY STEP

STAN MIASTKOWSKI

Reinstall Windows

NO MATTER which version of Windows you run, at times your PC will start to become unstable—especially if you often install and uninstall software or change hardware. System lockups or the dreaded Blue Screen of Death can spoil your day.

Diagnosing specific problems can be difficult, even with the help of Windows' built-in diagnostics or popular commercial utilities such as Symantec's Norton SystemWorks. It's important to remember, however, that accumulated installed software—not hardware—is the most common cause of Windows headaches.

If thorny Windows problems have you stymied, consider "refreshing" Windows. The more you use your PC, the greater the chance that some key Windows files have become corrupt. A fresh installation isn't guaranteed to solve all your problems, but it's an important first step.

In general the steps below work with all versions: 95, 98, 98 SE, NT, Me, 2000, and XP Home Edition and Professional. ∎

Stan Miastkowski is a PC World *contributing editor. Contact him at stan_miastkowski@ pcworld.com. Visit* find.pcworld.com/31676 *for past* Step-By-Step *columns.*

1 **Do a complete backup.** Reinstalling Windows can make major changes in your PC, so back up your system before you begin. See the "Ultimate Backup Guide" (find.pcworld.com/30719) for more.

2 **Start the reinstallation (if you lack a full Windows CD-ROM).** Many computers manufactured in the last couple of years ship with a "Windows Restore" CD-ROM (the exact terminology varies by PC maker) instead of a full-fledged Windows disc. The features available on the CD-ROM also vary. Some merely return your system to its original state, wiping out your data and all the programs you've installed. More common is a disc with several options, including the ability to reinstall only the key Windows files. This is the option you should try first.

4 **Complete the reinstallation.** Read each screen carefully as it comes up. Though you'll have fewer choices than you would during a new installation, some screens require your input (you'll usually need to reenter the registration number). XP users may have to activate Windows again. You may also have to reinstall some software. The entire process usually takes 30 to 45 minutes.

5 **Check over and update the reinstallation.** Make sure that all your programs run correctly and your data is intact (unless something went very wrong, it should be). Then run Windows Update (*Start•Windows Update*). Download and install all the critical system updates.

3 **Start the reinstallation (if you have a full Windows CD-ROM).** If you upgraded to a newer version of Windows, or your PC came with a full Windows CD-ROM, reinstalling Windows should be easy. You don't have to exit Windows to begin; just insert your Windows CD into the drive.

If you're reinstalling Windows 98 and you have CD autorun enabled, the disc will display a screen that has no install option. To

begin the install, go to *Start•Run*, enter **D:\setup.exe** (replace the *D* with the drive letter of your CD-ROM drive), and click *OK*.

If you're reinstalling Windows Me or XP, the installation screen should come up automatically as soon as the CD runs. If the screen doesn't appear, or if you have CD autorun disabled, follow the directions in the paragraph above to run setup.exe.

6 **If it doesn't work:** If reinstalling Windows doesn't solve your problems, it's time to consider reformatting your hard drive and doing a "clean" Windows installation. This approach requires making a complete backup, saving all your data, and reinstalling your applications. You'll also need to have the original install discs with drivers for your hardware. The clean install process is complex and time-consuming, and we don't have space to cover it here. However, this approach provides your best bet of getting everything running normally. Check out www.windowsreinstall.com for more information.

HARDWARE TIPS

KIRK STEERS

ROAD TEST A USED PC BEFORE BUYING **MAKE SENSE OF DOT-PITCH NUMBERS** **CHANGE MONITOR SETTINGS QUICKLY**

Don't Get Caught With Your Disk Down

WHEN WAS THE last time you backed up your important files? Last week? Last month? You don't remember? You're not alone. Even the most conscientious computer users have some unsaved data on their hard drive, and that data is always at risk. Why? Because sooner or later, all hard drives fail. And when yours does, your unprotected data will go with it.

If you know what to look for, what to listen for, and how to respond when you see it or hear it, there's a good chance you'll be able to rescue your data from a dying disk before it's too late.

STOP, LOOK, AND LISTEN

SOMETIMES FAILING hard drives offer warning signs of their imminent demise. If you're lucky enough to see or hear one of these signs, stop what you're doing and immediately back up your data. It isn't uncommon for a failing drive to go from being partly accessible to being completely inaccessible in a very short time.

KICK THE TIRES

THINKING OF BUYING a used PC? These days, many older PCs have a lot of life left in them. But before you shell out any of your hard-earned dough, put your prospective purchase through its paces. PassMark Software's $22 BurnInTest 3 will push a PC's CPU, hard drives, graphics, and other major components to their limits to ensure that they're all working properly. Go to find.pcworld.com/30707 to download the trial version.

How can you tell if your drive is dying? Watch for any error messages about the names or locations of files or folders. For example, if Windows can't find a file that you're sure is on the hard disk, be worried. Likewise, if Windows won't let you move or save a familiar file, or if the names of files and folders contain strange characters or have changed to complete gibberish, it's safe to suspect disk trouble as the cause.

If you encounter any of the symptoms described above, don't panic. Some of your data may have been scrambled by errant software or by an isolated hardware glitch. To check, run Windows' ScanDisk utility. In Windows 98 and Me, click *Start•Programs•Accessories•System Tools•ScanDisk*. In Windows 2000 and XP, open *My Computer*, right-click the drive, select *Properties•Tools*, and click the *Check Now* button under 'Error-checking'.

Set ScanDisk to examine the entire disk for physically damaged sectors. To do this in Windows 98 and Me, enable the *Thorough* option (see **FIGURE 1**). In Windows 2000 and XP, check both *Automatically fix file system errors* and *Scan for and attempt to fix bad sectors*. (On multigigabyte hard disks, this may take hours, so be patient.)

If ScanDisk reports more than a few physical errors, there's a good chance your hard disk is on the way out. But if it

reports only a few logical errors, such as cross-linked or fragmented files, let Scan-Disk repair the files and then run Scan-Disk periodically to see if the errors recur. Running ScanDisk once a month is a good way to catch hard disk problems before they become irreparable.

CLICKS AND GRINDS

KEEP YOUR EARS tuned for any unusual noises coming from your hard disk: Strange sounds often mean big trouble. Go to find.pcworld.com/30695 to download .wav files of some common hard-drive-in-distress sounds. (Thanks to John Christopher of data recovery service Drive-Savers.com for providing these files.)

A high-pitched whining sound (bearings.wav) could mean your hard drive's bearings are going bad. Relatively speak-

FIGURE 1: SCANDISK CAN TELL YOU whether corrupted data is due to a failing hard disk or a less serious problem.

ing, this is good news; you may actually be able to rescue your soon-to-be-stranded data. If your operating system loads and you're able to move files off the hard disk, do so immediately.

If you hear sustained clicking noises, you probably won't be able to access the hard disk at all, and your operating system most likely won't load. A pause-click, pause-click sound (cycleclick.wav) indicates that your drive's read/write heads are trying to orient themselves. The drive has probably sustained some damage, and you've likely lost some data. Continuous, rapid-fire clicking (excess.wav) is an ominous sound for any drive. ▶

FIGURE 2: RESET YOUR MONITOR quickly by checking **Show settings icon on task bar** in your Display settings.

In either case, your chances of recovering your data manually are slim. Don't keep turning your system on and off in hopes that your hard drive will finally catch, or start up, one last time; it won't.

Any grinding or scraping sound (grind. wav) is another sign of serious trouble. Your hard drive's read/write heads are in contact with the disk's media surface—where the data is stored. Shut down your drive immediately; the longer it runs, the more data you may lose.

Your best chance of recovering data from the catastrophic failure indicated by these clicking and grinding sounds is to send your drive to a data recovery service. Both DriveSavers.com and Ontrack (www. ontrack.com) are very skilled at rescuing data from dead drives. But be prepared to pay hundreds or even thousands of dollars, depending on your PC's operating system, the size of the hard drive, and how quickly you need to recover your data.

GET SMART

SELF-MONITORING, Analysis, and Reporting Technology (SMART) is a diagnostic capability built into most of the hard drives manufactured in the past few years. SMART technology constantly monitors hard drive components and performance. When it sees indications of a possible failure, it issues a warning.

How the warning reaches you varies from manufacturer to manufacturer. It

may show up in the BIOS announcements that appear on your screen when you first start your computer, or you may need to run diagnostic software capable of accessing SMART information. Check with your hard drive's manufacturer to see whether it has specific programs for this.

Both Ontrack's SystemSuite and Symantec's SystemWorks utility suites monitor SMART data. If you want to run a quick check of your hard drive right away, try Western Digital's Data Lifeguard Online Diagnostics (available at find.pcworld.com/ 30698). This program is designed to work with all SMART-enabled hard drives.

SALES PITCH

I'M SHOPPING FOR a low-cost 17-inch monitor, and I'm confused about dot-pitch numbers. A salesman insisted that I need a monitor with a dot pitch of no more than .25mm, but I've seen less-expensive monitors with a slightly larger dot pitch. If I'm only using my PC for word processing and reading news on the Internet, do I really need the more expensive models?

Karen Smith, San Diego

CRT MONITORS HAVE red, green, and blue phosphorus painted on the inside of the glass. There are two types: One has more than a million tightly spaced phosphor dots that light up to create the images on your monitor's screen, and the other has thousands of continuous vertical phosphor stripes. Dot pitch is the distance between dots of the same color in the first type of monitor; stripe pitch, the corresponding measurement for the second type, is the distance between stripes of the same color. (The Sony Trinitron introduced striped monitors, but several other vendors—notably Mitsubishi with its Diamondtron line—now make them as well.) You'll also hear the terms *mask pitch* and *aperture grill pitch*, which are nearly equivalent to dot pitch and stripe pitch, respectively. Generally, the smaller the pitch, the crisper the image. Even if

you rarely view graphics on your screen, you may benefit from a smaller pitch.

As a rule of thumb, don't buy a monitor with a dot pitch higher than .28mm or a stripe pitch greater than .25mm. (Because stripe pitch is measured horizontally and dot pitch is measured diagonally, a .25mm stripe pitch is roughly equivalent to a .27mm dot pitch.) You should be able to find such a monitor that suits both your needs and your budget. If you do a lot of reading on your PC—especially if you frequently look at small fonts—a monitor with a smaller pitch may be worth the extra expense.

QUICK-CHANGE ARTIST?

BEING A GRAPHIC ARTIST, I frequently change my monitor's resolution and color-depth settings. In Windows 98, clicking an icon on the taskbar immediately brought up the settings. But I can't do this in Windows XP. Do you know of any alternative methods that work for XP?

Robert Thrasher, Provo, Utah

YOU NEED A NEW version of the Quick-Res utility that was included in previous versions of Microsoft's free PowerToys program. In Windows 98 and Me, Quick-Res is integrated into the operating system. Simply right-click your desktop, select *Properties*, click the *Settings* tab, and choose the *Advanced* button. Check *Show settings icon on task bar* to have a handy icon appear in the taskbar (see **FIGURE 2**). Click this icon to see a list of your available color and resolution options. You can select your new setting with a single click.

Unfortunately, Microsoft didn't provide this functionality in Windows XP, nor did the company include a separate utility with QuickRes's features in the version of PowerToys for Windows XP. So instead, go to find.pcworld.com/30704 to download the free 1st QuickRes Light from Green Parrots Software (the Pro version, which is available at www.greenparrots. com/aqr.html, costs $25). ∎

You can reach PC World Contributing Editor Kirk Steers at kirk_steers@pcworld.com. We welcome your tips and questions and pay $50 for published items. Visit find.pcworld. com/31511 for more Hardware Tips.

ANSWER LINE

LINCOLN SPECTOR

Where Should I Delete Private Information?

I REGULARLY EMPTY the folders holding my cookies and temporary Internet files. What other folders should I clean out to protect my privacy?

Barbara Pecan, Clearwater, Florida

IT'S EASY TO cover your cybertracks via the Paranoia tab of Tweak UI 1.33, Microsoft's free Windows add-on. Go to find. pcworld.com/30710 to download the program. (PowerToys for Windows XP's version of Tweak UI lacks this tab, but the tab in Tweak UI 1.33 works fine in XP. The two versions of Tweak UI can coexist on an XP-based system, as long as you don't try to use them at the same time.)

After you download Tweak UI 1.33, double-click it to extract the compressed files, right-click the *tweakui.inf* file (the icon for this file looks like a notepad with a cog wheel in front of it), and choose *Install*. Once you've installed Tweak UI, open Control Panel, double-click the *Tweak UI* icon, and click the *Paranoia* tab.

You'll find a number of options in the 'Covering your tracks' list. If you check any of these items and click OK, Windows will clear them each time you boot. Not all are worth selecting, however. Here are the key options to enable:

Document history: This is the list of recently opened documents you get by selecting Start•Documents (or in XP, Start•Recent Documents).

Internet Explorer history: This clears visited links and the drop-down list of recently visited URLs in IE's Address Bar toolbar. It does not reliably clear the browser's history list; to empty that, select IE's *Tools•Internet Options,* click the *General* tab, and select *Clear History.*

Run history: This option removes the list of commands that you typed in the Start•Run dialog box.

MAKING EUROS

HOW CAN I assign the euro symbol to my keyboard other than by holding down <Alt> as I type 0128 on the numeric keypad?

Bob Hertzka, New York

I'LL SHOW YOU two ways to type easy euros. Note, however, that not all fonts support the euro symbol (€). If you have Windows set to use the United States–International keyboard layout, you can make a euro by pressing **<Ctrl>-<Alt>-5** (use the 5 on your keyboard's number row, not the one on the numeric keypad).

To switch to this layout in Windows XP, begin by selecting *Start•Control Panel.* If the Control Panel window says 'Pick a category', click *Switch to Classic View.* Double-click *Regional and Language Options* (or select it from the Control Panel menu), click the *Languages* tab, choose *Details,*

and click *Add.* Finally, in the Keyboard layout/IME drop-down list, select *United States-International* (see **FIGURE 1**).

In Win 98, 2000, and Me, select *Start• Settings•Control Panel.* Double-click *Keyboard,* click the *Language* tab (that's *Input Locales* in Windows 2000), and select *Properties.* In the Keyboard layout drop-down list, select *United States-International.*

The second option works only in Office applications, but doesn't involve changing keyboard settings. In Word or Excel, select *Tools•AutoCorrect* or *Tools•AutoCorrect Options,* depending on your version of Office. In the Replace field, enter a symbol, such as a tilde (˜) or pipe (|), that you

FIGURE 1: SWITCH TO THE U.S.-International keyboard layout to add the euro symbol to documents easily.

rarely use. In the With field, hold down **<Alt>** while you type **0128** on the numeric keypad (with NumLock on, of course). Release the <Alt> key and click *OK.*

Now you can enter a euro symbol in your Office apps by pressing your chosen key. To type the original character instead of the euro symbol, press the key and then **<Backspace>**. ∎

Send questions to answer@pcworld.com. Answer Line pays $50 for published items. Go to find.pcworld.com/31577 for additional Answer Line columns. Lincoln Spector is a contributing editor for PC World.

EASY WORD VIRUS SAFETY

RONALD GOERS OF Palmyra, New York, offers a simple way to protect your system from Word macro viruses: Microsoft's free Word 97/2000 Viewer (which also reads Word 2002 files) displays the documents but can't run macros. Go to find.pcworld.com/30713 to download your copy. If you make the viewer your default program for loading .doc files, selecting a Word file e-mail attachment will open it harmlessly in the viewer. You can still load any document into Word by right-clicking it and selecting *Open.*

INDEX

Installation: Easy? No, Queasy!

ONCE UPON A TIME, installing a program or peripheral meant taking a floppy disk out of a Ziploc bag and copying it to your hard drive. Then things got ugly. Programs would ship on 40 floppies, locking you into your seat for hours and making you play disk jockey. Next in line came the lethargic 1X CD-ROM drive and the 56-kbps download. The Windows Registry helpfully added multiple reboots.

Fast optical drives, broadband, and newer Windows versions have helped a bit. But utterly unchanged are the trepidation you feel upon running setup.exe and the queasiness you get when discovering that unpleasant things are happening to your PC. Things you can't do anything about. Things like these:

More than you needed to know—and less: I don't care about precisely when the installer is "writing new Registry values." I do care about precisely what it is going to do to my system, like whether it will force the machine to run an unwanted program at every boot. Most installers tell me the former but not the latter. More missing information: Exactly when will my presence be required to answer screen prompts, and how long can I let the PC do its thing while I grab a stiff drink?

Installation overkill: Installers for peripherals like scanners and cameras often perform multipart installations. You get drivers for the device, but typically you also get programs for editing pictures or recognizing printed characters, and usually a copy of Adobe Acrobat Reader so you can read the manual that the company was too cheap to print. Unless you demand a "custom" installation (and sometimes even then), you may end up with space-wasting junk you couldn't care less about.

Smart stupidity: How come installers rarely notice that I already have a copy of Acrobat Reader—one that's newer than the past-its-pull-date version on the CD? How come they keep asking me what to do about system DLLs that are older than the ones already on my hard drive?

Flaw in order: Vendors unendingly develop drivers that make you install software and plug in hardware in a particularly rig-orous order. Many peripherals also include instructions warning you to respond to Windows prompts in ways that make no obvious sense—like telling the system to disregard the product you just connected. And how about messages that imply you're installing several products ("Installing standard USB doofusation hub; installing Mass Pike device") when you're actually adding just one?
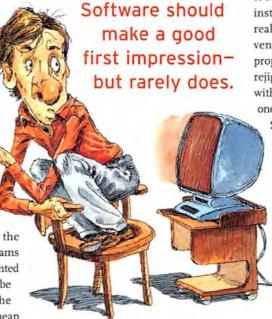
Bumptious presumptions: Where do programs get off assuming that they can stuff another icon on the desktop or into the system tray without asking? Where do they get the chutzpah to declare themselves the default players for whatever file types they want to run? And where do they acquire the gall to waste cycles constantly checking for updates?

Installing a product ought to be simple. It ought to create a good first impression instead of an uneasy sense that nobody really gives a damn. And though some vendors do handle some of this stuff properly, asking your permission before rejiggering your desktop or sticking you with extra baggage, it's hard to think of one that does everything right every time.

So the only good news about installing a new piece of hardware or software is that you have to do it just once.

At least until the moment you discover that the CD-ROM in the box is out-of-date and you have to download an upgrade. ∎

> **Software should make a good first impression— but rarely does.**

Visit find.pcworld.com/31595 for more columns by Contributing Editor Stephen Manes. He has been writing about PCs for nearly two decades.

ILLUSTRATION: JOHN CUNEO

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Inspiron™ 8200 Notebook

Extreme Performance Notebook
- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 15" Super XGA+ TFT Display
- 128MB DDR PC2100 SDRAM
- 30GB¹ Ultra ATA Hard Drive
- 32MB DDR NVIDIA® GeForce2 Go™ AGP 4X Graphics
- Fixed Internal 8x Max DVD-ROM Drive
- Internal Modem and NIC Included
- 8-Cell Li-Ion Battery w/ ExpressCharge™ Technology
- Windows® XP Home Edition; Office XP Small Business
- 1-Yr Mail-In Service

$1549 as low as **$44**/mo., (46 pmts.*) 60 Days
Same-As-Cash for qualified customers
E-VALUE Code: 13843-S81115

Recommended upgrade:
- Windows® XP Professional, add $79

Latitude™ C640 Notebook

Network-Optimized Mobility Notebook
- Mobile Intel® Pentium® 4 Processor-M at 2GHz
- 14.1" XGA Active Matrix Display
- 128MB DDR PC2100 SDRAM (Up to 1GB)
- 20GB¹ Ultra ATA/100 Hard Drive
- 32MB DDR AGP 4X ATI® Radeon™ Video
- Modular 24x Max CD-ROM/Floppy Drive
- Internal Modem and NIC Included
- Internal Wireless-Ready Antenna
- Windows® XP Professional
- 3-Yr Mail-In Service

$1499 as low as **$43**/mo., (46 pmts.*) 60 Days
Same-As-Cash for qualified customers
E-VALUE Code: 13843-S71114

Recommended upgrades:
- 8x Max DVD-ROM, add $129
- 3-Yr CompleteCare™ Accidental Coverage; add $169

Dell | Servers and Workstations

PowerEdge™ 600SC* Server

NEW Basic Value Server
- Intel® Celeron® Processor at 1.70GHz
- 128MB 200MHz ECC DDR SDRAM
- Upgradeable to 4GB of Memory
- 20GB¹ (7200 RPM) IDE Hard Drive
- Upgradeable to 480GB¹ of Internal Hard Drive Storage
- Embedded Intel® PRO Gigabit™ NIC
- Five PCI Expandability Slots (4-64/33MHz, 1-32/33MHz)
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service²

$499 as low as **$15**/mo., (46 pmts.*) 60 Days
Same-As-Cash for qualified customers
E-VALUE Code: 13843-S21104

Recommended upgrades:
- Network Custom-Install Site Survey, add $199
- Power Connect 2016 16-Port 10/100 Ethernet Switch, add $119
- System Including Windows® 2000 Server, only $1299

PowerEdge™ 1600SC* Server

New Reliable High Performance Server
- Intel® Xeon® Processor at 1.80GHz
- Dual Processor Capable (Up to 2.80GHz)
- 128MB 200MHz ECC DDR SDRAM (Up to 4GB)
- 18GB¹ (10K RPM) Ultra320 SCSI Hard Drive
- Upgradeable to 438GB¹ of Internal Hard Drive Storage
- Embedded Intel® PRO Gigabit™ NIC
- Six PCI Slots (2-64/100MHz, 2-64/66MHz, 2-32/33MHz)
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service²

$999 as low as **$29**/mo., (46 pmts.*) 60 Days
Same-As-Cash for qualified customers
E-VALUE Code: 13843-S21109

Recommended upgrades:
- Network Custom-Install Site Survey, add $199
- Hot-Swap Redundant Power Supply, add $349
- System Including Windows® 2000 Server, only $1799

Dell Precision™ 340 Workstation

Affordable, Scalable Performance Workstation
- Intel® Pentium® 4 Processor at 2GHz
- 128MB PC800 ECC RDRAM
- 20GB¹ (7200 RPM) EIDE Hard Drive
- 32MB ATI® RAGE™ 128 Ultra AGP 4X Graphics Card
- 48x Max CD-ROM Drive; Integrated Sound
- Mini-Tower Chassis
- Windows® XP Professional
- Lifetime 24x7 Dell Precision™ Dedicated Tech Support
- 3-Yr Next Business Day On-Site Service²
- Monitor Not Included

$849 as low as **$25**/mo., (46 pmts.*) 60 Days
Same-As-Cash for qualified customers
E-VALUE Code: 13843-S41108

Recommended upgrades:
- 3-Yr Same-Day 4-Hour (5x10) On-Site Service; add $199
- NVIDIA® Quadro2 EX 32MB AGP 4X Graphics, add $99

Click www.dell.com/pcworld Call 1-800-531-2751

Dell | Home Desktops

Dimension™ 2300 Desktop

Affordable Desktop System
- Intel® Pentium® 4 Processor at 1.80GHz with 512K L2 Cache
- 128MB Shared² SDRAM at 133MHz
- NEW 30GB³ Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .27dp) E772 Monitor
- Integrated Intel® 3D Extreme Graphics
- 40x/10x/40x CD-RW Drive with Roxio's Easy CD Creator™
- Integrated Audio
- Harman Kardon HK-395 Speakers with Subwoofer
- 56K¹ Modem and 10/100 NIC
- Windows® XP Home Edition; WordPerfect® Productivity Pack with Quicken® New User Edition
- 6 Months America Online® Membership Included¹
- 1-Yr Limited Warranty;¹ 1-Yr At-Home Service⁴

$799 Ask us about no payments for 90 days for well-qualified customers
E-VALUE Code: 13843-D51107m

NEW Dimension™ 4550 Desktop

Superior Performance, Smart Value
- Intel® Pentium® 4 Processor at 2GHz with 400MHz System Bus and 512K L2 Cache
- 256MB DDR SDRAM at 266MHz
- 40GB³ Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .25dp) M782 Flat Screen Monitor
- 32MB ATI® RAGE™ Ultra Graphics Card
- 16x Max DVD-ROM Drive
- 40x/10x/40x CD-RW Drive with Roxio's Easy CD Creator™ (2nd bay)
- SB Live! 1024V Digital Sound Card
- Harman Kardon HK-395 Speakers with Subwoofer
- 56K¹ Modem and Integrated 10/100 NIC
- Windows® XP Home Edition; Works Suite 2002
- 6 Months America Online® Membership Included¹
- 1-Yr Limited Warranty;¹ 1-Yr At-Home Service⁴

$1099 Ask us about no payments for 90 days for well-qualified customers
E-VALUE Code: 13843-D51110m

NEW Dimension™ 8250 Desktop

Cutting-Edge Technology
- Intel® Pentium® 4 Processor at 2.53GHz with 533MHz System Bus with 512K L2 Cache
- NEW 256MB PC1066 RDRAM
- 40GB³ Ultra ATA/100 Hard Drive (7200 RPM)
- 19" (18.0" v.i.s., .24dp) M992 Flat Screen Monitor
- 64MB DDR NVIDIA® GeForce4™ Ti 4200 Graphics Card with TV-Out and DVI
- 16x Max DVD-ROM Drive
- NEW 48x/24x/48x CD-RW Drive with Roxio's Easy CD Creator™ (2nd bay)
- SB Live! 1024V Digital Sound Card
- NEW Altec Lansing® ADA745 4.1 Surround Speakers with Subwoofer
- 56K¹ Modem and Integrated 10/100 NIC
- Windows® XP Home Edition; Works Suite 2002
- 6 Months America Online® Membership Included¹
- 1-Yr Limited Warranty;¹ 1-Yr At-Home Service⁴

$1599 Ask us about no payments for 90 days for well-qualified customers
E-VALUE Code: 13843-D51115n

Dell | Home Notebooks

Inspiron™ 2650 Notebook

Practical and Affordable Mobility
- Mobile Intel® Celeron® Processor at 1.50GHz
- 14.1" XGA TFT Display
- 128MB DDR PC2100 SDRAM
- 20GB³ Ultra ATA Hard Drive
- 8x Max DVD-ROM Drive
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4X Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8-Cell)
- Internal Modem and Network Card
- Windows® XP Home Edition; WordPerfect® Productivity Pack with Quicken® New User Edition
- 6 Months America Online® Membership Included¹
- 3-Yr Limited Warranty;¹ 3-Yr Mail-In Service

$1179 Ask us about no payments for 90 days for well-qualified customers
E-VALUE Code: 13843-D81111m

Inspiron™ 2650 Notebook

Mobile Power, Great Price
- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 30GB³ Ultra ATA Hard Drive
- 24x Max CD-RW/DVD Combo Drive with Roxio's Easy CD Creator™
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4X Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8-Cell)
- Internal Modem and Network Card
- Windows® XP Home Edition; Works Suite 2002
- 6 Months America Online® Membership Included¹
- 3-Yr Limited Warranty;¹ 3-Yr Mail-In Service

$1629 Ask us about no payments for 90 days for well-qualified customers
E-VALUE Code: 13843-D81116n

Inspiron™ 8200 Notebook

Ultimate Mobile Multimedia Performance
- Mobile Intel® Pentium® 4 Processor-M at 1.80GHz
- 15" Super XGA+ TFT Display
- 256MB DDR PC2100 SDRAM
- 40GB³ 5400 RPM Performance Hard Drive
- 24x Max CD-RW/DVD Combo Drive with Roxio's Easy CD Creator™
- 32MB DDR NVIDIA® GeForce2 Go™ AGP 4X Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 66WHr Li-Ion Battery with ExpressCharge™ Technology (8-Cell)
- Internal Modem and Network Card
- Windows® XP Home Edition; Works Suite 2002
- 6 Months America Online® Membership Included¹
- 1-Yr Limited Warranty;¹ 1-Yr Mail-In Service

$1979 Ask us about no payments for 90 days for well-qualified customers
E-VALUE Code: 13843-D81119n